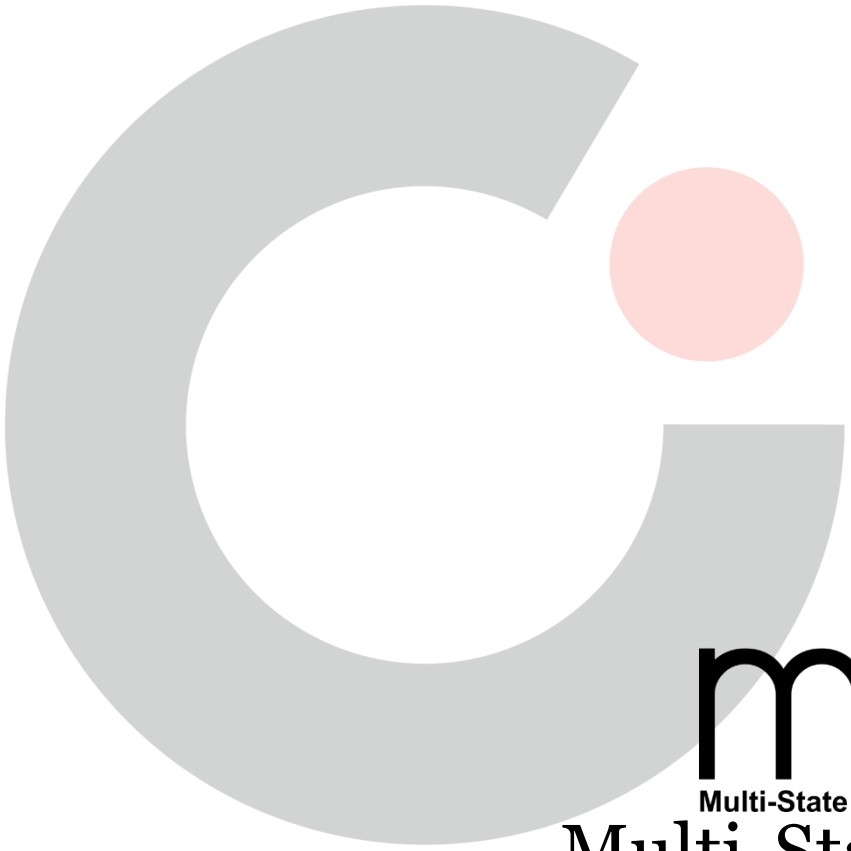

msaa
Multi-State Alternate Assessment

Multi-State Alternate Assessment

2019 Technical Report

10/17/19

Prepared by Cognia for MSAA

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TABLE OF CONTENTS

CHAPTER 1 OVERVIEW OF MSAA AND 2019 UPDATES

1.1 PURPOSES AND USES OF THE MSAA

The Multi-State Alternate Assessment (the MSAA)[1] is a comprehensive, two-stage adaptive, summative assessment system designed to promote increasingly higher academic outcomes for students with the most significant disabilities to prepare them for a broader array of post-secondary outcomes. The MSAA is designed to measure grade level academic content that is aligned with, and derived from, MSAA Partner States' content standards. This test contains many built-in supports that allow students to use materials they are most familiar with and communicate what they know and can do as independently as they are able. The MSAA is administered in the areas of English Language Arts (ELA) and mathematics in grades 3–8 and 11.

The MSAA Partner States' long-term goal is to ensure that students with the most significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school with the potential to pursue productive post-secondary options. A well-designed summative assessment alone is insufficient to achieve this goal. The MSAA is a component of a system of curriculum, instruction, and professional development that enables students with the most significant cognitive disabilities to access grade-level content aligned with grade-level state content standards.

The MSAA is an alternate assessment aligned with alternate academic achievement standards (AA-AAAS) as described in the Elementary and Secondary Education Act (ESEA). This law mandates that all students participate in assessments that measure student achievement of grade-level content standards. The MSAA was developed to ensure that all students with the most significant cognitive disabilities are able to participate in a summative assessment that is a measure of what they know and can do in relation to grade-level state content standards. In order to ensure that MSAA measures student achievement of the Core Content Connectors, this technical report provides the standard psychometric data and descriptions of technical procedures found in all state assessment technical reports. In addition, this MSAA technical report identifies four primary intended interpretations and uses of MSAA scores and cites the assumptions, elements, and evidence that are relevant to those interpretations and uses.

1.2 INTENDED MSAA SCORE INTERPRETATIONS AND USES

MSAA is designed, developed, and implemented to support four primary intended score interpretations and uses, described in the following sections.

[1] See Appendix A for a list of acronyms.

Primary Intended MSAA Score Interpretation

MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.

Primary Intended MSAA Score Uses

- Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers.
- Teachers use the MSAA and its results to better integrate assessment with their instructional planning.
- Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year.

The intended score interpretation and uses stated here align with the original statements of intended score interpretations and uses in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see the "claim" and "uses" statements on page 8).

Assumptions, elements, and evidence that support the intended interpretations and uses of MSAA scores are provided in Chapter 11.

1.3 Validity Arguments for the MSAA

The 2019 technical report describes several procedural and psychometric processes of the MSAA program. These processes contribute to the accumulation of validity evidence to support MSAA score interpretations and uses. Because the interpretations and uses of test scores, rather than the test itself, are evaluated for validity, this report presents documentation to substantiate intended interpretations and uses of test scores (AERA, APA, & NCME 2014). Each section in this report contributes important information about the MSAA: test design and development, test alignment, test administration, scoring, reliability, performance levels, and reporting. The information to support validity arguments for intended MSAA score interpretations and uses, summarized in chapter 11, are formed as assumptions and elements that underlie each interpretation and use and evidence that supports the assumptions and elements.

The phrase "intended score interpretations for uses" appears several times in the *Standards for Educational Psychological Testing* and is the core of the field's views on validity and validation. For the MSAA and other assessment programs, the phrase refers broadly to **test scores** (e.g., total test scale scores, aggregations of test scores, the percentage of students at or above Level 3), and other test performance information elements (e.g., the definition of Level 3 in the performance level descriptors). The *Standards for Educational and Psychological Testing* (AERA et al., 2014) also gives a framework for describing sources of evidence that should be considered when constructing a validity argument. These sources include evidence based on the following five areas: test content, response processes, internal structure, relationship to other variables, and consequences of testing. These sources address different aspects of supporting evidence for validity arguments; they are not distinct types of validity. Instead, each contributes to a body of evidence

about the comprehensive validity of score interpretations and uses and the four intended interpretations and uses. Moreover, these sources represent only a partial list of sources of evidence from the MSAA design, development, test administration, analysis, and reporting processes that are relevant to the overall validity arguments for intended interpretations and uses of MSAA scores and other information.

1.4 UPDATES FOR THE 2019 ADMINISTRATION

For the 2019 assessment, the MSAA Partner States comprise American Samoa, Arizona, Maine, Maryland, Montana, the Marianas (Guam and the Commonwealth of the Northern Mariana Islands), South Dakota, Tennessee, the U.S. Virgin Islands (USVI), and Washington, D.C.

New for the 2019 assessment, MSAA expanded the number and type of sample items available to teachers through the online assessment platform. In mathematics, a selected-response or constructed-response sample item was added at each grade. In ELA, new passage sets (including a passage and related items) and writing standalone items were added at grades 5, 8, and 11. Each grade or grade span has its own *Directions for Test Administration* (DTA) that corresponds with the items in the online system to emulate the student testing experience.

The 2019 assessment includes field-test items in both mathematics and ELA (reading and writing) with differing levels of complexity. In order to address some of the overlap in item difficulty across Tiers 2, 3, and 4, the MSAA Partner States adjusted the item design to consist of three levels. Items that were field tested in 2019 were written to three target levels, whereas the operational items in the 2019 test forms, and all previous year's items, were written to four target tiers. The writing prompts were already developed at only three tiers, and as such, were renamed to designate them as levels instead of tiers. The levels-to-tiers mapping is shown in table 1-1.

Table 1-1. Mapping of Tiers and Complexity Levels

Tier 4	Item complexity level 3
Tier 3	Item complexity level 2
Tier 2	
Tier 1	Item complexity level 1

The *Passage and Item Sloping Guidelines, ELA Level Guidelines, Mathematics Level Guidelines,* and item specifications for each grade and content were updated to reflect the three item complexity levels. A primary distinction among items written at item complexity levels 1-3 is (a) their connection to content standards, and (b) the scaffolded supports provided at each level.

- Complexity level 3 items target the Core Content Connectors, with minimal supports provided during item administration.
- Complexity level 2 items target Core Content Connectors, with content supports (e.g., graphics, examples, definitions) provided during item administration.

- Complexity level 1 items target Essential Understandings, with content supports (e.g., graphics, simplified language) and item supports (e.g., two response options provided during item administration.

Detailed information on the operational design, field-test items, and the development cycle is provided in Chapters 3 and 4.

Test documentation was updated to reflect changes in the *Test Administration Manual* (TAM), *MSAA Online Assessment System User Guide for Test Administrators*, *MSAA Online Assessment System User Guide for Test Coordinators*, *Directions for Test Administration* (DTA), and the *MSAA 2019 Guide for Score Report Interpretation Guide*. The TAM, *MSAA Online Assessment System User Guide for Test Administrators*, *MSAA Online Assessment System User Guide for Test Coordinators*, DTA, and online training modules were revised in order to streamline information and provide more clarity to test administrators (TAs) and test coordinators (TCs). Additional detailed information is available in Chapter 5.

CHAPTER 2 OVERVIEW OF THE MSAA

The MSAA assesses ELA and mathematics at grades 3–8 and 11 and is aligned with the States' Content Standards and the MSAA Core Content Connectors (CCCs). The MSAA is a computer-based, on-demand, two-stage adaptive assessment consisting primarily of selected-response items, along with some constructed-response items and open-response writing prompts. These item types are written at distinct levels of complexity, representing different levels of skill and knowledge acquisition by students.

Students with the most significant cognitive disabilities often need materials and instructional strategies that are substantially adapted and scaffolded providing built-in supports to meet their individual needs. When students begin to learn a new skill or acquire new knowledge, they need more support and scaffolding. As students learn and develop mastery of that skill or knowledge, they need less support.

The MSAA levels of complexity are designed to follow instructional practices. The test items are developed with many scaffolds and supports embedded within the items. Students are provided additional support based on their individual requirements, including other allowable ways for test administrators (TAs) to present each item.

The MSAA is designed to be administered one-on-one, delivered in an online format or via a paper-pencil/hybrid format as an accommodation if appropriate. The needs of the student are also addressed through other supports, such as assessment features built into the platform, accommodations such as using assistive technology, a scribe, and/or sign language. Appendix B contains the 2019 summary of accommodation usage frequencies for the MSAA. TAs have substantial leeway in developing a testing schedule, including the ability to start and stop a test depending on the engagement of the student.

Mathematics consists of 35 operational items, primarily selected-response with some constructed-response items. ELA consists of 38-41 operational items, consisting of selected-response items, along with a multiple-part, selected-response writing prompt and an open-response writing prompt at each grade level. Each content area assessment is accomplished in two test sessions. There are also embedded field-test items in Session 1 for each grade and content area.

2.1 HISTORY OF THE MSAA

Work leading up to the MSAA began in late 2010, when the National Center and State Collaborative (NCSC) began development of the NCSC Alternate Assessment, which was designed to meet the requirements of the Elementary and Secondary Education Act and the Individuals with Disabilities Education Act and is based on Alternate Achievement Standards (AA-AAS) for students with the most significant cognitive disabilities. This work culminated in the operationalized NCSC assessment in spring 2015. The work of NCSC ended following the spring 2015 administration. For additional information about the NCSC assessment, please refer to the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see "References" for URL) or contact the MSAA Partner States at MSAA@azed.gov. The

MSAA Partner States continued the work of NCSC following many of the same principles, purposes, and core beliefs. The first administration of MSAA was in the spring of 2016.

2.1.1 Core Beliefs

The core beliefs that underlie the MSAA began with NCSC and were laid out in the prior planning and development of the AA-AAS. As recorded in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*, states and organizational partners implementing the NCSC development plan found they needed to come to a consensus on topics that were a mix of practice and theory in the comprehensive context of teaching and learning. A blend of policy, educational, and technical solutions was required. Through policy discussions and in iterative research and design steps, the partners arrived at a shared philosophy and guiding principles that were reflected in the overall project resources. These project resources included a comprehensive system of curriculum, instruction, classroom assessment, and professional development as well as the operational assessment design.

The MSAA Partner States believe, as their NCSC counterparts did before them, that accessibility is central to the validity argument of the assessment, and that access to content based on college- and career-ready academic standards begins with rigorous curriculum, instruction resources, and training for teachers. The original design of NCSC curriculum and instruction resources was informed by extant research and iterative small studies to ensure inclusive accessibility and appropriately high expectations for learning. Then, the NCSC assessments were based on the same model of learning as reflected in classroom resources. Finally, the NCSC project provided resources for intervention in communicative competence to ensure that all students have a way first to learn the concepts, and then to show what they know and can do on the assessment. The NCSC Theory of Action and Validity Approach, available at ncscpartners.org/Media/Default/PDFs/Resources/NCSCBrief9.pdf, was developed to explain the basis for these resources, how they were intended to relate to one another and to college- and career-ready academic standards, and, ultimately, how they relate to the goal of having all students with the most significant cognitive disabilities leave high school ready to participate in college, careers, and their community.

Practice-focused summaries of the foundational components reflected in the design of the NCSC assessment, known as the NCSC Brief series, are available to orient readers to the larger context of the comprehensive NCSC system of curriculum, instruction, assessment, and professional development. The NCSC Brief series can be found in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see “References” for URL) or by contacting the MSAA Partner States at MSAA@azed.gov.

2.1.2 Stakeholders

Many stakeholders are involved in the development of the 2019 MSAA. MSAA State Leads are key representatives from each Partner State who together compose the decision-making body for MSAA. Members of this body participate in various subcommittees that focus on specific aspects of the assessment and have decision-making authority on behalf of the MSAA Partner States for each subcommittee’s focal

area. Table 2-1 illustrates 2019 state representation for each subcommittee, and is followed by a description of each subcommittee's area of responsibility.

Table 2-1. Subcommittee Representation

Subcommittee	State Representation
Item Development	Arizona, Maine, Maryland, Montana, The Marianas, and U.S. Virgin Islands
Manuals, User Guides, and Training	Arizona, Maryland, The Marianas, South Dakota, and Washington, D.C.
Psychometric and Test Construction	Arizona, Maine, Maryland, South Dakota, and Tennessee
Platform (currently inactive)	Arizona, Maine, Maryland, and Tennessee (most recent composition)
Scoring	Arizona, Maine, The Marianas, South Dakota, and Washington, D.C.
Reporting	Arizona, Maryland, and South Dakota.

The MSAA Item Development Subcommittee provides overall input and direction related to development of field-test items; reviews all item development tasks; participates in development planning, item and passage reviews, and post-IRC edits; reviews alternative text; participates in Accessible Portable Item Protocol (APIP) reviews, plus the computer-based and paper-based materials review; and provides direction on updates to the graphics and editorial style guides, teacher directions, and front matter for the *Directions for Test Administration* (DTA). In addition to the Item Development Subcommittee, stakeholders from schools and districts across the MSAA states participate in the field-test item development process during the passage content and bias meeting and the item content and bias meeting. Additional detailed information is available in Chapter 4.

The Manuals, User Guides, and Training Subcommittee oversees development of the *Test Administration Manual* (TAM), *MSAA Online Assessment System User Guide for Test Administrators, MSAA Online Assessment System User Guide for Coordinators*, online training modules, and best practice videos.

The Psychometric and Test Construction Subcommittee oversees planning Technical Advisory Committee (TAC) meetings, contributes to psychometric decisions, reviews item performance statistics for each field-tested item during Data Review, approves the test design, approves the test construction test blueprint, provides decisions and approvals related to the MSAA constructed sets (operational and field-test items), provides the content of the End-of-Test Survey, determines relevant policies, receives the survey results after administration, and advises on the structure of the technical report.

The Platform Subcommittee, though currently inactive, has determined development priorities for the online assessment platform used in the 2019 MSAA. This group also reviewed recommendations and

development pertaining to the security of the online platform and ultimately approved all changes made to the platform.

Members of the Scoring Subcommittee review and approve the scoring specifications and scorer training materials, and observe scoring processes, review daily scorer quality control and production management reports, and participate in daily debriefs during operational scoring.

Finally, the Reports Subcommittee is responsible for decisions pertaining to report revisions and design. This group also approves all changes made to the overall layout of the student results files and the final processing and reporting business requirements implemented for MSAA reporting.

2.2 MSAA PARTICIPATION

The criteria for student participation in the 2019 MSAA reflect the pervasive nature of a significant cognitive disability. Both the mathematics and ELA content areas are considered when determining who should participate in this assessment. Table 2-2 below shows the participation criteria and the descriptors used to determine eligibility for each student.

Table 2-2. Participation Criteria

Participation Criteria	Participation Criteria Descriptors
1. The student has a significant cognitive disability.	Review of student records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior.*
2. The student is learning content linked to grade-level content standards.	Goals and instruction listed in the IEP for this student are linked to the enrolled grade-level content standards and address knowledge and skills that are appropriate and challenging for this student.
3. The student requires extensive, direct, individualized instruction and substantial supports to achieve measurable gains in the grade- and age-appropriate curriculum.	The student (a) requires extensive, repeated, individualized instruction and support that is not of a temporary or transient nature, and (b) uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings.

*Adaptive behavior is defined as essential for someone to live independently and to function safely in daily life.

Appendix C shows the 2019 summary of participation rates for the MSAA for both mathematics and ELA by demographic category.

Assessments for students with the most significant cognitive disabilities rely on a foundation of communicative competence. Students who do not have receptive and expressive communication are unlikely

to be able to demonstrate what they know and can do on an assessment. Students who do not have an appropriate mode of communication are identified during the assessment process. Post-assessment, teachers have the opportunity to use the Communication Tool Kit developed by NCSC to help these students develop an appropriate mode of communication. The Tool Kit can be found here: https://wiki.ncscpartners.org/index.php/Communication_Tool_Kit.

CHAPTER 3 TEST CONTENT

3.1 History of Alternate Academic Achievement Standards and Core Content Connectors

Designed specifically for students with the most significant cognitive disabilities, the NCSC AA-AAS was a performance-based test that was aligned with grade-level state content standards for ELA and mathematics and tested student performance based on alternate academic achievement standards.

The NCSC state and Center partners, comprising content and special education experts, focused on defining the constructs of reading, writing, and mathematics to reflect an appropriate expectation of instruction and learning throughout a student's educational experience. Furthermore, the experts sought to make those constructs adaptable to the way in which students with the most significant cognitive disabilities demonstrate acquired knowledge and skills. NCSC established overarching content definitions by examining: (a) existing content definitions in general education; (b) the content, concepts, terminology, and tools of each domain; (c) a body of extant research; and (d) the Common Core State Standards (CCSS). These content definitions became central to the development of assessment items.

NCSC developers revised and refined the NCSC AA-AAS design using cycles of continuous feedback from state and Center partners. Developers evaluated proposed designs through iterative item and test development steps, special studies, and pilot testing, all of which were central to the final NCSC assessment model implemented through the first administration of the operational test in spring 2015.

Prior to the start of item development, the Core Content Connectors (CCCs) connecting the Learning Progression Frameworks (LPFs) to the CCSS were developed.

3.1.1 The Learning Progression Frameworks

The LPFs present a broad description of the essential content and general sequencing for student learning and skill development (Hess, 2010). The LPFs provide the educational logic to help move students with the most significant cognitive disabilities along with their peers, based on researched teaching and learning, toward mastering skills for college and career readiness. Experts at NCSC looked at these learning targets together with grade-level content expectations from the CCSS to identify and clarify the most salient grade-level core academic content to guide instruction and assessment from kindergarten through high school for students with the most significant cognitive disabilities. This core academic content is referred to as the CCCs.

3.1.2 Core Content Connectors

The CCCs were defined by NCSC as the academic content designed to frame the instruction and assessment of students with the most significant cognitive disabilities. This identified core content serves as a connection or stage between the LPFs (designed for typically developing students) and the CCSS (which

define grade-level content and achievement). The CCCs are intentionally dually aligned with both. The CCCs are designed to contribute to a fully aligned system of content, instruction, and assessment that focuses on the core content, knowledge, and skills needed at each grade to ensure success at the next grade level.

Each CCC represents a teachable and assessable part of the content. Related CCCs are addressed during instruction to create deeper understanding of grade-specific academic content. The CCCs are specifically intended to promote success as students advance alongside peers without disabilities from grade level to grade level. They are the starting point for instruction, not necessarily everything an individual student can and should learn.

The CCCs preserve the sequence of learning outlined in the LPFs, to the extent possible, while deconstructing the progress indicators (which describe concepts and skills along the learning continuum for each grade span in the learning progression) into smaller segments of content. The CCCs and corresponding *Curriculum Resource Guides* were developed to help explain and promote how students can engage in the CCSS while following the LPFs. To demonstrate the content sequence maintained by the CCCs, Table 3-1 shows a series of CCCs developed for multiple grades by NCSC for one big idea within the mathematics strand of geometry.

Table 3-1. CCCs Developed for Geometry Big Idea: Shapes and Figures—Their Attributes, Properties, and Corresponding Parts

Grades	Geometry Core Content Connectors			
Gr K-2	K.G.M1a1 Recognize two-dimensional shapes (e.g., circle, square, triangle, rectangle) regardless of orientation or size	K.GM.1a2 Recognize two-dimensional shapes in environment regardless of orientation or size	K.GM.1a3 Use spatial language (e.g., above, below) to describe two-dimensional shapes	2.GM.1a4 Identify two-dimensional shapes such as rhombus, pentagons, hexagons, ovals, equilateral, isosceles, and scalene triangles
Gr 3-4	3.GM.1h1 Identify shared attributes of shapes	4.GM.1h2 Classify two-dimensional shapes based on attributes (number of angles)		
Gr 5-6	5.GM.1a1 Recognize properties of simple plane figures	5.GM.1b1 Distinguish plane figures by their properties		
Gr 7-8	7.GM.1e Construct or draw plane figures using properties	8.GM.1g1 Recognize congruent and similar figures		
HS	H.GM.1e Make formal geometric constructions with a variety of tools and methods	H.GM.1b Use definitions to determine congruency and similarity of figures		

The CCCs reference the *Learning Progressions Frameworks Designed for Use with the Common Core State Standards in Mathematics K–12* (Hess, 2010). The letter/number in each box provides a cross-reference to the letter/number in the original learning progressions. For example, for *3.GM.1h1*, the *3* means third grade, the *GM* means geometry, the *1h* relates to the specific progress indicator in the original learning progression, and the *1* means that it is the first in a series of connectors.

Table 3-1 shows how learner understanding builds across years. For example, in the second column, the student recognizes shapes, then compares shapes based on attributes, then distinguishes plane figures by properties, then recognizes congruent/similar figures, and finally by high school can use definitions to determine congruency/similarity of figures. These skills all promote the big idea about shapes—their attributes, properties, and corresponding parts (Wakeman, Lee, & Browder, 2012).

3.2 Alignment and Linkages

Evidence that test content reflects the concepts that were meant to be measured is one of the critical sources of information necessary to support valid interpretations of test scores (AERA et al., 2014). *Alignment* refers to coherent connections within and across a system (Forte, 2013a, 2013b). Traditional alignment procedures describe the degree of intersection, overlap, or relationship among academic content embedded in state content standards, assessment, and instruction (Webb, 1997).

As part of the assessment development process, NCSC conducted a series of studies to answer several key questions related to the alignment of the assessment. These efforts were meant to ensure that students' scores can be interpreted as reflecting the knowledge and skills defined in the standards and claims (developed by NCSC, see *National Center and State Collaborative 2015 Operational Assessment Technical Manual*). The alignment questions were:

1. What is the degree of alignment between the CCCs and the grade-level CCSS?
2. What is the degree of alignment between instructional student learning expectations and measurement targets (expectations for assessed knowledge and skills)?
3. To what degree do the assessment tasks and items align to the grade-level CCSS?
4. To what degree do the assessment tasks and items align to the performance level descriptors (PLDs)?
5. How well do the claims align with grade-level content and provide useful information for tracking student progress toward achieving the knowledge and skills in the grade-level standards?

To address the five alignment questions, various studies were conducted between 2012 and 2015 at different points in the development process to ensure system coherence. The following table lists the studies, when each was conducted, and the alignment question being addressed.

Table 3-2. Studies Related to Evidence of System Coherence

Study	Conducted	Claim for Which Evidence Is Provided
Relationship Studies	Mathematics: Summer 2012; Reading: Winter 2013; Writing: Summer 2013	Evidence for Alignment Question #1. The content and skills in the CCCs represent an adequate and appropriate sample of the grade-level CCSS.
UMASS Study of Coherence	Fall 2013	Evidence for Alignment Question #2. The targets for measurement provide information useful for tracking student progress in the CCSS and to teachers for providing instruction focused on academic expectations.
Task/Item Alignment Study	Summer 2015	Evidence for Alignment Question #3. The content and skills assessed by the NCSC AA-AAS represent an adequate and appropriate sample of the grade-level CCSS.
Item Mapping Study	Summer 2015	Evidence for Alignment Question #4. The score reports are accurate and support appropriate inferences about student knowledge and skills.
Vertical Coherence Study	Summer 2015	Evidence for Alignment Question #5. The targets for measurement provide information useful for tracking student progress in the CCSS and for providing instruction focused on academic expectations.

MSAA has carefully and gradually evolved from NCSC, ensuring the alignment has been maintained while still allowing for adjustments. For example, the prioritized CCCs and reporting categories have remained the same for mathematics and for ELA (with the exception of one adjustment to the Reading Foundational CCC at grades 3 and 4) from those originally identified by NCSC. Section 3.4 provides detail on the contents and blueprints. The various alignment studies noted in Table 3-2 are applicable for the MSAA as the NCSC Theory of Action serves as the foundation for the MSAA program. MSAA has implemented test design adjustments that were outlined by NCSC during the original test design planning phase. One example of this is the implementation of the stage-adaptive test design. Section 3.3 below provides detailed information about the assessment design.

3.3 2019 MSAA Assessment Design

3.3.1 Operational Design

The operational MSAA is designed to produce valid and reliable mathematics and ELA scores. The mathematics and reading portions of the test are composed primarily of selected-response items. In mathematics, all grade levels also include constructed-response items. Writing is composed of selected-response stand-alone items, a multiple-part selected-response writing prompt, and an open-response writing prompt.

The operational items vary in complexity following the *Mathematics Tier Guidelines*, *ELA Tier Guidelines,* and *Passage and Item Sloping Guidelines,* where each tier at a given standard addresses both

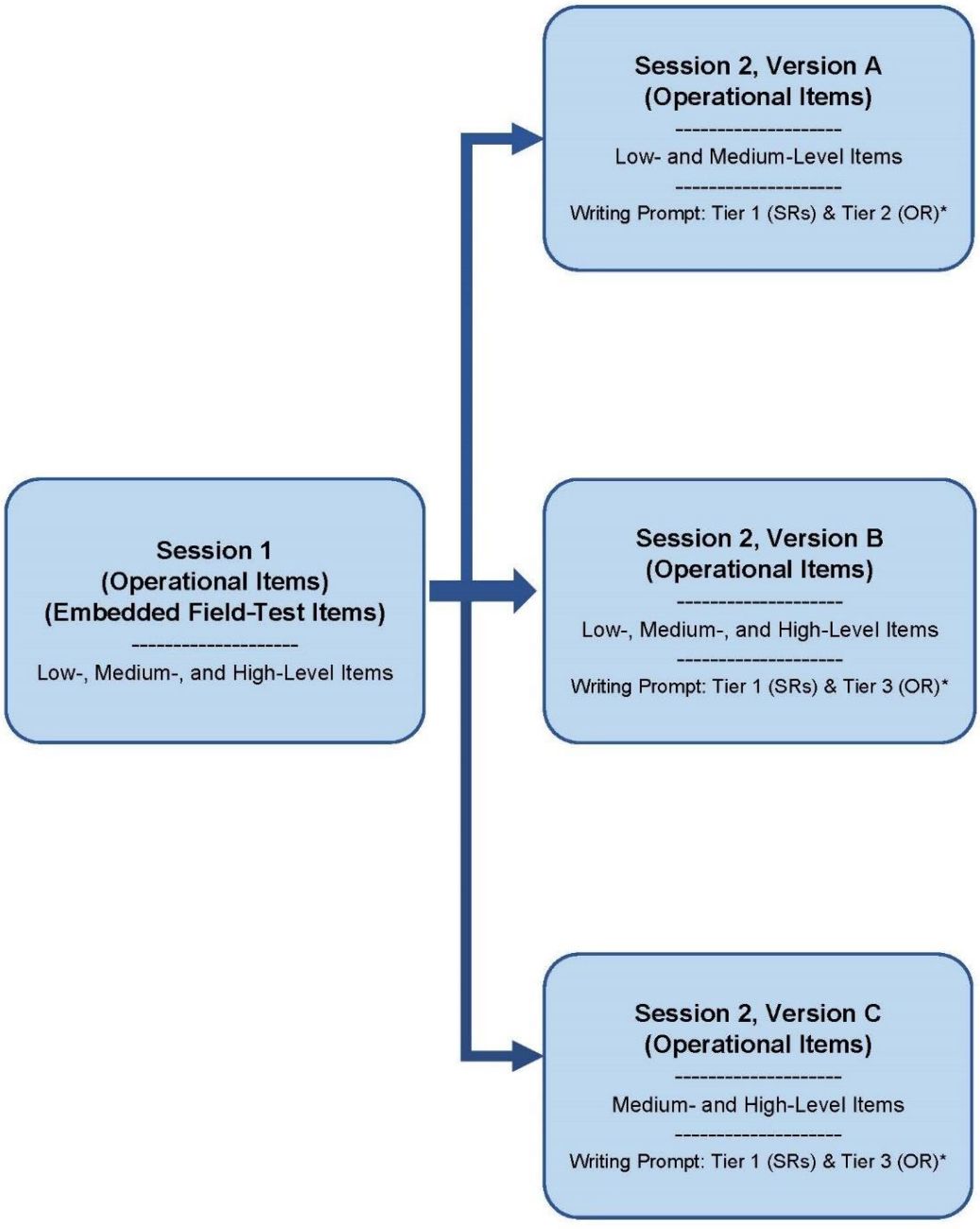
the content complexity and the degree of scaffolding and support provided with the items. The tiers provide four decreasingly complex versions (items) of the task referred to as Tier 4 (most complex), Tier 3 (less complex), Tier 2 (less complex than Tier 3), and Tier 1 (least complex). The writing prompts use three levels of items. Tier 1 is a multiple-part selected-response item series, where all items build on each other toward the creation of a final product. Tier 2 and Tier 3 are open-response writing prompts that vary in complexity based on the amount of support provided at each tier. Additional detailed information about item design and administration is provided in Section 3.3.3.

For the 2019 assessment, three two-stage adaptive forms were developed for both ELA and mathematics to accommodate the inclusion of field-test items within Session 1. The forms follow guidelines informed by the respective content-area test blueprints (test blueprints are discussed in Section 3.3.4). Each form contains 10 field-test items. The operational items are presented in two sessions. The Session 1 operational items are the same across all forms. Session 1 is considered Stage 1. Session 1 is taken by all students, while Session 2, which is considered Stage 2, is assigned to students based on how they perform on Session 1. There are three versions of Session 2, of varying difficulty, that may be assigned. Version C is intended to be slightly more complex and difficult than Version B, and Version B is intended to be slightly more complex and difficult than Version A. There are, thus, three possible paths for a student to take through the multistage test. All students take Stage 1, and, depending on how they perform on Stage 1, are assigned either 2A, 2B, or 2C.

In 2019 there is a moderate overlap of items in each version, but enough variation to ensure varying degrees of the desired separation of test information functions (TIFs) across the paths. The previous administration had a higher number of items that overlapped in each version; the goal was to reduce this number for 2019. For more information on TIF, see Chapter 9, and for more information on the measurement reliability stemming from these TIF values, see Chapter 10.

A Tier 1 writing prompt is included for Session 2A, 2B, and 2C. A Tier 2 writing prompt is included in Session 2A, and a Tier 3 writing prompt is included in Sessions 2B and 2C. Figure 3-1 illustrates the two-stage adaptive design with field-test items indicated in Session 1, along with the levels of items that were used in each session. The three paths (Session 1 plus Session 2A, Session 1 plus Session 2B, and Session 1 plus Session 2C) for the operational assessment exist for each of the three field-test forms.

Figure 3-1. Two-Stage Adaptive Design



*ELA Only, SR=Selected Response, OR=Open Response

3.3.2 Operational Items and Embedded Field-Test Items

As discussed earlier, there are three versions of Session 2. A number of items are the same across Sessions 2A, 2B, and 2C in Tier 2 and Tier 3.

As shown in Table 3-3, the ELA tests administer 39-42 operational items including two writing prompts, consisting of 18-21 Session 1 items and 20-21 Session 2 items. Each field-test form has 10 field-test items for a total of 30 across the three field-test forms. As discussed earlier, there are three versions of Session 2, which consist of 3 passage sets and 5-7 writing items. In Session 2 a total of 9-16 items overlap across Sessions 2A, 2B, and 2C depending on the grade. The items that overlap are not always the same ones across all 3 versions (i.e., one passage set may overlap across 2A and 2B, and a different passage set may overlap across 2B and 2C).

Table 3-3. ELA Operational and Embedded Field-Test Items

Grade	Total Operational Items Administered to Each Student	Writing Prompt Operational Items	Selected-Response Field-Test Items
			Total across three field-test forms
3	42	2	30
4	41	2	30
5	38	2	30
6	39	2	30
7	39	2	30
8	39	2	30
11	39	2	30

As shown in Table 3-4, the mathematics tests consist of 35 operational items across the testing sessions per grade, consisting of 15 Session 1 items and 20 Session 2 items. Each field-test form has 10 different field-test items for a total of 30 field-test items across the three field-test forms. As discussed earlier, Session 2A, 2B, and 2C each have 20 items. A subset of the items in Session 2A are common with items in Session 2B. There can be up to 10 items that are common between Session 2A and 2B. A subset of the items in Session 2C are common with items in Session 2B. There can be up to 10 items that are common between Session 2C and 2B. There are no common items between Session 2A and Session 2C.

Table 3-4. Mathematics Operational and Embedded Field-Test Items

Grade	Total Operational Items Administered to Each Student	*Field-Test Items*
		Total across three field-test forms
3	35	30
4	35	30
5	35	30
6	35	30
7	35	30
8	35	30
11	35	30

The 2019 field-test items are selected based on the following criteria:

- mathematics and ELA items represent a variety of item complexity levels (including the writing stand-alone component and a Level 1 writing prompt);
- ELA passage or writing topics are unique to the form and provide a variety of genres; and
- the passage and items are engaging, accurate, and free of regional bias.

The items on each of the forms are reviewed by psychometrics for any validity and reliability concerns. All constructed tests, as well as the field-test items, are posted on a secure FTP site for the Psychometric and Test Construction Subcommittee review and approval. A webinar is held with the MSAA subcommittee to explain the test construction process and to review the Test Construction Design document, which provides information specific to each content area about the items selected. The MSAA subcommittee then has an opportunity to provide input and final approval.

3.3.3 Item Design and Administration

The MSAA item design and administration is intended to capture student performance at different levels of skill and knowledge acquisition. The assessment items incorporate important aspects of item design related to both varying levels of content complexity and the degree and type of scaffolds and supports. The MSAA Partner States follow NCSC's intentional assessment development process to address the targeted grade-level academic content linked to evidence-based curricular and instructional materials.

The MSAA content development processes address levels of cognitive and language complexity, specifically addressing the States' Content Standards, and the heterogeneous characteristics of the target student population. The assessment items vary systematically in complexity yet remain aligned with the focal knowledge, skill, and ability (FKSA) behind the CCCs. The items are designed to capture student performance by varying two characteristics: (1) levels of content complexity, and (2) degrees and types of scaffolds and supports. The scaffolds and supports (e.g., reminders, examples, and models) are provided to focus the student on the task and elicit a response without guiding the student's response. As discussed in Section 3.3.1 ("Operational Design"), items are built as item families, where each tier within the family addresses both the content complexity and the degree of scaffolding and support provided with the items.

Overall Item Structure

A range of item levels are developed for each CCC, as described in Section 3.3.1. Each level provides variable features and supports that offer multiple entry points for a variety of students to demonstrate their knowledge and skill. All items assess grade-level academic concepts defined by either the FKSAs or the Essential Understandings (EUs). Operational items follow the tier guidelines and item specifications that were developed and implemented in the initial design phase of NCSC. As outlined in the tier guidelines, items of graduated complexity address the same FKSA but provide increased levels of support and/or decreased levels of complexity, and at the lowest tier address the EU which has the most decreased level of complexity, and also as part of the item, provide the greatest level of support. Additionally, the MSAA item specifications

are consistent with design patterns and task template guidelines that were originally developed by NCSC. The item types, as outlined in the MSAA item specifications, are selected-response, multiple-part selected-response, constructed-response, and open-response. Regardless of tier or item type, all items include teacher directives.

Mathematics and ELA (reading, language, and stand-alone writing) selected-response items are multiple-choice items where a student selects a response from three options (two options at Tier 1); the answer is worth 0 or 1 point. ELA multiple-part selected-response items are multiple-choice items that are clustered together and connected to a single CCC. For each item, the student selects a response from three options (two options at Tier 1); the answer is worth 0 or 1 point. The overall cluster could, then, be worth more than 1 point. There are two- and three-part items. A typical example of a multiple-part selected-response item would be an initial item in the cluster that asks the student to identify the main idea and then a second item that asks for a supporting detail. In contrast, the mathematics MSAA item specifications and tier guidelines require CCCs with multiple components to be addressed with unique items. For example, a CCC asking a student to identify and solve an equation might be evaluated using one item that requires the student to identify the correct equation for a word problem and a separate item that requires solving an equation.

Mathematics constructed-response items require the student to interact in some way with a set of materials to provide a response. These items are scored as correct or incorrect by the TA following the directions provided in the *Directions for Test Administration* (DTA). For example, students might construct a graph, solve a problem, or complete a table. These items are worth 0 or 1 point because the items ask the student to show whether a single concept is understood.

ELA reading foundational items (as field-test) focus on comprehension skills and are administered as selected-response items worth 0 or 1 point. Students are asked to read five words and select the most appropriate word to complete the sentence provided.

ELA writing prompt items require students to compose a permanent product about a specific topic, following the writing process. The Tier 1 writing prompt is a multiple-part selected-response item where the items build on each other toward the creation of a final product. For each item in the series, the student selects a response from two options, with the answer worth 0 or 1 point. Items may have four to six parts, depending on the grade.

Unlike Tier 1, the Tier 2 and Tier 3 writing prompts are open-response writing prompts that vary in complexity with the amount of support provided at each tier. The Tier 2 writing prompt provides a graphic organizer and a template with sentence starters that a student utilizes to create a product based on information he or she included in the graphic organizer. The Tier 3 writing prompt provides a graphic organizer and a template that does not have sentence starters; the student completes his or her product within the template based on information he or she included in the graphic organizer. For Tiers 2 and 3, the student response is evaluated against a grade- and tier-specific rubric. Open-response writing prompt items were developed for Tiers 2 and 3 only. As outlined in Chapter 1, the writing prompt items are operational in each grade for the 2019 MSAA. For reference, the specific writing rubrics are included as an appendix in the *MSAA 2019 Guide for Score Report Interpretation*.

Administration

For every grade level, the ELA and mathematics test require two test sessions. TAs begin with Session 1 of either the ELA test or the mathematics test. Descriptions of the test sessions are shown in Tables 3-5 and 3-6.

Table 3-5. ELA Test Sessions

Session 1: ELA	Session 2: ELA, includes Writing Prompts
Literary and informational reading passages and associated selected-response reading items	Literary and informational reading passages and associated selected-response reading items
Selected-response writing stand-alone items	One multiple-part selected-response writing prompt
Reading Foundational items field-test (grades 3 and 4 only)	One open-response writing prompt

Table 3-6. Mathematics Test Sessions

Session 1: Mathematics	Session 2: Mathematics
Selected-response mathematics items	Selected-response mathematics items
Constructed-response mathematics items	Constructed-response mathematics items

3.3.4 Item Components

3.3.4.1 *Selected-Response: Reading, Writing (stand-alone items and multiple-part, selected-response writing prompt), Mathematics*

All directions and materials needed for administering selected-response items are provided in the secure grade-, content- and form-specific DTA. Selected-response items are presented to students in a standardized and consistent format. Every item is presented in the following order:

- item stimulus (which may include a passage, passage part, picture, graphic, or other illustration);
- item question; and
- response options presented in vertical or horizontal formation depending on the size of the response options.

Students select a response from the options in a variety of ways (e.g., using the computer mouse, verbalizing, gesturing, using eye gaze or communication devices, using assistive technology). Students' responses are entered into the MSAA system. If a student has the scribe accommodation, the scribe enters the student-selected response on behalf of the student.

3.3.4.2 *Constructed-Response: Mathematics*

The secure grade-, content-, and form-specific DTA contains the directions as well as the materials and manipulatives needed by the TA to assess the student on the constructed-response items. The TA prints out the materials and manipulatives with which the student will interact. Each item is presented to the student in a standardized, scripted sequence of steps, culminating in the TA scoring the student performance using the required Mathematics Scoring Rubrics. The Mathematics Scoring Rubrics provide scoring standards that must be used in evaluating student responses. The constructed-response item is scored as correct or incorrect based on the Mathematics Scoring Rubric for that item. The TA enters the student constructed-response score into the MSAA system.

3.3.4.3 *Open-Response: Writing Prompt*

All open-response writing prompt directions and stimulus materials, including the response template, are included in the secure grade-, content-, and form-specific DTA. TAs print or prepare any writing stimulus materials that they would need to use for the test. The open-response writing prompt is presented to the student by the TA in a standardized, scripted sequence of steps.

The student, or a scribe, records the response to the writing prompt either on the response template in the online MSAA system or on the paper response template included in the DTA. If the student uses a paper version of the response template, the TA

- uploads the response template, including any annotations, into the MSAA system, or
- transcribes or types (exactly) the student's writing response, including any annotations, into the MSAA system.

If the student's writing response includes inventive spelling, hard-to-read penmanship, or use of symbols, TAs are directed to annotate the response so that it can be understood by a scorer.

3.4 CONTENT AND BLUEPRINTS

The test blueprints followed by MSAA are consistent with the original NCSC Theory of Action, the evidence-centered design undertaken to develop the summative assessment, and with best practices in educational measurement. Tables 3-7 and 3-8 show the broad targets developed to guide the item development process and to inform test construction. The tables provide general guidance for identifying areas of emphasis in the development of the mathematics and ELA tests. The test blueprints in Appendix D incorporate the overall content distributions used for the development of the operational tests. Each grade level/content area is represented by a table that first describes the domain (e.g., operations and algebraic thinking) or text type (e.g., reading informational text), weights by domain and ELA strands and text types, CCC, item types, and number of items. To continuously improve the assessment following each administration, the items statistics for each test in each grade and content area are revisited to balance both the content requirements of the blueprints and the psychometric characteristics of the items for the

subsequent administration. The core set of operational items on each two-stage adaptive test is established from this balanced approach.

3.4.1 English Language Arts

For the 2019 MSAA, the ELA items in reading and writing are aligned with prioritized CCCs, which are in turn connected to the CCSS and States' Content Standards, as well as to the LPFs. The distribution of ELA items related to various text types (e.g., literary, informational, and argument) aligns to the text type emphasis in reading and writing outlined in the CCSS and States' Content Standards.

For the 2019 MSAA, reading comprehension assessment items are presented as a single selected-response or multiple-part selected-response item as described in Section 3.3.3.

In grades 5–8 and 11, some prioritized content standards require evaluation of content across more than one passage. These skills are measured using paired passage sets. All paired passages are written in the informational text type. Tables in the test blueprints identify which CCCs require paired passages.

In grades 3 and 4, the reading foundational content category addresses the anchor standard of fluency. In 2019 reading foundational items are being used operationally as well as being field tested.

The three CCCs prioritized for writing at each grade level consist of one CCC operationally assessed by a multiple-part selected-response writing prompt and an open-response writing prompt, and two CCCs operationally assessed by selected-response writing stand-alone items. The selected-response writing stand-alone items are designed to assess discrete basic writing skills. The multiple-part selected-response writing prompt and the open-response writing prompt are designed to measure a student's ability to generate a permanent product to represent organized ideas specific to a writing mode, supported with details or facts to develop those ideas or clarify meaning, and the use of standard English conventions (for the open-response writing prompt only).

Table 3-7. Guidelines for Distribution of ELA Content by Grade Level

ELA Content Category	Gr 3	Gr 4	Gr 5	Gr 6	Gr 7	Gr 8	Gr 11
Reading Literary	29-38%	32%	34%	45%	28-38%	36%	33-36%
Reading Informational	22-31%	32%	39%	25%	21-31%	36%	26-28%
Reading Vocabulary and Foundational (G3 and G4)	17%	17%	5%	8%	11-13%	10%	8-13%
Writing	26%	20%	21%	23%	28%	26%	28%

3.4.2 Mathematics

Mathematics items are aligned with prioritized CCCs, which are in turn connected to the CCSS and States' Content Standards, as well as to the LPFs. Mathematical knowledge across the CCCs is assessed through selected-response items and constructed-response items. The need for constructed-response items is determined by the FKSA associated with a given CCC.

Table 3-8. Guidelines for Distribution of Mathematics Content by Grade Level

Mathematics Content Category	Gr 3	Gr 4	Gr 5	Gr 6	Gr 7	Gr 8	Gr 11
Operations and Algebraic Thinking	10-11	10-11	3-4				
Number and Operations Base Ten	7	3-4	14				
Number and Operations Fractions	7	10-11	7				
Measurement and Data	7	7	7				
Geometry	3-4	3-4	3-4	3-4	7	10-11	3-4
Ratio and Proportions				10-11	14		
Expressions and Equations				7	3-4	7	
The Number System				10-11	7	3-4	
Statistics and Probability				3-4	3-4	7	7
Functions						7	
Algebra and Functions							17-18
Number and Quantity							7
Total	**35**	**35**	**35**	**35**	**35**	**35**	**35**

In some cases, the selected FKSAs are best addressed by separating the skill into two parts, creating two unique items to fully address a single content standard. Tables in Appendix D identify which CCCs require two items.

In addition, there are items identified as not allowing the use of calculators. These items tend to be related to computation, where the construct being assessed would be masked using a calculator.

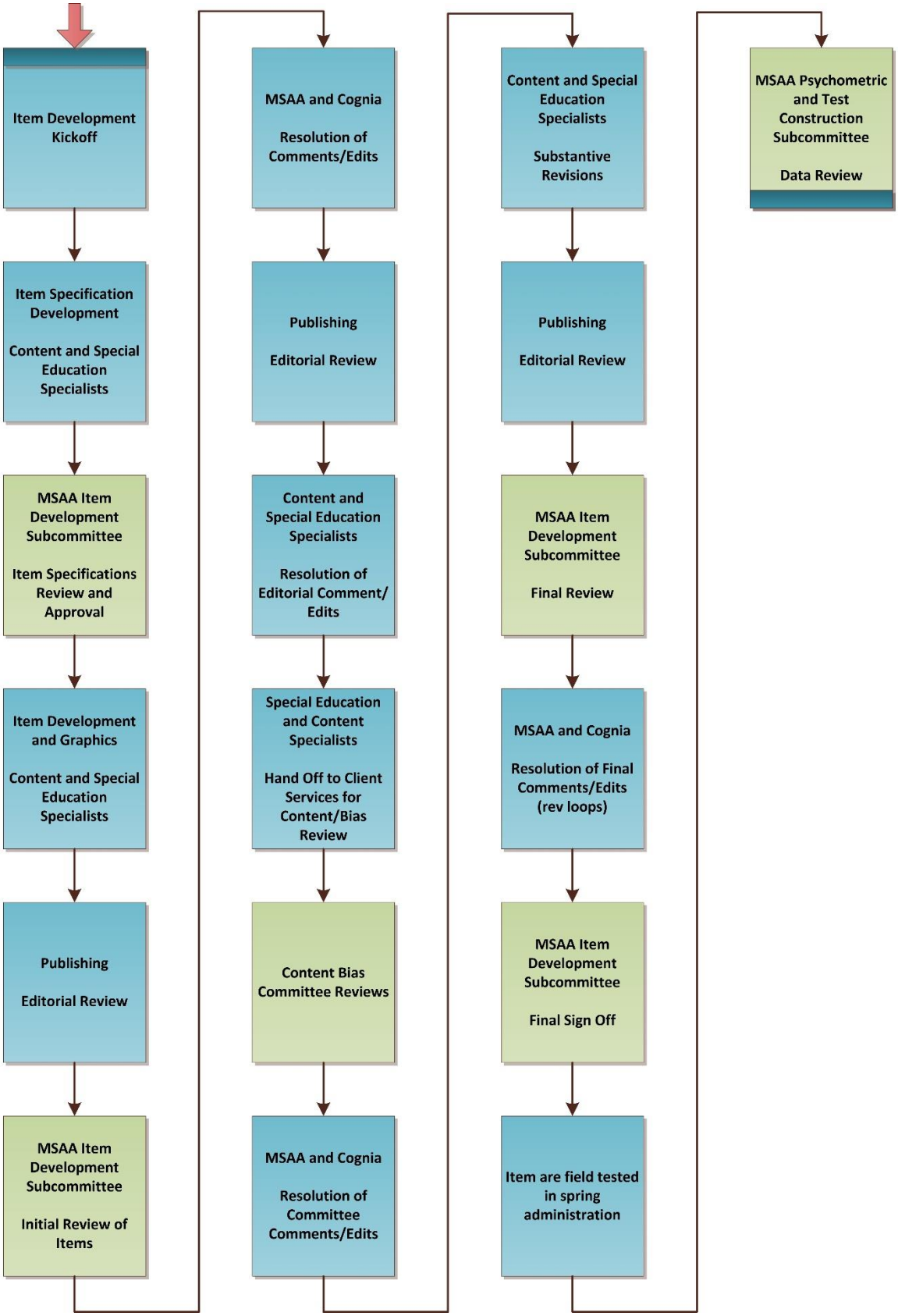
CHAPTER 4 TEST DEVELOPMENT

4.1 General Philosophy and Role of the Item Development and Psychometric Subcommittees and Other Stakeholders in Test Development

As discussed previously, the MSAA is a comprehensive assessment system designed to promote increasingly higher academic outcomes for students with the most significant cognitive disabilities in preparation for a broader array of post-secondary outcomes. The MSAA is designed to assess the academic content of the CCCs through an assessment design that consists of items written at various levels of complexity and provides built-in supports to meet the individual needs of the students. The two-stage adaptive assessment allows students to demonstrate what they know and can do. Given the wide diversity of the student population, great emphasis is placed on ensuring that the MSAA is appropriate and accessible to all students.

The MSAA items on the 2019 administration are from the previous NCSC 2015 administration, the 2016 MSAA administration, 2017 MSAA administration, and the 2018 MSAA administration. As described in Chapter 3, the items selected as field-test items are developed by MSAA. The item development process is an iterative one, which allows for multiple opportunities for review of the items by various stakeholders including MSAA State Leads, content experts and Partner State representative reviewers that are selected by MSAA State Leads, and external passage and item content and bias review participants. Items that are newly developed are field tested during the spring administration. Once they are field tested, the items undergo data analysis and then go through a data review process with MSAA State Leads. Figure 4-1 provides a flowchart outlining the item-development process.

Figure 4-1. Item Development Process



General and special education teachers, administrators and other education specialists are selected to review passages for content or bias and sensitivity before item development begins for the ELA assessment. The review committee convenes in the summer to review newly developed items for content or bias and sensitivity in ELA and Mathematics. Each ELA and mathematics content group reviews items for content-related considerations, such as alignment to the FKSA or EU, ratings of depth of knowledge, clarity of the item content, and consistency of teacher directions. Separate bias and sensitivity groups review the ELA and mathematics items for bias and sensitivity considerations, as well as accessibility considerations. The list of participants in the item content and bias review is included in Appendix E. The Item Development Subcommittee, which is made up of the MSAA State Leads, provides overall direction and guidance regarding field-test item development. This multistage development and review process provide ample opportunity to evaluate items for their accessibility, appropriateness, and adherence to the principles of Universal Design. In this way, accessibility serves as a primary area of consideration throughout the item development process. This focus on accessibility is critical in developing an assessment that allows for the widest range of student participation, as educators seek to provide access to the general education curriculum and foster higher expectations for students with the most significant cognitive disabilities.

The Psychometric Subcommittee participate in the data review meeting(s) and are responsible for making determinations about the future usage of the items based on the field-test statistics. During the data review meeting(s) with the Psychometric Subcommittee, Measured Progress (now Cognia) content specialists, accessibility specialists, and psychometricians review the Field Test Calibration Report, which includes item statistics for each field-test item that has been flagged by psychometrics. The statistical parameters that trigger an item being flagged are shared with the subcommittee. Referenced during data review are the IRT analyses summarized in the Field Test Calibration Report (see section 9.2 for field test calibration details) and DIF statistics. Data review attendees are also supplied with Asset Detail Reports, which provide the actual passage and item for each of the flagged items. This step allows for the content of the flagged items to be considered when determining future usage.

Flagged items are placed into categories. The items might be flagged only for Form 2A (Use only in forms 2B and 2C), flagged for 2A and 2B (Use only in form 2C), flagged for all three Do Not Use (DNU), or flagged as Use with Caution (UWC). The content of the item is reviewed along with the statistics. After each item is reviewed, the subcommittee members determine whether an item is accepted with the corresponding usage recommendation, rejected, or designated as revise and re-field test.

The items deemed eligible for usage are considered part of the operational item pool and may be selected during the test construction process. The items that are designated as rejected and designated as revise and re-field test do not become part of the operational pool.

CHAPTER 5 TRAINING AND ADMINISTRATION

5.1 TEST ADMINISTRATOR AND TEST COORDINATOR TRAINING

The MSAA Partner States adhere to the premise from the testing standards (AERA et al., 2014) that a key consideration in developing test administration procedures and manuals is that test administration should be fair to all examinees. When all TAs are utilizing the same well-defined administration procedures and the provided training, manuals, and supporting documents, administration is optimally standardized and poised to be fair to all examinees. Test Coordinators (TCs) are directly responsible for supporting TAs in understanding and following the administration procedures. Comprehensive TC training and materials targeted at their role and responsibility ensure that they are appropriately prepared to support the TAs.

As the MSAA is a computer-administered test, the administration procedures are consistent with the hardware and software requirements of the test specifications. MSAA requires completion of training by all TCs and TAs to support standardized test processes and procedures. MSAA provides ancillary testing materials each year outlining specific practices and policies including (a) the *Test Administration Manual* (TAM); (b) *MSAA Online Test Administration Training*; (c) *MSAA Online Assessment System User Guide for Test Administrators*; (d) *MSAA Online Assessment System User Guide for Test Coordinators*; and (e) grade-, content-, and form-specific Directions for Test Administration (DTA). The online training and the supporting documents are comprehensive and prescriptive, but also provide clear information on where and how much flexibility a TA has while administering the MSAA. TCs and TAs receive both the online training and the supporting documents to ensure fidelity of implementation and the validity of the assessment results as well as to help MSAA prevent, detect, and respond to irregularities in academic testing and maintain testing integrity practices for technology-based assessments.

5.2 TEST ADMINISTRATOR TRAINING MODULES

The online training modules for TAs are available prior to the beginning of the testing window and throughout the testing window. The training modules are customized to address the specific responsibilities of the TA and to provide important information from the three documents TAs are required to use the (1) TAM, (2) DTA, and (3) *MSAA Online Assessment System User Guide for Test Administrators*. These training modules are updated for the 2019 administration in correspondence with the updates to the required documents. There are six modules (see Table 5-1). Each module requires approximately 25 minutes to complete.

Table 5-1. Training Modules for Test Administrators

Module 1: MSAA Overview
Module 2: Test Design and Experience
Module 3: Navigating the MSAA Online Assessment System
Module 4: Completing the Student Information
Module 5: Accessibility Features and Accommodations
Module 6: Student Response Check and Early Stopping Rule

TAs are required to view the training modules (accessed through the MSAA system) in sequence and to successfully complete a final quiz after viewing all modules. Each module must be viewed before the link for the subsequent module becomes accessible.

Questions pertaining to information in the module follow each online training module for TAs. These questions are included as a review of the content to prepare TAs for the final quiz. TAs must obtain a score of 80% or higher on the final quiz to be certified to access the secure test administration materials. If TAs do not fulfill this certification requirement, they are not allowed access to the secure test materials. The TAs are notified within the MSAA system whether they pass the final quiz. TAs are allowed multiple attempts to obtain a score of 80% or higher on the final quiz.

In addition to the module training, TAs are instructed to become familiar with the online system by accessing sample items. In addition to the sample items, which were developed by content and measurement experts for teachers, administrators, and policymakers for the NCSC assessment, MSAA added sample items for the 2019 administration that are representative of current MSAA item development. The sample items do not address all assessed content at each grade level and are not representative of every item type. Rather, the sample items provide a preview of the array of items and illustrate multiple item features that allow students with a wide range of learner characteristics can interact with the assessment process.

5.3 TEST COORDINATOR TRAINING MODULES

Online modules specific to the role of TCs are made available both before and during the testing window. These training modules are customized to address the specific responsibilities of the TCs and to provide important information from the documents TCs are required to use: the (1) TAM and (2) *MSAA Online Assessment System User Guide for Test Coordinators*. Like the TA training modules, the TC training modules are updated based on the revisions made to the required documents. There are six modules; each of which run 20–25 minutes (see Table 5-2).

Table 5-2. Training Modules for Test Coordinators

Module 1: MSAA Overview
Module 2: Test Design and Experience
Module 3: Navigating the MSAA Online Assessment System
Module 4: Completing the Student Information
Module 5: Create Users and Orgs
Module 6: Student Response Check and Early Stopping Rule

TCs are required to view the online training modules (accessed through the MSAA system) in sequence. Each module must be viewed before the link to the subsequent module becomes accessible. There are quiz questions at the end of each module as a review of the content of that module. TCs are required to complete the online training but not required to take a final quiz.

5.4 Best Practice Videos

The Best Practice videos are accessed through the MSAA system and provide TAs with targeted information about the MSAA. Video 1 focuses on (1) reviewing assessment features that are available within the MSAA online system, (2) how to go to full screen mode and zoom within the browser, and (3) procedures to follow when using the hybrid approach to administration (i.e., both online and paper-pencil formats). Video 2 focuses on the purpose and steps of conducting the student response check (SRC) and on how to implement the early stopping rule (ESR). Videos 3 and 4 focus on administration of the open-response writing prompts. In each of these videos a mock student-TA interaction is used to provide TAs with a true picture of these administration processes.

Table 5-3. Best Practice Videos

Video 1: How to Administer an Item
Video 2: How to Administer the SRC and Implement the ESR
Video 3: How to Administer a Level 2 Writing Prompt
Video 4: How to Administer a Level 3 Writing Prompt

5.5 Test Administration Manual

The Test Administration Manual (TAM) provides an overview of, and the guidelines for, planning and managing the MSAA administration for district and school personnel. Additionally, the TAM defines the roles and responsibilities of the TA, TC, and State MSAA Coordinator, who are involved in and oversee the administration of MSAA. It is organized according to the following tasks:

- providing an overview of the MSAA and the required documents (i.e., TAM, DTA, MSAA *Online Assessment System User Guide for Test Administrators*, *MSAA Online Assessment System User Guide for Test Coordinators*),
- defining the roles and responsibilities of the TA and TC, as well as training requirements,
- describing the accessibility features for both online and paper administration as well as the allowable accommodations (i.e., assistive technology, paper version, scribe, sign language), and
- providing detailed information about how to maintain test security and what constitutes a test irregularity.

The TAM also contains appendices for scribe accommodation and sign language accommodation protocols, the procedures for annotations, and guidelines regarding the use of augmentative and alternative communication by students taking the MSAA. The TAM is accessible to TAs and TCs through the MSAA system and is made available prior to the beginning of the testing window, as well as throughout the testing window.

5.6 DIRECTIONS FOR TEST ADMINISTRATION (DTA)

The secure grade-, content-, and form-specific DTAs are required to be used by TAs when administering the MSAA. Each DTA is accessible through the MSAA system once a TA has been certified. The DTAs are required to be used by the TA for MSAA administration. The following elements are provided as part of each DTA (as applicable for a content area):

- Standardized directions and scripts that must be followed exactly as written for each item, including alternative text as appropriate;
- details about manipulatives required in order to administer a test item, such as calculators and counters;
- reference sheets that contain important graphics;
- scoring rubrics for mathematics constructed-response items;
- writing prompt scripts, graphic organizers, student response templates, and stimulus materials for all writing prompts in each grade-level ELA DTA;
- specific directions to administer the braille versions of ELA foundational reading items in grades 3 and 4.

While the TA has some flexibility in administration to ensure the MSAA is accessible to a student, the DTAs are designed to provide standardization to ensure a TA is not changing what is being measured.

5.7 Test Coordinator and Test Administrator User Guides

The *MSAA Online Assessment System User Guide for Test Coordinators* and *MSAA Online Assessment System User Guide for Test Administrators* provide technical information and troubleshooting tips, plus step-by-step instructions to navigate the MSAA system. Each user guide contains specific information relevant to the role of the TA and the TC. The user guides provide many efficient screen shots that demonstrate the functionality of the MSAA system. The user guides also contain appendices that describe accessibility features, assistive technology compatibility, and the MSAA system technology requirements.

As with the TAM, the user guides are accessible to TAs and TCs through the MSAA system and are available prior to the beginning of the testing window, as well as throughout the testing window.

5.8 Operational Administration

The administration window for the MSAA is March 18 - May 3, 2019. Both the ELA and mathematics are completed within the same administration window. Regardless of administration format (i.e., online or paper), the student assessments are submitted electronically by the TA on or before May 3, 2019. The MSAA is not a timed test. Testing time varies for each student, with testing paused and resumed based on a student's needs. If a student becomes sick or exhibits frustration, lack of engagement, or refusal to participate during the administration of the MSAA, TAs are directed to pause the testing and take a break, which can last for a few minutes or a few days, depending on the student's needs. The MSAA protocols allow the TA to pause and resume the administration of the test as often as necessary during the testing window, based on a student's needs.

Throughout the administration window, monitoring and quality control processes are ongoing, as part of the MSAA. Support is provided to TCs and TAs through the MSAA Service Center, additional supports built into the MSAA system functionality, and the MSAA State Partners. TA feedback is gathered through an end of administration test survey. Review of the service center logs and analysis of the test survey results informs MSAA State Partners about areas where clarification and further support is needed.

5.8.1 MSAA Service Center

To provide support to schools before, during, and after testing, Measured Progress (now Cognia) operates and provides tiered technical support through the MSAA Service Center. The MSAA Service Center is available for extended hours throughout registration and the testing window (from 7:00 a.m. to 8:00 p.m. EST, Monday through Friday) to accommodate the multiple time zones in which the test is administered.

The TAM directs TAs and TCs to contact the MSAA Service Center with questions pertaining to the MSAA system and test administration procedures. The MSAA Service Center's toll-free support number and e-mail address are disseminated to the field through the MSAA system and related communications.

Functionally, support is provided in a tiered manner where Tier 1 support involves direct support to the caller by MSAA Service Center representatives; Tier 2 support includes support by the program

management team for items such as policy questions, and Tier 3 support applies to technical requests, which are escalated to the technology vendor for attention.

All activity is tracked in the new MSAA Service Center ticketing system, ServiceNow, and is included in weekly status reports that are provided to MSAA State Leads. These reports summarize ticket activity, call analysis data (e.g., call duration, hold time), and per-grade/-content and per-state test status summaries throughout the administration window.

5.8.2 Additional Supports

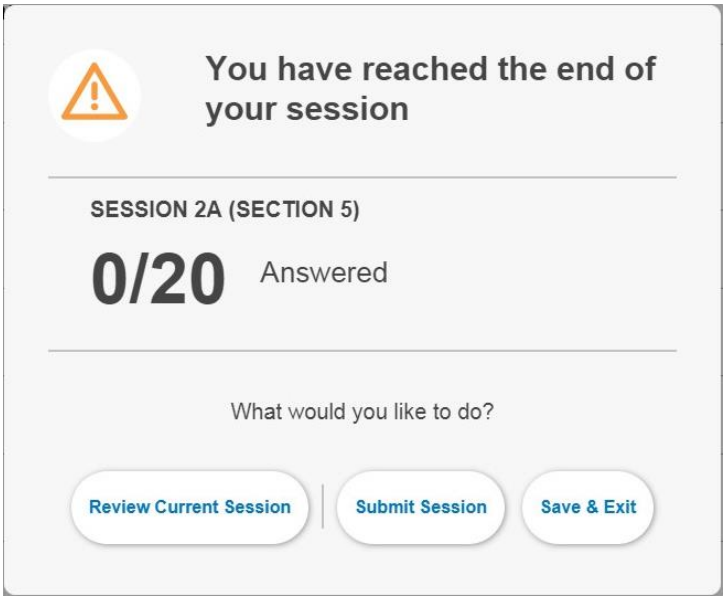
In addition to the MSAA Service Center, the Measured Progress (now Cognia) program management team periodically provides direct phone and e-mail support where logistical or procedural support is needed by MSAA State Leads. In cases with policy or consortium-wide implications, program management refers the State Lead to the MSAA Partner States and related policy documentation.

Furthermore, a banner messaging system in the MSAA system is implemented, as needed, to notify users of important information during the administration window. When the messaging system is activated, a banner message appears at the top of the screen upon login to notify users of system information and upcoming system activities, such as known issues and scheduled system maintenance, as well as upcoming test administration deadlines.

5.8.3 Monitoring and Quality Control

To ensure that proper testing procedures and appropriate test practices are maintained throughout administration, numerous measures are taken both to communicate participants' responsibilities and to monitor the appropriateness, accuracy, and completion of key procedures and tasks. The TAM outlines the procedure for reporting any violation or suspected violation of test security or confidentiality by notifying the school or district TC. TCs are then instructed to follow state procedures regarding reporting the issue or suspected issue; however, district TCs are informed that they must report to the State MSAA Coordinator any incidents involving alleged or suspected violations that are considered serious irregularities. The TAM further explains that the consequences for inappropriate test practices are determined by the individual state's professional codes of ethics and state law.

The online MSAA system contains built-in measures to ensure proper testing procedures, as seen in the session-based test design. When the TA clicks the *Next* button on the last question of a session, a prompt appears notifying the TA that he or she has reached the end of the session, displaying the number of answered items, and presenting options for the TA to proceed to the next phase of the test (either Session 2 or final submission of the completed test, as appropriate), return to the current session, or save and exit the test.



If the TA clicks the *Save & Exit* button, the test will resume the next time on the last item answered. If the TA clicks the *Submit Session* button, the session is submitted and cannot be re-opened, and the TA is permitted to continue to the next phase of the test. This prompt reduces the risk of users accidentally submitting a session without properly understanding the implications.

Throughout the administration window, Measured Progress (now Cognia) monitors activity and provides weekly updates to State Leads on the test statuses across MSAA Partner States and on trends identified in support calls. These updates provide a mechanism for concerns to be identified early and the appropriate measures to be taken, such as creation of assessment-wide or state-level materials and communications. This high level of communication and collaboration throughout the assessment process contributes to a proper and valid administration of MSAA.

5.8.4 Operational Test Survey Results

An End-of-Test Survey (EOTS) allows MSAA to gain knowledge from the experience of each TA administering the test. TAs are instructed to complete at least one EOTS after completing test administration for all of their students. The survey questions focus on several themes:

- technology use in the classroom,
- student behaviors and engagement, and
- instructional time spent on academic content.

The results of the EOTS highlight several areas of concern that the MSAA Partners had identified prior to reviewing the survey data. The data support continued work in the following areas:

- increasing student engagement,

- monitoring the available technology in classrooms to ensure the platform is up to date for compatibility,
- providing professional development to support effective instructional strategies.

The survey data also identify the effectiveness of several improvements implemented in the 2019 MSAA to correct issues identified in the 2018 administration. These include

- improving the online messages for submission of tests, and
- referring to best practice videos that address common administration questions.

One issue raised by the teachers in the EOTS data is a lack of continuity between instruction and assessment. The MSAA Partners focus on providing professional development to improve instructional practices and to clarify administration policies that increase student engagement by utilizing strategies that align with instruction and still allow for a standard administration.

Several questions on the survey address teachers' viewpoints and philosophies regarding teaching students with the most significant cognitive disabilities. The results again indicate the need for professional development that builds awareness and use of the available instructional and curricular materials, which illustrate various ways that students in this population have access to rigorous academic content.

The perception persists that the test is too difficult for some of the targeted population. To address this issue, the 2017 administration introduced a stage adaptive design. The MSAA Partner States continue work to ensure that future administrations' multistage tests increase differentiation while still maintaining the required match to the blueprint.

Furthermore, responses from TAs regarding the high level of difficulty of the test reveal that many students are not fully engaging with the assessment. Individual comments regarding engagement suggest the need for professional development in preparing students for testing. Professional development efforts should make use of the best-practice videos to highlight administration strategies.

The EOTS data also show that many students are using a variety of Augmentative and Alternative Communication (AAC) devices to access the test. In addition, most of the responses indicate that students use desktop computers, laptops, and tablets in the classroom with and without AAC devices and that devices and browsers are compatible with the test. However, some responses indicate that the students in these classrooms either do not utilize or have no access to electronic devices outside of testing. This valuable information can be used to gauge the impact of limited prior exposure to computers on student engagement with the online test.

CHAPTER 6 SCORING

6.1 SELECTED-RESPONSE AND CONSTRUCTED-RESPONSE ITEM SCORING PROCESSES

6.1.1 Overview of Scoring Process within the System and Test Administrator/Scorer Training

Overview of Scoring Process within the Assessment System

The MSAA system provides automated machine scoring for all item types, aside from the open-response writing prompt and mathematics constructed responses, which requires human scoring. The selected-response and constructed-response item types are described in detail in Chapter 3. The student may provide their responses to the items within the MSAA system. The system also allows for teacher entry of student responses for paper-based test delivery. The selected-response items are scored according to the answer keys provided in each test package. The mathematics constructed-response items are scored as a correct or incorrect student response, which is then entered by the TA. At the completion of the operational test, all test data is extracted from the system and is then compiled to generate full result sets for each student's tests.

All item responses are exported from the system and are provided to the Measured Progress (now Cognia) Information Technology Reporting (IT-Reporting) Department. The exported items go through a key verification check to confirm that the selected-response and constructed-response item keys were entered correctly. A key verification check is conducted by the data analyst. Any items that may be flagged are provided to the content specialists to conduct a blind key check. The content specialists review the actual item and mark the key in the flagged file. Any mismatches are researched by the content specialist, and updates are made following a problem item notice process to update and correct the key. In cases where no mismatches are found, the content specialist notifies the data analyst, and the file is released for final processing.

Items are scored in the MSAA testing system as correct or incorrect, with each of them contributing a score of 1 or 0 to the content-area raw score. Non-responses (blank responses) to any item are scored as 0 points. Detailed score assignments and the comprehensive data analysis requirements are provided in the *IT Reporting Processing and Reporting Business Requirements* document, which can be reviewed in Appendix F.

Test Administrator/Scorer Training and Support

All TAs must participate in training modules and pass a final quiz in order to be certified to administer the MSAA, as described in detail in Chapter 5. During the test administration, TAs use the grade, content, and form-specific DTAs to administer each item. When TA scoring is required, such as in the case of the

mathematics constructed-response items, the DTA includes the teacher scripting and directions related to any item setup and administration specifics, any templates required by the items, and the rubrics used to score the items.

The *MSAA Online Assessment System User Guide for Test Administrators* provides further direction to TAs on entering item responses in the MSAA. The guide outlines the use of the system, including how to enter student responses and submit each content-area test.

For support related to the administration, scoring, entry of student responses, and submission of student responses during the administration window, TAs can call or e-mail the MSAA Service Center with any questions.

6.2 Open-Response Writing Prompts Scoring Processes

6.2.1 Overview of Open-Response Writing Entry Process within the Assessment System and Test Administrator Training

Open-Response Writing Entry Process

As described in Chapter 1, the open-response writing prompts in grades 3–8 and 11 are being operationally administered in the 2019 MSAA. The open-response writing prompts are described in detail in Chapter 3. The student, or a qualified scribe, records the response on either the response template in the MSAA system or the paper response template included in the writing DTA. TAs can upload the student's final writing response template directly in the system, retype the student response within the item response field of the item, or upload the template and retype it within the item response field. The item responses (no matter how they are entered) are then extracted from the online system and provided to Measured Progress (now Cognia) for human scoring.

Test Administrator Training and Support

All TAs are required to participate in administration training modules and pass a final quiz to be certified to administer the MSAA assessment, as described in Chapter 5. The TA training includes review of the parameters for the administration of the open-response writing prompt, as well as entry of the student responses into the MSAA system. In addition, the best practice videos provide a student-TA representation that gives TAs a true picture of the processes involved in conducting the open-response writing prompt. During the test administration, TAs use the grade-, content-, and form-specific DTAs to administer each open-response writing prompt. The DTAs includes the teacher scripting and directions related to any item setup, administration specifics, and the materials for the open-response writing prompt.

The *MSAA System User Guide for Test Administrators* provides further direction on entry of student responses to the open-response writing prompt. Additionally, the MSAA Service Center provides support for TAs.

6.2.2 Benchmarking and Identification of Scoring Materials

The open-response writing prompts were benchmarked during the 2015, 2016, and 2017 field tests. Measured Progress (now Cognia) scoring experts (Scoring Supervisors and Scoring Team Leaders [STLs], defined below) worked collaboratively with NCSC representatives in 2015 and with MSAA representatives from the Scoring Subcommittee in 2016 and 2017 to review student responses, assign a score based on the MSAA grade and tier specific rubrics for each trait (i.e., organization, idea development, conventions), and identify item-specific writing anchors and practice sets.

The final scores for the anchor and practice sets were recorded, and representatives from NCSC (2015) and the MSAA Scoring Subcommittee (2016 and 2017) acknowledged their consensus on the signoff document for each prompt. Also, development of a scoring decisions document began in 2017. It was reviewed by the MSAA Scoring Subcommittee, which provided rationale and decision points to be used during scoring by the Scoring Supervisors and STLs.

Following the identification of the anchor sets, two qualification sets were identified for each prompt. Each qualification set consisted of 10 responses; scores were based on anchor responses and scoring decisions made during the benchmarking meetings. The MSAA Scoring Subcommittee reviewed and approved the scores and responses used for qualification sets.

6.2.3 Scorer Recruitment and Qualifications

The MSAA scorers are a diverse group of individuals with a broad range of backgrounds, including teachers, business professionals, graduate students, and retired educators. They are primarily obtained through Kelly Services, a temporary employment agency. All selected scorers hold the minimum of a four-year college degree that included ELA or writing coursework. 100% of the leadership and 84% of the scorer group assigned to the MSAA have previous experience in scoring alternate assessments, and 42% have scored previous MSAA administrations. All scorers sign a nondisclosure/confidentiality agreement.

Table 6-1 summarizes the qualifications of the 2019 MSAA scoring leadership and scorers.

Table 6-1. Qualifications of Scoring Leadership and Scorers

Scoring Responsibility	Educational Credentials			
	Doctorate	*Master's*	*Bachelor's*	*Number*
Scoring Leadership[1]	0%	14%	86%	7
Scorers	3%	28%	69%	29

[1] Scoring Leadership = Scoring Supervisors and Scoring Team Leaders

6.2.4 Measured Progress (now Cognia) Staff and Scoring Leadership

The MSAA operational open-response writing prompts were scored in Dover, New Hampshire, between May 6 and May 24, 2019. The following staff members participated:

- Director, Scoring Operations: Primarily responsible for coordinating scheduling, budgeting, and logistics of all Scoring Centers. In addition, the Director for Scoring Operations coordinates the scoring of special education contracts, has overall responsibility for MSAA scoring-related activities, and serves as the Scoring Services Project Manager for MSAA.
- ELA Group Manager for Scoring: Responsible for managing scoring-related activities and monitoring reports, as well as leadership and training of scorers to ensure overall consistency of scoring.
- Scoring Content Specialist: Responsible for overseeing scoring activities across grades and monitoring accuracy and productivity across groups.
- Accessibility Assessment Specialist: Responsible for overseeing scoring activities and acting as the accessibility lead in coordination with the Measured Progress (now Cognia) scoring staff.
- *iScore* Operations Manager: Responsible for setup and maintenance of *iScore* scoring system and for coordinating technical communication.
- Scoring Supervisor: Responsible for selecting calibration responses, training STLs and scorers, resolving arbitrations, and monitoring the consistency of scoring for items in assigned grades. Scoring Supervisors may also participate in benchmarking and identifying qualification sets prior to the onset of scoring.
- Scoring Team Leader (STL): Responsible for performing quality-control measures, resolving arbitrations, and monitoring the accuracy of a small group of scorers, usually consisting of not more than six. STLs may also participate in benchmarking and identifying qualification sets prior to the onset of scoring.

6.2.5 Training

Scoring Content Specialists and Scoring Supervisors assigned to train the STLs and scorers thoroughly review the decisions and materials that result from the benchmarking meetings in preparation for training. One Scoring Supervisor is assigned to each tier's writing prompts across grades. The Scoring Content Specialists and Scoring Supervisors are responsible for creating prerecorded training modules for use in training. 2019 leadership training took place on May 1st through May 6th. STLs are required to meet or exceed the accuracy standard of 80% exact agreement on all items and at least 90% exact/adjacent[2] agreement on each trait. This requirement is applied to each of the three writing traits[3] individually across qualification sets 1 and 2. The STLs are also present during scorer training, which further reinforces their understanding of the rubrics and training materials.

Scoring Content Specialists and Scoring Supervisors conduct training on each open-response writing prompt before scorers are allowed access to student responses. Scorers are divided into two groups. One group focuses on Level 2 items and the other on Level 3 items. Training sessions for scorers are facilitated by the Scoring Content Specialists and a Scoring Supervisor and are conducted in the following manner:

[2] "Adjacent agreement" means that the two scores differed by only one score point.
3 The three writing traits are organization, idea development, and conventions. See rubrics embedded in Appendix G.

- Training commences with an introduction to scoring and an overview to explain the purpose and goal of the testing program and any unique features of the test and/or testing population.
- A general discussion addresses the security, confidentiality, and proprietary nature of testing, scoring materials, and procedures.
- Initial item training consists of a pre-recorded module that focuses on:
    - The three traits of the MSAA analytic rubrics for writing and how the scoring for each trait are applied to student work. (See "Writing Scoring Rubrics," an appendix to the *MSAA 2019 Guide for Score Report Interpretation,* provided in Appendix G of this report.)
    - Pertinent information on the testing instructions and item stimuli.
    - Actual responses with an item-specific anchor set, averaging 10 responses representing a range of scores across traits.
    - Anchor exemplars (presented in a predetermined order) that consist of responses that are typical, rather than unusual or uncommon; solid, rather than controversial or borderline; and true.
    - The anchor response score and the scoring rationale, allowing scorers to internalize typical characteristics of each score point.
- Scorers are instructed to refer to the anchor set frequently during scoring.
- After completing the module, training continues with the Scoring Content Specialist and/or the Scoring Supervisor presenting the supplementary training materials practice responses representing all score points across traits, when possible, and often containing responses that are more unusual and/or less solid (e.g., are shorter than normal, employ atypical approaches, or contain both very low and very high attributes). None of the practice papers contain responses that would require identification as nonscorable responses.
- During the review of practice responses, the trainer(s) often focus on the distinction between adjacent score points or clarification of other scoring issues that are traditionally difficult for scorers to internalize.
- After scorers independently read and score each practice response, the trainer(s) discusses the actual score and explains the rationale.
- A question and answer segment address any remaining questions from scorers and provides clarification prior to the qualification process.

6.2.6 Qualification

Following the training for each prompt, scorers are required to complete a qualification set to determine eligibility to score student work. There are two qualification sets in each grade and tier consisting of

10 responses each. The responses, which represent a range of score points, are randomly distributed to scorers through *iScore*.

Scorers have two opportunities to qualify. If scorers attain a score match of at least 80% exact and 90% exact/adjacent agreement on all traits for the first qualification set, they are considered a "qualified scorer" and permitted to score live student responses. If they do not attain the required percentages, the Scoring Supervisor conducts a retraining. Following this retraining, scorers are assigned qualification set 2. Since scorers qualify at the trait level, a scorer who qualifies on the first and third trait in qualification set 1, for example, receives the retraining referenced above. However, this scorer would only be required to qualify on trait 2 in qualification set 2. When the data indicates that a qualified scorer has demonstrated a weakness in a particular trait, that qualified scorer receives additional training prior to the start of scoring.

Scorers who fail to achieve the minimum levels of agreement are not allowed to score. When scorers demonstrate a level of understanding and the ability to apply feedback during the training and qualification process on a certain writing prompt, Scoring Leadership may choose to include the scorer in future trainings on a different writing prompt.

Typically, once the first open-response writing prompt for a grade and tier is completely scored, the training process is repeated for the next prompt. This process continues until all 14 open-response writing prompts are scored. However, for this administration, student responses were delivered to Scoring in two batches to allow Measured Progress (now Cognia) to include the operational writing results for all students. The first batch consisted of approximately 40% of all student responses, and the second batch contained the remaining student responses. All items were delivered during the first batch and scorers retrained and recalibrated before scoring the second batch. (See Section 6.2.12.1.) Qualification statistics are located in Appendix H.

6.2.7 Methodology for Scoring Operational Open-Response Writing Prompts

Student responses to the open-response writing prompts and any uploaded material are exported from the platform and imported to the Measured Progress (now Cognia) *iScore* scoring system. Through *iScore*, qualified scorers read and evaluate student responses, submitting scores electronically. The processes by which images are logged in, scanned, and uploaded into *iScore* provides anonymity to individual students and ensures random distribution of all responses during scoring.

All student responses are scored from uploaded evidence and/or computer-generated text, defined as student work directly entered into the MSAA system. For Tier 2 prompts, when both uploaded and computer-generated text is available, the uploaded evidence is scored first, and the computer-generated text is used for clarification and confirmation of the uploaded student writing evidence. When there is only uploaded writing evidence but no computer-generated text to provide clarification and confirmation, the uploaded writing evidence is scored. When there is only computer-generated text but no uploaded writing evidence, the computer-generated text is scored. For Tier 3 prompts, the computer-generated text and the uploaded evidence serve to provide a holistic demonstration of student ability and are considered together when both are available. When only one portion is available, the prompt is scored like a Tier 2 prompt.

The following processes are in place during the scoring of the MSAA operational open-response writing prompts:

- The *iScore* system forces scorers to review all available pages before allowing a score to be submitted.
- All scoring is "blind." Only booklet numbers within *iScore* are linked to student responses; no student names are visible to scorers unless a name appears on material uploaded by the TA.
- Measured Progress (now Cognia) maintains security during scoring by using a highly secure server-to-server interface to ensure that access to all student response images is limited to those who are scoring or working for Measured Progress (now Cognia) in a scoring management capacity.
- During scoring, *iScore* enables a constant measuring and monitoring of scorers for scoring accuracy and consistency. Each scorer's reading rate and total number of scored responses are also monitored.
- Scorers are required to maintain an acceptable scoring accuracy rate (80% exact/90% exact/adjacent agreement) on a daily basis as measured through read-behinds, double-blinds, and daily calibration sets. (These measures are described below.)
- Scorers who repeatedly fall below standard are retrained or dismissed from scoring that item.
- Scoring rules are in place to determine the final score of record, or when a final score is to be provided by Scoring Leadership. (For examples of scoring resolutions, see Tables 6-6 through 6-8.)

Table 6-3 represents the total number of student responses scored by writing prompt in each grade.

Table 6-3. Student Responses per Grade

Grade	Number of Student Responses		
	WRCC002	*WRCC003*	*Total*
3	1,164	1,573	2,737
4	1,456	1,449	2,905
5	1,213	1,915	3,128
6	1,017	2,147	3,164
7	1,413	1,906	3,319
8	1,448	1,896	3,344
11	891	2,103	2,994

Note: For identification purposes in *iScore*, Tier 2 prompts were designated as WRCC002 across all grades, and Tier 3 prompts were designated WRCC003.

Scoring Rules

All open-response writing prompts are scored against a three-trait rubric (see rubrics in Appendix G). The scoring scale options of 0, 1, 2, and 3 are applied to each trait. (Note: for determining a student's total raw score to be transformed to a scaled score, the score categories of "1" and "2" were combined to be converted to a "1", and score category "3" was converted to a "2". These converted trait scores were the

scores used in the psychometric analyses.) When a response does not conform to score point parameters, scorers can designate the response as one of the following:

- **Blank:** There is no attempt to respond to the item; no uploaded material is provided, and no response has been typed.
- **Unreadable:** The text on the scorer's computer screen is indecipherable or too faint to read accurately.
- **Non-English:** The response is written in a language other than English.
- **Repeats the Prompt:** The response is a direct copy of the prompt without any original text.
- **No Score:** The response requires clarification or adjudication by Scoring Leadership; scorers can assign this designation only with approval from Scoring Leadership.

Table 6-4 displays the resolution process for each of the responses described above.

Table 6-4. Scoring Resolution Process

Designation	Resolution Process
Blank	Responses scored Blank are sent to another scorer for a second read. Responses scored Blank twice are converted to zeros ("0") for reporting purposes. Any discrepancies are resolved by the Scoring Leadership.
Unreadable	Responses judged unreadable are forwarded to a special queue within *iScore* to be reviewed by a Scoring Supervisor, who resolves the student score. (If the response remains unreadable after review, the Scoring Supervisor assigns a score of "0.")
Non-English	Responses written in a language other than English are marked Non-English and are converted to zeros ("0") for reporting purposes.
No Score	Responses that require additional clarification or adjudication are escalated to Scoring Leadership for response appraisal and scoring. This designation includes responses where more than one student's work appears to have been uploaded to the response. Responses where the uploaded evidence is a mismatch to the typed response are escalated to Scoring Leadership for response appraisal and scoring. Responses that legitimately respond to another item are escalated for review by Scoring Leadership. Any student response indicating administrative inconsistencies, potential cheating, and/or security lapses before, during, or after the test administration is scored based on its merits and then forwarded for review. If further attention is warranted, the State Services team notify the appropriate MSAA partner state. Responses that are determined to be nonscorable are resolved by the Measured Progress (now Cognia) leadership team in consultation with the MSAA Scoring Subcommittee, if necessary.

Scorers also have the option of flagging a response as an "Alert" requiring immediate review and possible immediate action by Scoring Leadership and a MSAA Partner State. "Alert" responses can include, but are not limited to, those that suggest one or more of the following problems:

- thoughts of suicide;

- criminal activity;
- alcohol or drug use;
- extreme depression;
- violence;
- rape, sexual or physical abuse;
- self-harm or intent to harm others; and/or
- neglect.

Scoring flagged a total of twenty-three responses as "Alert" during the scoring process and were forwarded to the appropriate Partner State representatives. See Table 6-5.

Table 6-5. Responses Flagged with "Alert"

MSAA Partner State	Number of "Alert" Responses Flagged
Arizona	2
Maryland	5
Tennessee	4

Note: No responses were flagged "Alert" from any other State Partners

6.2.8 Monitoring of Scoring Quality Control

Scorers are continuously monitored to ensure that scoring is accurate and consistent. Throughout the scoring process, read-behind scoring, double-blind scoring, and calibration sets are used as quality-control measures. MSAA Scoring Subcommittee representatives, along with the Measured Progress (now Cognia) Accessibility and Scoring teams, monitor reports daily. Read-behind and double-blind statistics are reviewed daily. Calibration sets are administered and reviewed repeatedly during the course of the project. Scoring Leadership and Content Specialists from the Scoring Services and Content Development – Accessibility departments at Measured Progress (now Cognia) pay close attention to the disaggregated read-behind, double-blind, and calibration statistics.

Scorers in need of additional clarification on applying scores to specific traits are coached by Scoring Leadership. This continuous training allows Scoring Leadership an opportunity to resolve issues, reiterate scoring guidelines, and establish parameters for atypical student responses. Scorers who demonstrate inaccurate or inconsistent scoring are retrained and allowed to resume scoring under increased supervision. Scoring Leadership removes scorers who continue to fall below accuracy standards. On any day that a scorer falls below accuracy standards, the work is voided and rescored by other qualified scorers. During MSAA scoring, the work of twenty scorers and one STL was voided. All voids occurred in Level 3. This happened five times in grade 3, 7 times in grade 4, twice in grade 5, ten times in grade 6, four times in grade 7 and one time each in grade 8 and grade 11. The voids in grade 7 were the result of the STL falling below the quality standard and as a result, all work completed by that STL and the scorers the STL was monitoring was voided.

6.2.8.1 *Calibration Sets*

To determine whether scorers are still calibrating to the scoring standard, they are required to complete a trio of online calibration sets at the start of each day, beginning with the second day of scoring. Scoring Leadership selects the responses for the sets, with each calibration set consisting of five responses representing a range of scores. Scorers who assign at least 12 out of 15 scores exactly can then begin scoring for the day. Scorers who fail to meet that standard are retrained by discussing the calibration responses in terms of the rubric and the anchor set. Scoring Leadership determines if these retrained scorers should be allowed to begin scoring, though if they are, these scorers continue to be closely monitored. Over the course of scoring, only 21 scorers (across all seven grades and 14 items), required retraining. In most cases, scorers who received retraining successfully returned to scoring or, as mentioned previously, and had their work voided for that day.

6.2.8.2 *Read-Behind Scoring*

Read-behinds provide a crucial tool in verifying scorer accuracy. The STLs complete read-behinds on individual scorers on a daily basis. An STL's evaluation of each response is performed with no knowledge of the scores assigned across traits. The scores are only available to the STLs after they have also scored the response. If there is a difference in scores, either adjacent (one score point difference) or discrepant (more than one score point difference), the STL score is the score of record. If the scores are discrepant, or if there are a significant number of adjacent scores between the scorer and the STL, the STL discusses the rationale with the scorer.

The average number of read-behinds for each scorer is 5–10 reads a day, but this number varies depending on the accuracy of each scorer. Read-behinds provide an immediate means of identifying scorers in need of further clarification on how to effectively apply the scoring rubrics to student responses. If scorers fall consistently below the 80% exact and 90% exact/adjacent threshold, Scoring Leadership has the prerogative to void their scores for the day and/or stop them from scoring that item. Scoring Leadership monitors scoring accuracy and consistency by reviewing the read-behinds performed by the STLs as well as completing read-behinds on the STLs whenever possible.

6.2.8.3 *Double-Blind Scoring*

While read-behinds measure scorer accuracy in relationship to STL scores, double-blind scoring provides statistics on scorer-to-scorer agreement. Double-blind scoring is the practice of having two scorers independently score a response, without knowing either the identity of the other scorer or the score the other scorer assigned. In double-blind scoring, neither scorer knows which response will be (or already has been) scored by another randomly selected scorer. All responses for MSAA are 100% double-blind scored.

In addition to monitoring inter-rater agreement rates, double-blind scoring allows Scoring Leadership to resolve arbitrations when two scorers' double-blind scores do not agree across any of the three traits. If there is not exact agreement, *iScore* automatically places the response into an arbitration queue. Scoring Leadership, with no prior knowledge of the scores assigned, evaluates the response, with theleadership score

becoming the score of record. The double-blind statistics provide an overview of agreement rate among the entire pool of scorers and assists in identifying any need of retraining.

Final Score Resolution

Scoring Leadership provides resolution scores for responses that do not have exact agreement on all traits after read-behind or double-blind scoring. Tables 6-6, 6-7, and 6-8 provide examples of how the final score of record may be determined through resolutions.

Table 6-6. Examples of Scoring Resolutions: Read-Behind Scoring [1] (Trait 1-Trait 2-Trait 3)

Scorer Score	Leadership Score	Score
3-3-3	3-3-3	3-3-3
3-2-2	3-3-3	3-3-3
3-3-3	2-2-2	2-2-2

[1] In these cases, the leadership score overrides the scorer score.

Table 6-7. Examples of Scoring Resolutions: Double-Blind Scoring[1] (Trait 1-Trait 2-Trait 3)

Scorer #1	Scorer #2	Leadership Resolution	Final
3-3-3	3-3-2	3-3-3	3-3-3
3-2-2	1-1-1	3-3-2	3-3-2
2-1-1	1-1-1	2-2-1	2-2-1
1-1-1	3-3-3	2-2-2	2-2-2

[1] All adjacent or discrepant scores are resolved in arbitration; in these cases, the leadership score becomes the final score of record.

Table 6-8. Examples of Scoring Resolutions: Edit Scoring[1]

(Trait 1-Trait 2-Trait 3)

Scorer #1	Scorer #2	STL #1 RB	STL #2 RB	Scoring Supervisor Resolution	Final
3-2-2	3-2-2	-	-	-	3-2-2
2-2-2	3-2-2	2-2-2	2-2-2	-	2-2-2
0-1-1	1-2-1	1-2-1	1-2-1	-	1-2-1
3-2-2	2-1-1	3-2-2	3-1-2	3-2-2	3-2-2
1-0-1	1-1-2	1-1-1	1-1-2	1-1-2	1-1-2

[1] If a response receives more than one read-behind and the scores supplied by the STLs do not agree, a resolution score is needed. In these cases, the Scoring Supervisor provides a final score.

6.2.9 Quality and Production Management Reports

Reports generated through *iScore* are essential during the scoring of the MSAA. Reports provide real-time statistics for review by the Measured Progress (now Cognia) Scoring team and the MSAA Scoring Subcommittee to closely monitor scoring, thereby ensuring that

- scorer data (individual level) is monitored in real time to allow early scorer intervention when necessary;
- overall accuracy, consistency, and reliability of scoring (group level) is maintained;
- individual traits in need of further clarification are identified; and
- scoring schedules are upheld.

The reports listed in Table 6-9 provide the comprehensive tools and statistical information needed to execute quality control and manage production.

Table 6-9. Scoring Quality Control and Production Management

Report	Description
Read-Behind Disaggregated Summary	The Read-Behind Disaggregated Summary report shows the total number of read-behind responses read by both the scorer and the STL, and notes the number and percentage of exact, adjacent, and discrepant scores across each trait.
Double-Blind Disaggregated Summary	The Double-Blind Disaggregated Summary report shows the total number of double-blind responses read by a scorer and notes the number and percentage of exact, adjacent, and discrepant scores across each trait.
Compilation Report	The Compilation Report shows, for each scorer, the total number of responses scored, the number of calibration responses scored, and the percentage of exact, adjacent, and discrepant scores across each trait.
Summary Report	The Summary Report lists the total number of student responses loaded into *iScore*. This report includes the number of reads completed to date and the number of reads that remain.

6.2.10 Interrater Agreement

Kappa statistics (kappa coefficients) measure the agreement among two or more raters. The calculation is based on the difference between the level of agreement actually present compared to the level of agreement that would be expected by chance alone. Kappa is a measure of this difference standardized to lie on a -1 to 1 scale, where 1 is perfect agreement, 0 is exactly what would be expected by chance, and negative values indicate disagreement. The kappa information in Table 6-10 shows agreement between raters at Substantial Agreement or Almost Perfect Agreement ranges for most of the open-response writing prompts across grades. In five cases, the kappa agreement rate is at the Moderate Agreement range (see grades 7 and 8 Organization and Idea Development traits for one prompt, grade 11 Idea Development trait for one prompt).

Table 6-10. Kappa Agreement—Operational Open-Response Writing Prompts

Grade	Item	Organization Trait 1	Idea Development Trait 2	Conventions Trait 3
Grade 3	WRCC002	0.71	0.68	0.81
	WRCC003	0.74	0.70	0.80
Grade 4	WRCC002	0.68	0.67	0.85
	WRCC003	0.76	0.72	0.82
Grade 5	WRCC002	0.66	0.63	0.87
	WRCC003	0.65	0.67	0.77
Grade 6	WRCC002	0.63	0.67	0.75
	WRCC003	0.62	0.62	0.78
Grade 7	WRCC002	0.67	0.70	0.76
	WRCC003	0.52	0.49	0.79
Grade 8	WRCC002	0.72	0.68	0.85
	WRCC003	0.60	0.55	0.82
Grade 11	WRCC002	0.80	0.71	0.80
	WRCC003	0.66	0.60	0.74

Note: For identification purposes in *iScore,* Tier 2 prompts are designated as WRCC002 across all grades and Tier 3 prompts are designated as WRCC003.

Agreement Ranges:

< 0 Disagreement

0 = Chance Agreement

0.01–0.20 Slight Agreement

0.21–0.40 Fair Agreement

0.41–0.60 Moderate Agreement

0.61–0.80 Substantial Agreement

0.81–0.99 Almost Perfect Agreement

.

CHAPTER 7 REPORTING

7.1 DEVELOPMENT AND APPROVAL OF REPORT SPECIFIC DOCUMENTS

Processing and Reporting Business Requirements Document

To ensure that reported results for MSAA are accurate relative to collected data, the *Processing and Reporting Business Requirements* document delineating processing rules is prepared, edited in collaboration with the MSAA Reports Subcommittee, and then approved by all participating MSAA Partner States prior to processing of the results. The processing and reporting business requirements and participation status structure provide the framework for the reporting requirements, which are defined for each unique report and similarly edited in collaboration with the MSAA Reports Subcommittee. The *Processing and Reporting Business Requirements* are then approved by the MSAA Reports Subcommittee prior to reporting.

The *Processing and Reporting Business Requirements* document contains the hierarchy by which the participation statuses are assigned for each individual test, incorporating data elements collected by the test platform and directly from the MSAA Partner States. The reporting requirements and corresponding report design templates were developed by Measured Progress (now Cognia) with the guidance of the MSAA Reports Subcommittee. Both documents underwent iterative review processes that included draft reviews by the appropriate subcommittee, incorporation of edits, draft reviews by all participating MSAA Partner States, and subcommittee review and integration of feedback, until final revisions were approved by all participating MSAA Partner States.

Creating the Report Design Templates

To develop the report design templates, Measured Progress (now Cognia) worked with the MSAA Reports Subcommittee to identify modifications to the templates used last year that would ensure that the data elements, layout, and report text were meaningful for reporting the spring 2019 MSAA results. Once finalized, the results of this collaborative process were presented to participating MSAA State Leads for final approval.

MSAA 2019 Guide for Score Report Interpretation

Measured Progress (now Cognia) uses an iterative process to annually update the *Guide for Score Report Interpretation* with the MSAA Reports Subcommittee. Updates are made to ensure that the guide provides the most helpful information to district and school staff as they review reports for their own knowledge and as they discuss the reports with parents or guardians. The guide includes an overview of MSAA, student participation criteria, score reporting overview, and samples of the various types of reports available to schools and districts. Guidelines inform the interpretation and utilization of MSAA scores. The guide also includes explanations for all special reporting codes and messages, as well as performance-level scale score ranges. States are permitted to remove codes not used in their state. Appendices included in this

guide contain the PLDs for ELA and mathematics, a sample individual student report, and the writing prompt scoring rubrics. The final, approved *2019 MSAA Guide for Score Report Interpretation* is delivered electronically to the MSAA Partner States for state-specific revisions and distribution.

7.2 Specific Primary Reports Generated for Schools, Districts, and States

Cognia, in collaboration with the MSAA Reports Subcommittee, annually reviews and updates the following primary reports:

- Student reports
- School roster reports
- School, district, and state summary reports

Reports are generated for each school, district, or state that has results, as defined by the MSAA processing and reporting business requirements and reporting requirements. These reports, along with student results data files, are posted online via the MSAA Online Assessment System's secure data and reporting portal. As determined by the MSAA State Leads, only test coordinators (TCs) are granted access to the online reports. Access is controlled by user-permissioned accounts, as illustrated in Table 7-1:

Table 7-1. Report Accessibility by Role

Reports	Test Coordinator		
	State	*District*	*School*
Student	Yes	Yes	Yes
School Roster	Yes	Yes	Yes
School Summary	Yes	Yes	Yes
District Summary	Yes	Yes	No
State Summary	Yes	No	No

For the purposes of the assessment system, MSAA State Leads are regarded as State TCs. As such, they can add new district and school TCs to the online system and to block from the system any users no longer in the TC role. For 2019, these reports were provided in August to schools, districts, and parents as soon as possible at the beginning of the school year.

The primary results reported are the student's scale score and performance-level classification for mathematics and ELA. The performance-level classifications, with cut scores determined through the original standard setting and subsequent standards validation processes (see Chapter 9 for more information), are reported under the generic labels, Level 1, Level 2, Level 3, and Level 4. Level 4 is the highest attainable performance level.

The average scale score and the percentage of students in each performance level are summarized by school, district, and state on both the roster and summary reports. These summaries allow for the

comparison of individual student performance to overall state performance, as well as comparison of school and district results with the overall state results.

7.2.1 Student Report

The student report is a two-sided, single-page document generated for each student eligible to receive a performance level in at least one content area, as defined by the student report requirements. The report contains results for both ELA and mathematics content areas and was developed for parents and guardians of students who participated in MSAA. Reports are organized by school and posted via the secure-access portal for authorized users to download, print, and disseminate to parents and guardians. Each report contains the student name, test grade, and school on the front of the report. The back page contains the student name, state student ID, school, and test grade. Sample student reports are included in the *MSAA 2019 Guide for Score Report Interpretation*.

Page 1 of the report contains the scale score, performance level, and associated performance-level descriptor for the level obtained by the student for each content area. A sentence below the graphical display explains the standard error of measurement (SEM) in an easy-to-understand manner by providing the expected range of scores the student would likely earn if tested again.

Page 2 contains a brief overview of MSAA, including examples of some of the built-in supports available during testing, and highlights the compatibility of the assessment with various modes of communication. Parents and guardians are encouraged to discuss with their child's teacher the supports their child used on the MSAA.

Tests for students unable to show an observable mode of communication are closed using the Early Stopping Rule, and the lowest scale score is assigned and displayed along with the Level 1 performance level. This is annotated, and in place of the Level 1 performance-level descriptor, the following text is displayed: *Your child did not show a consistent observable mode of communication during the test, and the test was closed by the teacher. Since your child did not complete the test, the results may not be an accurate representation of your child's skills. If you have additional questions, please contact your child's teacher.*

If a student receives a student report but does not receive results for one of the two content areas, results for the missing content area are replaced with text encouraging parents or guardians to contact the child's teacher or school for more information.

7.2.2 School Roster Report

The school roster report is organized at the school level and provides a by-grade list of all students enrolled in MSAA, with a snapshot of their participation/test status and results for both content areas. The number of tested students, the average scale score, and the percent of students by performance level are summarized for the school, district, and state at the top of the roster. The processing and reporting business requirements and roster report requirements identify which of the participation status codes are included on the roster and which of the participation test status codes are included in each calculation.

The summary information at the top of the school roster report supports interpretation of results by users, typically those at the school and district levels. Given that many schools have a relatively small number of students in this population, MSAA Partner States do not suppress information when the number of students

participating is small. This practice places a burden on users to understand the data in the context of small numbers and to use all of the provided information to understand the results, as explained in the *MSAA 2019 Guide for Score Report Interpretation*.

Student results are listed below the summary section and are identified by name and by state student identification number. It is intended that these data points be used in conjunction with the *MSAA 2019 Guide for Score Report Interpretation*. For each content area, the following student-level elements are reported:

- Participation/Test Status
- State Compare (Comparison to state average)
- Scale Score
- Performance Level

7.2.3 Summary Reports

Summary reports are organized at the school, district, and state levels for each entity with at least one student included in summary report calculations. Inclusion in these calculations is defined by the processing and reporting business requirements and summary report requirements. The following information is summarized by grade and content area and displayed for the school, district, and state based on the level of the report:

- Enrolled (number of students enrolled)
- Tested (number of valid student tests)
- Did Not Test (number of enrolled students who did not test)
- Average Scale Score
- Performance Level (number and percentage at each performance level by grade in the state, district, school)

This summary provides a comparative snapshot of results and participation information at a high level and includes both participation and performance summary information, allowing users to evaluate both aspects of their assessment results as guided by the *MSAA 2019 Guide for Score Report Interpretation*.

7.2.4 Quality Assurance

Proprietary quality-assurance measures at Cognia are embedded throughout the entire process of data capture, analysis, and reporting. The data processors and data analysts who work on the project implement quality-control checks of their respective computer programs. Moreover, when data are handed off to different functions within the IT-Reporting Department, the sending function verifies that the data are accurate prior to handoff. Additionally, when a function receives a data set, the first step is to verify the data for accuracy.

A second level of quality-assurance measurement is parallel processing. One data analyst is responsible for writing all programs required to populate the student and aggregate reporting tables for the

administration. Each reporting table is assigned to another data analyst on staff who uses the processing and reporting business requirements to independently program the reporting table. The production and quality-assurance tables are compared, and only after 100% agreement is attained are the tables released for report generation.

The third aspect of quality control at Cognia involves the Software Quality Assurance (SQA) team, which works together with the data processing and data analysis teams to ensure quality data is captured and delivered accurately. Quality control checks are being performed by the data processors and data analysts as the data is handed off via multiple internal software tools. These quality checks initialize the accuracy of the data being ingested into the database and subsequent tables/columns. Software Quality Assurance develops a test plan that includes previously agreed upon report designs and decision rule documents. Test cases housed in an internal test cases repository are then executed in a process including but not limited to the following steps:

1. Testing data counts of data imported.
2. Testing data quality of individual fields for valid values, such as Gender, Ethnicity, etc.
3. Validating scripts developed by the software developers to ensure that they match business requirements and technical specifications.

In this testing effort to ensure the quality of the data, the SQA team uses a sample of schools and districts that is selected based on multiple criteria. A few are identified below:

- Unique student testing records
- Students complete testing
- Students partial complete testing
- Invalidated students

Working with the data processing and data analysis teams allows for timely and precise turnaround if any data anomalies are found. To allow full transparency and cohesive teamwork in data validation, test cases are tied to tickets outlining required work.

Finally, the Software Quality Assurance team executes test cases validating student printed reports in comparison to the previously agreed-to report design specifications.

Once all the test cases have passed, the SQA team notifies the Cognia State Services team for final sign off and communication.

CHAPTER 8 CLASSICAL ITEM ANALYSIS

As noted in Brown (1983), “A test is only as good as the items it contains.” A complete evaluation of a test’s quality must include an evaluation of each item. Both *Standards for Educational and Psychological Testing* (AERA et al., 2014) and *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) include standards for identifying quality items. Items should assess only knowledge or skills that are identified as part of the domain being tested and should avoid assessing irrelevant factors. Items should also be unambiguous and free of grammatical errors, potentially insensitive content or language, and other confounding characteristics. In addition, items must not unfairly disadvantage students, particularly racial, ethnic, or gender groups.

Both qualitative and quantitative analyses have been conducted to ensure that the 2019 MSAA ELA (reading and writing) and mathematics items met these standards. Qualitative analyses are described in earlier chapters of this report; this chapter focuses on quantitative evaluations. Statistical evaluations are presented in three parts: (1) differential item functioning (DIF) statistics and (2) dimensionality analysis of inter-item correlations. The item analyses presented here are based on the administration of MSAA in spring 2019.

Note that classical difficulty (p-value) and discrimination (point-biserial) indices are often used in testing programs to compare the quality of items. However, such indices are not appropriate for a multistage adaptive test. The inappropriateness of these statistics stems from the fact that when two items are on two different stages or on different levels of a stage, the students taking one of the items will tend to have a higher overall ability distribution (as measured by scaled score) compared to the students taking the other item. As an example of the inappropriateness, consider a case where the two items have similar p-values, but one item is from Stage 2A, and the other is from 2C. This similarity would lead to the misleading inference that the two items are comparable in difficulty when, in fact, the 2C item is much harder than the 2A item. Thus, the classical difficulty and discrimination statistics are not included in the evaluation of item quality presented in this chapter.

8.1 DIFFERENTIAL ITEM FUNCTIONING

The *Code of Fair Testing Practices in Education* (Joint Committee on Testing Practices, 2004) explicitly states that subgroup differences in performance should be examined when sample sizes permit and that actions should be taken to ensure that differences in performance are due to construct-relevant, rather than irrelevant, factors. Chapter 3 of *Standards for Educational and Psychological Testing* (AERA et al., 2014) includes similar guidelines. As part of the effort to identify such problems, MSAA items were evaluated in terms of DIF statistics.

For the 2018-19 MSAA, the standardization DIF procedure (Dorans & Kulick, 1986) was employed to evaluate subgroup differences. The standardization DIF procedure is designed to identify items for which subgroups of interest perform differently, beyond the impact of differences in overall achievement. The DIF procedure calculates the difference in item performance for two groups of students (at a time) matched for

achievement on the total test. Specifically, average item performance is calculated for students at every total score. Then an overall average is calculated, weighting the total score distribution so that it is the same for the two groups.

When differential performance between two groups occurs on an item (i.e., a DIF index in the "low" or "high" categories, explained below), it may or may not indicate item bias. Course-taking patterns or differences in school curricula can lead to DIF but for construct-relevant reasons. On the other hand, if subgroup differences in performance can be traced to differential experience (such as geographical living conditions or access to technology), the inclusion of such items should be reconsidered.

For the 2018-19 MSAA, six subgroup comparisons were evaluated for DIF:

- Male compared with female
- White compared with Black
- White compared with Hispanic
- White compared with American Indian
- Not economically disadvantaged status compared with low economically disadvantaged
- Not Limited English Proficiency (LEP) compared with LEP (including current, exited one year, and exited two years)

The DIF statistics were calculated based only on the members of the subgroup in question in the computations; values were calculated only for subgroups with 100 or more students. The tables in Appendix I present the number of items classified as either "low" or "high" DIF, overall and by group favored. Computed DIF indices have a theoretical range from -1.0 to 1.0 for selected-response items. Dorans and Holland (1993) suggested that index values between -0.05 and 0.05 should be considered negligible. The preponderance of MSAA items fell within this range (see Appendix I). Dorans and Holland further state that items with values between -0.10 and -0.05 and those with values between 0.05 and 0.10 (i.e., "low" DIF) should be inspected to ensure that no possible effect is overlooked, and that items with values outside the -0.10 to 0.10 range (i.e., "high" DIF) are more unusual and should be examined very carefully; thus, content experts conducted review of items flagged for DIF.

The number of items with a "high" DIF index for each tier is shown in Tables 8-6 and 8-7. Since an item can exhibit DIF for multiple comparisons, an item was counted once if any of the comparisons showed "high" DIF. Tables 8-1 and 8-2 show that only a few items were classified as "high" DIF for each grade and each tier.

Table 8-1. Number of Items with "High" DIF by Tier—ELA

Grade	Tier 1	Tier 2	Tier 3	Tier 4
3	2	2	5	1
4	1	4	0	2
5	1	1	0	1
6	2	0	1	2
7	0	0	1	2
8	0	0	1	1
11	0	2	0	0

Table 8-2. Number of Items with "High" DIF by Tier—Mathematics

Grade	Tier 1	Tier 2	Tier 3	Tier 4
3	1	3	1	0
4	1	1	1	1
5	1	0	0	0
6	0	5	1	0
7	0	0	1	1
8	0	0	2	0
11	2	1	0	0

8.2 DIMENSIONALITY ANALYSIS

Because tests are constructed with multiple content-area subcategories and their associated knowledge and skills, the potential exists for a large number of dimensions being invoked beyond the common primary dimension. Generally, the subcategories are highly correlated with each other; therefore, the primary dimension they share typically explains an overwhelming majority of variance in test scores. In fact, the presence of just such a dominant primary dimension is the psychometric assumption that provides the foundation for the unidimensional item response theory (IRT) models that are used for calibrating, linking, scaling, and equating the 2018–19 MSAA operational tests.

The purpose of dimensionality analysis is to investigate whether violation of the assumption of test unidimensionality is statistically detectable and, if so, (a) the degree to which unidimensionality is violated and (b) the nature of the multidimensionality. Findings from dimensionality analyses performed on the 2018–19 MSAA operational items for ELA and mathematics are reported below. (Note: Only operational items were analyzed since they are used for score reporting.)

The dimensionality analyses were conducted using the nonparametric IRT-based methods DIMTEST (Stout, 1987; Stout, Froelich, & Gao, 2001) and DETECT (Zhang & Stout, 1999). Both of these methods use as their basic statistical building block the estimated average conditional covariances for item pairs. A conditional covariance is the covariance between two items conditioned on expected total score for the rest of the test, and the average conditional covariance is obtained by averaging across every possible conditioning score. When a test is strictly unidimensional, all conditional covariances are expected to take on values within random noise of zero, indicating statistically independent item responses for examinees with equal expected

total test scores. Nonzero conditional covariances are essentially violations of the principle of local independence, and local dependence implies multidimensionality. Thus, nonrandom patterns of positive and negative conditional covariances indicate multidimensionality.

DIMTEST is a hypothesis-testing procedure for detecting violations of local independence. The data are first divided into a training sample and a cross-validation sample. Then an exploratory analysis of the conditional covariances is conducted on the training sample data to find the cluster of items that displays the greatest evidence of local dependence. The cross-validation sample is then used to test whether the conditional covariances of the selected cluster of items displays local dependence, conditioned on total score on the nonclustered items. The DIMTEST statistic follows a standard normal distribution under the null hypothesis of unidimensionality.

The DETECT statistic is an effect-size measure of multidimensionality. As with DIMTEST, the data are first divided into a training sample and a cross-validation sample. The training sample is used to find a set of mutually exclusive and collectively exhaustive clusters of items that best fit a systematic pattern of positive conditional covariances for pairs of items from the same cluster and negative conditional covariances from different clusters. Next, the clusters from the training sample are used with the cross-validation sample data to average the conditional covariances: within-cluster conditional covariances are summed; from this sum the between-cluster conditional covariances are subtracted; this difference is divided by the total number of item pairs; and this average is multiplied by 100 to yield an index of the average violation of local independence for an item pair. DETECT values less than 0.2 indicate very weak multidimensionality (or near unidimensionality); values of 0.2 to 0.4, weak to moderate multidimensionality; values of 0.4 to 1.0, moderate to strong multidimensionality; and values greater than 1.0, very strong multidimensionality (Roussos & Ozbek, 2006).

Note that the goal of the dimensionality analysis is to evaluate the assumption of unidimensionality in the IRT model used for the calibration. Because the calibration data had the R9-stringers removed, the data used in the dimensionality analysis also had the R9-stringers removed.

DIMTEST and DETECT were separately applied to the three operational paths of each grade on the 2018–19 MSAA ELA and mathematics tests. The three paths resulted in three datasets to be analyzed for each ELA or mathematics grade-level test. Thus, a total of 42 analyses were conducted. First, each dataset was split into a training sample and a cross-validation sample. The sample sizes across the 42 analyses varied from a low of 598 (grade 3 ELA, Path B) to a high of 1384 (grade 8 mathematics, Path C). All but one sample size was larger than 600, and the sample sizes were over 1000 in 12 cases. A rough tabulation of the sample size distribution is given in Table 8-3.

Table 8-3. Dataset Sample Sizes Used for Dimensionality Analyses

Sample Size	Number of Datasets		
	Path A	*Path B*	*Path C*
< 600	0	1	0
600 to 800	6	5	3
800 to 1000	6	5	4
> 1000	2	3	7

DIMTEST was then applied to every dataset. Even though the sample sizes were not large for the MSAA test paths, the DIMTEST null hypothesis was rejected at a significance level of 0.05 for every dataset indicating that the assumption of test unidimensionality was violated. Next, DETECT was used to estimate the effect size for the violations of local independence for all the tests. Table 8-4 displays the multidimensional effect size estimates from DETECT.

Table 8-4. Average Multidimensional Effect Sizes by Content Area and Grade

Path	*Content Area*	*Grade*	Multidimensionality Effect Size	
			2017-18	*2018-19*
A	ELA	3	0.52	0.60
		4	0.51	0.65
		5	0.49	0.49
		6	0.40	0.80
		7	0.59	0.74
		8	0.50	0.64
		11	0.40	0.41
		Average	0.49	0.62
	Mathematics	3	0.55	0.82
		4	0.35	0.69
		5	0.56	0.78
		6	0.82	1.17
		7	0.89	0.73
		8	0.41	0.56
		11	0.57	0.64
		Average	0.59	0.77
B	ELA	3	0.37	0.50
		4	0.42	0.48
		5	0.47	0.50
		6	0.45	0.51
		7	0.50	0.46
		8	0.34	0.26
		11	0.39	0.31
		Average	0.42	0.43
	Mathematics	3	0.96	0.60
		4	0.66	1.12
		5	0.75	0.72
		6	0.44	0.48
		7	0.73	0.98
		8	0.68	0.97
		11	0.82	0.79
		Average	0.72	0.81
C	ELA	3	0.20	0.19
		4	0.22	0.23
		5	0.30	0.32
		6	0.27	0.21

continued

Path	*Content Area*	*Grade*	Multidimensionality Effect Size	
			2017-18	*2018-19*
C	ELA	7	0.25	0.18
		8	0.14	0.14
		11	0.13	0.17
		Average	0.22	0.21
	Mathematics	3	0.45	0.29
		4	0.50	0.46
		5	0.60	0.49
		6	0.24	0.38
		7	0.43	0.56
		8	0.47	0.56
		11	0.29	0.37
		Average	0.43	0.44

Results for 2018-19 as displayed in Table 8-4 can be reviewed as follows. First, the ELA tests tend to show lower DETECT indices than the mathematics tests. Second, Path C indices tend to be lower than Paths A and B, for both ELA and mathematics. The ELA Path C tests had the lowest indices and were the only set of tests for a fixed combination of content area and path that consistently displayed low DETECT indices (weak or very weak multidimensionality). For mathematics, although the Path C tests tended to be lower than for Paths A or B, the DETECT indices were still generally moderate. Summarizing the remaining results in Table 8-4, the DETECT indices for the ELA Paths A and B tests were mostly at a moderate level; whereas for mathematics, the DETECT indices for Paths A and B were a mixture of moderate and strong values.

For comparison purposes, Table 8-4 also provides the results from last year, 2017-18. The two sets of results are seen to be mostly consistent with each other. The two strong trends for 2018-19 (ELA having lower indices than mathematics; Path C having lower indices than Paths A and B) were also present in 2017-18. Moreover, the detailed 2018-19 tendencies described above also occurred in 2017-18. The most notable trend differences between 2017-18 and 2018-19 were that the mathematics indices for Paths A and B tended to be slightly larger for 2018-19, and the ELA Path A indices tended to be slightly larger for 2018-19.

Next, an investigation was conducted to identify the possible source(s) of the violations of local independence that could help explain the DIMTEST and DETECT results. Hence, psychometricians at Cognia investigated how DETECT divided the tests into clusters to see if there were any discernable patterns with respect to known substantive item characteristics. Prior to 2017-18, R9-stringers were included in the data, and we found a strong and consistent pattern related to the answer keys of the items — for tests administered on Paths A and B, the placement of the correct-response key option was a strong indicator of the cluster membership of nearly every multiple-choice item. In other words, nearly all the multiple-choice items fell into three clusters, where one cluster was dominated by items with a key of “A” (the first option), another was dominated by items with a key of “B” (the middle option, when it was available), and the third was dominated by items with a key of “C” (the last option). Note that the vast majority of multiple-choice items had three answer-choice options, and the few items that did not have three options were items that had only two options; these were labeled “A” and “C” for cluster-membership labeling purposes.

The removal of the R9-stringers from the data in 2017-18 did not totally eliminate the key-option clustering, but it did greatly weaken its effect. Psychometricians looked for it again this year and found that this same pattern again occurred to a significant degree. Specifically, for both ELA and mathematics, nearly every grade-level test for Paths A and B had both an "A" cluster (12 out of 14 tests) and a "C" cluster (14 out of 14 tests). Half of the ELA tests on Paths A and B had a "B" cluster (7 out of 14 tests), while nearly every mathematics test had a "B" cluster (12 out of 14 tests). This difference is supported by the DETECT indices because mathematics tests tended to have larger values than the ELA tests. For Path C, far fewer key-related clusters occurred. For ELA, about half the tests had either an "A" or "C" cluster. For mathematics, five out of seven Path C tests had a "C" cluster, but no other consistent key clustering occurred. Overall, these results were very similar to those of 17-18.

For the ELA tests, the operational items also included a writing prompt that had three trait scores. For Path A, for every ELA test, the writing prompt traits clustered together into a single cluster. For Paths B and C, half the tests displayed this clustering pattern for the writing prompt traits (four out of seven for Path B, and three out of seven for Path C). These results indicate that the writing prompt traits tend to display evidence of dimensionality distinctiveness relative to the rest of the test. These results are similar to what was found in 2017-18, the first year that writing prompts were operationally administered, and led to proactive measures that were taken at that time to deal with it. Specifically, the non-writing prompt items were calibrated first, and then the writing prompt traits were calibrated while holding the psychometric model for the rest of test fixed. As a result, the same scale that was set prior to the introduction of the writing prompts was maintained while also allowing the writing prompt traits to contribute in an appropriate manner to that scale.

As in past years, the dimensionality analysis results for Paths A and B continue to indicate a violation of local independence having to do with how some student scores are related to the placement of the correct response options; however, the violations of local independence are greatly reduced because of the removal of the R9-stringers from the datasets. In general, it is important that violations of local independence be understood, monitored, and controlled on tests. The violations of local independence that are related to the ordering of the correct-response option in selected-response items are a phenomenon that will continue to require close study.

CHAPTER 9 ITEM RESPONSE THEORY SCALING AND EQUATING

This chapter describes the procedures used to calibrate, equate, and scale the 2019 MSAA. Throughout these psychometric analyses, a number of quality-control procedures and checks on the processes were implemented. These procedures included evaluation of item parameters and their standard errors for reasonableness, examination of test characteristic curves (TCCs) and test information functions (TIFs) for reasonableness, evaluation of model fit, and evaluation of the scaling results (e.g., parallel processing by the Data and Reporting Services and the Psychometrics and Research Departments, and comparison of lookup tables to the previous year's lookup tables).

9.1 ITEM RESPONSE THEORY

All MSAA items were calibrated using item response theory (IRT). IRT uses mathematical models to define a relationship between an unobserved measure of student performance, usually referred to as theta (θ), and the probability ($P(\theta)$) of obtaining a particular score on an item. This mathematical relationship is referred to as the item characteristic curve (ICC). In IRT, all items are assumed to be independent measures of the same construct (i.e., of the same θ). Another way to think of θ is as a mathematical representation of the latent trait of interest. Several common IRT models are used to specify the relationship between θ and $P(\theta)$ (Hambleton & Swaminathan, 1985; Hambleton & van der Linden, 1997). The process of determining the specific mathematical relationship between θ and $P(\theta)$ is called *item calibration*. After items are calibrated, they are defined by a set of parameters that specify a nonlinear relationship between θ and $P(\theta)$. Once the item parameters are known, an estimate of θ for each student can be calculated based on the student's observed responses to the items. This estimate, $\hat{\theta}$, is considered to be an estimate of the student's true score or a general representation of student performance. It has characteristics that may be preferable to those of raw scores for equating purposes because it specifically models examinee responses at the item level, and also facilitates equating to an IRT-based item pool (Kolen & Brennan, 2014).

For the 2019 MSAA tests, the two-parameter logistic (2PL) model was used to estimate the ICC for dichotomous items, and the graded-response model (GRM) was used for polytomous items (Nering & Ostini, 2010). The 2PL model for dichotomous items can be defined as:

$$P_i(\theta_j) = P(U_i = 1|\theta_j) = \frac{\exp[Da_i(\theta_j - b_i)]}{1+\exp[Da_i(\theta_j - b_i)]},$$

where

U indexes the scored response on an item,

i indexes the items,

j indexes students,

a represents item discrimination,

b represents item difficulty,

θ is the student proficiency, and

D is a normalizing constant equal to 1.701.

In the GRM for polytomous items, an item is scored in $k + 1$ graded categories that can be viewed as a set of k dichotomies. At each point of dichotomization (i.e., at each threshold), a two-parameter model can be used to model the probability that a student's response falls at or above a particular ordered category, given θ. This implies that a polytomous item with $k + 1$ categories can be characterized by k item category threshold curves (ICTCs) of the two-parameter logistic form:

$$P_{ik}^{*}(\theta_j) = P(U_i \geq k | \theta_j) = \frac{\exp[Da_i(\theta_j - b_i + d_{ik})]}{1+\exp[Da_i(\theta_j - b_i + d_{ik})]},$$

where

U indexes the scored response on an item,

i indexes the items,

j indexes students,

k indexes threshold,

θ is the student ability,

α represents item discrimination,

b represents item difficulty,

d represents threshold, and

D is a normalizing constant equal to 1.701.

After computing k ICTCs in the GRM, $k + 1$ item category characteristic curves (ICCCs), which indicate the probability of responding to a particular category given θ, are derived by subtracting adjacent ICTCs:

$$P_{ik}(\theta_j) = P(U_i = \mathrm{k} | \theta_j) = P_{ik}^{*}(\theta_j) - P_{i(k+1)}^{*}(\theta_j),$$

where

i indexes the items,

j indexes students,

k indexes threshold,

θ is the student ability,

P_{ik} represents the probability that the score on item *i* falls in category k, and

P_{ik}^{*} represents the probability that the score on item *i* falls at or above the threshold k ($P_{i0}^{*} = 1$ and $P_{i(m+1)}^{*} = 0$).

The GRM is also commonly expressed as:

$$P_{ik}(\theta_j) = \frac{\exp[Da_i(\theta_j - b_i + d_k)]}{1+\exp[Da_i(\theta_j - b_i + d_k)]} - \frac{\exp[Da_i(\theta_j - b_i + d_{k+1})]}{1+\exp[Da_i(\theta_j - b_i + d_{k+1})]}.$$

Finally, the item characteristic curve (ICC) for a polytomous item is computed as a weighted sum of ICCCs, where each ICCC is weighted by a score assigned to a corresponding category. The expected score for a student with a given theta is expressed as:

$$E(U_i|\theta_j) = \sum_k^{m+1} w_{ik} P_{ik}(\theta_j),$$

where

w_{ik} is the weighting constant and is equal to the number of score points for score category *k* on item *i*.

Note that for a dichotomously scored item, $E(U_i|\theta_j) = P_i(\theta_j)$. For more information about item calibration and determination, refer to Lord and Novick (1968), Hambleton and Swaminathan (1985), or Baker and Kim (2004).

9.2 Calibration Procedure

Because the 2019 MSAA was a pre-equated assessment program, the item parameters for the 2019 operational administration came from calibrations conducted in previous years. Items previously used operationally were calibrated in the post-equating procedures that were implemented after the corresponding operational administrations. Items previously used only as field-test items were calibrated in the corresponding field-test calibration that occurred after the calibration of the operational items. No new calibrations were run for the 2019 MSAA prior to the reporting of scores. The procedures used to conduct the calibrations are described in this section.

As explained in Section 8.3, in 2019 an additional culling procedure was introduced to determine which data would be used to calibrate the operational items. The new procedure was introduced in response to the repeated finding in dimensionality analyses from previous years that a small (but nontrivial) percentage of the students, referred to as "R9-stringers," were exhibiting response behavior incompatible with the assumptions of the psychometric model. R9-stringers are students who respond to nine (or more) consecutive multiple-choice items with the exact same option. For 2019, the data from R9-stringers were first identified and removed prior to conducting the operational and field-test calibrations. Table 9-1 summarizes the calibration sample sizes both prior to and after removing the data from the R9-stringers.

Table 9-1. Summary of Testing Population

Subject	Grade	Total before removing stringers	Total after removing stringers	Number of Stringers	Percent Stringers
ELA	3	2,737	2,268	469	17
	4	2,904	2,436	468	16
	5	3,123	2,677	446	14
	6	3,162	2,698	464	15
	7	3,316	2,848	468	14
	8	3,340	2,842	498	15
	11	2,993	2,585	408	14
Mathematics	3	2,746	2,431	315	11
	4	2,906	2,536	370	13
	5	3,129	2,648	481	15
	6	3,166	2,838	328	10
	7	3,314	2,864	450	14
	8	3,344	2,985	359	11
	11	2,994	2,670	324	11

In calibrating the operational items, first, an off-scale calibration was conducted on all the operational items using PARSCALE (Muraki & Bock, 2003). At this point, each item was carefully examined for model fit. In particular, a visual inspection of the item fit plots was conducted. The empirical proportions of correct responses at a given level of ability must follow the shape of the model-based curve. In addition, the item parameter estimates were inspected. The discrimination parameters should not be extreme in either direction (neither greater than 3 nor less than 0.25); the difficulty parameters should also not be extreme (generally between -3 and 3, and definitely between -4 and 4); and the standard error of the difficulty parameters should generally be less than 0.3.

The equating set (a subset of the operational items) was then carefully chosen to represent the test as a whole, in terms of content coverage and difficulty levels, and the equating items were evaluated to ensure only psychometrically stable items were used. For any equating design, it is critical that rigorous procedures are implemented to monitor the quality of the equating and to check that the assumptions underlying the equating are not violated. Cognia psychometricians have conducted research studies (Hagge & Keller, 2009; Keller et al., 2008; Keller et al., 2007; Parker et al., 2009) in this regard and have developed tools to estimate equating error across years under realistic violations of the equating assumptions. The Psychometrics and Research Department monitors well-known violations of IRT equating assumptions and uses the research to estimate their effects on the reliability and validity of the equating. Specifically, the equating data were analyzed in detail for scale drift through traditional *b*-*b* analyses.

The *b*-*b* analysis compared the old *b* parameters to the new *b* parameters using linear regression analysis. A standardized perpendicular difference from the regression line was calculated for each item; any item with a difference of a magnitude of 3 or greater was flagged for drift. Furthermore, special procedures were enacted during the calibration phase to check that the quality of the equating items was maintained

consistently across years. Equating items that displayed lack of stability (e.g., standard error of the *b* parameters being large, inadequate model-data fit, etc.) were flagged and removed. Using this equating set, the Stocking-Lord transformation constants were calculated to determine the relationship between the off-scale calibration and the base-year scale established in the first year of the program. The Stocking-Lord transformation was then applied to all the off-scale operational item parameters to bring them onto the base-year scale.

Next, the field-test items were calibrated. Then the field-test items were evaluated based on model-fit and item parameter estimates in the same way as described above for the operational items. Based on the evaluation of model-fit and item parameter estimates, the field-test items were classified as either Do-Not-Use (DNU) or Use-With-Caution (UWC) if any model-fit issues were identified or any item parameter estimates fell outside of the criteria. Items that were not classified as DNU were considered eligible were then uploaded to the item bank.

9.3 Item Response Theory Results

The tables in Appendix J give the IRT item parameters for all the operational items on the 2019 MSAA tests by grade and content area. The statistics for the operational items are summarized in Tables 9-2 through 9-5. The mean item parameter estimates shown in the tables below are within generally acceptable and expected ranges. For easy reference, Table 9-2 displays the means and standard deviations averaged across all dichotomously scored operational items for each grade and content area.

Table 9-2. IRT Summary Statistics for Dichotomously Scored Items

Content Area	Grade	Number of Items	a		b	
			mean	*SD*	*mean*	*SD*
ELA	3	69	0.67	0.26	-0.55	0.66
	4	60	0.72	0.31	-0.34	0.68
	5	51	0.63	0.30	-0.11	1.06
	6	57	0.88	0.43	-0.13	0.79
	7	58	0.83	0.34	-0.40	0.55
	8	52	0.81	0.37	-0.44	0.55
	11	61	0.88	0.36	-0.43	0.56
Mathematics	3	66	0.79	0.35	-0.06	0.55
	4	62	0.65	0.36	0.29	0.94
	5	66	0.64	0.28	0.39	0.88
	6	59	0.85	0.23	-0.13	0.49
	7	61	0.80	0.26	-0.04	0.51
	8	64	0.77	0.28	0.00	0.55
	11	63	0.94	0.39	0.09	0.47

Because the items were developed to correspond to different tiers, the item statistics have also been summarized by tier for ELA (Table 9-3 for the dichotomous items and Table 9-4 for the writing prompt traits) and for mathematics (Table 9-5).

Table 9-3. IRT Summary Statistics by Grade and Tier—ELA Dichotomous Items

Grade	Tier	Number of Items	a		b	
			Mean	*SD*	*Mean*	*SD*
3	1	22	0.83	0.26	-1.16	0.26
	2	15	0.66	0.22	-0.47	0.49
	3	21	0.55	0.25	-0.19	0.74
	4	11	0.62	0.20	-0.15	0.34
4	1	14	0.86	0.30	-1.14	0.32
	2	28	0.70	0.33	-0.13	0.63
	3	12	0.55	0.15	-0.22	0.36
	4	6	0.85	0.37	0.29	0.49
5	1	8	0.85	0.25	-1.15	0.40
	2	26	0.59	0.30	-0.04	0.72
	3	11	0.54	0.27	0.36	1.71
	4	6	0.68	0.29	0.07	0.50
6	1	16	1.24	0.43	-0.79	0.31
	2	15	0.89	0.26	-0.11	0.84
	3	15	0.82	0.38	-0.11	0.34
	4	11	0.44	0.25	0.79	0.76
7	1	17	1.07	0.42	-0.94	0.34
	2	19	0.83	0.24	-0.49	0.25
	3	15	0.67	0.24	-0.06	0.41
	4	7	0.56	0.10	0.42	0.32
8	1	16	1.04	0.45	-0.98	0.22
	2	11	0.97	0.25	-0.63	0.36
	3	15	0.59	0.22	-0.05	0.42
	4	10	0.58	0.20	0.05	0.38
11	1	16	1.14	0.34	-0.99	0.19
	2	25	0.84	0.31	-0.44	0.29
	3	9	0.84	0.44	-0.24	0.30
	4	11	0.63	0.17	0.26	0.69

Table 9-4. IRT Summary Statistics by Trait and Tier—ELA Writing Prompt Items

Trait	Tier	Number of Items	a		b		d0		d1		b-d0		b-d1	
			Mean	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*	*Mean*	*SD*
C	2	7	0.80	0.08	-0.15	0.19	0.68	0.11	-0.68	0.11	-0.83	0.16	0.53	0.27
	3	7	0.80	0.08	0.30	0.22	0.92	0.11	-0.92	0.11	-0.62	0.21	1.22	0.27
I	2	7	0.81	0.10	0.23	0.25	0.69	0.19	-0.69	0.19	-0.46	0.17	0.92	0.41
	3	7	0.84	0.18	1.41	0.46	0.96	0.24	-0.96	0.24	0.45	0.59	2.36	0.43
O	2	7	0.76	0.08	0.35	0.31	1.19	0.14	-1.19	0.14	-0.84	0.24	1.54	0.41
	3	7	0.91	0.19	1.36	0.45	1.38	0.31	-1.38	0.31	-0.02	0.54	2.74	0.56

Note. C = Conventions, I = Idea Development, O = Organization.

Table 9-5. IRT Summary Statistics by Grade and Tier—Mathematics

Grade	Tier	Number of Items	a		b	
			Mean	*SD*	*Mean*	*SD*
3	1	11	0.83	0.28	-0.78	0.21
	2	25	0.83	0.37	-0.03	0.45
	3	25	0.76	0.39	0.17	0.46
	4	5	0.64	0.23	0.26	0.59
4	1	14	0.52	0.29	-0.98	0.66
	2	20	0.67	0.36	0.52	0.71
	3	21	0.72	0.32	0.62	0.51
	4	7	0.69	0.57	1.15	0.58
5	1	13	0.76	0.29	-0.91	0.29
	2	27	0.63	0.27	0.43	0.48
	3	24	0.59	0.29	1.01	0.72
	4	2	0.62	0.28	0.70	0.69
6	1	9	0.94	0.27	-0.88	0.15
	2	26	0.83	0.24	-0.08	0.38
	3	18	0.82	0.19	0.01	0.33
	4	6	0.94	0.25	0.41	0.42
7	1	9	0.91	0.21	-0.93	0.20
	2	24	0.79	0.33	-0.04	0.36
	3	20	0.73	0.14	0.13	0.21
	4	8	0.89	0.27	0.48	0.49
8	1	10	0.89	0.40	-0.74	0.40
	2	26	0.66	0.25	0.06	0.41
	3	22	0.81	0.23	0.18	0.50
	4	6	0.88	0.28	0.35	0.44
11	1	10	1.10	0.51	-0.71	0.28
	2	28	0.98	0.43	0.13	0.28
	3	20	0.82	0.24	0.31	0.31
	4	5	0.83	0.39	0.61	0.31

Results for the dichotomously scored items are as follows. As seen in Tables 9-3 and 9-5, item difficulty tends to have a positive relationship with tier: as the tier increases, the items tend to be more difficult (as intended). In all cases, the average difficulty increased from Tier 1 to Tier 2 and from Tier 2 to Tier 3. The average difficulty increased from Tier 3 to 4 for ELA, but not for mathematics. The largest differences were clearly the Tier 1 to Tier 2 differences for all grade levels for both ELA and mathematics. To investigate these tendencies more rigorously, a one-way analysis of variance (ANOVA) was conducted on item difficulty with tier level as the factor. Separate ANOVAs were run for ELA and mathematics. Item difficulty did not differ significantly by grade level for either ELA or mathematics.

The ANOVAs indicated that tier level was statistically significant for both ELA and mathematics with R-squared values of 37.4% for ELA and 44.3% for mathematics. Further Tukey paired-comparison tests were

also conducted. These results showed that for both ELA and mathematics, the Tukey tests indicated statistically significant differences between Tier 1 and each of the other tiers. For both ELA and mathematics, the Tukey comparisons for Tier 2 versus Tiers 3 and 4 were also significant. Only the Tier 3 versus Tier 4 difference was significant for ELA but not for mathematics.

Next are the results for the polytomously scored writing prompt traits. A shown in table 9-4, for all three traits, the Tier 3 traits tend to be more difficult than the Tier 2 traits, but the difference is much greater for the Idea Development trait and the Organization trait than for the Conventions trait.

The IRT statistics were also summarized by different paths (Tables 9-6 and 9-7).

Table 9-6. IRT Summary Statistics by Grade by Path—ELA Dichotomous Items

Grade	Path	Number of Items	a		b	
			Mean	*SD*	*Mean*	*SD*
3	A	41	0.73	0.27	-0.75	0.59
	B	41	0.60	0.22	-0.41	0.58
	C	41	0.63	0.22	-0.43	0.62
4	A	40	0.72	0.31	-0.54	0.70
	B	40	0.68	0.27	-0.25	0.54
	C	40	0.65	0.27	-0.22	0.53
5	A	37	0.64	0.29	-0.30	0.78
	B	37	0.61	0.29	-0.01	1.16
	C	37	0.60	0.29	0.04	1.17
6	A	38	0.94	0.44	-0.30	0.73
	B	38	0.78	0.37	0.02	0.79
	C	38	0.75	0.35	0.10	0.82
7	A	38	0.94	0.36	-0.65	0.43
	B	38	0.80	0.30	-0.41	0.49
	C	38	0.81	0.29	-0.37	0.54
8	A	38	0.88	0.39	-0.63	0.47
	B	38	0.83	0.38	-0.49	0.51
	C	38	0.82	0.38	-0.47	0.53
11	A	38	0.95	0.34	-0.65	0.39
	B	38	0.84	0.29	-0.51	0.33
	C	38	0.77	0.31	-0.25	0.59

Table 9-7. IRT Summary Statistics by Grade by Path—Mathematics

Grade	Path	Number of Items	a		b	
			Mean	*SD*	*Mean*	*SD*
3	A	35	0.81	0.37	-0.18	0.58
	B	35	0.75	0.32	-0.09	0.58
	C	35	0.79	0.33	0.05	0.53
4	A	35	0.68	0.33	0.13	0.87
	B	35	0.68	0.33	0.02	0.91
	C	35	0.69	0.34	0.42	0.66
5	A	35	0.64	0.29	0.17	0.97
	B	35	0.58	0.24	0.32	0.88
	C	35	0.65	0.24	0.49	0.83
6	A	35	0.81	0.23	-0.3	0.46
	B	35	0.81	0.18	-0.2	0.46
	C	35	0.86	0.21	-0.03	0.53
7	A	35	0.78	0.25	-0.23	0.51
	B	35	0.72	0.18	-0.04	0.42
	C	35	0.82	0.24	0.08	0.47
8	A	35	0.77	0.31	-0.22	0.5
	B	35	0.77	0.25	-0.05	0.47
	C	35	0.75	0.24	0.08	0.6
11	A	35	0.94	0.41	-0.08	0.48
	B	35	0.88	0.3	0.09	0.44
	C	35	0.96	0.38	0.19	0.43

The average item difficulty substantially increased from Path A to Path B for all tests, as intended. While difficulty also usually increased from Path B to Path C, in most cases the difference was negligible.

The TCCs provide a more complete picture of the various paths. TCCs display the expected (average) raw score associated with each θ_j value between -4.0 and 4.0. Mathematically, the TCC is computed by summing the expected score on all the ICCs of all items that contribute to the raw score. Using the notation introduced in the previous section, the expected raw score at a given value of θ_j is

$$E(X|\theta_j) = \sum_{i=1}^{n} E(U_i|\theta_j),$$

where

X indexes total raw test score,

U_i indexes the scored response on an item,

i indexes the items (and *n* is the number of items contributing to the raw score),

j indexes students (here, θ_j runs from -4 to 4), and

$E(X|\theta_j)$ is the expected raw score on the test for a student of ability θ_j.

The expected raw score monotonically increases with θ_j, consistent with the notion that students of high ability tend to earn higher raw scores than do students of low ability. Most TCCs are "S-shaped"—flatter at the ends of the distribution and steeper in the middle.

The TIF, $I(\theta)$ (see Lord, 1980, for theoretical definitions and examples of equations), displays the amount of statistical information the test provides at each value of θ_j. Information functions depict test precision across the entire latent trait continuum. There is an inverse relationship between the information of a test and its standard error of measurement (SEM). The SEM at a given θ_j is approximately equal to the inverse of the square root of the statistical information at θ_j (Hambleton, Swaminathan, & Rogers, 1991), as follows:

$$SEM(\theta_j) = \frac{1}{\sqrt{I(\theta_j)}}.$$

Compared to the tails, TIFs are often higher near the middle of the θ distribution where most students generally are located and where most items are sensitive by design. Appendix K shows graphs of the TCCs and TIFs for each grade and content area.

9.4 EQUATING

The purpose of equating is to ensure that scores obtained from different forms of a test are equivalent to each other. Equating may be used if multiple test forms are administered in the same year, as well as to equate one year's forms to those given in the previous year. Equating ensures that students are not advantaged or disadvantaged because the test form they took is easier or harder than those taken by other students.

All 2018–19 MSAA tests used item pre-equating methodology as described in Kolen and Brennan (2014). Item pre-equating allows the raw-to-scaled score conversion to be produced before the form is administered, which in turn allows for faster reporting and turnaround times. In item pre-equating, new forms are built from a pool of pre-existing IRT-calibrated items. In addition to these operational items, new non-operational items (field-test items) were also included on the forms. The operational items were used as a set of common items for transforming the item parameters of the non-operational items so that they would be on the same theta scale as the IRT-calibrated item pool. This allows for the item pool to be expanded continually.

However, with pre-equating, a number of cautions need to be taken into consideration. Kolen and Brennan (2014) state that, to ensure that items behave the same on each administration, the items should appear in the same contexts and positions operationally as they did non-operationally. Thus, care must be taken to avoid significant shifts in position and context. Any drift must be carefully monitored and controlled to ensure comparability between forms of the test.

Item parameters for the 2018–19 operational administration were calibrated after the 2017–18 MSAA operational administration. As such, no new calibrations were run for the 2018-19 operational items on these pre-equated tests prior to the reporting of scores. Raw score to scaled score lookups are displayed in Appendix L.

Post-equating procedures were implemented after the 2018-19 operational administration. For any equating design, it is critical that rigorous procedures are implemented to monitor the quality of the equating

and to check that the assumptions underlying the equating are not violated. The equating data are analyzed in detail for scale drift through traditional *b-b* analyses.

Item parameter estimates for the 2019 MSAA were placed on the base-year scale (i.e., the item bank scale) by using the method of Stocking and Lord (1983), which is based on the IRT principle of item parameter invariance. According to this principle, the equating items for both the base year and current year tests should have the same item parameters. After the item parameters for each current year's test are estimated using PARSCALE (Muraki & Bock, 2003), the Stocking and Lord method is employed to find the linear transformation (slope and intercept) that adjusts the equating items' parameter estimates such that the current year's test characteristic curve (TCC) for the equating items is as close as possible to that of the base year's tests.

In addition, the calibrated and equated parameters are evaluated to further investigate drift at both the item and test levels. At the item level, the individual item parameters are compared and investigated, and at the test level, the TCC, test information function (TIF), and raw score cuts are compared. Finally, the item parameters resulting from this process are updated in the item bank, and these updated parameters are used in field-test calibrations and in future test form development.

9.5 Reported Scale scores

Because the θ scale used in IRT calibrations is not readily understood by most stakeholders, reporting scales were developed for MSAA. The reporting scales are simple linear transformations of the underlying θ scale. The reporting scales range from 1200 through 1290 for all grade/content-area combinations. The second cut was originally fixed at the August 2015 standard setting to be 1240 for each grade level, but some of the scale score cuts, including some of the second cuts, were adjusted during the July 2018 standards validation, as evidenced in Table 9-9.

By providing more specific information about the position of a student's results, scale scores supplement performance-level scores. Students' raw scores (i.e., total number of points) on the 2019 MSAA tests were translated to scale scores using a data analysis process called *scaling,* which simply converts from one scale to another. In the same way that a given temperature can be expressed on either Fahrenheit or Celsius scales, or the same distance can be expressed in either miles or kilometers, student scores on the 2019 MSAA tests can be expressed in raw or scale scores.

It is important to note that converting from raw scores to scale scores does not change students' performance-level classifications. Scale scores make for more consistent reporting of results. Raw scores are not comparable from year to year (nor across Paths A, B, and C) because they are affected by differences in group ability and/or difficulty of the items that appear on each test form. Equating is a statistical procedure that is used to adjust for differences in form difficulty so that scores on alternate forms can be used interchangeably (Kolen & Brennan, 2014). Since the θ scale is used for equating, scale scores are comparable from one year to the next.

The scale scores are obtained by a simple translation of ability estimates ($\hat{\theta}$) using the linear relationship between threshold values on the θ metric and their equivalent values on the scale score metric.

Students' ability estimates are based on their raw scores and are found by mapping through the TCC. Scale scores are calculated using the following linear equation:

$$SS = m\hat{\theta} + b,$$

where
m is the slope, and
b is the intercept.

For MSAA, the base-form operational scale was set so that the theta corresponding to the proficient cut from the August 2015 standard setting was transformed to a scale score of 1240, and so that the standard deviation of the scale scores in the base-year was 15. The lowest obtainable scale score (LOSS) was set at 1200, and the highest obtainable scale score (HOSS) was set at 1290. A separate linear transformation is used for each grade and content-area combination. Because only one point within the θ scale score space and the standard deviation of the scale was fixed, the scale score cutpoints between Level 1 and Level 2 and between Level 3 and Level 4 were free to vary across the grade and content-area combinations. When the standards validation was conducted in July 2018, the transformation constants established in the base year were not modified, but some of the theta cuts were modified, including some of the Level 2/Level 3 cuts (i.e., the proficient cuts). Thus, scale score value for the proficient cut is no longer equal to 1240 for some tests (as seen in Table 9-9).

Table 9-8 shows the slope and intercept values used to calculate the scale scores for each content area and grade. Note that the values in Table 9-8 will not change unless the standards are reset.

Table 9-8. Scale Score Slope and Intercept by Content Area and Grade

Content Area	Grade	Slope	Intercept
ELA	3	11.72020	1242.05370
	4	12.05930	1240.09100
	5	12.42360	1241.61490
	6	12.35220	1237.81260
	7	12.29640	1242.43320
	8	12.60820	1239.45700
	11	11.49220	1244.22400
Mathematics	3	13.05520	1243.66510
	4	13.10020	1239.86740
	5	13.07690	1241.41020
	6	12.82030	1241.25320
	7	12.90930	1243.24380
	8	13.02130	1242.35830
	11	12.98970	1242.47990

Appendix L contains raw score to scale score lookup tables for the 2019 MSAA tests. These are the actual tables used to determine student scale scores, error bands, and performance levels. Graphs of the scale score cumulative frequency distributions for the 2019 MSAA tests and tests of the last two years are presented in Appendix M. The cumulative graphs show the proportion of students at or below each scale score.

9.6 MSAA Performance Levels, Cut Scores, and Standards Validation

Cut scores for MSAA in ELA and mathematics were originally set in a standard setting process that took place in August 2015. Details of the standard setting procedures can be found in the standard setting report (Measured Progress, 2015). In July 2018, Cognia and the MSAA Psychometric Subcommittee conducted a standards validation. Standards validation does not change the scale; its purpose is only to determine whether adjustments to the cut scores are needed.

The standards validation process for the 2018 MSAA was necessary to ensure that cut scores, set in 2015 for the assessments, continue to provide valid interpretation of ELA and mathematics performance using the Performance Level Descriptors (PLDs). The standards for both ELA and mathematics were vertically articulated, using 2017 performance data, to update the performance standards and provide a coherent basis for interpreting 2018 scores and performance, and in preparation for validating the ELA standards further. No additional steps were necessary to validate the mathematics performance standards. The validation process for the ELA performance standards was necessitated by the addition of the open-response writing prompt scores to the existing ELA score scale.

A complete description of the standards articulation and validation processes appears in the 2018 *MSAA Standards Validation Report* (see Appendix M of the 2018 *MSAA Technical Report* located online here: https://cms.azed.gov/home/GetDocumentFile?id=5cb0b3b61dcb2511e88cfef7).

Final cut scores, after mathematics and ELA vertical articulation and ELA standards validation for the 2018-19 MSAA, appear in Table 9-9.

Table 9-9. 2018-19 Cut Scores on the Theta Metric and Reporting Scale

Content Area	Grade	Theta				Scale Score			
		Cut1	*Cut2*	*Cut3*	*Minimum*	*Cut1*	*Cut2*	*Cut3*	*Maximum*
ELA	3	-0.70318	-0.21788	0.97664	1,200	1,234	1,240	1,254	1,290
	4	-0.53007	-0.00755	1.52654	1,200	1,234	1,240	1,259	1,290
	5	-0.83676	-0.12999	1.15500	1,200	1,232	1,240	1,256	1,290
	6	-0.63000	-0.10626	1.02714	1,200	1,231	1,237	1,251	1,290
	7	-0.59215	-0.19788	0.94792	1,200	1,236	1,240	1,255	1,290
	8	-0.75241	-0.15521	0.78177	1,200	1,230	1,238	1,250	1,290
	11	-0.76610	-0.41106	0.89860	1,200	1,236	1,240	1,255	1,290
Mathematics	3	-0.70202	-0.16584	0.76660	1,200	1,235	1,242	1,254	1,290
	4	-0.63872	-0.10438	0.81776	1,200	1,232	1,239	1,251	1,290
	5	-0.75784	-0.10784	0.84805	1,200	1,232	1,240	1,253	1,290

continued

Content Area	Grade	Theta				Scale Score			
		Cut1	*Cut2*	*Cut3*	*Minimum*	*Cut1*	*Cut2*	*Cut3*	*Maximum*
Mathematics	6	-0.68276	-0.21475	0.72127	1,200	1,233	1,239	1,251	1,290
	7	-0.75478	-0.25128	0.76727	1,200	1,234	1,240	1,254	1,290
	8	-0.65755	-0.21950	0.62527	1,200	1,234	1,240	1,251	1,290
	11	-0.61432	-0.22940	0.54044	1,200	1,235	1,240	1,250	1,290

Table 9-10 shows the percentage of students by performance-level categories along with the average and standard deviation of the scale scores for each grade/content-area combination. Also, the percentages of Levels 3 and 4 (levels corresponding to proficient or above, which are the levels of critical interest for federal accountability purposes) within each grade and content area are provided in the table.

Table 9-10. Percentage of Students by Performance-Level Categories

Content Area	Grade	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	*Level 2*	*Level 3*	*Level 4*	*Levels 3 & 4*		
ELA	3	2,894	44	16	28	12	40	1237.21	15.44
	4	3,050	46	18	28	8	36	1236.56	15.04
	5	3,247	34	28	27	11	38	1237.42	15.01
	6	3,292	29	23	35	13	48	1237.05	13.70
	7	3,441	40	12	32	17	48	1240.27	14.67
	8	3,478	33	26	27	14	41	1235.62	13.22
	11	3,098	31	15	41	12	54	1241.10	13.49
Mathematics	3	2,905	33	30	27	11	38	1238.52	14.44
	4	3,052	25	28	35	11	47	1237.03	13.54
	5	3,253	23	32	31	14	45	1238.85	14.36
	6	3,295	31	22	30	17	47	1238.90	14.30
	7	3,439	21	33	33	13	46	1239.99	13.43
	8	3,484	27	21	37	16	52	1239.69	14.50
	11	3,099	18	29	38	15	53	1240.40	12.29

Tables 9-11 (ELA) and 9-12 (mathematics) show the percentage of students in each performance-level category by path, along with the average and standard deviation of the scale scores for each grade/content-area combination. Note that the percentage of examinees being classified as Level 3 and Level 4 (levels of proficient or above) increased as we move from Path A to Path C. This trend was expected due to the stage adaptive nature of the 2019 MSAA.

Table 9-11. Performance-Level Distributions by Path—ELA

Grade	Path	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	*Level 2*	*Level 3*	*Level 4*	*Levels 3 & 4*		
3	A	1,323	86	11	2	0	2	1225.45	11.01
	B	695	17	42	41	0	41	1238.74	4.76
	C	876	0	4	56	41	96	1253.74	10.15
4	A	1,601	83	15	2	0	2	1226.37	10.20
	B	766	10	40	50	0	50	1240.63	5.19
	C	683	0	1	65	35	99	1255.88	10.04

continued

Grade	Path	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	*Level 2*	*Level 3*	*Level 4*	*Levels 3 & 4*		
5	A	1,337	78	21	1	0	1	1225.17	10.13
	B	1,182	6	53	41	1	42	1239.30	5.93
	C	728	0	2	52	46	98	1256.87	10.01
6	A	1,148	74	23	3	0	3	1224.97	10.15
	B	1,146	9	41	49	1	50	1236.81	4.92
	C	998	0	2	57	41	98	1251.23	10.18
7	A	1,537	87	11	3	0	3	1228.24	9.89
	B	635	7	34	59	0	59	1241.35	4.24
	C	1,269	0	2	53	45	98	1254.30	9.14
8	A	1,587	70	28	3	0	3	1225.44	9.55
	B	852	4	50	45	1	47	1237.53	4.53
	C	1,039	0	6	49	45	94	1249.59	8.51
11	A	995	84	12	4	0	4	1228.22	11.17
	B	961	13	34	52	0	52	1240.00	4.52
	C	1,142	0	1	65	34	98	1253.25	8.64

Table 9-12. Performance-Level Distributions by Path—Mathematics

Grade	Path	Number of Students	Levels					Average Scale Score	SD of Scale Score
			Level 1	*Level 2*	*Level 3*	*Level 4*	*Levels 3 & 4*		
3	A	1,357	66	32	2	0	2	1228.75	12.03
	B	870	7	47	45	1	46	1241.10	4.52
	C	678	0	3	53	44	97	1254.77	10.67
4	A	945	70	28	2	0	2	1223.70	11.92
	B	1,134	9	50	40	1	41	1237.28	4.60
	C	973	0	3	62	35	97	1249.68	8.93
5	A	1,186	59	40	1	0	1	1226.49	11.02
	B	911	7	53	39	1	40	1238.53	4.69
	C	1,156	0	6	56	38	94	1251.77	10.73
6	A	1,173	81	17	2	0	2	1226.37	10.74
	B	1,030	8	48	43	1	44	1238.45	4.57
	C	1,092	0	2	49	49	98	1252.79	10.56
7	A	886	62	36	2	0	2	1226.90	12.81
	B	1,440	12	54	34	0	34	1238.31	4.01
	C	1,113	0	4	56	40	96	1252.58	10.36
8	A	1,217	71	27	2	0	2	1226.66	11.59
	B	777	9	44	47	0	48	1238.91	4.13
	C	1,490	0	4	60	36	96	1250.74	10.59
11	A	985	54	40	5	0	5	1229.66	11.89
	B	1,204	2	40	57	1	57	1240.47	3.51
	C	910	0	1	50	49	99	1251.93	9.36

CHAPTER 10 RELIABILITY

Although an individual item's performance is an important focus for evaluation, a complete evaluation of an assessment must also address the way items function together. Tests that function well provide a dependable assessment of the student's level of ability. Unfortunately, no test can do this perfectly. A variety of factors can contribute to a given student's score being either higher or lower than his or her true ability. For example, a student may misread an item or mistakenly fill in the wrong bubble when he or she knew the right answer. Collectively, extraneous factors that affect a student's score are referred to as "measurement error." Any assessment includes some amount of measurement error; that is, no measurement is perfect. This is true of all academic assessments—some students will receive scores that underestimate their true ability and other students will receive scores that overestimate their true ability. When tests have a high amount of measurement error, student scores are very unstable. Students with high ability may get low scores or vice versa. Consequently, one cannot reliably estimate a student's true level of ability with such a test. Assessments that have less measurement error (i.e., errors made are small on average and student scores on such a test will consistently represent their ability) are described as "reliable."

There are a number of ways to estimate an assessment's reliability. The most common method is Cronbach's alpha, which assumes that all the students for a given assessment were administered the same fixed form. For the 2018-19 MSAA, there were three different paths (A, B, and C), each of which essentially corresponded to a different test form. Even though Cronbach's alpha could be applied to each form separately, this would not be ideal for two reasons. First, the ability distributions for the three forms are very different from each other by design—essentially the standard deviation for any one form is much smaller than the standard deviation for the whole population, and the mean increases from paths A to B to C. The resulting restriction of ability range causes severe underestimation of reliability for each path. Second, a single measure of reliability for each grade-level assessment, is preferable to three values. Thus, an IRT-based formulation of reliability that results in a single value for each grade-level assessment was used.

10.1 IRT Marginal Reliability

IRT marginal reliability estimation is based on applying the standard classical test theory (CTT) formula, relating variances of true score, observed score, and measurement error, in the IRT setting. In CTT, the relationship between these variances is given by:

$$\sigma_X^2 = \sigma_T^2 + \sigma_E^2$$

where σ_X^2 is the observed-score variance, σ_T^2 is the true-score variance, and σ_E^2 is the error variance.

Starting from this basic equation, it can be shown that the formula for CTT reliability can be expressed by:

$$CTT\ Reliability = 1 - \frac{\sigma_E^2}{\sigma_X^2}.$$

IRT marginal reliability is based on extending the CTT model to an IRT framework (Samejima, 1994) and provides an IRT-based estimate of the overall test reliability. Error variance is estimated as the mean squared conditional standard error of measurement (CSEM) of the theta estimates across students within a grade. Observed score variance is estimated as the variance of the theta estimates across students within a grade. Equivalently, the mean squared CSEM of the scale scores and the variance of the scale scores can be used in place of the CSEM of the theta estimates and the variance of the theta estimates, respectively. IRT marginal reliability is then given by the following formula:

$$IRT\ Marginal\ Reliability = 1 - \frac{\overline{CSEM(\theta)^2}}{Var(\hat{\theta})} = 1 - \frac{\overline{CSEM(SS)^2}}{Var(SS)},$$

where

$\overline{CSEM(\theta)^2}$ is the mean squared CSEM,

$\overline{CSEM(SS)^2}$ is the mean squared scale CSEM,

$Var(\hat{\theta})$ is the variance of theta estimates, and

$Var(SS)$ is the scale score variance.

Using this formula, IRT marginal reliability estimates were calculated for each multistage test in ELA and mathematics, using the scale scores (and their standard errors) for all the students across all three paths.

The reliability of a test can also be evaluated by simply examining directly the CSEMs themselves. CSEMs facilitate the interpretation of individual scale scores. With any given scale score estimate for a student, the reasonable limits of the true scale score for the student can be calculated by using the CSEM for the scale score.

Tables 10-1 and 10-2 present descriptive scale score statistics, IRT-based reliability, and mean scale score CSEMs for ELA and mathematics by grade. (Statistics are based on operational items, which counted toward students' reported scores only.) As shown in the tables, most of the values reached levels associated with adequate reliability (0.85 or higher).

Table 10-1. IRT Marginal Reliability by Grade—ELA

Grade	Min	Max	Mean	SD	IRT Marginal Reliability	Mean Scaled CSEM
3	1200	1289	1241.25	13.30	0.90	3.86
4	1200	1290	1240.14	13.25	0.91	3.74
5	1200	1290	1240.32	13.62	0.89	4.19
6	1200	1290	1240.04	11.89	0.89	3.48
7	1200	1290	1243.52	12.70	0.90	3.63
8	1200	1286	1238.54	11.44	0.88	3.56
11	1200	1290	1243.81	11.49	0.90	3.27

Table 10-2. IRT Marginal Reliability by Grade—Mathematics

Grade	Min	Max	Mean	SD	IRT Marginal Reliability	Mean Scaled CSEM
3	1200	1290	1241.58	11.65	0.84	3.94
4	1200	1290	1239.45	11.31	0.83	4.27
5	1200	1290	1241.57	12.70	0.83	4.75
6	1200	1290	1241.45	12.35	0.86	3.89
7	1200	1290	1242.38	11.60	0.85	3.99
8	1200	1290	1242.11	12.47	0.85	4.12
11	1200	1290	1242.52	9.98	0.83	3.34

10.2 SUBGROUP RELIABILITY

The reliability coefficients discussed in the previous section were based on all students who took a particular 2018-19 MSAA test. As an alternate assessment program, it is likely that there are reliability differences across subgroups. For this reason, reliability coefficients for different subgroups were calculated, including gender, ethnicity, LEP status, socioeconomic status, migrant status, and various disability groups. Appendix N presents reliabilities for various subgroups of interest. Subgroup reliabilities were calculated using the IRT-based formula (defined above) based only on the members of the subgroup in question in the computations; values were calculated only for subgroups with 100 or more students and where more than 25% of the students scored above the LOSS (lowest obtainable scale score, which was 1200).

For several reasons, the results relating to subgroup reliability should be interpreted with caution. First, reliabilities are dependent not only on the measurement properties of a test but on the statistical distribution of the studied subgroup. For example, it can readily be seen in Appendix N that subgroup sample sizes varied considerably, which results in a natural variation in reliability coefficients. Alternatively, reliability, which is a type of correlation coefficient, may be artificially depressed for subgroups with little variability (Draper & Smith, 1998). Second, there is no industry standard to interpret the strength of a reliability coefficient, especially when the population of interest is a single subgroup. Again, the reliability statistics provided in the tables in Appendix N should be cautiously interpreted because of the restriction of range mentioned earlier (Section 8.1).

10.3 RELIABILITY OF PERFORMANCE-LEVEL CATEGORIZATION

While related to reliability, the accuracy and consistency of student classification into performance categories are even more important statistics in a standards-based reporting framework (Livingston & Lewis, 1995). After the performance levels were specified and students' performances were classified into those levels, empirical analyses were conducted to determine the statistical accuracy and consistency of the classifications. For the MSAA, students are classified into one of four performance levels: Level 1, Level 2,

Level 3, or Level 4. This section of the report explains the methodologies used to assess the reliability of classification decisions, and results are provided.

Accuracy refers to the extent to which decisions based on test scores match decisions that would have been made if the scores did not contain any measurement error. Consistency measures the extent to which classification decisions based on test scores match the decisions based on scores from a second, parallel form of the same test. Consistency can be evaluated directly from actual responses to test items if two complete and parallel forms of the test are given to the same group of students. In operational test programs, however, such a design is usually impractical.

However, techniques have been developed to estimate both the accuracy and the consistency of classification decisions based on a single administration of a test. The Rudner (2001, 2005) technique was used for the 2019 MSAA because it can be easily applied to data that is scored in the IRT theta metric or any linear transformation of this metric, such as the MSAA scale scores. The applicability of the Rudner technique to IRT-based metrics distinguishes this method from methods based on observed scores, such as the Lewis and Livingston (1995) method. Thus, the Rudner method can be used to provide a single index for a multistage test, whereas an observed score method would need to be separately applied to each path of a multistage test.

For details of the Rudner method, refer to Rudner (2001, 2005); given here is a brief review of the basic idea behind the method. Using an examinee's estimated scale score and standard error, assuming a normal probability distribution, the method first calculates for all examinees at a fixed value of true scale score, the expected proportion whose observed scale score is in an interval [a,b]. Then, by summing over all examinees whose true scale scores are in an interval [c,d], the method yields the expected proportion of all examinees whose true scale score is in [c,d] and whose observed scale score is in [a,b]. By setting [a,b] and [c,d] to correspond to the true score intervals defined by the cut scores yields the elements of a classification table that shows the expected proportion of all examinees with observed and true scale scores in each cell. These proportions can then be used to calculate both classification accuracy and classification consistency estimates.

For the classification accuracy tables, cell [*i*, *j*] represents the estimated proportion of students whose true scale score fell into classification *i* (where *i* = 1 to 4, for the four achievement levels) and whose observed scale score fell into classification *j* (where *j* = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students whose true and observed classifications matched) signified overall accuracy.

For the classification consistency tables, cell [*i*, *j*] of this table represents the estimated proportion of students whose observed scale score on the first of the two hypothetical parallel multistage tests would fall into classification *i* (where *i* = 1 to 4) and whose observed scale score on the second hypothetical parallel multistage test would fall into classification *j* (where *j* = 1 to 4). The sum of the diagonal entries (i.e., the proportion of students categorized by the two forms into exactly the same classification) signified overall consistency.

Another way to measure consistency is to use Cohen's (1960) coefficient κ (kappa), which assesses the proportion of consistent classifications after removing the proportion of consistent classifications that would be expected by chance. It is calculated using the following formula:

$$\kappa = \frac{(\text{Observed agreement}) - (\text{Chance agreement})}{1 - (\text{Chance agreement})} = \frac{\sum_i C_{ii} - \sum_i C_{i.} C_{.i}}{1 - \sum_i C_{i.} C_{.i}},$$

where

$C_{i.}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the first hypothetical parallel form of the test;

$C_{.i}$ is the proportion of students whose observed performance level would be Level i (where i = 1–4) on the second hypothetical parallel form of the test; and

C_{ii} is the proportion of students whose observed performance level would be Level i (where i = 1–4) on both hypothetical parallel forms of the test.

Because κ is corrected for chance, its values are lower than other consistency estimates.

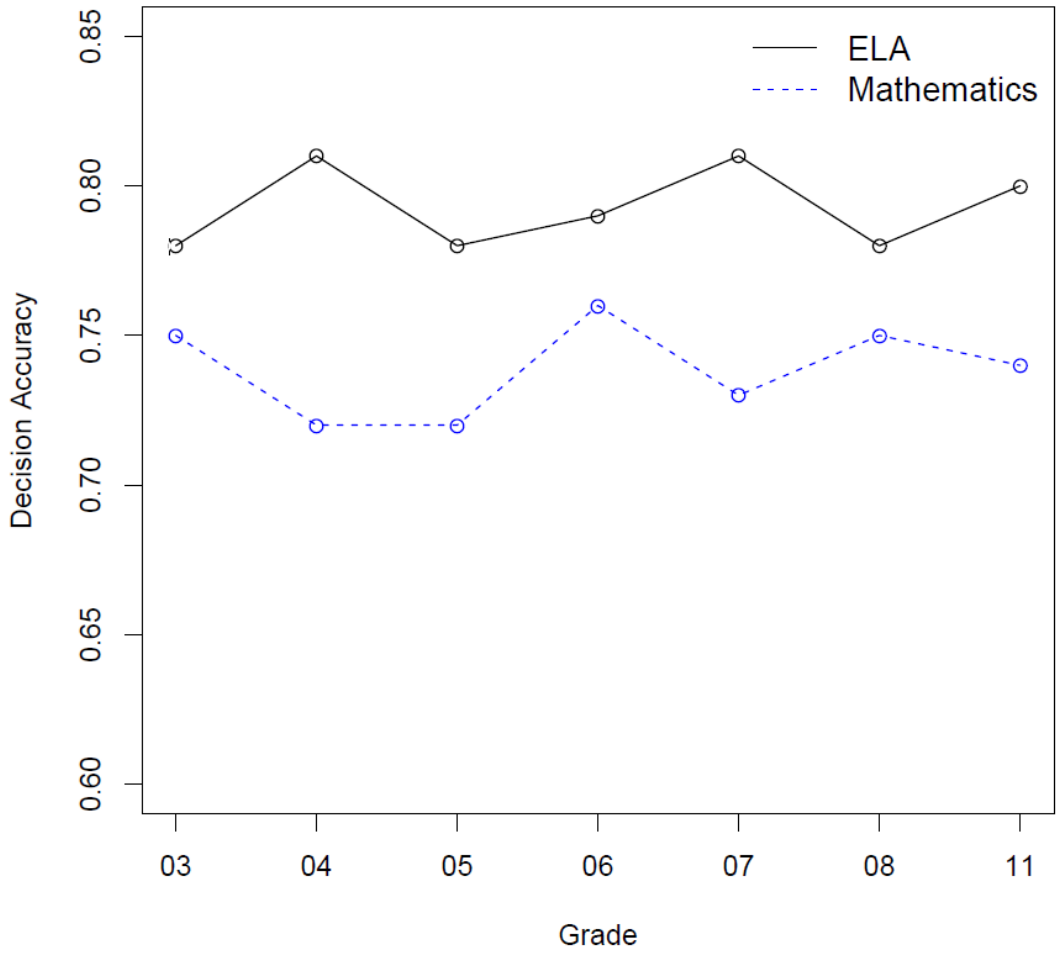
10.3.1 Accuracy and Consistency

Figure 10-1 shows the overall decision accuracy for ELA and mathematics by grade level. More details on decision accuracy and consistency (DAC) are provided in Appendix O. Table O-1 in Appendix O includes overall accuracy and consistency indices, along with kappa. Accuracy and consistency values conditional on performance level are also provided in Table O-1. For these calculations, the denominator is the proportion of students associated with a given performance level. Following is an example from Table O-1, looking at Level 1 for grade 3 ELA.

- The conditional *accuracy* value was 0.88. This indicates that among the students whose *true scale scores* placed them in Level 1, 88% would be expected to be in this same level again when categorized according to their observed scale scores.
- The *consistency* value was 0.83. This indicates that among the students whose *observed scale scores* placed them in Level 1, 83% would be expected to be in this same level again if a second parallel test form were used.

For some testing situations, the greatest concern may be decisions regarding level thresholds. For example, in testing done for No Child Left Behind accountability purposes, the primary concern is distinguishing between students who are proficient and those who are not yet proficient. For the 2019 MSAA, Table O-2 in Appendix O provides accuracy and consistency estimates at each cutpoint, as well as false positive and false negative decision rates. A false positive rate is the proportion of students whose observed scores were above the cut and whose true scores were below the cut. A false negative rate is the proportion of students whose observed scores were below the cut and whose true scores were above the cut.

Figure 10-1. Overall Decision Accuracy by Content Area by Grade



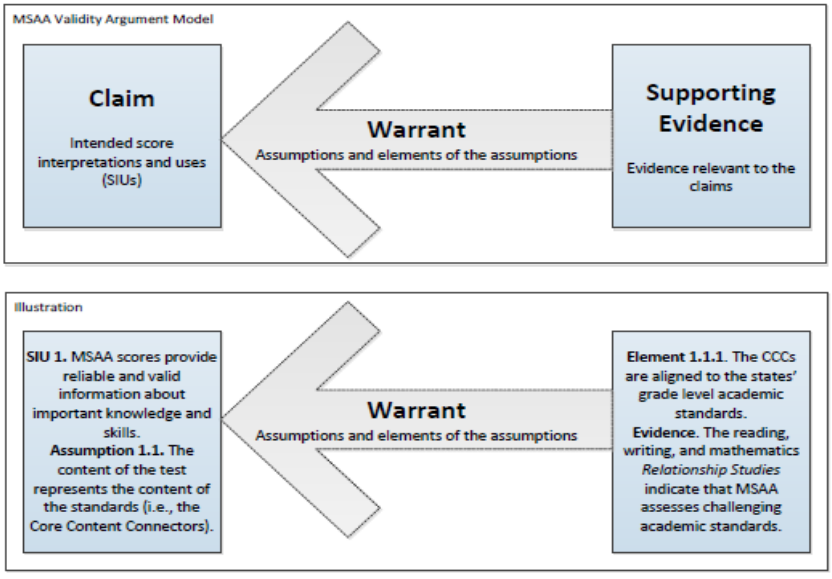
CHAPTER 11 VALIDITY ARGUMENTS TO SUPPORT INTENDED SCORE INTERPRETATIONS AND USES

Chapter 11 presents the primary intended score interpretation and three primary intended score uses. This chapter presents the assumptions that underlie these four score interpretations and uses (SIUs) and the evidence that supports the assumptions. The MSAA validity argument model is introduced and applied to develop validity arguments to support the four SIUs.

The *Standards for Educational and Psychological Testing* (2014) define validity as "the degree to which evidence and theory support the interpretations of test scores for proposed uses of tests" (p. 11). Elaborating on that definition, the *Standards* assert that "it is the interpretations of test scores for proposed uses that are evaluated, not the test itself" (p. 11) and that "validation logically begins with an explicit statement of the proposed interpretation of test scores, along with a rationale for the relevance of the interpretation to the proposed use" (p. 11). This definition applies specifically to intended interpretations and uses of test scores, rather than to the broader program of curriculum and instruction in which a testing program is embedded or to the surrounding education and school improvement policies and aspirations for student learning.

Further, the *Standards* state that "a sound *validity argument* integrates various strands of evidence into a coherent account of the degree to which existing evidence and theory support the intended interpretations of test scores for specific uses" (p. 21; emphasis added). Emerging common practice in state assessment programs is to construct validity arguments based on Toulmin's model of argumentation (Toulmin, 1958). A model for MSAA validity arguments, derived from the Toulmin model, is shown in Figure 11-1. The first figure shows the model and the second figure is an illustration of the model applied.

Figure 11-1. MSAA Validity Argument Model



In the MSAA validity argument model, the overall validity argument is that the existing design, procedural, and psychometric evidence supports the four intended score interpretations and uses. Each of the interpretation and uses represents a sub-claim that requires supporting evidence and warrants (Toulmin's term; here, an assumption) that connect the evidence to the claim. This line of reasoning and argumentation leads to supported conclusions, which are MSAA validity arguments. Sections 11.1 through 11.2 below describe:

1. the four sub-claims (i.e., the intended SIUs);
2. assumptions and their elements, which are the warrants that connect the MSAA design, procedural, and psychometric information to the four sub-claims; and
3. the evidence that supports each sub-claim (and which is provided in detail in chapters 2-10).

The relationships among the score interpretations and uses, assumptions, and elements appear in Table 11-1 (below). Each score interpretation and use, assumption, and element in the table is presented following the table, with descriptions and summaries of the supporting evidence.

Table 11-2. Relationships among Score Interpretations and Uses, Necessary Assumptions, and Elements that Support the Assumptions

Necessary Assumptions	Elements that Support Assumptions
Primary Intended Score Interpretation	
MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.	
1.1 The content of the test represents the content of the standards (i.e., the Core Content Connectors).	
	1.1.1 MSAA content is aligned to the CCCs and grade level standards.
	1.1.2 MSAA items are aligned to the CCCs.
	1.1.3 States have confirmed alignment of MSAA to state content standards.
	1.1.4 MSAA items are aligned to the PLDs.
1.2 MSAA test items are construct relevant. The elements corresponding to this assumption are concerned with the skills and cognitive processes required to understand and respond to an item in particular, whether they correspond to the skills and processes required in the PLDs.	
	1.2.1. Items require application of the KSAs of the targeted construct.
	1.2.2. Items are accessible to all students.
	1.2.3. Appropriate accommodations are provided to meet student needs.
	1.2.4. Scoring rubrics focus on construct relevant aspects of student responses.
	1.2.5. Scaffolding is not a source of construct-irrelevant variance.
	1.2.6. Item rendering does not interfere with student access to test content.
	1.2.7. Platform does not interfere with student interaction with test content.

continued

Necessary Assumptions	Elements that Support Assumptions
	1.2.8. Items are free of bias and sensitive issues.
1.3	Test administrations in MSAA states in 2019 followed prescribed, standardized procedural requirements.
	1.3.1. Test administrators and Schools and District Coordinators understood and performed their roles properly.
	1.3.2. Test security concerns were limited.
1.4	Test scores on the 2019 MSAA are reliable and valid.
	1.4.1. MSAA scores and categorizations into performance levels are adequately reliable for their intended purpose.
	1.4.2. Item characteristics support intended interpretations about all students who take MSAA.
	1.4.3. Test characteristics, for paths A, B, and C support intended interpretations about all students who take MSAA.
	1.4.4. Scaling of MSAA supports intended interpretations about all students who take MSAA.
	1.4.5. Equating of MSAA test forms supports intended interpretations about MSAA students.
	1.4.6. State 1 covers a broad enough range of item difficulty and item cognitive complexity to route students into appropriate stage 2 tests.
	1.4.7. Routing into the stage 2 test level is appropriate for students.
	1.4.8. Stage 2 test levels are sufficiently separable and targeted toward different ranges of achievement for the MSAA students who are routed to those levels.
1.5	Item and test scoring in 2019 were implemented accurately.
	1.5.1. Machine scored items were scored accurately.
	1.5.2. Constructed response item scoring training and monitoring procedures met industry standards.
1.6	MSAA scores correlate as expected with external indicators of student proficiency (1.e., concurrent evidence).
	1.6.1. MSAA scores correlate as expected with other measures of student proficiency.
Primary Intended Score Use 1 Schools and districts use the MSAA and its results to (a) monitor trends in school performance, and (b) design professional development for teachers.	
2.1	MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups
	2.1.1. MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups.

continued

Necessary Assumptions	Elements that Support Assumptions
	2.1.2. MSAA scores and proficiency level categorizations of groups of students are adequately reliable and valid to enable monitoring of grade level performance and student cohort performance.
	2.1.3. The relationship between MSAA scores and external measures of student achievement and growth is as expected, compared to grade level assessments and other alternate assessments.
2.2	MSAA results are used to design professional development for teachers.
	Primary Intended Score Use 2
	The MSAA and its results are used to help teachers integrate MSAA scores and other information with their instructional planning.
3.1	Teachers use the MSAA and its results to better integrate assessment with their instructional planning
	3.1.1. Teachers find the performance level descriptors and their students' performance levels useful for planning instruction, especially students in performance levels 1 and 2.
	3.1.2. Teachers find their students' scale score information useful for planning instruction, especially students in levels 1 and 2.
3.2	Teachers use MSAA scores and other information for instructional planning.
	3.2.1. Teachers use MSAA scores and other information for planning instruction.
	Primary Intended Score Use 3
	Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.
4.1	Parents find MSAA scores and other information useful for understanding what their child knows and can do.
	4.1.1. Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.
	4.1.2. Parents use MSAA scores and other information appropriately to understand what their child knows and can do and make decisions about their child's education and learning needs.
4.2	Parents find MSAA scores and other information useful for understanding their child's progress from year to year.
	4.2.1. Parents understand and interpret correctly MSAA scores and other information to understand their child's progress from year to year.
	4.2.2. Parents use MSAA scores and other information appropriately to understand their child's progress from year to year and make decisions about their child's education and learning needs.

Evidence that supports elements of the assumptions in MSAA validity arguments is summarized below, using a relevance rating scale, with rating levels defined in Table 11-2.

Table 11-3. Relevance of Evidence in Support of Elements and Assumptions Underlying Validity Arguments for MSAA Score Interpretations and Uses

Complete Evidence	When all required pieces of relevant evidence are provided to support a validity argument
Moderate to Substantial Evidence	When several pieces or nearly all required pieces of relevant evidence are provided, but not all required pieces of evidence are provided
Limited Evidence	When only one or two pieces of evidence are provided, where the evidence may be only marginally relevant or where more than 1-2 pieces of evidence is required
No Evidence	When no relevant evidence exists

Relevance ratings summarize the **applicability** of the evidence, in terms of "the quality or state of being closely connected or appropriate" (Lexico.com, 2019), and the **completeness** of the evidence. Relevance ratings do not imply the persuasiveness of the evidence, which is defined as "the power to induce the taking of a course of action or the embracing of a point of view by means of argument or entreaty" (Vocabulary.com, 2019). Cognia's MSAA Psychometric Team developed these definitions in response to recommendations from the MSAA Technical Advisory Committee and applied the ratings to the assumptions and elements below.

The primary score interpretation and use statements (SIUs) for which supporting evidence is needed are as follows.

Primary Intended MSAA Score Interpretation

MSAA scores provide reliable and valid information about important grade-level numeracy and literacy knowledge and skills attained by students with the most significant cognitive disabilities.

Primary Intended MSAA Score Uses

- Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers.
- Teachers use the MSAA and its results to better integrate assessment with their instructional planning.
- Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year.

11.1 Primary Intended Score Interpretation

MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.

Assumption 1.1. The content of the test represents the content of the standards (i.e., the Core Content Connectors).

The evidence to support this test alignment assumption and its elements was generated in a series of alignment studies that were conducted between 2012 and 2015 by the National Center and State Collaborative (NCSC). Details regarding the alignment reports and evidence of findings is available in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual* (see http://ncscpartners.org/Media/Default/PDFs/Resources/NCSC15_NCSC_TechnicalManualNarrative.pdf).

Element 1.1.1. The Core Content Connectors are aligned to the states' grade level academic content standards. (See alignment question 1 in the technical manual.)

> ***Evidence:*** The technical manual summarizes evidence from the Reading, Writing, and Mathematics Relationship Studies and states that "all the evidence suggested the mathematics, reading, and writing CCCs had a strong relationship to the CCSS standards" (p. 75). The evidence in all three content areas includes content centrality and performance centrality, that the overall cognitive complexity of the assessment is appropriately lower than that of the grade level content standards, and that some Core Content Connectors were rated at high depth of knowledge levels, suggesting that MSAA accesses challenging academic standards.
>
> ***Summary of evidence:*** Complete evidence

Element 1.1.2. The 2019 MSAA items are aligned to the Core Content Connectors. (See alignment question 3 in the technical manual.)

> ***Evidence*:** The NCSC technical manual indicates that "NCSC designed the operational items to assess the knowledge and skills of a wide variety of students with the most significant cognitive disabilities [and]…The study provided evidence that the assessment's operational items allowed students using various communication modes and with specific characteristics to access the items. Panelists indicated that the items were suitable for students who used various communication modes, and panelists indicated that no modifications were necessary to enable student access to the test items" (p. 80). Item specifications and development and review processes every year since 2015 are designed and implemented to ensure that items are closely aligned to the Core Content Connectors.
>
> ***Summary of evidence:*** Complete Evidence

Element 1.1.3. The states have confirmed that the MSAA Core Content Connectors, which are assessed on the MSAA, are aligned with each state's academic content standards for each grade level.

> ***Evidence:*** Membership in MSAA requires each member state to adopt the academic content standards that are assessed on MSAA.

Summary of evidence: Complete Evidence

Element 1.1.4. The 2019 operational MSAA items are aligned to the MSAA performance level descriptors. (See alignment question 4 in the technical manual.)

Evidence: As reported in the technical manual, "Panelists rated item groups based on their judgment of whether the KSAs in the item groups represent the KSAs in the PLDs… For all content areas and grade levels, the majority of the item groups were rated as having the same KSAs as the PLDs, ranging from 57% to 78%. Some panelists indicated that some KSAs were missing in the item groups or the PLDs, but overall the overlap of KSAs found in the item groups and PLDs was acceptable" (p. 81). The items are developed following item specifications for each CCC. The items specifications accomplish two purposes: (1) they provide both general and specific guidelines for developing all test items at the grade levels assessed and (2) they describe the test items and prompt types needed. Within the specifications documents are sections dedicated to information about item contexts, variable features, cognitive task levels, use of graphics, item style and format, and general content limits by academic grade-level content target. As such, in addition of the items to the performance level descriptors, there is alignment from the item specifications to the performance level descriptors.

Summary of evidence: Moderate to Substantial; a follow-up study of alignment between more recent items and the MSAA performance level descriptors may be warranted.

Assumption 1.2. MSAA test items are construct relevant. The elements corresponding to this assumption are concerned with the skills and cognitive processes required to understand and respond to an item in particular, and whether they correspond to the skills and processes required in the PLDs.

Element 1.2.1. Items require application of the KSAs of the targeted construct.

Element 1.2.2. Items are accessible for all students.

Element 1.2.3. Appropriate accommodations are provided to meet student needs.

Element 1.2.4. Item scoring rubrics and criteria focus on construct relevant aspects of student response.

Element 1.2.5. Scaffolding is not a source construct-irrelevant variance.

Element 1.2.6. Item rendering does not interfere with students' access to test content.

Element 1.2.7. Platform does not interfere with students' ability to interact with test content.

Element 1.2.8. Items are free of bias and sensitive issues.

The evidence for Elements 1.2.1 through 1.2.8 is interrelated. Some evidence is relevant to a single element. Other evidence is relevant to multiple elements. For that reason, we have listed the element as a group, rather than for each individual element. After listing the evidence for these elements, we summarize the relevance of the evidence for each individual element.

Evidence for 1.2.1: The 2019 operational MSAA items are aligned to the Core Content Connectors, through the targeted focal knowledge, skills, and abilities (FKSAs) and/or essential understandings (EUs), which supports this element. The evidence for Element 1.2.1 is directly linked to the Element 1.1.2. As noted above in Element 1.1.2 (Assumption 1.1: The content of the test represents the content of the standards (i.e., the Core Content Connectors)), the evidence for 1.1.2 is Complete Evidence.

Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, and 1.2.8: During the item development process, the items followed a rigorous development cycle, including reviews by MSAA State Leads and by Item Content and Bias and Sensitivity panelists. See Chapter 3 for a detailed description of item review process.

Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, and 1.2.7: Cognitive labs (also referred to NCSC as Student Interaction Studies) were conducted by NCSC in the early stages of development of the assessment program to acquire detailed information about the cognitive processes used by students in responding to assessment tasks. The studies resulted in adjustments in the assessment program to ensure the construct validity of student response data. This information is outlined in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*.

Evidence for 1.2.5, 1.2.6, and 1.2.7: Three usability studies were conducted by NCSC in the early stages of development of the assessment program to evaluate how students and teachers interacted with items and gathered evidence related to item complexity and usability. The studies resulted in adjustments to ensure the assessment met all usability standards required to support the validity of the assessment program. This information is outlined in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*.

Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6 and 1.2.8: During the item development process, the items followed a rigorous development cycle, including reviews by MSAA State Leads and by Item Content and Bias and Sensitivity panelists. See Chapter 3 for a detailed description of item review process.

Evidence for 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.6, and 1.2.7: Cognitive labs (also referred to NCSC as Student Interaction Studies) were conducted by NCSC in the early stages of development of the assessment program to acquire detailed information about the cognitive processes used by students in responding to assessment tasks. The studies resulted in adjustments in the assessment program to ensure the construct validity of student response data. This information is outlined in the *National Center and State Collaborative 2015 Operational Assessment Technical Manual*.

Evidence for 1.2.8: In differential item functioning (DIF) analyses, we examine subgroup differences in performance when sample sizes permit. Actions are taken to ensure that differences in performance are due to construct-relevant, rather than irrelevant, factors. A detailed description of the DIF analysis procedures is given in Chapter 8 along with a summary of the results. Detailed results are presented in Appendix I.

Summary of evidence for 1.2.1: Moderate to Substantial Evidence; if the standard setting included a process where subject matter experts evaluated the KSA demands of the items relative to the KSAs in the PLDs would provide additional evidence.

Summary of evidence for 1.2.2: Moderate to Substantial Evidence; results of a teacher survey, on their experience in regard to accessibility during test administration.

Summary of evidence for 1.2.3: Moderate to Substantial Evidence; results of a teacher survey of their experience in regard to accommodations during test administration would provide additional evidence.

Summary of evidence for 1.2.4: Moderate to Substantial Evidence; a description of the standard setting process where subject matter experts evaluated the KSA demands of the scoring rubrics and criteria relative to the KSAs in the PLDs would provide additional evidence.

Summary of evidence for 1.2.5: Moderate to Substantial Evidence; a follow-up study evaluating construct-irrelevant variance of more recent items may be warranted

Summary of evidence for 1.2.6: Moderate to Substantial Evidence; results of a teacher survey of their experience in regard to any issues having to do with item rendering during test administration would provide additional evidence

Summary of evidence for 1.2.7: Moderate to Substantial Evidence; results of a teacher survey of their experience in regard to any issues having to do with the platform during test administration would provide additional evidence.

Summary of evidence for 1.2.8: Moderate to Substantial Evidence; results from the NCSC Student Interaction studies may contain evidence of bias or sensitivity issues reported during that study

Assumption 1.3. Test administrations in MSAA states in 2019 followed prescribed, standardized procedural requirements.

Element 1.3.1. Test administrators and School and District Coordinators understood and performed their roles appropriately.

Evidence: Test administrators participated in mandatory test administration training. Chapter 5, *Training and Administration*, provides detailed evidence in regard to ensuring the test administrators and test coordinators properly understood and performed their roles.

Six online training modules address the specific responsibilities of the test administrators and provide information from the three documents they were required to use: Test Administrator Manual (TAM), the Directions for Test Administration (DTA), and the MSAA *Online Assessment System User Guide for Test Administrators*. After completing the training modules, test administrators were required to successfully complete a final quiz with a score of 80% or better.

Required training for test coordinators. Six online training modules address the responsibilities of the test coordinators. Test coordinators are also provided the following supporting documents: TAM, DTAs, the MSAA *Online Assessment System User Guide for Test Administrators*, and the *MSAA Online Assessment System User Guide for Test Coordinators*. In addition:

- Four best-practice videos are provided to the test administrators.
- A technical support chart provides examples of when and who to contact to obtain answers in regard to MSAA assessment or administration.
- Each test administrator completes a survey. Results are evidence that address this element.

All the above evidence is described in detail in Chapter 5.

Observers were sent into the field to observe test administration and complete an observation checklist. The checklists and any accompanying notes provide evidence as to whether the training was effectively followed by the test administrators and test coordinators.

The Arizona Department of Education summarized results from its spring 2019 MSAA administration observations. Their observations included the following:

- Of 61 observations, 93.4% administered MSAA following the instructions in the *Directions for Test Administration* (DTA).
- Of 45 observations, 75.6 % reported high implementation of DTA requirements, 20% reported medium implementation, and 4.4% reported low implementation fidelity.
- Of 54 responses, 96.3% observed secure storage of secure test materials.

Summary of evidence: Moderate to Substantial. Complete Evidence would require positive reports on observations of test administrations in all states. Observations and reports should be conducted annually in order to ensure implementation fidelity and maintain Complete Evidence status.

Element 1.3.2. Test security concerns were limited.

Chapter 5, Section 5.6.11, *Test Security and Test Irregularities*, provides detailed evidence indicating that test security policies and practices resulted in limited test security concerns.

Evidence: Evidence for 1.3.2 includes the following.

- Irregularity reports: Testing irregularities are defined in the TAM (p. 25) and what constitutes a testing irregularity is defined in the training. Summary reports were organized at the school, district, and state levels and included information on administration irregularities.

- Service Center records: Before, during, and after testing, the service center operated to receive, respond to, and track reported issues, including routing issues to appropriate people for resolution. All activity was tracked and included in weekly status reports.

- Monitoring activities: Numerous measures taken to ensure proper testing procedures and appropriate test practices were maintained during test administration. These measures are detailed in Section 5.7.20, "Monitoring and Quality Control."

- Observation checklists: Observers were sent into the field to observe test administration and fill-in an observation checklist. The checklists provide evidence as to whether secure administration protocol was followed and whether secure storage of the testing materials occurred. The reports by the observers were a new feature of the 2019 test and observations are compiled by both state-level observers and test coordinators.

Summary of evidence: Moderate to Substantial Evidence; we could consider existing statistical forensic analyses that might apply to MSAA to supplement the substantive analyses listed above. In addition, Cognia will redesign the Irregularity Reports for 2020 to distinguish possible test security incidents from all other irregularities.

Assumption 1.4. Test scores on the 2019 MSAA are reliable and valid.

Element 1.4.1. MSAA scores and categorizations into performance levels are adequately reliable for their intended purpose.

Evidence: Evidence for 1.4.1 includes the following.

- Internal consistency: Chapter 10 provides a description of reliability theory and interpretation, a review of the relevant equations, and a summary of the results. In particular, the reliability

estimates can be interpreted as the correlation that would be obtained between scaled scores on two parallel forms.

- Scaled score standard errors: Chapter 9 provides a description of calculation and interpretation of the scaled scores, as well as a description of the calculation of the standard error for a scaled score. The average standard error for a reported scaled score is reported in Chapter 10. The scaled score standard error can be compared to the scaled score range and the scaled score standard deviation to provide some context for interpretation.

- Performance level classification consistency and accuracy estimates: Accuracy is an estimate of the probability that the observed classification is the true classification. Consistency is an estimate of the probability that students would receive the same classification if they tested twice on parallel forms. Chapter 11 describes the theory and equations underlying the estimation of classification accuracy and consistency, while also reporting summary statistics. Detailed results are provided in Appendix M.

Summary of evidence: Complete Evidence

Element 1.4.2. Item characteristics support intended interpretations about all students who take MSAA.

Evidence: The psychometric characteristics most pertinent to evaluating the adequacy of individual items are the estimated item parameters. The item parameter estimates are summarized in tables in Chapter 9. For dichotomously scored items, the item parameters include the discrimination parameter and the difficulty level parameter. For polytomously scored items, namely the writing traits, the item parameter estimates include the discrimination parameter, the overall difficulty level parameter, and the step difficulty parameters for each of the possible non-zero scores. All items undergo statistical analyses at the time of field testing, including classical, DIF, and IRT analyses. The results of these analyses are reviewed in Data Review meetings with the MSAA psychometric subcommittee. After field testing and prior to operational administration, items from the previous operational administration are reviewed for their item information function (IIF) contributions at the performance level cuts to evaluate and rate the quality of each item. After each operational administration, dimensionality analyses are also conducted to determine how the items correlate with each other in terms of the underlying constructs of the test.

Summary of evidence: Complete Evidence

Element 1.4.3. Test characteristics for paths A, B, and C support intended interpretations about all students who take MSAA.

Evidence: Evidence for 1.4.3 includes the following.

- Dimensionality: Dimensionality analysis was conducted on each Path for each grade-level test. Section 8.3 gives a detailed description of the hypothesis testing and effect size estimation methods. Results are summarized in a table accompanied by a description of the results. Small to moderate violations of local independence were noted, and interpretations of these results were presented.

- Test Information Functions: Chapter 9 provides a detailed description of the psychometric model that was fitted to the data. In particular, it describes the test information function (TIF), the most pertinent product of the psychometric model in regard to evaluating the adequacy of the test. Appendix K shows the TIF graphs for all three paths for all the MSAA tests. By examining the value of TIF at the performance level cuts (given in the graphs), the psychometric appropriateness of each test can be evaluated.

Summary of evidence: Moderate to Substantial. The TIFs indicate that path-specific information functions are maximized at three different locations on the theta scale. Two other pieces of evidence would enhance this argument: (a) The overlap of path-specific TIFs and path-specific student proficiency distributions, and (b) evidence that path-specific TCC locations are ordered logically and reasonably separated would enhance the TIF information.

Element 1.4.4. Scaling of MSAA supports intended interpretations about all students who take MSAA.

Evidence: Evidence for 1.4.4 includes the following.

- Differential item functioning (DIF) analyses: The scale used for reporting scores is assumed to be measuring only those constructs that are intended to be measured by each test. DIF analyses were conducted to detect items that may be measuring construct-irrelevant variance. Subgroup differences in item-level performance are examined when sample sizes permit. If an item is flagged, appropriate actions are taken to investigate whether the differences in performance are due to construct-irrelevant factors. A detailed description of the DIF analysis procedures is given in Chapter 8 along with a summary of the results. Detailed results are presented in Appendix I.

- Dimensionality: The scale used for reporting scores is a unidimensional scale. Dimensionality analysis was conducted on each Path for each grade-level test to examine the degree to which unidimensionality is evident. When the null hypothesis of unidimensionality is reject, the dimensionality analysis quantifies the violation of unidimensionality and attempts to describe what may be causing the violation. Section 8.3 gives a detailed description of the hypothesis testing and effect size estimation methods. Results are summarized in a table

accompanied by a description of the results. Small to moderate violations of local independence were noted, and interpretations of these results were presented.

- Calibration: The unidimensional scale used for reporting scores is based on an underlying unidimensional IRT model. The initial form of the IRT model is established by an initial calibration of the item response data. The calibration must be conducted accurately in order for the scaling to be appropriately implemented. Section 9.2 provides evidence that can be used to evaluate the effectiveness of the calibration. The evidence provided for the calibration procedure includes discussion of the removal of stringers and a description of how the convergence of the statistical calibration was evaluated.

- Model fit: After the initial calibration converged to a solution, the fit of the model was evaluated. Section 9.2 described how model fit was evaluated and the criteria that were used.

Summary of evidence: Complete Evidence

Element 1.4.5. Equating of MSAA test forms supports intended interpretations about MSAA students.

Evidence: Evidence to support 1.4.5 includes the following.

- Evaluation of equating items: The appropriateness of the equating is contingent upon the substantive and statistical quality of the equating items. Section 9.2 gives a detailed description of the procedures used to ensure the quality of the equating items, in terms of both content representativeness, as well as statistical stability.

- Third-party analysis: As a check on our equating procedures, a third-party vendor is contracted with to also conduct the equating analysis. The third-party results are not included in the technical report. A separate report is written up by the third party and is available upon request. The third-party results for the 2019 were essentially identical to the results reported in the technical report.

Summary of evidence: Moderate to Substantial Evidence; a brief summary of the results of the third-party analyses would provide additional evidence.

Element 1.4.6. Stage 1 covers a broad enough range of item difficulty and item cognitive complexity to route students into appropriate stage 2 test levels.

Element 1.4.7. Routing into the stage 2 test level is appropriate for students.

Element 1.4.8. Stage 2 test levels are sufficiently separable and targeted toward different ranges of achievement for the MSAA students who are routed to those levels.

Evidence for 1.4.6, 1.4.7, and 1.4.8 includes the following.

- Test construction process: The evidence most pertinent to the stages is the report *MSAA Test Construction Process for 2019* (which also reflects the process and criteria for the 2018 MSAA). This detailed report describes how item and test information is targeted for the various stages, including the determination of the routing rules. A brief description is given in Chapter 4. Refer to the full report for a more detailed description.

- Performance level distributions by test path: The test-level statistical results in the technical report are focused on the test as a whole. Thus, the statistical results are focused on Paths A, B, and C, rather than on the stages. Still, some of the path results are especially pertinent to evaluating the psychometric characteristics of the stages. In particular, Section 9.5 reports the Performance Level Distributions across the different paths. If the stages are properly constructed and the routing is properly implemented, the performance level distributions should differ across paths in reasonable ways. The results presented in Section 9.5 can be evaluated in this regard.

Summary of evidence: Complete Evidence

Assumption 1.5. Item and test scoring in 2019 were implemented accurately.

Element 1.5.1. Machine scored items were scored accurately.

Evidence: Machine scorable MSAA items are submitted to a key verification process. As mentioned in Chapter 6, all the operational multiple-choice items are examined prior to score reporting to ensure that the option that was designated as the key was indeed the correct response.

Summary of evidence: Complete Evidence

Element 1.5.2. Constructed response item scoring training and monitoring procedures met industry standards.

Evidence: Scorer recruitment, training, and qualification and scoring monitoring procedures follow industry standards. Section 6.2, *Open-Response Writing Prompts Scoring Processes*, is predominantly devoted to describing all the procedures that are used to ensure the accuracy of the scoring for the constructed response items, including: administrator training and monitoring (6.2.1.2),

benchmarking and identification of scoring materials (6.2.1.3), scorer recruitment and qualifications (6.2.2), scoring leadership (6.2.3), qualification (6.2.4), specific scoring rules to ensure accuracy (6.2.5), monitoring of quality control (6.2.6), quality reports (6.2.7), and inter-rater reliability (6.2.8).

Summary of evidence: Complete Evidence

Assumption 1.6. MSAA scores correlate as expected with external indicators of student proficiency (i.e., concurrent evidence).

Element 1.6.1. MSAA scores correlate as expected with other measures of student proficiency.

Evidence: Peer reviewers acknowledge the challenge of acquiring additional evidence of student achievement that can be correlated with state alternate assessment scores, which they require for state grade levels assessments. As an alternative, peer reviewers do accept correlations that are internal to an alternate assessment as evidence in support of this assumpton. (D. Peasley, personal communication to S. Ferrara, October 21, 2019.) The correlations between 2019 MSAA ELA and mathematics scores in grades 3-8 and 11 are, in order, .85, .84, .83., .83, .80, .82, and .79. These correlations indicate strong convergent validity.

Summary of evidence: Limited Evidence.

11.2 Primary Intended Score Uses

11.2.1 Primary Intended Score Use 1

Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers.

Assumption 2.1. MSAA scores enable teachers and school, district, and state leaders to monitor trends in student proficiency.

Element 2.1.1. MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups.

Evidence: Evidence for the reliability and validity of the scores and the corresponding scoring processes is presented above under Assumptions 1.4 and 1.5 and in Chapters 6, *Scoring*, and 10, *Reliability*. Specifically:

- Evidence of individual score reliability in section 10.1, *IRT Marginal Reliability*, is comparable to industry standards for grade level educational achievement tests. The reliability of aggregated scores typically is as high as or higher than individual score reliabilities (cf. Brennan, 1990s sometime.)
- Evidence presented in Appendix N and discussed in section 10.2, *Subgroup Reliability*, indicates that reliability for some subgroups is strong. However, section 10.2 discusses caveats in interpreting subgroup score reliability with caution because of the potential deleterious effects of small subgroup sizes on estimator standard error as well as possible severe restriction of range.
- No other aggregate score reliabilities (e.g., at the school level) exist.

Summary of evidence: Limited Evidence; possible additional evidence is discussed under Assumptions 1.4, 1.5, and 1.6

Element 2.1.2. MSAA scores and proficiency level categorizations of groups of students are adequately reliable and valid to enable monitoring of grade level performance and student cohort performance.

Evidence: Evidence for the reliability and validity of proficiency level categorizations is presented above under Assumption 1.4. The most pertinent evidence follows.

- Performance level classification consistency and accuracy estimates: Accuracy is an estimate of the probability that the observed classification is the true classification. Consistency is an estimate of the probability that students would receive the same classification if they tested twice on parallel forms. Chapter 11 describes the theory and equations underlying the estimation of classification accuracy and consistency, while also reporting summary statistics. Detailed results are provided in Appendix M.
- Performance level distributions by testing path: Section 9.5 reports the Performance Level Distributions across the different paths. If the stages are properly constructed and the routing is properly implemented, the performance level distributions should differ across paths in reasonable ways. The results presented in section 9.5 can be evaluated in this regard.

Summary of evidence: Complete Evidence

Element 2.1.3. The relationship between MSAA scores and external measures of student achievement and growth is as expected, compared to grade level assessments and other measures of student achievement.

Evidence: In 2015, NCSC submitted the following evidence in support of peer review critical element 3.4, *Evidence of Relations to Other Variables*.

(a) Alignment between knowledge, skills, and abilities in assessment to student learning expectations for instruction. Chapter 2 Test Development; pp. 75-76 and Appendix 3-B, Study 2. Notes: This investigation affirmed that the targets for measurements provide information useful for tracking student progress in the CCSS and to teachers for providing instruction focused on academic expectations.

(b) Vertical coherence study. Chapter 2 Test Development; pp. 82-84 and Appendix 3-B, Study 5. Notes: This investigation addresses the extent to which assessment claims align with grade-level content and are useful for tracking progress. Results indicate measurement targets are appropriate and useful for these purposes.

In addition, the internal correlations between 2019 MSAA ELA and mathematics scores for grades 3-8 and 11 are, in order, .85, .84, .83, .83, .80, .82, and .79. These correlations indicate a moderate to strong relationship between ELA and mathematics MSAA scores, reasonably consistent with correlations observed between grade level state assessments and external measures (e.g., local interim assessments). They suggest that MSAA scores enable teachers and school, district, and state leaders to monitor trends in student achievement as when, for example, student achievement in both content areas progress similarly or do not progress similarly.

Internal correlations are accepted as evidence for critical element 3.4, specifically for alternate assessments, because of the difficulties in collecting additional, external assessment evidence on students with significant cognitive disabilities (D. Peasley, personal communication to S. Ferrara, October 17, 2019).

Summary of evidence: Substantial to Moderate

Assumption 2.2. MSAA results are used to design professional development for teachers.

Evidence: States provide guidance to local districts to promote and guide development of teacher professional development. For example, the Arizona Department of Education provides a document called *How to Teach the State Standards to Students Who Take Alternate Assessments* https://cms.azed.gov/home/GetDocumentFile?id=5866dbe1aadebe085c4de5b4

Summary of evidence: Limited Evidence; an example of additional evidence would be a survey of LEAs to begin to understand the degree to which MSAA-based professional development is implemented

11.2.2 Primary Intended Score Use 2

The MSAA and its results are used to help teachers integrate MSAA scores and other information with their instructional planning.

Assumption 3.1. Teachers use the MSAA and its results to better integrate assessment with their instructional planning.

Element 3.1.1. Teachers find the performance level descriptors and their students' performance levels useful for planning instruction, especially students in performance levels 1 and 2.

> ***Evidence:*** Annual compliance monitoring of IEPs in all states indicates that special education teachers refer to PLDs to establish present levels of performance and to inform goals. For example, the Arizona Department of Education guidance on IEP-required components requires that "The IEP includes measurable annual goals, including academic and functional goals that reflect the needs identified in the PLAAFP and current assessment data" (p. D40; see https://cms.azed.gov/home/GetDocumentFile?id=5b2a897d1dcb250f1c55e5b3).
>
> ***Summary of evidence:*** Limited Evidence; an example of additional evidence would be a survey of teachers to begin to understand the degree to which teachers find MSAA scores and other MSAA-based information useful for planning instruction

Element 3.1.2. Teachers find their students' scale score information useful for planning instruction, especially students in levels 1 and 2.

> ***Evidence:*** Annual compliance monitoring of IEPs in all states suggests that special education teachers refer to PLDs to establish present levels of performance and to inform goals. For example, the Arizona Department of Education guidance on IEP required components requires that "The IEP includes measurable annual goals, including academic and functional goals that reflect the needs identified in the PLAAFP and current assessment data" (p. D40; see https://cms.azed.gov/home/GetDocumentFile?id=5b2a897d1dcb250f1c55e5b3).
>
> ***Summary of evidence:*** Limited Evidence; an example of additional evidence could be a survey of teachers to begin to understand the degree to which teachers find MSAA scores useful for planning instruction

Assumption 3.2. Teachers use MSAA scores and other information for instructional planning.

Element 3.2.1. Teachers use MSAA scores and other information for planning instruction.

Evidence: Annual compliance monitoring of IEPs in all states indicates that special education teachers refer to PLDs to establish present levels of performance and to inform goals. For example, the Arizona Department of Education guidance on IEP required components requires that "The IEP includes measurable annual goals, including academic and functional goals that reflect the needs identified in the PLAAFP and current assessment data" (p. D40; see https://cms.azed.gov/home/GetDocumentFile?id=5b2a897d1dcb250f1c55e5b3).

Summary of evidence: Limited Evidence. An example of additional evidence could be a survey of teachers to begin to understand the degree to which teachers use MSAA scores and other MSAA-based information for planning instruction

11.2.3 Primary Intended Score Use 3

Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year.

Assumption 4.1. Parents find MSAA scores and other information useful for understanding what their child knows and can do.

Element 4.1.1. Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.

Evidence: MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a *Parent Overview* to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly the (a) Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf), and (b) Maryland State Department of Education provides *Curriculum and Instruction Resources for Families* (see http://marylandpublicschools.org/programs/Documents/Special-Ed/IEP/CurriculumInstructionalResourcesFamilies.pdf).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents correctly understand and interpret MSAA scores and other MSAA-based information to understand what their child knows and can do

Element 4.1.2. Parents use MSAA scores and other information appropriately to understand what their child knows and can do and make decisions about their child's education and learning needs.

Evidence: MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a *Parent Overview* to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly the (a) Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf), and (b) Maryland State Department of Education provides *Curriculum and Instruction Resources for Families* (see http://marylandpublicschools.org/programs/Documents/Special-Ed/IEP/CurriculumInstructionalResourcesFamilies.pdf).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents use MSAA scores and other MSAA-based information to understand what their child knows and can do

Assumption 4.2. Parents find MSAA scores and other information useful for understanding their child's progress from year to year.

Element 4.2.1. Parents understand and interpret correctly MSAA scores and other information to understand their child's progress from year to year.

Evidence:

MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a *Parent Overview* to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly the (a) Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf), and (b) Maryland State Department of Education provides *Curriculum and Instruction Resources for Families* (see http://marylandpublicschools.org/programs/Documents/Special-Ed/IEP/CurriculumInstructionalResourcesFamilies.pdf).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents correctly understand and interpret MSAA scores and other MSAA-based information to understand their child's progress from year to year

Element 4.2.2. Parents use MSAA scores and other information appropriately to understand their child's progress from year to year and make decisions about their child's education and learning needs.

***Evidence*:**

MSAA provides information to guide parents in interpreting and using MSAA scores and other information about their child's achievement and learning needs. For example, the Arizona Department of Education sends to districts a *Parent Overview* to accompany each child's Individual Score Report. The overviews are available online in both English and Spanish; see http://www.azed.gov/assessments/parents/. Similarly the (a) Maine Department of Education provides the Parent Overview of the MSAA Assessment System (see https://www.maine.gov/doe/sites/maine.gov.doe/files/inline-files/2016ParentOverview-allgradescombined.pdf), and (b) Maryland State Department of Education provides *Curriculum and Instruction Resources for Families* (see http://marylandpublicschools.org/programs/Documents/Special-Ed/IEP/CurriculumInstructionalResourcesFamilies.pdf).

Summary of evidence: Limited Evidence; an example of additional evidence could be a survey of parents to begin to understand the degree to which parents use MSAA scores and other MSAA-based information to understand their child's progress from year to year.

11.3 CONCLUSIONS

The majority of the assumptions and underlying elements that support the four claims—that is, the primary intended score interpretations and three intended score uses—are supported by solid evidence. These assumptions and elements comprise the validity arguments for MSAA scores. Table 11-3 summarizes the relevance ratings for each assumption and element. The table indicates the following.

Primary Score Intended Score Interpretation

MSAA scores provide reliable and valid information about important grade-level numeracy and literacy knowledge and skills attained by students with the most significant cognitive disabilities. Of the 25 assumptions and elements that support the intended score interpretation, 11 sets of evidence are Complete and 14 sets of evidence are Moderate to Substantial.

Intended Score Use 1

Schools and districts use the MSAA and its results to (a) monitor trends in student performance, and (b) design professional development for teachers. Of the four assumptions and elements that the support intended score use 1, one set of evidence is Missing, two sets are Limited, none are Moderate to Substantial, and one is Complete.

Intended Score Use 2

Teachers use the MSAA and its results to better integrate assessment with their instructional planning. The evidence for all three assumptions and elements that the support the intended score use 2 is Limited.

Intended Score Use 3

Parents use the MSAA and its results to get information about (a) what their child knows and can do, and (b) their child's progress from year to year. The evidence for all four assumptions and elements that the support the intended score use 3 is Limited.

Table 11-4. Status of Evidence for All Four SIUs, Assumptions, and Elements

Element	Relevance of the Evidence to the Element			
	No Evidence Exists Currently	Limited	Moderate to Substantial	Complete
Primary Intended Score Interpretation				
MSAA scores provide reliable and valid information about important knowledge and skills in grade-level numeracy and literacy that students with the most significant cognitive disabilities are attaining.				
1.1.1. MSAA content is aligned to the CCCs and grade level standards.				X
1.1.2. MSAA items are aligned to the CCCs.				X
1.1.3. States have confirmed alignment of MSAA to state content standards.				X
1.1.4. MSAA items are aligned to the PLDs.			X	
1.2.1. Items require application of the KSAs of the targeted construct.			X	
1.2.2. Items are accessible to all students.			X	
1.2.3. Appropriate accommodations are provided to meet student needs.			X	
1.2.4. Scoring rubrics focus on construct relevant aspects of student responses.			X	
1.2.5. Scaffolding is not a source of construct-irrelevant variance.			X	
1.2.6. Item rendering does not interfere with student access to test content.			X	
1.2.7. Platform does not interfere with student interaction with test content.			X	
1.2.8. Items are free of bias and sensitive issues.			X	
1.3.1. Test administrators and Schools and District Coordinators understood and performed their roles properly.			X	
1.3.2. Test security concerns were limited.			X	
1.4.1. MSAA scores and categorizations into performance levels are adequately reliable for their intended purpose.				X

continued

Element	Relevance of the Evidence to the Element			
	No Evidence Exists Currently	Limited	Moderate to Substantial	Complete
1.4.2. Item characteristics support intended interpretations about all students who take MSAA.				X
1.4.3. Test characteristics, for paths A, B, and C support intended interpretations about all students who take MSAA.			X	
1.4.4. Scaling of MSAA supports intended interpretations about all students who take MSAA.				X
1.4.5. Equating of MSAA test forms supports intended interpretations about MSAA students.			X	
1.4.6. State 1 covers a broad enough range of item difficulty and item cognitive complexity to route students into appropriate stage 2 tests.				X
1.4.7. Routing into the stage 2 test level is appropriate for students.				X
1.4.8. Stage 2 test levels are sufficiently separable and targeted toward different ranges of achievement for the MSAA students who are routed to those levels.				X
1.5.1. Machine scored items were scored accurately.				X
1.5.2. Constructed response item scoring training and monitoring procedures met industry standards.				X
1.6.1. MSAA scores correlate as expected with other measures of student proficiency.		X		
Primary Intended Score Use 1 Schools and districts use the MSAA and its results to (a) monitor trends in school performance, and (b) design professional development for teachers.				
2.1.1. MSAA scale scores for groups of students are adequately reliable and valid to enable school, district, and state leaders to monitor changes in means, standard deviations, and proficiency level percentages for classroom, school, district, and state groups.		X		

continued

Element	Relevance of the Evidence to the Element			
	No Evidence Exists Currently	Limited	Moderate to Substantial	Complete
2.1.2. MSAA scores and proficiency level categorizations of groups of students are adequately reliable and valid to enable monitoring of grade level performance and student cohort performance.				X
2.1.3. The relationship between MSAA scores and external measures of student achievement and growth is as expected, compared to grade level assessments and other alternate assessments.			X	
2.2 (Assumption) MSAA results are used to design professional development for teachers.		X		
Primary Intended Score Use 2 The MSAA and its results are used to help teachers integrate MSAA scores and other information with their instructional planning.				
3.1.1. Teachers find the performance level descriptors and their students' performance levels useful for planning instruction, especially students in performance levels 1 and 2.		X		
3.1.2. Teachers find their students' scale score information useful for planning instruction, especially students in levels 1 and 2.		X		
3.2.1. Teachers use MSAA scores and other information for planning instruction.		X		
Primary Intended Score Use 3 Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.				
4.1.1. Parents understand and interpret correctly MSAA scores and other information to understand what their child knows and can do.		X		
4.1.2. Parents use MSAA scores and other information appropriately to understand what their child knows and can do and make decisions about their child's education and learning needs.		X		
4.2.1. Parents understand and interpret correctly MSAA scores and other information to understand their child's progress from year to year.		X		
4.2.2. Parents use MSAA scores and other information appropriately to understand their child's progress from year to year and make decisions about their child's education and learning needs.		X		

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[4] See chapter 7: http://ncscpartners.org/Media/Default/PDFs/Resources/NCSC15_NCSC_TechnicalManualNarrative.pdf

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APPENDICES

APPENDIX A—LIST OF ACRONYMS

Table A-1. Terms and Acronyms

TERMS AND ACRONYMS USED IN THE 2019 MSAA TECHNICAL REPORT	
2PL	two-parameter logistic
AA-AAS	Alternate Assessment Aligned with Alternate Achievement Standards (utilized under ESEA until 2015)
AA-AAAS	Alternate Assessment Aligned with Alternate Academic Achievement Standards (current use under ESSA)
AAC	augmentative and alternative communication
AERA	American Educational Research Association
ANOVA	analysis of variance
APA	American Psychological Association
APIP	Accessible Portable Item Protocol
CCC	Core Content Connector
CCSS	Common Core State Standards
CSEM	conditional standard error of measurement
DAC	decision accuracy and consistency
DETECT	Dimensionality Evaluation to Enumerate Contributing Traits
DIF	differential Item functioning
DIMTEST	computer program used by Measured Progress
DNU	do not use
DTA	Directions for Test Administration
ELA	English language arts
EOTS	end-of-test survey
ESR	early stopping rule
EU	essential understanding
FKSA	focal knowledge, skills, and ability
GM	geometry (in standards)
GRM	graded-response model
HOSS	highest obtainable scale score
ICC	item characteristic curve
ICCC	item category characteristic curve
ICTC	item category threshold curve
IEP	individualized education program
IRC	Item Review Committee (includes Content Review Committee and Bias-Sensitivity Review Committee)
IRT	Item Response Theory
IT	information technology
KSA	knowledge, skills, and ability
LEP	limited English proficiency
LOSS	lowest obtainable scale score
LPF	Learning Progression Framework
MSAA	Multi-State Alternate Assessment
NCME	National Council on Measurement in Education
NCSC	National Center and State Collaborative

continued

TERMS AND ACRONYMS USED IN THE 2019 MSAA TECHNICAL REPORT	
PARSCALE	Item response theory (IRT) software program that can perform item analysis and test scoring for dichotomous and polytomous IRT models
PLD	performance level descriptor
R9-stringer	student who responds to nine (or more) consecutive multiple-choice items with the exact same option
SD	standard deviation
SEM	standard error of measurement
SRC	student response check
STL	scoring team leader
TA	test administrators
TAC	Technical Advisory Committee
TAM	Test Administration Manual
TC	test coordinators
TCC	test characteristic curve
TIF	test information function
UWC	use with caution

APPENDIX B—ACCOMMODATION FREQUENCIES

Table B-1. Accommodation Frequencies—ELA

Accommodations	*Grades*						
	3	*4*	*5*	*6*	*7*	*8*	*11*
LCI_Vision[1]	168	205	187	187	182	211	149
SAR_Assistive_Presentation_After[2]	-	-	-	-	-	-	-
SAR_Assistive_Response_After[2]	313	334	360	392	400	362	281
SAR_No_Accomm_Needed_After[3]	527	561	646	763	856	892	911
SAR_Paper_Version_After[4]	228	222	189	231	161	179	141
SAR_Scribe_After[5]	949	997	1028	1005	906	904	511
SAR_Sign_Interpretation_After[6]	27	37	35	35	41	24	31

[1]: LCI_Vision - Input could occur through alternate keyboards, eye-gaze, switch devices, speech-to-text, and other similar input devices. Students are also expected to access text using AT devices (e.g., screen readers), but refreshable Braille display is not supported for presentation of text-based content for the first operational year.
[2]: SAR_Assistive_Response_After - Assistive Technology (AT) for viewing, responding, or interacting with test items. [3]: SAR_No_Accomm_Needed_After - No accommodations needed.
[4]: SAR_Paper_Version_After - Paper version of item/s.
[5]: SAR_Scribe_After - A scribe will enter in the MSAA Online Assessment System the student-indicated answer to a selected-response item. For the constructed-response writing item, the scribe will record the student's response to the writing prompt on the response templates in the MSAA Online Assessment System.
[6]: SAR_Sign_Interpretation_After - TA may communicate passages, items and response options using sign language to student.

Table B-2. Accommodation Frequencies—Mathematics

Accommodations	*Grades*						
	3	*4*	*5*	*6*	*7*	*8*	*11*
LCI_Vision[1]	168	203	186	191	182	211	150
SAR_Assistive_Presentation_After[2]	-	-	-	-	-	-	-
SAR_Assistive_Response_After[2]	313	334	361	393	400	363	282
SAR_No_Accomm_Needed_After[3]	528	563	648	759	854	891	908
SAR_Paper_Version_After[4]	228	223	190	233	162	179	141
SAR_Scribe_After[5]	950	996	1027	1004	911	905	515
SAR_Sign_Interpretation_After[6]	27	37	36	35	41	24	31

[1]: LCI_Vision - Input could occur through alternate keyboards, eye-gaze, switch devices, speech-to-text, and other similar input devices. Students are also expected to access text using AT devices (e.g., screen readers), but refreshable Braille display is not supported for presentation of text-based content for the first operational year.
[2]: SAR_Assistive_Response_After - Assistive Technology (AT) for viewing, responding, or interacting with test items.
[3]: SAR_No_Accomm_Needed_After - No accommodations needed.
[4]: SAR_Paper_Version_After - Paper version of item/s.
[5]: SAR_Scribe_After - A scribe will enter in the MSAA Online Assessment System the student-indicated answer to a selected-response item. For the constructed-response writing item, the scribe will record the student's response to the writing prompt on the response templates in the MSAA Online Assessment System.
[6]: SAR_Sign_Interpretation_After - TA may communicate passages, items and response options using sign language to student.

Table B-3. Accommodation Summary

Content Area	*Grade*	*Number of Students Tested*	
		With Accommodations	*Without Accommodations*
ELA	3	1,685	1,209
	4	1,779	1,271
	5	1,899	1,348
	6	2,047	1,245
	7	2,043	1,398
	8	2,081	1,397
	11	1,702	1,396
Mathematics	3	1,687	1,218
	4	1,780	1,272
	5	1,900	1,353
	6	2,048	1,247
	7	2,045	1,394
	8	2,082	1,402
	11	1,704	1,395

APPENDIX C—PARTICIPATION RATES

Table C-1. Summary of Participation by Demographic Category—ELA

Description	*Tested*		*Total Tested*	*Total Percent*
	# Complete	*# No Observable Mode of Communication*[1]		
All Students	21,568	932	22,500	100.00
Female	6,983	340	7,323	32.55
Male	13,105	514	13,619	60.53
Gender Undefined	1,480	78	1,558	6.92
Hispanic or Latino	4,476	205	4,681	20.80
American Indian or Alaska Native	541	35	576	2.56
Asian	598	26	624	2.77
Black or African American	5,273	173	5,446	24.20
Native Hawaiian or Pacific Islander	127	17	144	0.64
White (non-Hispanic)	8,278	360	8,638	38.39
Two or More Races (non-Hispanic)	567	18	585	2.60
No Primary race/Ethnicity Undefined	1,708	98	1,806	8.03
Currently receiving LEP services	1,781	76	1,857	8.25
Not receiving LEP services	7,592	389	7,981	35.47
LEP: All Other Students	12,195	467	12,662	56.28
Economically Disadvantaged Students	3,375	165	3,540	15.73
Non-economically Disadvantaged Students	4,605	257	4,862	21.61
SES: All Other Students	13,588	510	14,098	62.66
Migrant	6	0	6	0.03
Non- migrant	7,974	422	8,396	37.32
Undefined Migrant Status	13,588	510	14,098	62.66
Augmentative Communication	3,832	269	4,101	18.23
No Augmentative Communication	17,615	659	18,274	81.22
Undefined Augmentative Communications	121	4	125	0.56
Hearing Loss	585	157	742	3.30
Within Normal Limits	20,916	771	21,687	96.39
Undefined Hearing Loss	67	4	71	0.32
Visual Impairment	942	347	1,289	5.73
Within Normal Limits	20,497	578	21,075	93.67
Undefined Visual Impairment	129	7	136	0.60
Sensory Stimuli Response	1,619	764	2,383	10.59
Follow Directions	19,941	168	20,109	89.37
Undefined Receptive Language	8	0	8	0.04
Special School	2,260	246	2,506	11.14
Regular School Self-contained	13,538	612	14,150	62.89
Regular School Resource Room	3,567	52	3,619	16.08
Regular School Primarily Self-contained	1,550	9	1,559	6.93
Regular School General Education	645	13	658	2.92
Undefined Classroom Setting	8	0	8	0.04
Student Communicates Primarily Through Cries	1,355	747	2,102	9.34
Uses Intentional Communication	4,650	151	4,801	21.34
Uses Symbolic Language	15,555	34	15,589	69.28
Undefined Expressive Communication	8	0	8	0.04

[1] No Observable Mode of Communication indicates that the students' test was closed because they had no visible means of communication.

Table C-2. Summary of Participation by Demographic Category—Mathematics

Description	*Tested*		*Total Tested*	*Total Percent*
	# Complete	*# No Observable Mode of Communication*[1]		
All Students	21,595	932	22,527	100.00
Female	6,977	340	7,317	32.48
Male	13,132	514	13,646	60.58
Gender Undefined	1,486	78	1,564	6.94
Hispanic or Latino	4,488	205	4,693	20.83
American Indian or Alaska Native	543	35	578	2.57
Asian	601	26	627	2.78
Black or African American	5,281	173	5,454	24.21
Native Hawaiian or Pacific Islander	124	17	141	0.63
White (non-Hispanic)	8,276	360	8,636	38.34
Two or More Races (non-Hispanic)	569	18	587	2.61
No Primary race/Ethnicity Undefined	1,713	98	1,811	8.04
Currently receiving LEP services	1,787	76	1,863	8.27
Not receiving LEP services	7,594	389	7,983	35.44
LEP: All Other Students	12,214	467	12,681	56.29
Economically Disadvantaged Students	3,378	165	3,543	15.73
Non-economically Disadvantaged Students	4,604	257	4,861	21.58
SES: All Other Students	13,613	510	14,123	62.69
Migrant	7	0	7	0.03
Non- migrant	7,975	422	8,397	37.28
Undefined Migrant Status	13,613	510	14,123	62.69
Augmentative Communication	3,834	269	4,103	18.21
No Augmentative Communication	17,640	659	18,299	81.23
Undefined Augmentative Communications	121	4	125	0.55
Hearing Loss	582	157	739	3.28
Within Normal Limits	20,946	771	21,717	96.40
Undefined Hearing Loss	67	4	71	0.32
Visual Impairment	944	347	1,291	5.73
Within Normal Limits	20,522	578	21,100	93.67
Undefined Visual Impairment	129	7	136	0.60
Sensory Stimuli Response	1,620	764	2,384	10.58
Follow Directions	19,967	168	20,135	89.38
Undefined Receptive Language	8	0	8	0.04
Special School	2,259	246	2,505	11.12
Regular School Self-contained	13,568	612	14,180	62.95
Regular School Resource Room	3,567	52	3,619	16.07
Regular School Primarily Self-contained	1,550	9	1,559	6.92
Regular School General Education	643	13	656	2.91
Undefined Classroom Setting	8	0	8	0.04
Student Communicates Primarily Through Cries	1,358	747	2,105	9.34
Uses Intentional Communication	4,657	151	4,808	21.34
Uses Symbolic Language	15,572	34	15,606	69.28
Undefined Expressive Communication	8	0	8	0.04

[1] No Observable Mode of Communication indicates that the students' test was closed because they had no visible means of communication.

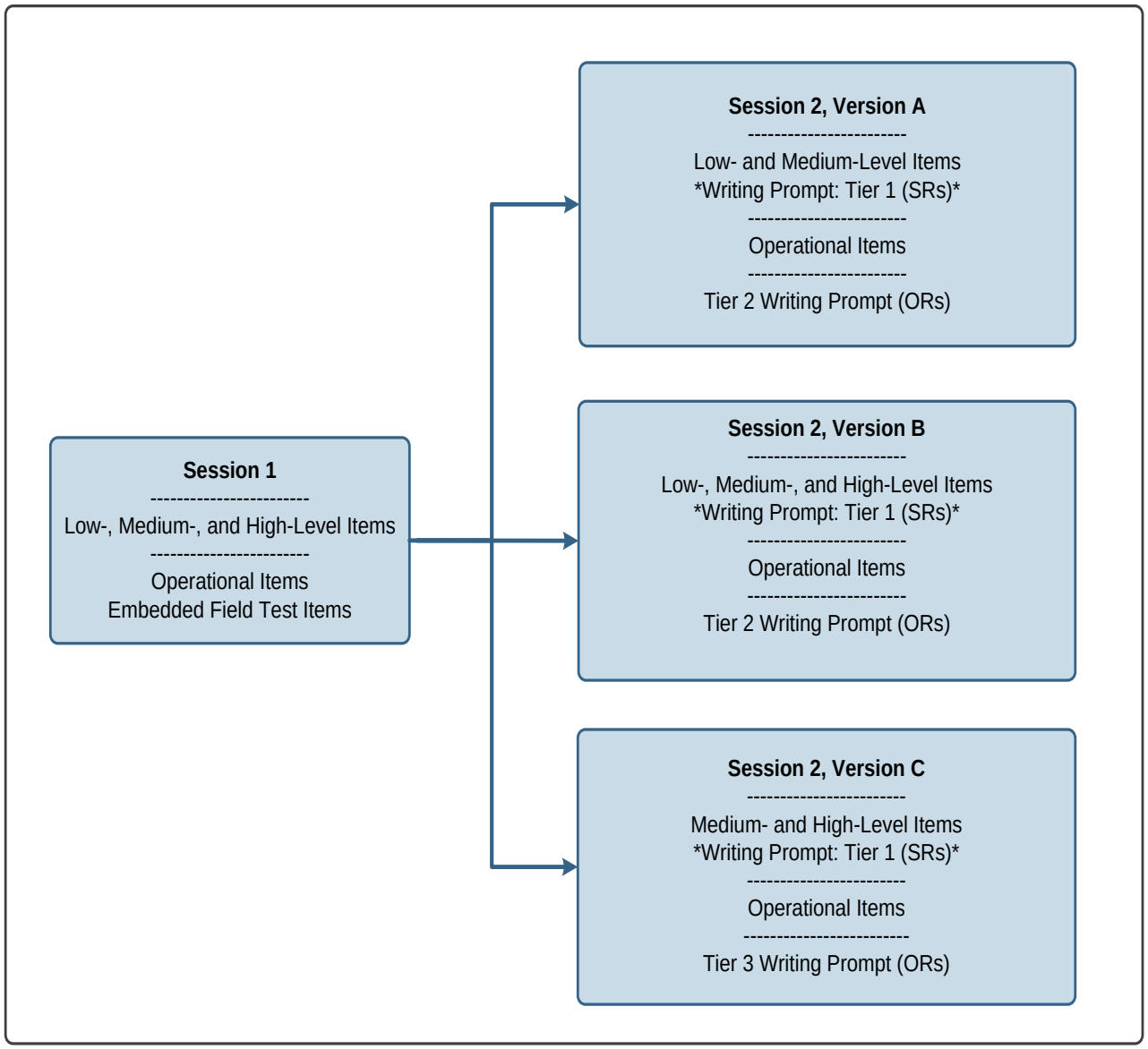
Table C-3. Participation Rates by Subgroup

Description	*Total Tested*	*Invalidated*	*Did Not Test*
ELA	22,500	143	1,287
Mathematics	22,527	132	1,271

APPENDIX D—TEST DESIGN BLUEPRINTS

I. Overview of 2019 MSAA Test Design

- Three Forms in Session 1
- Operational Test selection will use Stat data instead of Tiers for Test Construction.
- Items used to generate student scores are from the 2015 -2018 administrations
- Item sets may overlap within Session 2. Refresh rate 33% for both ELA and Mathematics
- All Field Test items will appear in Session 1
    - ~27-30 FT items in ELA (~9-10 FT in each form) (Each grade must be consistent in # of FT items per form but can vary across grades)
    - 30 FT items in Mathematics (10 FT in each form)



II. Blueprint Guidelines—ELA

When the item pool allows, these are the blueprint guidelines that will inform test construction.

*Chart reflects inclusion of 3 Operational Foundational Items in grades 3 and 4

The ELA chart below specifies where the Operational passage sets, operational writing items, and field test slots will be in the sessions.

ELA Content Category	*Gr 3*	*Gr 4*	*Gr 5*	*Gr 6*	*Gr 7*	*Gr 8*	*Gr 11*
Reading Literary	29-38%	32%	34%	45%	28-38%	36%	33-36%
Reading Informational	22-31%	32%	39%	25%	21-31%	36%	26-28%
Reading Vocabulary and Foundational (G3 and G4)	17%	17%	5%	8%	11-13%	10%	8-13%
Writing	26%	20%	21%	23%	28%	26%	28%

Notes:

- Cognia psychometricians have analyzed passage sets as a whole to show how well they differentiate between stages 2A, 2B, and 2C using IRT stats.
    - Goal is to move toward:
        - 2A: difficulty range-low
        - 2B: difficulty range-medium
        - 2C: difficulty range-high
- Writing standalones in Session 1.
- Writing Prompt-SRs (Tier 1) in Session 2 versions.
- Writing Prompt-OR Tier 2 in Session 2A and B versions. Writing Prompt -OR Tier 3 in Session 2C versions.
- FT Foundational items are added to Session 1, Form 1 for grades 3 and 4. Grades 3-8 & 11 will have FT writing items, L1 Writing Prompts or shortened passage set.
- Item Types:
  SR- Independent item that is not connected to any other items
  Two-Part SR- answering one item is not dependent on answering the previous item. Students could reference the previous item without impacting their score.
  MSR- indicates dependency (EBSR). Students should not be able to reference previous item because the answer to it is in the second item.

	Session One Gr 3& 4 OP Points* = 21 Gr 5-8 &11 OP Points* = 18 FT Points** = ~8-10	Session Two A OP Points–SRs = 18-20 OP Points–OR = 0-9	Session Two B OP Points–SRs = 18-20 OP Points–OR = 0-9	Session Two C OP Points–SRs = 18-20 OP Points–OR = 0-9
	Difficulty Range-low to high (with focus on medium)	Difficulty Range-low	Difficulty Range-medium	Difficulty Range-high
Form 1	Passage set	Passage set	Passage set	Passage set
	Passage set	Passage set	Passage set	Passage set
	Passage set	Passage set	Passage set	Passage set
	Gr 3&4 Foundational Items only			
	3-4 Writing Standalones	Writing Prompt - SRs (Tier 1)	Writing Prompt - SRs (Tier 1)	Writing Prompt - SRs (Tier 1)
	FT passage set 1	Writing Prompt – OR (Tier 2)	Writing Prompt – OR (Tier 3)	Writing Prompt – OR (Tier 3)
	FT Foundational Items for grades 3 & 4 FT writing stand-alone items OR shortened passage set grade 5-8 & 11 OR Level 1 WP			
Form 2	Passage set	same as above	same as above	same as above
	Passage set			
	Passage set			
	Gr 3&4 Foundational Items only			
	3-4 Writing Standalones			
	FT passage set 2			
	FT writing stand-alone items OR shortened passage set OR Level 1 WP			
Form 3	Passage set	same as above	same as above	same as above
	Passage set			
	Passage set			
	Gr 3&4 Foundational Items only			
	3-4 Writing Standalones			
	FT passage set 3			
	FT writing stand-alone items OR shortened passage set OR Level 1 WP			

*Session 1 will contain three operational passage sets. They will all be the same regardless of form.
**Field test slots are color-coded peach, orange, and green.

Options

1. Add 3 foundational items to operational tests and increase length of test
2. Remove items from Info or Literary passage sets and keep overall test length the same.

III. Blueprint Guidelines—Mathematics

When the item pool allows, these are the blueprint guidelines that will inform test construction.

Mathematics Content Category	*Gr 3*	*Gr 4*	*Gr 5*	*Gr 6*	*Gr 7*	*Gr 8*	*Gr 11*
Operations and Algebraic Thinking	30%	30%	10%				
Number and Operations Base Ten	20%	20%	40%				
Number and Operations Fractions	20%	20%	20%				
Measurement and Data Geometry	20%	20%	20%				
Geometry	10%	10%	10%	10%	20%	30%	10%
Ratio and Proportions				30%	40%		
Expressions and Equations				20%	10%	20%	
The Number System				30%	20%	10%	
Statistics and Probability				10%	10%	20%	20%
Functions						20%	
Algebra and Functions							50%
Number and Quantity							20%

Guidelines for MSAA Mathematics Tier Distribution

Stage	*Tier 1*	*Tier 2*	*Tier 3*	*Tier 4*
1	5	5	5	0
2A	5	10*	5	0
2B	0	10*	10**	0
2C	0	5	10**	5

*These 10 items are identical if possible **These 10 items are identical if possible

Guidelines for MSAA Content Category Distribution—Number of Items

Content Category	*GR 3*	*GR 4*	*GR 5*	*GR 6*	*GR 7*	*GR 8*	*GR 11*
Operations and Algebraic Thinking	10-11	10-11	3-4				
Number and Operations Base Ten	7	3-4	14				
Number and Operations Fractions	7	10-11	7				
Measurement and Data	7	7	7				
Geometry	3-4	3-4	3-4	3-4	7	10-11	3-4
Ratio and Proportions				10-11	14		
Expressions and Equations				7	3-4	7	
The Number System				10-11	7	3-4	
Statistics and Probability				3-4	3-4	7	7
Functions						7	
Algebra and Functions							17-18
Number and Quantity							7
TOTAL	35	35	35	35	35	35	35

Guidelines for MSAA CR items—Number of Items

Grade	*3*	*4*	*5*	*6*	*7*	*8*	*11*
Number of CR items	1-2	2-4	2-3	1-2	1-2	1-2	1-2

Note: MSAA would like to see more CRs developed for Mathematics.

Field Test Positions: 5, 6, 9, 10, 14, 15, 19, 20, 24, 25

IV. 2019 MSAA ELA Blueprint

Notes:

- Measured Progress psychometricians have analyzed passage sets as a whole to show how well they differentiate between stages 2A, 2B, and 2C using IRT stats.
    - Goal is to move toward:
        - 2A: difficulty range-low
        - 2B: difficulty range-medium
        - 2C: difficulty range-high
- Overlapping passage sets will occur in Session 2A, B & C, but they will vary based on how well they differentiate based on IRT stats
- Writing standalones to Session One.
- Writing Prompt-SRs (Level 1) administered to all Session 2 versions.
- Writing Prompt-OR WP Level 2 administered to Session 2A. Writing Prompt -OR WP Level 3 administered to Sessions 2B and 2C.
- Foundational items are added to Session 1, Form 1 for grades 3 and 4 in Field Test. FT Foundational items are added to Session 1, Form 1 for grades 3 and 4. Grades 3-8 & 11 will have FT writing items, L1 Writing Prompts or shortened passage set.
- Item Types:
  SR- Independent item that is not connected to any other items
  Two-Part SR- answering one item is not dependent on answering the previous item. Students could reference the previous item without impacting their score.
  MSR- indicates dependency (EBSR). Students should not be able to reference previous item because the answer to it is in the second item.

Blueprint Guidelines—ELA

When the item pool allows, these are the blueprint guidelines that will inform test construction.

ELA Content Category	*Gr 3*	*Gr 4*	*Gr 5*	*Gr 6*	*Gr 7*	*Gr 8*	*Gr 11*
Reading Literary	29-38%	32%	34%	45%	28-38%	36%	33-36%
Reading Informational	22-31%	32%	39%	25%	21-31%	36%	26-28%
Reading Vocabulary and Foundational (G3 and G4)	17%	17%	5%	8%	11-13%	10%	8-13%
Writing	26%	20%	21%	23%	28%	26%	28%

*Chart reflects inclusion of 3 Operational Foundational Items in grades 3 and 4

Grade 3 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Reading: Literary	29-38%	3.RL.h1** Answer questions related to the relationship between characters, setting, events, or conflicts (e.g., characters and events, characters and conflicts, setting and conflicts) NOT 2-PART	SR, MSR one or two-part item	12-16
		3.RL.i2 Answer literal questions and refer to text to support your answer	SR	
		3.RL.k2** Determine the central message, lesson, moral, and key details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally	MSR MSR two-part	
Reading: Informational	22-31%	3.RI.h1** Identify the purpose of a variety of text features NOT 2-PART	SR	9-13
		3.RI.h4 Use illustrations (e.g., maps, photographs, diagrams, timelines) in informational texts to answer questions	SR	
		3.RI.i2 Determine the main idea of text read or read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally	SR	
		3.RI.k5** Determine the main idea of a text; recount the key details and explain how they support the main idea	SR MSR two-part	
Reading: Vocabulary and Foundational	17%	3.RWL.i2 Use sentence context as a clue to the meaning of a new word, phrase, or multiple meaning word	SR	7
		3.RWL.i1 Use context to confirm or self-correct word recognition.	SR	
Writing	26%	3.WI.l4 Sort evidence (e.g., graphic organizer) collected from print and/or digital sources into provided categories	SR	4
		3.WI.p1 Include text features (e.g., numbers, labels, diagrams, charts, graphics) to enhance clarity and meaning	SR	
		3.WL.o1 With guidance and support from adults, produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g., to entertain), or audience	MSR, CR	6 MSR 1 CR
Total	100%			42

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

Grade 4 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Reading: Literary	32%	4.RL.i1 Refer to details and examples in a text when explaining what the text says explicitly	SR	13
		4.RL.k2** Determine the theme of a story, drama, or poem; refer to text to support answer	SR, MSR one or two-part item	
		4.RL.I1** Describe character traits (e.g., actions, deeds, dialogue, description, motivation, interactions); use details from text to support description	SR, MSR two-part	
Reading: Informational	32%	4.RI.h4 Use information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) to answer questions	SR	13
		4.RI.i3 Determine the main idea of an informational text	SR	
		4.RI.I1** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears	SR, two-part MSR	
Reading: Vocabulary Reading Foundational	17%	4.RWL.i2 Use context as a clue to determine the meaning of unknown words, multiple meaning words, or words showing shades of meaning	SR	7
		4.RWL.j1 Use general academic and domain specific words and phrases accurately	SR	
		4.RWL.i1 Use context to confirm or self-correct word recognition.	SR	
Writing	20%	4.WI.q1 Provide a concluding statement or section to support the information presented	SR	3
		4.WI.p1 Include formatting (e.g., headings, bulleted information), illustrations, and multimedia when useful to promote understanding	SR	
		4.WL.o1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g. to entertain), or audience	MSR, CR	4 MSR 1 CR
Total	100%			41

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

Grade 5 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Reading: Literary	34%	5.RL.b1 Refer to details and examples in a text when explaining what the text says explicitly	SR	12-13
		5.RL.c2** Summarize a text from beginning to end in a few sentences	SR, MSR single or multi-part	
		5.RL.d1 Compare characters, settings, events within a story; provide or identify specific details in the text to support the comparison	SR	
Reading: Informational	39%	5.RI.d5** Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts 2 Part	SR	15
		5.RI.c4** Determine the main idea, and identify key details to support the main idea 2 PART	SR, MSR two-part	
		5.RI.e2 Explain how an author uses reasons and evidence to support particular points in a text	SR	
Reading: Vocabulary	5%	5.RWL.a2 Use context to determine the meaning of unknown or multiple meaning words or phrases	SR	2
Writing	21%	5.WI.b3 Organize ideas, concepts, and information (using definition, classification, comparison/contrast, and cause/effect)	SR	3
		5.WI.d1 Support a topic with relevant facts, definitions, concrete details, quotations, or other information and examples	SR	
		5.WL.h1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (e.g. to entertain), or audience	MSR, CR	4 MSR 1 CR
Total	100%			38

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

Grade 6 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Reading: Literary	45%	6.RL.b2 Refer to details and examples in a text when explaining what the text says explicitly	SR	18
		6.RL.b3 Use specific details from the text (words, interactions, thoughts, motivations) to support inferences or conclusions about characters including how they change during the course of the story	SR	
		6.RL.c3** Summarize a text from beginning to end in a few sentences without including personal opinions 3-PART	SR, SR two-part, MSR	
Reading: Informational	25%	6.RI.b4 Summarize information gained from a variety of sources including media or texts	SR	9-10
		6.RI.c2** Provide a summary of the text distinct from personal opinions or judgments 2 PART	SR, MSR single or multi-part	
		6.RI.g4 Determine how key individuals, events, or ideas are elaborated or expanded on in a text	SR	
		6.RI.g6 Evaluate the claim or argument; determine if it is supported by evidence	SR	
Reading: Vocabulary	8%	6.RWL.a1 Use context to determine the meaning of unknown or multiple meaning words or phrases	SR	2-3
		6.RWL.c1 Use general academic and domain specific words and phrases accurately	SR	
Writing	23%	6.WL.c1 Organize ideas and event so that they unfold naturally	SR	3
		6.WL.c3 Use a variety of transition words, phrases, and clauses to convey sequence and signal shifts from one time frame or setting to another	SR	
		6.WI.h2 Produce a clear, coherent, permanent product that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (e.g., reader)	MSR, CR	5 MSR 1 CR
Total	100%			40

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

Grade 7 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Ranges
Reading: Literary	28-38%	7.RL.i2** Use two or more pieces of textual evidence to support inferences, conclusions, or summaries of text	SR, SR two-part	11-15
		7.RL.j1 Analyze the development of the theme or central idea over the course of the text	SR	
Reading: Informational	21-31%	7.RI.j1** Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR, SR two-part	8-12
		7.RI.j5 Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events)	SR	
		7.RI.l1** Compare/contrast how two or more authors write about the same topic	SR, SR two-part	
		7.RI.k4 Evaluate the claim or argument to determine if they are supported by evidence	SR	
Reading: Vocabulary	11-13%	7.RWL.g1 Use context as a clue to determine the meaning of a grade appropriate word or phrase	SR	4-5
Writing	28%	7.WL.o1 Select or provide a concluding statement or paragraph that follows from the narrated experiences or events.	SR	4
		7.WL.l1 Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events	SR	
		7.WI.o1 Produce a clear, coherent, permanent product (e.g. select/generate responses to form paragraph/essay) that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience(reader)	MSR, CR	6 MSR 1 CR
Total	100%			39

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

Grade 8 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Ranges
Reading: Literary	36%	8.RL.i2** Use two or more pieces of evidence to support inferences, conclusions, or summaries of text	SR, SR two-part	14
		8.RL.j2 Analyze the development of the theme or central idea over the course of the text including its relationship to the characters, setting, and plot	SR	
Reading: Informational	36%	8.RI.j1** Use two or more pieces of evidence to support inferences, conclusions, or summaries of text 2 PART	SR, SR two-part	14
		8.RI.l1 Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation	SR	
		8.RI.k2 Determine how the information in each section contribute to the whole or to the development of ideas	SR	
		8.RI.k4 Identify an argument or claim that the author makes	SR	
Reading: Vocabulary	10%	8.RWL.g1 Use context as a clue to the meaning of a grade-appropriate word or phrase	SR	4
		8.RWL.i1 Use general academic and domain specific words and phrases accurately	SR	
Writing	26%	8.WP.k2 Create an organizational structure in which ideas are logically grouped to support the writer's claim	SR	3
		8.WP.j1 Gather relevant information (e.g., highlight in text, quote or paraphrase from text or discussion) from print and/or digital sources	SR	
		8.WI.o1 Produce a clear, coherent, permanent product (e.g. select/generate responses to form paragraph/essay) that is appropriate to the specific task (e.g., topic), purpose (e.g., to inform), and audience (e.g., reader)	MSR, CR	6 MSR 1 CR
Total	100%			39

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

Grade 11 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Ranges
Reading: Literary	33-36%	1112.RL.b1** Use two or more pieces of evidence to support inferences, conclusions, or summaries of the plot, purpose, or theme within a text	SR, SR two-part	13-14
		1112.RL.d1 Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning	SR	
Reading: Informational	26-28%	1112.RI.b1** Use two or more pieces of evidence to support inferences, conclusions, or summaries or text	SR, SR two-part	10-11
		1112.RI.b5** Determine how key details support the development of the central idea of a text	SR, SR two-part, MSR	
		1112.RI.d1 Determine the author's point of view or purpose in a text	SR	
		1112.RI.e1 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem	SR	
Reading: Vocabulary	8-13%	1112.RWL.b1 Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position in a sentence) as a clue to the meaning of a word or phrase	SR	3-5
		1112.RWL.c3 Develop and explain ideas for why authors made specific word choices within text	SR	
Writing	28%	1112.WI.b2 Create an organizational structure for writing that groups information logically (e.g., cause/effect, compare/contrast, descriptions and examples) to support paragraph focus	SR	4
		1112.WI.b4 Select the facts, extended definitions, concrete details, quotations, or other information and examples that are most relevant to the focus and appropriate for the audience	SR	
		1112.WP.f1 Produce a clear, coherent, permanent product that is appropriate to the specific task, purpose (to persuade), and audience	MSR, CR	6 MSR 1 CR
Total	100%			39

* Percentages are approximate with the total equaling 100%
** CCCs require a multipart item to assess.

V. 2019 MSAA Mathematics Blueprint

- * Standards with operational CR items in 2019
- ** Standards with operational CR items beginning in 2020

Grade 3 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Operations and Algebraic Thinking	28-32%	3.NO.2d3 Solve multiplication problems with neither number greater than 5 3.NO.2e1 Solve or solve and check one- or two-step word problems requiring addition, subtraction, or multiplication with answers up to 100 3.PRF.2d1 Identify multiplication patterns in a real word setting	SR	10-11
Number and Operations Base Ten	17-23%	3.NO.1j3 Use place value to round to the nearest 10 or 100 3.NO.2c1** Solve multi-step addition and subtraction problems up to 100	SR CR	7
Number and Operations Fractions	17-23%	3.NO.1l3 Identify the fraction that matches the representation (rectangles and circles; halves, fourths, thirds, and eighths) 3.SE.1g1 Use =, <, or > to compare 2 fractions with the same numerator or denominator	SR	7
Measurement and Data	17-23%	3.DPS.1g1* Collect data; organize into picture or bar graph 3.ME.1d2 Measure area of rectilinear figures by counting squares	SR CR	7
Geometry	9-11%	3.GM.1i1 Partition rectangles into equal parts with equal area	SR	3 -4
Total	100%			35

Grade 4 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Operations and Algebraic Thinking	28-32%	4.NO.2d7 Determine how many objects go into each group when given the total number of objects and groups where the number in each group or number of groups is not > 10	SR	10-11
		4.PRF.1e3 Solve multiplicative comparisons with an unknown using up to 2-digit numbers with information presented in a graph or word problem (e.g., an orange hat cost $3. A purple hat cost 2 times as much. How much does the purple hat cost? [3 x 2 = p])		
		4.NO.2e2 Solve or solve and check one or two step word problems requiring addition, subtraction, or multiplication with answers up to 100		
Number and Operations Base Ten	9-11%	4.NO.1j5 Use place value to round to any place (i.e., ones, tens, hundreds, thousands)	SR	3-4
Number and Operations Fractions	28-32%	4.NO.1m1 Determine equivalent fractions	SR	10-11
		4.NO.1n2 Compare up to 2 given fractions that have different denominators		
		4.SE.1g2 Use =, <, or > to compare 2 fractions (fractions with a denominator or 10 or less)		
Measurement and Data	17-23%	4.ME.1g2 Solve word problems using perimeter and area where changes occur to the dimensions of a rectilinear figure	SR CR	7
		4.DPS.1g3* Collect data; organize in graph (e.g. picture graph, line plot, bar graph)		
Geometry	9-11%	4.GM.1h2* Classify two-dimensional shapes based on attributes (# of angles)	SR CR	3-4
Total	100%			35

Grade 5 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Operations and Algebraic Thinking	9-11%	5.PRF.2b1 Generate or select a comparison between two graphs from a similar situation	SR	3-4
Number and Operations Base Ten	34-40%	5.NO.1b1 Read, write, or select a decimal to the hundredths place	SR CR	14
		5.NO.1b4 Round decimals to the next whole number		
		5.NO.2c1 Solve one-step problems using decimals		
		5.NO.2a5** Solve word problems that require multiplication or division		
Number and Operations Fractions	17-23%	5.NO.2c2 Solve word problems involving the addition, subtraction, multiplication, or division of fractions	SR	7
		5.PRF.1a1 Determine whether the product will increase or decrease based on the multiplier		
Measurement and Data	17-23%	5.ME.1b2 Convert standard measurements of length	SR	7
		5.ME.2a1 Use a calculator to solve one-step problems involving conversions of standard measurement units of area, volume, time, mass in the same system		
Geometry	9-11%	5.GM.1c3* Use order pairs to graph given points	SR CR	3-4
Total	100%			35

Grade 6 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Ratio and Proportions	28-32%	6.PRF.1c1 Describe the ratio relationship between two quantities for a given situation 6.ME.2a2 Solve one-step real world measurement problems involving unit rates with ratios of whole numbers when given the unit rate (3 inches of snow falls per hour, how much in 6 hours?) 6.NO.1f1 Find a percent of a quantity as rate per 100	SR	10-11
Expressions and Equations	17-23%	6.PRF.1d1 Solve real world single-step linear equations 6.NO.2a6 Solve problems or word problems using up to three-digit numbers and any of the four operations	SR	7
The Number System	28-32%	6.NO.2c3 Solve one-step, addition, subtraction, multiplication, or division problems with fractions or decimals 6.NO.1d4** Select the appropriate meaning of a negative number in a real world situation 6.NO.1d2* Locate positive and negative numbers on a number line	SR CR	10-11
Statistics and Probability	9-11%	6.DPS.1d3 Select the statement that matches mean, mode, and spread of data for 1 measure of central tendency for a given data set	SR	3-4
Geometry	9-11%	6.GM.1d1 Find area of quadrilaterals	SR	3-4
Total	100%			35

Grade 7 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Ratio and Proportions	34-40%	7.NO.2f1** Identify the proportional relationship between two quantities (use rules or symbols to show quantitative relationships)	SR CR	14
		7.NO.2f2 Determine if two quantities are in a proportional relationship using a table of equivalent ratios or points graphed on a coordinate plane		
		7.NO.2f6 Solve word problems involving ratios		
		7.PRF.1f1 Use proportional relationships to solve multistep percent problems in real world situations		
Expressions and Equations	9-11%	7.PRF.1g2 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities	SR	3-4
The Number System	17-23%	7.NO.2i1 Solve multiplication problems with positive/negative numbers	SR	7
		7.NO.2i2 Solve division problems with positive/negative numbers		
Statistics and Probability	9-11%	7.DPS.1k1* Analyze graphs to determine or select appropriate comparative inferences about two samples or populations	SR CR	3-4
Geometry	17-23%	7.ME.2d1 Apply formula to measure area and circumference of circles	SR	7
		7.GM.1h2 Find the surface area of three-dimensional figures using nets of rectangles or triangles		
Total	100%			35

Grade 8 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Functions	17-23%	8.PRF.2e2** Identify the rate of change (slope) and initial value (*y*-intercept) from graphs 8.PRF.1f2 Describe or select the relationship between the two quantities given a line graph of a situation	SR	7
Expressions and Equations	17-23%	8.PRF.1e2 Represent proportional relationships on a line graph 8.PRF.1g3 Solve linear equations with 1 variable	SR	7
The Number System	9-11%	8.NO.1k3* Use approximations of irrational numbers to locate them on a number line	SR CR	3-4
Statistics and Probability	17-23%	8.DPS.1h1* Graph bivariate data using scatter plots and identify possible associations between the variables 8.DPS.1k2 Analyze displays of bivariate data to develop or select appropriate claims about those data	SR CR	7
Geometry	28-32%	8.ME.1e1 Describe the changes in surface area, area, and volume when the figure is changed in some way (e.g., scale drawings) 8.GM.1g1 Recognize congruent and similar figures 8.ME.2d2 Apply the formula to find the volume of 3-dimensional shapes (i.e., cubes, spheres, and cylinders)	SR	10-11
Total	100%			35

Grade 11 Targets by Standard

Content Category	Weight	Core Content Connector	Item Type	2019 Item Range
Algebra and Functions	47-52%	H.PRF.2b1** Translate a real-world problem into a one-variable linear equation	SR CR	17-18
		H.PRF.2b2 Solve equations with one or two variables using equations or graphs		
		H.ME.1b2 Solve a linear equation to find a missing attribute given the area, surface area, or volume and the other attribute		
		H.PRF.1c1 Select the appropriate graphical representation of a linear model based on real world events		
		H.PRF.2c1 Make predictions based on a given model (for example, a weather model, data for athletes over years)		
Number and Quantity	17-23%	H.ME.1a2 Solve real world problems involving units of measurement	SR	7
		H.NO.1a1 Simplify expressions that include exponents		
Statistics and Probability	17-23%	H.DPS.1b1* Complete a graph given the data, using dot plots, histograms, or box plots	SR CR	7
		H.DPS.1c1 Use descriptive stats, range, median, mode, mean, outliers/gaps, to describe data set		
Geometry	9-11%	H.GM.1b1 Use definitions to demonstrate congruency and similarity in figures	SR	3-4
Total	100%			35

APPENDIX E—PANELISTS AND COMMITTEE MEMBERS

MSAA 2019 Item Content and Bias Review Meeting Final Panelists by Grade and Content Area

ELA Content Grades 3-6	
Name	**State**
Georgia Green	DC
Deb Feenstra	SD
Valerie Guerrero	GU
Christy LoCicero	ME
Rhonda Gross	CNMI
Prudence Lybeck	MT
Joellen Merry	ME
Tracy McAbee	TN
Loretta Donovan	AZ
Cassandra Laapui	AS

Mathematics Content Grades 3-6	
Name	**State**
Melissa Adams	ME
Sacha Richards	DC
Helene Cruz	GU
Kathleen Eichhorst	AZ
Carissa Hollinger	MD
Benjamin Morrison	SD
Robert Moss	TN
Senerita Kaleopa	AS
Jennifer Lowe	MD
Stephanie Powell	MT

ELA Content Grades 7, 8, 11	
Name	**State**
Melody Maitland	DC
Michele Deblois	ME
Caitlin Chiller	MT
Therese Flores	GU
Caitlin Jones	MD
Raquel Payton	AZ
Ralyna Schilling	SD
Iloaiuila Tavu'i	AS
Genevive Goodman	MD
Christle Price	TN

Mathematics Content Grades 7, 8, 11	
Name	**State**
Patricia Mulcahy	TN
Malele Kitiona	AS
Joe Benamati	MD
Jolene Wallace	MT
Nancy Leach	SD
Lisa Oliver	AZ
Pamela Parker	TN
Fasefulu Tigilau	CNMI
Jules O'Herron	AZ
Shelby Thibodeau	ME

ELA Bias All Grades	
Name	**State**
Jeri Ann Farkas	AZ
Kaitlyn Dove	MD
Kimberly Mountjoy	TN
Laura Monroe	MT
Travy Moncure	ME
Melissa Hill	SD
Timoteo Tali	AS
Brent Heist	MT
Rebecca Bays	DC
Tracy Lynn Del Rosario	CNMI

Mathematics Bias All Grades	
Name	**State**
Rhonda Frederick	SD
Kristy Wells Flesch	MT
Nick Pagani	MD
Kristen Dunn	SD
Lizelle Amirez	CNMI
Rebecca Coons	AZ
Mark Dennett	ME
Charmelle Smith	DC

ELA Grades 3-5 Reading-Writing	
Name	**State**
Gabbie Finn	AZ
Melissa Adams	ME
Erika West	DC
Caitlin Jones	MD
Jenny Wheeler	AZ
Kerisha Dick	DC
Shannon Tufts	TN
Yutzil Becker	SD

ELA Grades 6-7 Reading-Writing	
Name	**State**
Tracy Del Rosario	PAC6
Sabre Aldrette	MT
Jody Gary	SD
Jennie Zimmerman	AZ
Nick Pagani	MD
Danette Dicks	DC
Sacha Richards	DC
Christy LoCicero (previously Callahan)	ME

ELA Grades 8, 11 Reading-Writing	
Name	**State**
Harvey Hart	AZ
Meredith Verrill	ME
Allison Bennett	TN
Wendi Egnew	AZ
Johanna Connell	ME
Lori Jeffers	SD
Fasefulu Tigilau	CNMI

2018-19 MSAA Technical Advisory Committee Members		
Name	**Organization**	**Expertise**
Derek Briggs	University of Colorado	• Assessment • Growth • Psychometrics
Joseph Martineau	The National Center for the Improvement of Education Assessment	• Psychometrics • Computer Adaptive Testing
Rachel Quenemoen	National Center on Educational Outcomes	• Students with Significant Cognitive Disabilities • NCSC Awareness
Mike Russell	Boston College	• Technology • Accessibility
Martha Thurlow	University of Minnesota/NCEO	• Special Education • Accessibility

APPENDIX F—PROCESSING AND REPORTING BUSINESS REQUIREMENTS

Processing and Reporting Business Requirements

602800 Multi-State Alternate Assessment (MSAA)

Spring 2019 Administration

Version Number	Date	Updated Content Description	Updated By Name
0.1	12/25/2018	Initial Document	Keira Nevers
1.0	03/12/2019	Ready for Client Review	Keira Nevers
1.1	04/04/2019	Update to Student Participation Adjustments	Keira Nevers
1.5	04/09/2019	Update with ESR What skills… text	Keira Nevers
1.9	04/24/2019	Update with CS PM edits	Keira Nevers
2.0	05/01/2019	Updates with client: Approved	Keira Nevers
2.2	06/06/2019	Comment on ESR/ESM rules	Keira Nevers

Glossary

MSAA	Multi-State Alternate Assessment
ELA	English Language Arts
TAO	Testing Assisté par Ordinateur (in French) / Computer Based Testing
TAC	Technical Advisory Committee
SEM	Standard Error of Measurement
MSAA	Multi-State Alternate Assessment
ELA	English Language Arts
BT	Breakthrough Technologies

Approval

I acknowledge that I have read this Decision Rules document and been informed of the contents of this document. By entering my name, title and date approved, I certify my approval. I have received a copy of this document for my records and understand that any further changes will require additional approvals as necessary.

Version	Printed Name	Title	Date Approved

Table of Contents

I. Overview

This document will describe the Information Technology Processing and Reporting requirements for the 2018-2019 Spring testing window for MSAA in support of providing assessment reporting for assessed student test results.

Cognia shall use their vendor, Breakthrough for the MSAA Systems portal which shall be used for registration, participation and administration of the 2019 assessments. Each participating entity shall be reported out by Cognia separately, including but not limited to, results, datafiles and billing.

A. Points of Contact

Title	Name	Contact Email
Client Services Program Manager	Chris Clough	Clough.Chris@measuredprogress.org
Project Manager Information Technology	Sarah McCain	McCain.Sarah@measuredprogress.org
Manager Information Technology Processing & Reporting	Sanjay Iyer	Iyer.Sanjay@measuredprogress.org
Manager Information Technology Software Quality Assurance	Scott Duquette	Duquette.Scott@measuredprogress.org
Senior Business Analyst Information Technology	Keira Nevers	Nevers.Keira@measuredprogress.org
Primary Processing Developer	Chen Chang	Chang.Chen@measuredprogress.org
Primary Report Developer	Chris Lavertu	Lavertu.Chris@measuredprogress.org
Primary SQA Engineer	Ade Monareh	Monareh.Ade@measuredprogress.org
Primary Data Analyst Developer	Nicholas Pietrantonio	Pietrantonio.Nicholas@measuredprogress.org
Principal Data & Reporting Architect	Andrea Hebert	Hebert.Andrea@measuredprogress.org

B. Document References

Name the documents that were sources or results of this document that must be referenced to deliver the requirements as set forth in this document. Examples are File Layouts, Technical Documents, Schema Documents, Report Samples, etc.

Pertains to the referenced documents and the location where the documents can be found. Each document shall be stored in the SharePoint site and have a Change Control audit log.

1) Student Results Layout
   a) The Results Layout shall be delivered as one file for each state entity as a comma separated value file format

C. Assumptions

In order to commit to delivering Data and Printed reports to the client, the following assumptions must be assumed.

D. Risks

Any risks shall be identified and recorded in their respective repositories. All stakeholders shall be notified of any risks associated to their responsible area's and be engaged as necessary.

E. Changes from Prior Year

1) AR is no longer included as part of the MSAA Administration for 2018-2019
2) American Samoa (AS) shall be included as part of the MSAA Administration beginning 2018-2019
3) Student Results Datafile shall include a flag notating that the student participated and responded to at least one field test item
4) Modification of Results Form Number and Item Number to differentiate items and responses
5) The Student Results file positioning when the first items have blank response shall use a designated value to indicate that the blank response is blank (Z)
6) Rules when a category results in DNT or ESR and the decision around reporting both categories on one page
7) Add new text to Student report "What skills to work on next" when Participation Status is ESR

II. General Information

A. Assessments

1) Assessments shall be administered to students beginning March 18, 2019 and shall conclude on May 3, 2019
2) Eligible students shall be tested in ELA and Mathematics in grades 03-08 and 11
3) ELA includes reading and writing
    a) Writing prompt scores shall contribute to the overall ELA score and shall be reported with a separate Reading and Writing scaled percentage of possible points
4) Tests are a staged adaptive design
    a) The raw score of core items in Session I shall determine the version of Session II that is presented to the student to proceed
5) Jurisdictions included in the 2018-2019 Spring Administration are as follows
    a) AZ, Arizona
    b) AS, American Samoa
    c) GU, Guam
    d) CNMI, Northern Mariana Islands
    e) DC, District of Columbia
    f) MD, Maryland
    g) ME, Maine
    h) MT, Montana
    i) SD, South Dakota
    j) TN, Tennessee
    k) VI, Virgin Islands

B. Receivables

Data Files received shall pass all validation rules and formats based on the layout and specification document.

1) Demographic File (from MSAA Systems)
   a) Student Information
   b) Test Exemptions
   c) Invalidations
2) Bullpen File (2)
3) Organization File
4) Data Export (results)

C. Deliverables

Data Files delivered shall pass all validation rules and formats based on the layout and specification document.

Data Files delivered shall pass all validation rules and formats based on the layout and specification document.

1) Student Report PDF: online with print options below
   a) State Option - Print Copies (Parent): TN
   b) State Option - Print Copies (Parent & School): MD, including Gallaudet University
2) Roster Report PDF (School): online
3) Summary Report PDF (School, District, State): online
4) Student Results Datafile (School, District, State): online/datafile
5) Duplicate/Void Test Datafile (State): datafile
6) Stringer Response Datafile (State): datafile
7) Test Materials Download count (State): datafile
8) Demographics by State: datafile
9) Writing Score Off-Topic (State): datafile
   a) State,DistrictCode,SchoolCode,DistrictName,SchoolName,Lname,Fname,StateStudentID ,Grade,ItemNumber,Trait1Score,Trait2Score,Trait3Score
10) Scaled Score Lookup (AZ): datafile
    a) ELA
    b) Mathematics

Contract Code	Jurisdiction		Student Reports (Individual Student)
602850	MD	Maryland	2
602851	TN	Tennessee	1

D. Quality Assurance

All datafiles and reports identified as a deliverable to the Client shall pass internal Quality Assurance measures. The Software Quality Assurance (SQA) team works together with the data processing and data analysis teams to ensure quality data is captured and delivered accurately. Quality control checks are being performed by the data processors and data analysts as the data is handed off via multiple internal software tools. Included in the final execution, the Software Quality Assurance team executes test cases validating student printed reports and student labels for accuracy in comparison to the previously agreed upon report design specifications.

III. IT Processing Pre-Test Assessment Administration

Pre-Test Assessment Administration activities shall be completed prior to the Test Assessment Administration window. The Pre-Administration window shall allow for the client to gather the student and testing subject data to provide Cognia and all other vendors the information to administer the Test Assessments.

A. Test Data Preparation

1) Test Preparation and Materials Delivery
2) Test Item List validation
   a) Content Bank pull item metadata
   b) Item List shall be sent to Psychometrics
3) Demo Files for Data Load Validation to Breakthrough MSAA Testing Systems
4) Data Load Validation and Item Migration Validation

B. Student Data Preparation

1) Student Registration shall occur with each state utilizing the Breakthrough MSAA Systems portal
2) Organization Data shall be provided to the IT Processing group which includes each State, District and School
3) Student Data shall be provided to the IT Processing group which includes all registered students expected to be assessed
4) Each student shall be identified belonging to a School, District or State

IV. Post-Test Assessment Administration

The Test Assessment Administration window shall be defined and closed prior to processing and reporting for Reporting. The conclusion of the testing window shall initiate activity to complete all Results and Reporting to the Client.

A. Student Test Data Processing

1) Student Demographic Clean-up shall be supported with a Bullpen file exchange between the Client and Program Management
   a) Booklet numbers identified may include, but are not limited to;
      i) Setting specific forms
      ii) Swapping booklets between students
      iii) Students in which a school needs to change
      iv) Off grade testing responses

2) Student ID's must be unique within a Jurisdiction
   a) Student records shall be complete and contain all the demographic data values applicable
   b) Student Test Grade shall match the Students Enrollment grade

B. Item Response Data Processing

1) Test Proctor Rules shall be reviewed and reconciled by each state administrator for each case below
   a) If a Test Proctor has administered tests in multiple states

   b) If a Test Proctor has administered a test outside of their designated jurisdiction
2) Item Response records shall be associated with a Student record and have a valid score
   a) Student records shall be associated with one School, District and State
   b) All School, District or State records must exist in the Organization Data from iCore systems
   c) Item Response multiple choice items with a valid score shall be associated with the key value
   d) Item Response writing prompt items must have valid score value and not be missing scores where a writing prompt response exists
3) Item Evidence record count shall match the record count of submitted Evidence files and provided to Client Services for confirmation that all Evidence files have been received for processing

C. Organization Validation

1) The schools and districts returned by states for each demographic row of record in the demographic cleanup file are considered the final school and district codes to be used for analysis and reporting, regardless of where a student's test was taken
2) Cognia will work with states to identify the complete set of these school and district organizations, along with organization names for reporting, during the demographic file acceptance and organization cleanup process with each state
3) The complete set of organizations in the Analysis and Reporting dataset will be loaded in MSAA System to enable access to the reports. States may restrict access through control of the user-accounts associated with each organization
   a) New or revised Organization data shall be updated in both iCore and Breakthrough reporting platforms

D. Student Demographic Cleanup

1) For the purpose of performing demographic cleanup, including identification of the final set of students to be reported via the MSAA, states are provided the complete list of all students registered in the MSAA system
2) The demographic cleanup process enables states to:
   a) Identify and resolve instances of duplicate or erroneous registration records
   b) States may indicate records to "merge" in order to resolve duplicates, "remove", or add, as necessary
   c) Update and add up-to-date demographic data
   d) Update the school and district a student should be at for reporting and aggregations
   e) Provide state-supplied test status information, such as exemptions and invalidations
   f) Confirm or update the grade level expected for testing for each student
      i) The grade level returned by states is the grade level the student is expected to be reported in
3) See the Demographic Clean up Instructions document for additional details
4) Student demographic records from the state that do not have an 'on-grade' test for one or both subjects shall be included for reporting purposes, with no test data

E. Student Test Cleanup

1) All tests associated with a final student record, including tests from student records merged during the demographic cleanup process shall be compiled for the test cleanup process
2) The test cleanup process will independently determine the final ELA and Mathematics tests to be used for analysis and reporting for each student
   a) The tests are considered valid and included in the reporting dataset, else considered duplicate/void and submitted to the individual jurisdictions in a separate datafile
3) Off-Grade Tests may exist where a student's expected grade level for testing from the demographic file does not match the test grade the test is "off-grade"

a) Off-grade tests are classified as Duplicate/Void and are excluded from the Analysis and Reporting Dataset prior to completion of additional test cleanup steps
b) Cognia will create a discrepancy alert for states of any case(s) where the tests associated with a student are off-grade. For these cases, the state may:
    i) Leave the data as-is
        (1) The off-grade test will be considered Duplicate/Void
        (2) The student will be included in the Analysis and Reporting dataset without a test
    ii) Update the student's expected grade level for testing to match the test grade, if appropriate
        (1) The test will be considered on-grade and processed per normal rules at the test grade level
    iii) In either case above the state may also provide Cognia with an updated state-supplied status code for the student if they determine one is applicable for reporting while reviewing the scenario

4) Duplicate/Multiple Test Reconciliation
    a) After off-grade tests have been resolved, if a student still has more than one associated test for the same subject, the final test for Analysis and Reporting is determined using the following hierarchy:
        i) Submitted/Completed Test
        ii) Closed - Early Stopping Rule Applied
        iii) In Progress
    b) If two or more tests have the same status above the test associated with the last (latest) date-time stamp test record shall be used
5) States will provide Cognia with all unique test-clean up scenarios that need to be handled outside of the process defined above
6) The "Bull Pen" file will be handled manually to ensure the correct test, as identified by the state, is used for analysis and reporting

F. Billable Records

MSAA States shall be billed out based on record results. Each record shall be considered a valid billable record when a test is launched and In Progress, Closed or Submitted. The count of billable results shall be delivered to Cognia Finance Department for true up and final billing.

1) Each tested student shall be considered a billable record
    a) A billable record is considered any test that is deemed launched and "In Progress", "Closed" or "Submitted"
    b) A billable record shall not include any records where a student does not have a test record, is no longer enrolled or is withdrawn
2) Gallaudet University, code 60, shall be isolated and billed separately from the state of Maryland

G. Scoring Data

Cognia Scoring Department shall provide IT Reporting with a datafile of raw scores from all tests.

1) The Level 2 or Level 3 Writing Prompt is scored by Cognia using three traits
    a) Organization
    b) Idea Development
    c) Conventions
2) Writing Prompt scores shall be included in the overall ELA score

Original Score / Code	Description	Reported Value	Translated Score Value
0, 1-3	Final Score	0, 1-3	0 = No Evidence of Trait 1 = Limited Evidence 2 = Partial Evidence 3 = Full Evidence
B	Blank Prompt	0	Z = No Evidence Submitted
U	Unreadable	0	U = Unreadable
F	Foreign Language	0	F = Foreign Language
P	Copy of Prompt	0	P = Copy of Prompt
N	No Score	0	N = No Score
5	Off-Topic	0	O = Off Topic
6	Section is Blank	0	Z = Section is Blank

3) All other item scores are scored in the testing platform
4) Non-responses to items are scored as 0 points

V. Student Participation and Exclusions

Participation statuses are assigned independently for ELA and Mathematics for each student in the final Analysis and Reporting dataset using state-supplied test status information in conjunction with test submission and closure data, per the hierarchy.

A. Test Attempt Rules

Test Attempted indicates that a student has answered a minimum of valid test item response(s) within a content area, regardless number of sessions. Responses may be captured for ELA and Mathematics tests.

1) Tests are adaptive
2) A valid response value is any value except NULL or X, where X is an internal code to exclude an item from a student result
3) Writing Prompts shall be considered valid when the dimension score is one of '0','1','2','3','F', or 'P' values, else the response is considered 'Non-response'
4) ELA items are considered valid if the student has at least one item response
5) Mathematics items are considered valid if the student has at least one item response

B. Student Participation Status

Student Participation Status reflects the participation of the test assessment performed by an individual student. The Participation Status hierarchy based on a test status code submitted with the test result.

	Participation Status	Code	Description
Not Reported	Administration Irregularity	IRR	Administration Irregularity was reported but does not necessitate an invalidation
	Invalidated	INV	Student-based or administration-based irregularity resulting in invalidation
	Parental Refusal	PRF	Parental Refusal
	ELL Exempt (ELA Only)	ELL	Student meets the requirements for ELL 1st Year in the U.S. exemption from ELA
	Exempt	EXE	Student meets the requirements for exemption from the test
	Withdrew	WDR	Student withdrew
	No Longer Eligible	NLE	Student is no longer eligible for testing
Reported	Tested	TES	Submitted Test, regardless of number of item responses
	Tested-Incomplete	INC	In Progress Test, with at least one item response
	Early Stopping Rule	ESR	Closed Test - No Observable Communication with no item response
	Early Stopping Rule Misadministration	ESM	Closed Test - No Observable Communication with at least one item response
	Did Not Test	DNT	No Test, or In Progress Test with no item response

1) Duplicate and/or Void tests, including Off-Grade tests are not assigned a Participation Status and are not included in reporting analysis or final reporting
2) If the state has supplied a test status code for a subject, the Participation Status must use the state assigned code
   a) Administration Irregularity
   b) Invalidated
   c) Parental Refusal
   d) ELL Exempt (ELA Tests only)
   e) Exempt
   f) Withdrew
   g) No Longer Eligible
3) If the test is Submitted, the Participation status is considered Tested (TES), regardless of number of item responses
4) If the test is Closed with a status of No Observable Communication Mode and there are no item responses, the Participation Status is considered Early Stopping Rule (ESR)
5) If the test is Closed with a status of No Observable Communication Mode and there is at least one item response, the Participation Status is considered Early Stopping Rule Misadministration (ESM)
6) If the test is In Progress and there are no item responses, the Participation Status is considered Did Not Test (DNT)
7) If the test is In Progress and there is at least one item response, the Participation Status is considered Tested – Incomplete (INC)
8) All other remaining tests shall have set Did Not Test (DNT)
9) Adjustments to Participation Status shall be applied with specific scenario's where a student's Participation Status for each subject is different
   a) If a subject has ESR result, and the other subject has TES or INC or ESM, the ESR is adjusted to ESM with the assumption that the result should be a Misadministration regardless of item responses in that test
   b) If the subject has DNT, and the other subject is ESR, adjust the DNT to ESR to indicate the result as Early Stopping Rule with no item responses in either test

#	Result		Reported		Adjustment
	subject1	subject2	subject1	subject2	
1	TES	TES	TES	TES	
2	TES	INC	TES	INC	
3	TES	ESR	TES	ESM	ESR is adjusted to ESM
4	TES	ESM	TES	ESM	
5	TES	DNT	TES	DNT	
6	INC	ESR	INC	ESM	ESR is adjusted to ESM
7	INC	ESM	INC	ESM	
8	INC	DNT	INC	DNT	
9	INC	INC	INC	INC	
10	ESM	ESR	ESM	ESM	ESR is adjusted to ESM
11	ESM	ESM	ESM	ESM	
12	ESM	DNT	ESM	DNT	
13	DNT	ESR	ESR	ESR	DNT is adjusted to ESR
14	DNT	DNT	DNT	DNT	
15	ESR	ESR	ESR	ESR	

C. Student Participation Summary

Participation Status	Description	Abbrev.	MP Code	State Data File	School/District Data Files			In Agg. Calcs	Student Report Specifics			
				(All Scores[1])	Scaled Score	R/W Percent	Perf. Level		Scaled Score	R/W Percent	Perf Level	Alternate Text
Tested	Tested| Submitted regardless of number of item responses	TES	A	Yes	Yes	0-100	Yes	Yes	Yes	0-100	Yes	
Early Stopping Rule	Closed – No Observable Communication Mode, no responses	ESR	B	Yes	Yes	N/A	Yes	Yes	Yes (lowest)	N/A	Yes Level 1	**PLD Text** Your child did not show an observable response mode during the test, therefore, the test was not administered by the teacher. If you have additional questions, please contact your child's teacher.
Early Stopping Rule Misadministration	Closed – No Observable Communication Mode with at least 1 response	ESM	C	Yes	Yes	0-100	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Incomplete	In Progress with at least 1 response	INC	D	Yes	Yes	0-100	No	No	No Student Report			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.

Participation Status	Description	Abbrev.	MP Code	State Data File	School/District Data Files			In Agg. Calcs	Student Report Specifics			
				(All Scores[1])	Scaled Score	R/W Percent	Perf. Level		Scaled Score	R/W Percent	Perf Level	Alternate Text
* Administration Irregularity	Administration Irregularity was reported but does not necessitate an invalidation. Scores should be interpreted with caution	IRR	E	Yes	Yes	0-100	Yes	Yes	Yes	0-100	Yes	
* Invalidated	Student-based *or* administration-based irregularity resulting in invalidation	INV	F	Yes	No	N/A	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
* Parental Refusal	Parental Refusal	PRF	G	No	No	None	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
* ELL Exempt (ELA Only)	Student meets the requirements for ELL 1st Year in the U.S. exemption from ELA	ELL	H	No	No	N/A	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
* Exempt (Emergency, Medical, Other)	Student meets the requirements for exemption from the test	EXE	I	No	No	N/A	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.

Participation Status	Description	Abbrev.	MP Code	State Data File (All Scores[1])	School/District Data Files			In Agg. Calcs	Student Report Specifics			
					Scaled Score	R/W Percent	Perf. Level		Scaled Score	R/W Percent	Perf Level	Alternate Text
Did Not Test	No test or an In-Progress test with no responses	DNT	J	No	No	N/A	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
* Withdrew	Student withdrew	WDR	K	No	No	N/A	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
* No Longer Eligible	Student is no longer eligible for testing	NLE	L	No	No	N/A	No	No	No Student Report.			Your child did not receive a score in this content area. Please contact your child's teacher/school for more information.
Because the reports are displaying both ELA and Mathematics on one-page, Alternate Text where No Student Report may appear if, in fact, the student has a score in one of the ELA or Mathematics categories.												
Void/Duplicate	Test is a Duplicate or Void; excluded from Analysis and Reporting Dataset	N/A	M	Separate File from Student Results; raw (unscored) data only.								
REMOVE	Student demographic record marked by state as REMOVE	These students and all associated tests are excluded from the analysis and reporting dataset entirely and are not provided to the state.										

** Only available through a state-supplied status code.*

[1] All Scores: State Student Results Files include Item Responses, Raw Scores, Scaled Scores, and Performance Levels, as applicable by status.

VI. Calculations

Calculations shall be defined for reporting purposes. Once the student test records and demographics records are resolved of any and all discrepancies, the valid reporting records shall be used for final reporting.

A. Raw Scores

1) Overall raw scores are calculated based on the scores to items that are classified as “core” items for the test form
   a) Any other item response scores are excluded
2) The “core” item list shall be determined prior to the test administration and identified in the test mapping

B. Writing Trait Scores

1) Student level writing trait scores are not included in the individual student report, yet is considered as part of the overall ELA score reported
2) Student level writing trait scores are available with the final writing prompt score values in the state’s student results datafile

C. Scaling and Equating

1) Cognia Psychometrics department shall use raw score values to a scaled score lookup for each grade and subject for each adaptive version of the test items

D. Performance Levels

1) Performance levels have four categories in which a student test result shall report, Level 1 being the lowest through Level 4 being the highest
2) MSAA cut scores for each performance level shall be validated using Empirical Standards Validation Process as recommended by TAC

E. Aggregate Calculations

1) Eligible Students are included in Aggregate Calculations for reporting at the State, District and School levels based on reported Participation Status
2) Technical Reports and Item Statistics are aggregated at an overall MSAA level and reported based on reported Participation Status
3) All eligible students are included in participation summaries based on participation status for the subject based on reported Participation Status
4) Classification of participation statuses into reported groupings (i.e.: “the number of Tested students”) is documented for each individual report deliverable as necessary
5) Results-based aggregations include, but are not limited to:
   a) Min, Max, Average Raw Score and SEM
   b) Min, Max, Average Scaled Score and SEM
   c) Number and percent of students by performance level
6) Eligible students with the following participation statuses are included in results-based aggregate calculations for reporting:
   a) Tested
   b) Early Stopping Rule

   c) Administration Irregularity
7) Only eligible students with a participation status of Tested (A) are included in item statistic calculations for the technical report
8) Aggregations with less than 10 students included in the denominator will be suppressed from state level reports only

VII. Specific Reporting Rules

Students which are indicated with 'Withdrew' or 'No Longer Enrolled' shall be excluded from any printed student or summary reporting and shall only be included in final datafiles

Breakthrough shall manage the User permissions and access to specific reporting and student data

Each Student, School and District Level report shall be denotated in writing on the report as Confidential

All State Level reports shall have redaction applied to student size results less than 10 and be suppressed from reporting

A. Student Report(s)

1) Each student report shall be a two-page report (front and back). Page One shall be noted as 'Confidential'
2) Student reports are generated for all students in which a Performance Level in at least one category is achieved, or a valid Reason for no achievement is applicable
   a) Tested (with achievement level)
   b) Early Stopping Rule applied
   c) Administration Irregularity
3) Alternate text shall be displayed for any content area where there is no Achievement level reported or valid Reason where the other content area is reported
4) Student reports which have a valid scaled score, yet have no student achievement level shall not receive an Individual Student Report for that subject, but shall be included in the student results datafile
   a) Early Stopping Rule, Misadministration
   b) Tested-Incomplete
5) The Individual Student Report has been designed to display both ELA and Mathematics achievement level and information on one page, side by side
6) What is in this report shall describe the Page One and Page Two content
7) Performance Summary shall be displayed when applicable for both ELA and Mathematics
8) The scaled score and performance level achieved shall be printed in the appropriate Performance Summary sections
   a) ELA shall display the percentage of possible points earned in each area when applicable
   b) Specific text blocks based on Grade, Subject and Performance Level achieved shall display as the student's Performance Level Descriptor printed below the Performance Summary
   c) For students classified as Early Stopping Rule (ESR):
      i) An asterisk (*) is added to the earned performance level at the top: Level 1*
      ii) The asterisk corresponds to the alternate text to be displayed below the bar graph – see Participation Status Summary Table: Alternate Text
   d) The PLD text for Level 1 is not shown
   e) For statuses that do not receive a report but must appear because the other content area is reported:
      i) The sentences for "Your child's scaled score" and "Your child's performance level" are not shown

   ii) The graph is replaced with alternate text directing parents to contact their school or teacher, see the Participation Status Summary Table: Alternate Text
   iii) Because the reports are displaying both ELA and Mathematics on one-page, Alternate Text where No Student Report may appear if, in fact, the student has a score in one of the ELA or Mathematics categories
9) The Individual Student Report has been designed with specific text blocks based on Grade and Subject to display 'What skills can be worked on next?' on page two for each ELA and Mathematics
   a) In cases where there is no performance level to report, the area shall remain blank
   b) In cases where the Student received a Participation Status of ESR, the text shall read "Revisit IEP communication goals in collaboration with the speech language pathologist, AT specialist, and others who assist the student in developing a consistent mode of communication." as a single bullet item
10) The report shall include the "What Now" static text section at the bottom of page two
11) States electing to receive printed student reports will receive report packages packed by school and shipped to the district
12) If a state is receiving parent and school copies, two identical packages per school are created and shipped

B. School Roster Report(s)

School Roster reports are generated for each school in which students are reported, or otherwise tested with the exception of students No Longer Enrolled or Withdrawn

1) The School Roster shall display a comparison to the State Average and District Averages for both ELA and Mathematics
   a) The number of Enrolled students shall display for State, District and School for both ELA and Mathematics
   b) The number of Tested students shall be displayed for State, District and School for each ELA and Mathematics subjects
   c) The state average scaled score is calculated using the earned scaled score for all students included in aggregations for each ELA and Mathematics subjects
   d) The Percent of each student participation and Achievement Level shall be displayed for State, District and School for each ELA and Mathematics subjects
2) School Roster shall list all students with the exception of 'Withdrew' or 'No Longer Enrolled' status with results for each ELA and Mathematics subjects
   a) The Test Status shall be displayed for each student reported in the Roster
   b) The standard error of measurement associated with the student's obtained score is used to identify the range around the state average scaled score to classify the student as above (-), similar to (=) or below (+) the state average
   c) Each student's scaled score shall be displayed
   d) Each student's Performance Level shall be displayed

C. Summary Report(s)

1) Summary reports shall be generated for each subject and include School, District and State results reported by Grade the number of enrolled students, the number of tested students, the number of Did Not Test students, the Average Scaled Score and the number of students in each performance level and the percent to total Tested
2) Number of Enrolled students shall exclude any student No Longer Enrolled or Withdrawn
3) Number of Tested students shall include Tested (A), Early Stopping Rule (B), and Administration Irregularity (E) only

4) Number of Did Not Test students shall include Did Not Test (J), Parental Refusal (G), ELL Exempt (H), Exempt (I), Withdrew (K), No Longer Eligible (L), Invalidated (F), Tested-Incomplete (D) or Early Stopping Rule Misadministration (C) only
   a) Withdrew and No Longer Eligible students are only included if they are included in the number Enrolled, as a result of being reported in the other content area

D. Student Results Datafile

The Student Results Datafile shall be generated for each state and include all students tested with one result record per student. The student result datafile shall be comma separated values (.csv) format with a header row.

1) File Layout and Specification shall define each field and accepted values
2) Student results where records do not receive item scores, raw scores, scaled scores or performance level shall be set to blank in the School, District and State datafiles

E. State Duplicate/Void Datafile

1) Each state shall have a Duplicate/Void Datafile generated
2) Each file shall contain all non-reported tests identified as Duplicate or Void, including Off-Grade test records
3) The datafile shall include individual test records per student test record and shall not have merged records unless already merged as part of the test record duplicate processing
4) The grade shall reflect the tested grade which may differ from the enrolled grade
5) No scoring is available as part of the datafile and all records shall contain the results as received
6) Data within the datafile shall be interpreted with caution as it is raw data and no clean-up has been applied

VIII. Shipping Product Code Summary

A. Reporting Products

1) Reporting Products shall be created and emailed to icoredistribution@measuredprogress.org for all PDF's that are sent to Shipping for printing and distribution
2) The email shall contain record counts for each category

Reporting Products

IX. Non-Functional Requirements

A. Operational Requirements

1) Vendor system
   a) Performance shall be satisfactory
   b) Availability shall be uninhibited during the open windows
   c) Security measured shall be in place for protection of data and transfers
   d) Usability of the system must be satisfactory
   e) Integrity of the system shall be adequate
2) Carrier vendor timeliness
   a) Material receipt is on time
   b) Material delivery is on time
3) Training

   a) Any required training is performed
   b) Any required training is available and delivered adequately
4) Systems support, and maintenance is available
5) Schedules are adhered to (include handoff schedule to and from reporting groups)
   a) Scheduled dates are agreed to and adhered to
6) Resources
   a) Availability of personnel must be adequate and permit capacity
   b) Accessibility of systems and shall be available for processing and reporting

B. Approval

APPENDIX G—2019 GUIDE FOR SCORE REPORT INTERPRETATION

Multi-State Alternate Assessment (MSAA)

2019 Guide for Score Report Interpretation

State Specific Information

Listed below is the contact information for each state's MSAA State Lead(s):

American Samoa Teresa Atuatasi atuajjj@yahoo.com Kimberly Pili 684-633-4789 K_pili@yahoo.com Thor Tinitali 684-633-1323 ext. 243 thort@doe.as	**Arizona** Bethany Spangenberg 602-542-4061 Bethany.Spangenberg@azed.gov Courtney Pearce 602-542-3059 Courtney.Pearce@azed.gov Audra Ahumada 602-542-5450 Audra.Ahumada@azed.gov	**District of Columbia** Michael Craig 202-257-3371 Michael.craig@dc.gov
Maine Sue Nay 207-624-6774 Sue.Nay@maine.gov	**Marianas**[1] June De Leon 671-735-2494 June.DeLeon@guamcedders.org Terese Crisostomo 671-300-1323 tdcrisostomo@gdoe.net Fasefulu Tigilau 670-789-8739 Fasefulu.Tigilau@cnmipss.org	**Maryland** Ann Herrmann 410-767-0086 Ann.Herrmann@maryland.gov Nancy Schmitt 410-767-0743 Nancy.Schmitt@maryland.gov Michael Plummer 410-767-2498 Michael.Plummer@maryland.gov
Montana Yvonne Field 406-444-0748 yfield@mt.gov Duane Schlabach 406-444-0748 Duane.Schlabach@mt.gov	**South Dakota** Roxanne Weber 605-773-3246 Roxanne.Weber@state.sd.us Chris Booth 605-773-6156 Christina.Booth@state.sd.us	**Tennessee** Megan Sellers 615-906-1548 Megan.sellers@tn.gov
United States Virgin Islands Alexandria Baltimore-Hookfin 340-773-1095 ext. 7084 abaltimore-hookfin@vide.vi		

[1] previously PAC-6

Table of Contents

Introduction to the MSAA

Purpose

The Multi-State Alternate Assessment (MSAA) is a comprehensive assessment system designed to promote increasing higher academic outcomes for students with significant cognitive disabilities in preparation for a broader array of post-secondary outcomes. The MSAA is designed to measure academic content that is aligned to and derived from your state's content standards. This test contains many built-in supports that allow students to use materials they are most familiar with and communicate what they know and can do as independently as possible. The MSAA is administered in the areas of English Language Arts (ELA) and mathematics in grades 3-8 and 11.

This assessment was developed through the research and development completed by the National Center and State Collaborative (NCSC) and has been carried forward by the MSAA State Partners. MSAA is currently being administered by American Samoa, Arizona, Maine, Marianas,[1] Maryland, Montana, South Dakota, Tennessee, U.S. Virgin Islands, and Washington, D.C.

This guide provides information regarding the administration and results of the spring 2019 MSAA to district and school personnel.

[1] Marianas, previously referred to as PAC-6, consists of the Commonwealth of the Northern Mariana Islands and Guam, which are collectively considered one state.

Student Participation

The criteria for student participation in the MSAA reflect the pervasive nature of a significant cognitive disability. All content areas should be considered when determining who should participate in this assessment. The table below shows the participation criteria and the descriptors used to determine eligibility for participation for each student.
Students must meet the following eligibility criteria:

Participation Criteria	Participation Criteria Descriptors
1. The student has a significant cognitive disability.	Review of student records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior.* *Adaptive behavior is defined as essential for someone to live independently and to function safely in daily life.
2. The student is learning content linked to (derived from) the State's Content Standards.	Goals and instruction listed in the IEP for this student are linked to the enrolled grade-level State's Content Standards and address knowledge and skills that are appropriate and challenging for this student.
3. The student requires extensive direct individualized instruction and substantial supports to achieve measurable gains in the grade and age-appropriate curriculum.	The student (a) requires extensive, repeated, individualized instruction and support that is not of a temporary or transient nature, and (b) uses substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings.

Assessments for students with significant cognitive disabilities rely on a foundation of communicative competence. Students who do not have receptive and expressive communication are unlikely to be able to demonstrate what they know and can do on an assessment. Students who do not have a mode of communication are identified during the assessment process.

Post assessment, teachers may use the Communication Toolkit developed by NCSC to help these students develop a mode of communication. The Toolkit can be found here: https://wiki.ncscpartners.org/index.php/Communication_Tool_Kit.

Overview of the MSAA Format

The MSAA assesses ELA (reading and writing) and mathematics at grades 3-8 and 11 and is aligned to the State's Content Standards and the MSAA Core Content Connectors. The MSAA is a computer–based, on demand, stage adaptive assessment consisting mostly of selected response and some constructed response items written at four levels of complexity. These complexity levels represent different levels of skill acquisition by students.

Students with significant cognitive disabilities often need materials and instructional strategies that are substantially adapted, scaffolded, and have built-in supports to meet their individual needs.

The MSAA levels of complexity are designed to follow instructional practices. When students begin to learn a new skill, or acquire new knowledge, they need more support. As students learn and develop mastery of that skill or knowledge, they need less support. The test items on the MSAA are developed with many scaffolds and supports embedded within the items. Supports not embedded in the test items may be provided as accommodations, as well as other allowable ways to present the item to a student, based on their individual requirements.

The assessment is a computer-based test (CBT) and is administered one-on-one. Based on the needs of the student, the assessment may also be delivered in a paper–pencil format. The needs of the student may also be addressed through other supports and accommodations such as: reading the test aloud, having a scribe, using manipulatives, object replacement, translating the test into ASL, among others.

Each content area consists of 30-40 items that consist of mostly selected response with some constructed response items. The writing portion of the ELA test contains a scaffolded writing prompt at each grade level. Each content test is divided into test sessions. Test administrators have substantial leeway in developing a testing schedule with the ability to start and stop a test depending on the engagement of the student.

Scoring

Scoring of most items is accomplished within the online test platform. The selected response items are scored as correct or incorrect by the test platform based on the answer keys programmed into the system. Other constructed response items are scored by the Test Administrator and then marked correct or incorrect in the test platform. Items without responses receive a score of zero. Student responses to writing prompts are hand-scored by trained scorers utilizing the rubrics in Appendix A.

MSAA Score Reports

Overview

This guide describes the types of score reports provided for the 2018-19 MSAA administration. The data in the sample reports are for illustrative purposes only and are not intended to reflect performance of any student(s).

Information included on the score reports:

- *Performance Levels* describe how the student performed in relation to the knowledge and skills of that content area and grade level. Each performance level has two components: the scale scores that make up each level and the performance level descriptors. The performance level descriptors are broad and general statements regarding skills and abilities of students who have attained each level. Performance levels for the MSAA were established by committees of educators after the first NCSC administration of the assessment in 2015 and were updated in 2018. Performance level descriptors for each content area and grade level can be found in Appendix B of this document. The scale score ranges that make up each performance level can be found in Appendix C.
- *Scale scores* report the performance level the student achieved. Scale scores are more precise than performance levels and may be used to make comparisons between groups of students, schools, and districts. In Appendix C, Table 1 shows the scale score ranges for each performance level, content area, and grade level.
- *Descriptive and informative reports*. In addition to including student demographic information, performance level, and scale scores, the Individual Student Report contains supportive information about student performance and MSAA measures.
    - *Reading and Writing Scores*—the percent of items answered correctly for reading and writing separately. The writing items consisted of selected response and constructed response (or multiple choice and the writing prompt).
    - *What skills can be worked on next*—skills related to the standards in the following grade.
    - *What now?*—conversation starters for parents when talking with teachers about instruction for their child.

Interpreting and Using the MSAA Scores

The MSAA tests student performance in ELA and mathematics based on the State's Content Standards at the student's enrolled grade level. The student's performance level is based on alternate academic achievement standards. Results for the MSAA are reported by a scale score and performance level for each content area.

MSAA scores should be used in conjunction with the Individualized Education Program (IEP) progress reports, student work, diagnostic assessments, district-required assessments, and report cards in order to place the student's performance on academic content and skills in context and to provide a complete picture of the student's progress across a wide range of categories.

It is helpful to read the Performance Level Descriptors to understand the expectations for the performance level and grade level for each student. This information can provide a concrete link from the test to instructional planning.

Talking to Parents and Guardians

MSAA parent overviews are available for parents to introduce and describe the assessment. Contact your MSAA State Lead to locate these materials.

When talking to parents and guardians about their child's score, it may be helpful to keep the following in mind:

- MSAA assessment results should be used along with local assessment results and other information to determine what changes in curriculum and instruction may be needed to support students learning.
- MSAA scores alone should not be used to make placement or eligibility decisions.

Special Reporting Codes and Messages

In some cases, students were assigned a special reporting code. A complete list of special reporting codes and their associated descriptions is provided below. For additional information or interpretation of special reporting codes, contact your MSAA State Lead.

Code	Test Status	Description
ESR	Early Stopping Rule	If the TA did not observe a student response after the presentation of 4 items, the test was closed by the TC
ESM	Early Stopping Rule Misadministration	Testing may have ended early on the basis that a consistent mode of communication was not observed. At least one response was recorded for the student, but the student may not have had the opportunity to complete the entire test.
INC	Tested - Incomplete	The student's test was not submitted by the close of testing. The student may not have had the opportunity to complete the entire test.
IRR	Administration Irregularity	An administration irregularity not necessitating an invalidation of scores was reported for the student's test.
INV	Invalidated	The results of the student's test have been invalidated.
PRF	Parental Refusal	The student did not test due to a Parent/Guardian refusal.
ELL	ELL Exempt (ELA Only)	The student was exempt from ELA testing due to being a first year English Language Learner.
EXE	Exempt (Emergency, Medical, Other)	The student was exempt from testing.
DNT	Did Not Test	The student did not test via the MSAA assessment.
WDR	Withdrew	The student withdrew.
NLE	No Longer Eligible	The student is not eligible to test via the MSAA assessment.

Types of Score Reports

Below are the types of MSAA score reports that will be available on the MSAA Reporting Portal. Only District testing coordinators using their current MSAA username and password may access the MSAA reports here: https://www.msaaassessment.org under the Reporting tab. All MSAA score reports are confidential documents.

- Reports for the District
  - District Summary Report
  - Student Results File CSV
- Reports for the School
  - School Summary report
  - School Roster Report
  - Student Results File CSV
  - Individual Student Report

If you have any questions about accessing these MSAA reports, contact your MSAA State Lead. Contact information can be found at the beginning of this document.

Student Results File CSV

A CSV file of all student results at the district and school level will be available to District Test Coordinators through the MSAA Reporting Portal. For information regarding this file, contact your MSAA State Lead.

Testing Participation

All students in grades 3–8 and 11 are required to be assessed in ELA and mathematics. Participation Status is assigned independently for ELA and mathematics.

All Submitted tests receive a Participation Status, regardless of the number of item responses.

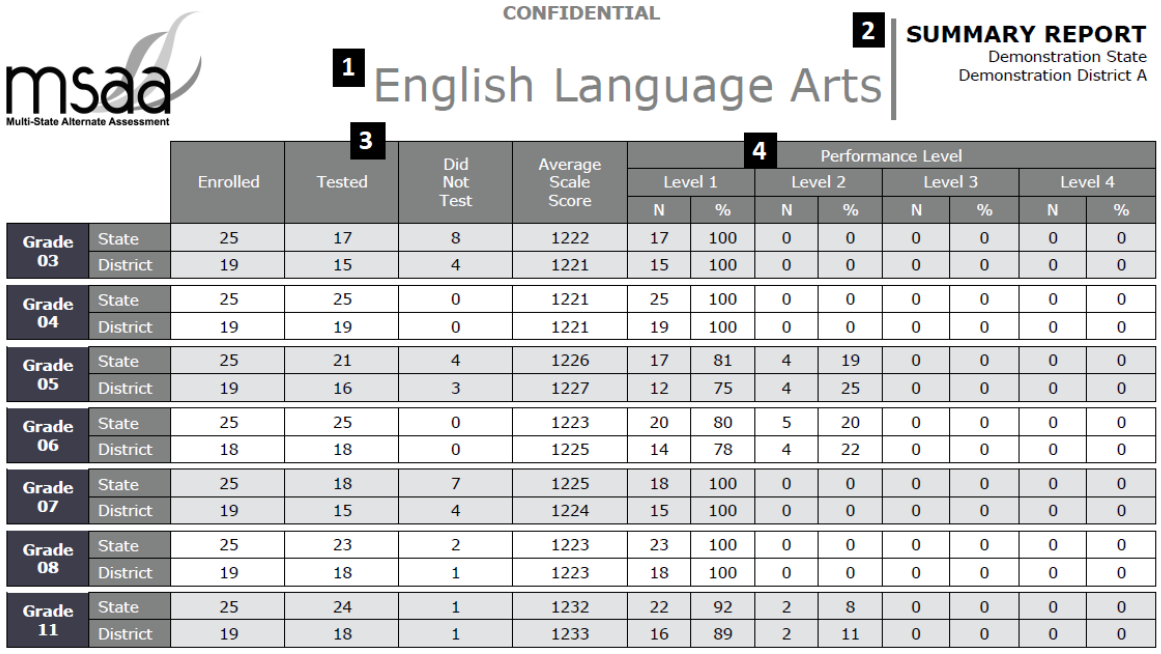
For additional information regarding the reported test status, contact your MSAA State Lead. Contact information can be found at the beginning of this document.

Report for the District

District Summary Report

The District Summary Report (DSR) provides district staff with a summary of student participation and performance by district and school. State level data is taken from the individual participating state. See Figure 1 below.

Figure 1 – Sample District Summary Report



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msaa
Multi-State Alternate Assessment

1 English Language Arts

2 SUMMARY REPORT
Demonstration State
Demonstration District A

		3 Enrolled	Tested	Did Not Test	Average Scale Score	4 Performance Level							
						Level 1		Level 2		Level 3		Level 4	
						N	%	N	%	N	%	N	%
Grade 03	State	25	17	8	1222	17	100	0	0	0	0	0	0
	District	19	15	4	1221	15	100	0	0	0	0	0	0
Grade 04	State	25	25	0	1221	25	100	0	0	0	0	0	0
	District	19	19	0	1221	19	100	0	0	0	0	0	0
Grade 05	State	25	21	4	1226	17	81	4	19	0	0	0	0
	District	19	16	3	1227	12	75	4	25	0	0	0	0
Grade 06	State	25	25	0	1223	20	80	5	20	0	0	0	0
	District	18	18	0	1225	14	78	4	22	0	0	0	0
Grade 07	State	25	18	7	1225	18	100	0	0	0	0	0	0
	District	19	15	4	1224	15	100	0	0	0	0	0	0
Grade 08	State	25	23	2	1223	23	100	0	0	0	0	0	0
	District	19	18	1	1223	18	100	0	0	0	0	0	0
Grade 11	State	25	24	1	1232	22	92	2	8	0	0	0	0
	District	19	18	1	1233	16	89	2	11	0	0	0	0

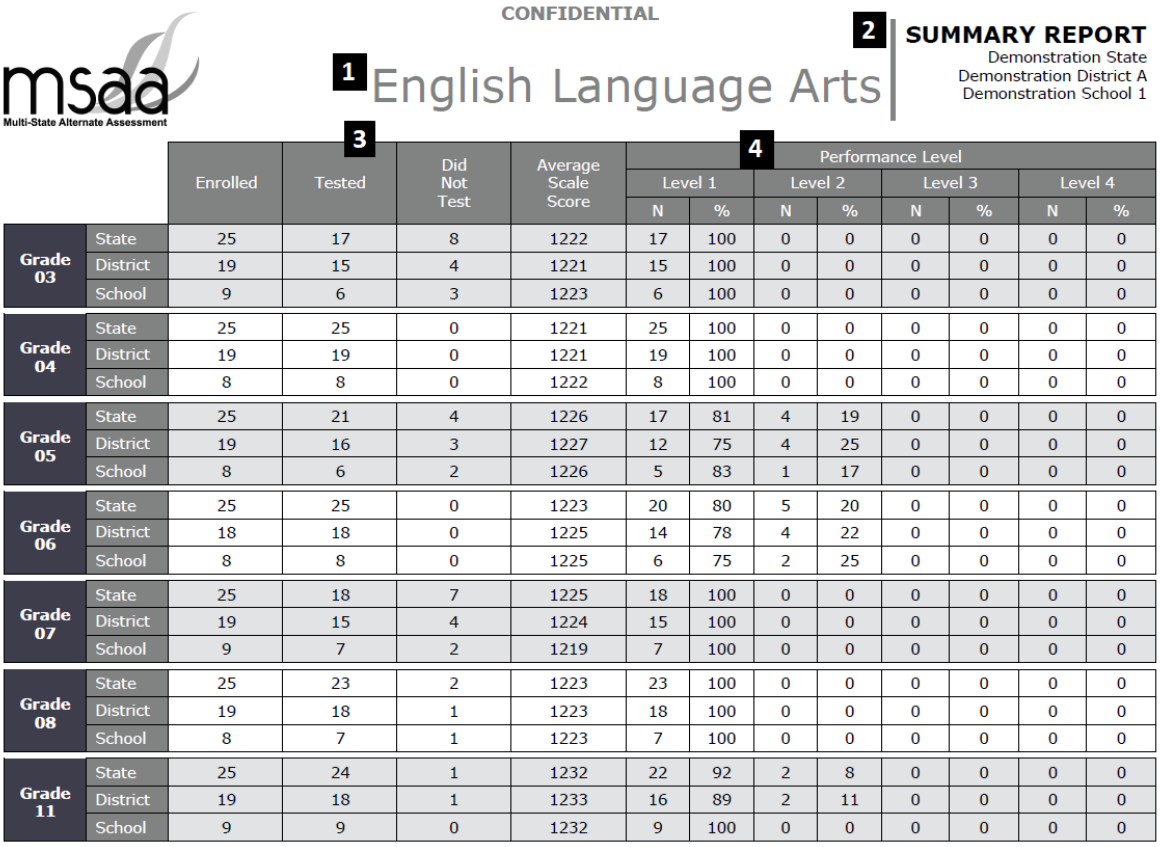
The District Summary Report contains the following features, highlighted above:

1. Content Area of the report.
2. State and District included in the report.
3. Number of students by grade that were Enrolled, Tested, Did Not Test, and Average Scale Score by State, District and School. Refer to the Special Reporting Codes and Messages for information regarding test status.
4. The number and percentage of students at each performance level by grade in the state and district.

Reports for the School

School Summary Report

Figure 2 – Sample School Summary Report



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msaa
Multi-State Alternate Assessment

1 English Language Arts

2 SUMMARY REPORT
Demonstration State
Demonstration District A
Demonstration School 1

		3 Enrolled	Tested	Did Not Test	Average Scale Score	4 Performance Level							
						Level 1		Level 2		Level 3		Level 4	
						N	%	N	%	N	%	N	%
Grade 03	State	25	17	8	1222	17	100	0	0	0	0	0	0
	District	19	15	4	1221	15	100	0	0	0	0	0	0
	School	9	6	3	1223	6	100	0	0	0	0	0	0
Grade 04	State	25	25	0	1221	25	100	0	0	0	0	0	0
	District	19	19	0	1221	19	100	0	0	0	0	0	0
	School	8	8	0	1222	8	100	0	0	0	0	0	0
Grade 05	State	25	21	4	1226	17	81	4	19	0	0	0	0
	District	19	16	3	1227	12	75	4	25	0	0	0	0
	School	8	6	2	1226	5	83	1	17	0	0	0	0
Grade 06	State	25	25	0	1223	20	80	5	20	0	0	0	0
	District	18	18	0	1225	14	78	4	22	0	0	0	0
	School	8	8	0	1225	6	75	2	25	0	0	0	0
Grade 07	State	25	18	7	1225	18	100	0	0	0	0	0	0
	District	19	15	4	1224	15	100	0	0	0	0	0	0
	School	9	7	2	1219	7	100	0	0	0	0	0	0
Grade 08	State	25	23	2	1223	23	100	0	0	0	0	0	0
	District	19	18	1	1223	18	100	0	0	0	0	0	0
	School	8	7	1	1223	7	100	0	0	0	0	0	0
Grade 11	State	25	24	1	1232	22	92	2	8	0	0	0	0
	District	19	18	1	1233	16	89	2	11	0	0	0	0
	School	9	9	0	1232	9	100	0	0	0	0	0	0

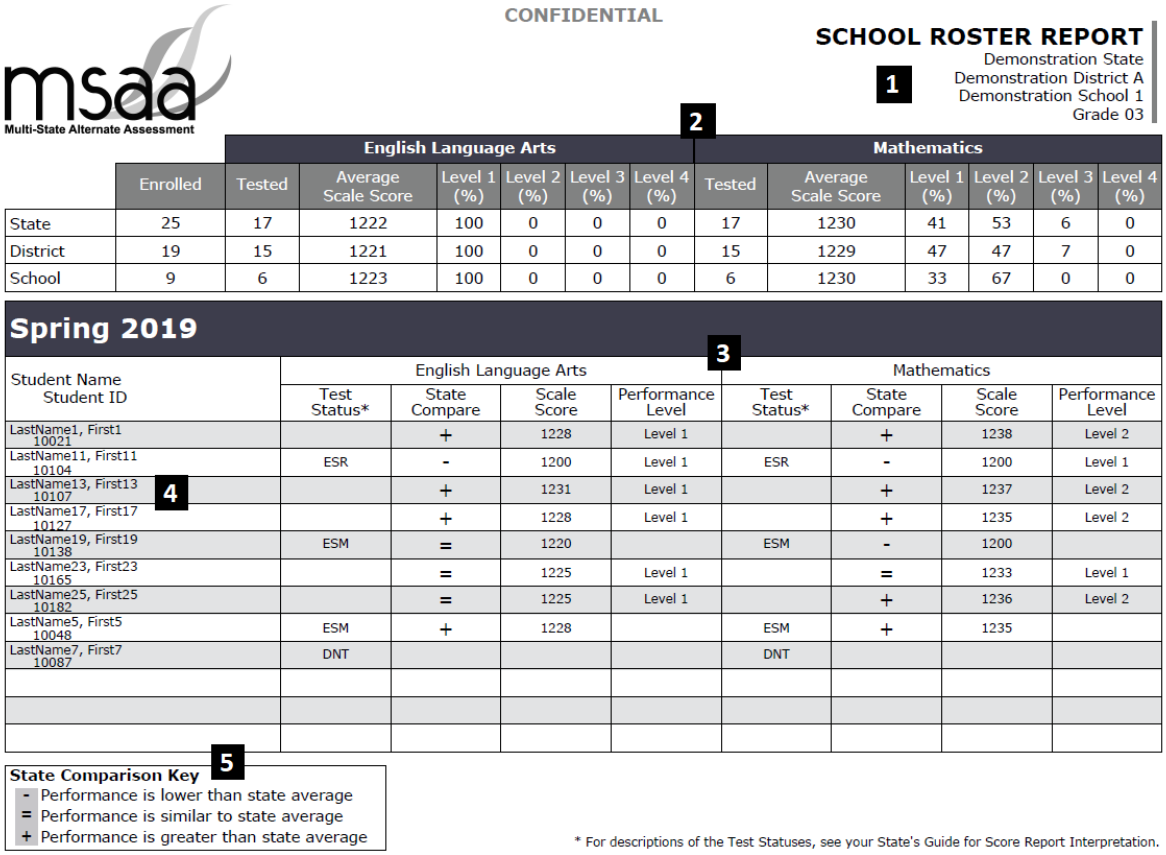
The School Summary Report contains the following features, highlighted above:

1. Content Area of the report.
2. State, District and School included in the report.
3. Number of students by grade that were Enrolled, Tested, Did Not Test, and Average Scale Score by State, District and School. Refer to the Special Reporting Codes and Messages for information regarding test status.
4. The number and percentage of students at each performance level by grade in the state, district and school.

School Roster Report

The School Roster Report provides student performance information at the school level for each grade, including each student's test status, scale score and performance level. See Figure 3, below.

Figure 3 – Sample School Roster Report



CONFIDENTIAL

SCHOOL ROSTER REPORT

1 Demonstration State
Demonstration District A
Demonstration School 1
Grade 03

2

		English Language Arts						Mathematics					
	Enrolled	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Tested	Average Scale Score	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)
State	25	17	1222	100	0	0	0	17	1230	41	53	6	0
District	19	15	1221	100	0	0	0	15	1229	47	47	7	0
School	9	6	1223	100	0	0	0	6	1230	33	67	0	0

Spring 2019

3

Student Name Student ID	English Language Arts				Mathematics			
	Test Status*	State Compare	Scale Score	Performance Level	Test Status*	State Compare	Scale Score	Performance Level
LastName1, First1 10021		+	1228	Level 1		+	1238	Level 2
LastName11, First11 10104	ESR	-	1200	Level 1	ESR	-	1200	Level 1
LastName13, First13 10107		+	1231	Level 1		+	1237	Level 2
LastName17, First17 10127		+	1228	Level 1		+	1235	Level 2
LastName19, First19 10138	ESM	=	1220		ESM	-	1200	
LastName23, First23 10165		=	1225	Level 1		=	1233	Level 1
LastName25, First25 10182		=	1225	Level 1		+	1236	Level 2
LastName5, First5 10048	ESM	+	1228		ESM	+	1235	
LastName7, First7 10087	DNT				DNT			

4

5

State Comparison Key
- \- Performance is lower than state average
- = Performance is similar to state average
- \+ Performance is greater than state average

* For descriptions of the Test Statuses, see your State's Guide for Score Report Interpretation.

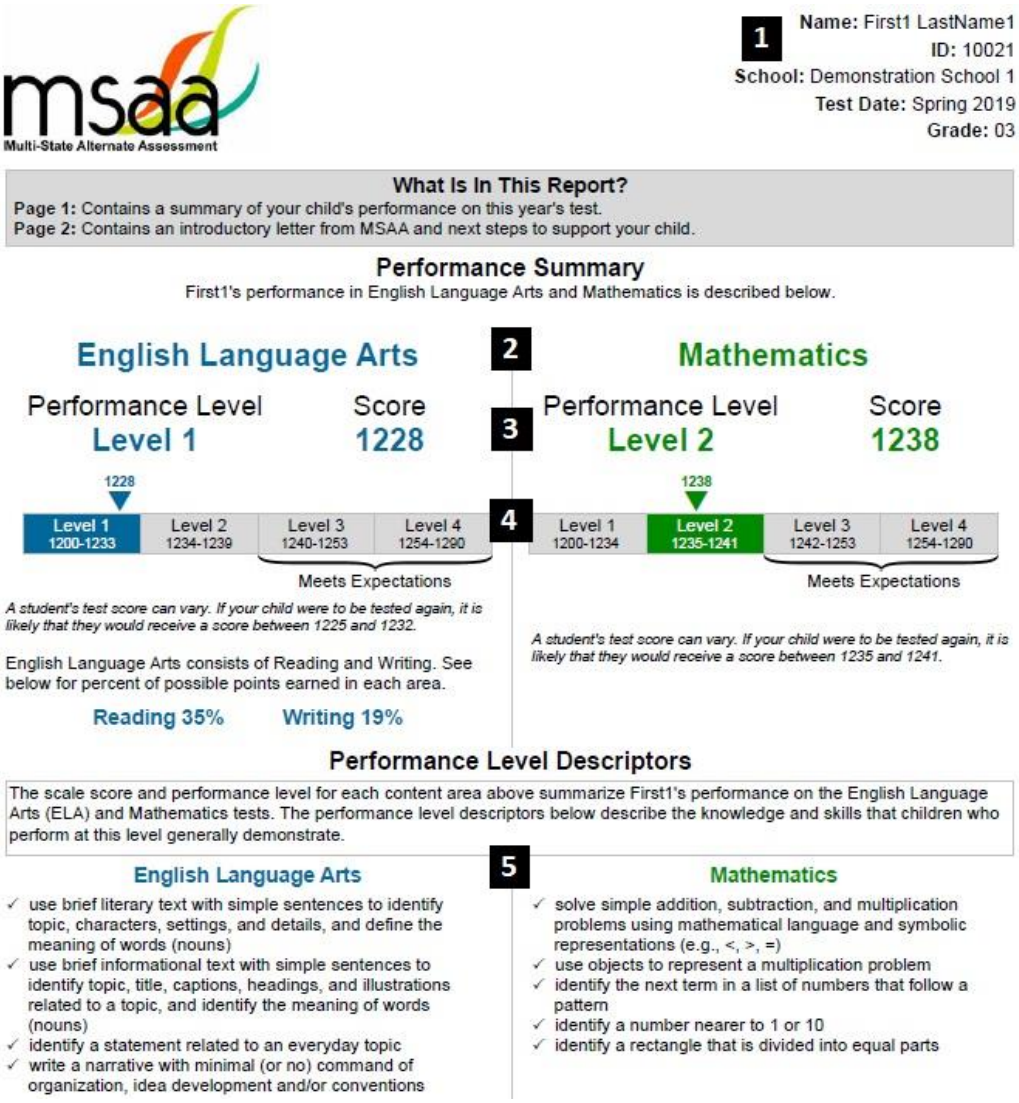
The School Roster Report contains the following features, highlighted above:

1. The state, district and school included in the report.
2. A summary of enrolled and tested students and the average scale score for the state, district and reported school. The results are displayed by Content Area.
3. For each content area the student's test status, comparison to other students in the same grade level in the state, scale score and performance level is displayed.
4. This section of the report includes all students tested at the school for the specified grade.
5. This key shows symbols used in the "State Compare" column.

Individual Student Report

The Individual Student Report (ISR) provides scale score and performance level information for a specific student. Figure 4 shows page 1 of the ISR. A full sample ISR is included in Appendix D.

Figure 4 – Sample Individual Student Report



The Individual Student Report contains the following features, highlighted above:

1. The report header includes the student's full name, student ID, Grade and School.
2. The results for each content area are displayed separately on the report.
3. The student's scale score and performance level for each content area is shown.
4. This display shows the student's score compared to the performance level scale.
5. This text shows the performance level descriptor for the student's performance level.

Appendix A
Writing Scoring Rubrics

Grade 3 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) and includes a character with relevant descriptive statements. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **and** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes a sequence of events that unfold naturally and develops a story using temporal words.	The narrative includes at a minimum: ☐ a sequence of **two** events related to the situation (activity **or** setting) ☐ **both** events include a detail	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The narrative includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** simple sentence that contains a complete thought **with** subject-verb agreement Ex: "Dog runs" or "dog runs"	The narrative includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** thought unit **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 3 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) and includes a character with relevant descriptive statements. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **and** setting) ☐ **two** descriptions related to a character ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ **one** description related to a character ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion **OR** ☐ descriptive words related to a character **or** situation (activity **or** setting)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes a sequence of events that unfold naturally and develops the story using temporal words (e.g., first, then, next).	The narrative includes at a minimum: ☐ **two** sequenced events related to the situation (activity **or** setting) ☐ **both** events include a detail ☐ appropriate use of temporal words that signal order of events	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail ☐ **one** temporal word that may **or** may not be used appropriately	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The narrative includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **more than one** thought unit ☐ **one** simple sentence that contains a complete thought **with** subject-verb agreement Ex: "Dog runs" or "dog runs"	The narrative includes at a minimum **two** of the following: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** simple sentence **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 4 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity or setting) and includes a character. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes a description of events using concrete words or sensory details (e.g., how things look, sound, taste, smell, or feel) related to the events.	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **both** of the events include a detail related to character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail related to a character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complex thought unit that expresses a complete idea **with** subject-verb agreement Ex: "The dog runs" or "the dog runs"	The narrative includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complex thought unit **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 4 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) and includes a character. The response provides a conclusion.	The narrative includes at a minimum: ☐ character **and** situation (activity **and** setting) ☐ description of character **and** situation (activity **or** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ character **and** situation (activity **or** setting) ☐ description of the character **or** the situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion **OR** ☐ descriptive words related to a character **or** situation (activity **or** setting)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes a description of events using concrete words or sensory details (e.g., how things look, sound, taste, smell or feel) related to the events.	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **both** events include a detail related to a character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **two** events related to the situation (activity **or** setting) ☐ **one** of the events includes a detail related to a character's action **or** response to a situation (activity **or** setting)	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The narrative includes at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **more than one** thought unit ☐ **one** complex thought unit that expresses a complete idea **with** subject-verb agreement Ex: "The dog runs" or "the dog runs"	The narrative includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complex thought unit **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

February 28, 2018

Grade 5 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) for the story and includes characters. The response provides a conclusion.	The narrative includes at a minimum: ☐ **two** characters **unchanged** through the narrative ☐ establish a situation (activity **and** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **two** characters ☐ a situation (activity **or** setting) ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character, situation (activity **or** setting), **or** conclusion	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes dialogue, and events supported with relevant details and descriptive statements.	The narrative includes at a minimum: ☐ **two** events that connect to the narrative ☐ **both** of the events include a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** dialogue statement from one character to the other character **relevant to the narrative** Ex.: I said "No, I want to play."	The narrative includes at a minimum: ☐ **two** events related to a characters' action **or** response to a situation (activity **or** setting) ☐ **one** of the events includes a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** dialogue statement from one character to the other character which **may not** be relevant to the narrative	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The narrative includes **more than one** sentence and at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The narrative includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 5 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The narrative establishes a situation (activity and setting) for the story and includes characters. The response provides a conclusion.	The narrative includes at a minimum: ☐ **two** characters unchanged through narrative ☐ identification of the situation (activity **and** setting) ☐ a conclusion that follows from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **two** characters ☐ identification of the setting **or** the activity ☐ a conclusion that **may not** follow from the narrated experiences **or** events	The narrative includes at a minimum: ☐ **some** evidence related to a character **or** conclusion	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The narrative includes dialogue, and events supported with relevant details and descriptive statements.	The narrative includes at a minimum: ☐ **two** sequenced events related to the situation (activity **or** setting) ☐ **both** events include a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** relevant conversation between two characters Ex.: I said "No! I don't want to go to bed." Mom said "OK."	The narrative includes at a minimum: ☐ **two** events related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** event that includes a detail related to a character's action **or** response to a situation (activity **or** setting) ☐ **one** relevant piece of dialogue showing what one character said to the other	The narrative includes at a minimum: ☐ **one** event related to the situation (activity **or** setting)	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The narrative includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The narrative includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The narrative includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

February 28, 2018

Grade 6 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized to describe two opposing conditions (e.g., compare/contrast).	The essay includes at a minimum: ☐ an introduction that states the essay is about **two opposing conditions** ☐ a body that includes: ○ **one** activity for **each** of the two opposing conditions; **and** ○ **one** activity common to **both** conditions ☐ a conclusion that states **two opposing conditions or** summarizes the content	The essay includes at a minimum: ☐ an introduction that states **one** activity **or** topic ☐ a body that relates **two** conditions with activities ☐ a conclusion that states **one** activity **or** the topic	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, compare/contrast relationship, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes relevant facts and details to promote meaning and create clarity.	The essay includes at a minimum: ☐ **three** activities, each with relevant details (the same detail may be used for all activities **if relevant to each**)	The essay includes at a minimum: ☐ **one** activity with a relevant detail	The essay includes at a minimum: ☐ **one** detail that describes an activity	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs**.**"	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 6 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized to describe two opposing conditions (e.g., compare/contrast). The response provides a conclusion.	The essay includes at a minimum: ☐ an introduction that presents the **two** opposing conditions ☐ a body that includes: ○ **one** activity **common to both** conditions ○ **one** activity related to **each** of the two opposing conditions ☐ a conclusion that states the **two** opposing conditions	The essay includes at a minimum: ☐ an introduction that presents the topic ☐ a body that includes: ○ **one** activity **common to both** conditions ○ **one** activity related to **one of the two** opposing conditions ☐ a conclusion that states the topic	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, compare/contrast relationship, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development –. The essay develops a topic, includes relevant facts and details, to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** activity related to **both** conditions **with** a relevant detail ☐ **one** activity related to **each** of the two opposing conditions, **each with** relevant details	The essay includes at a minimum: ☐ **two** activities **each with** a relevant detail	The essay includes at a minimum: ☐ **one** activity **OR** ☐ **one** detail that describes an activity	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

February 28, 2018

Grade 7 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized with an effect related directly to a cause (e.g., cause/effect).	The essay includes at a minimum: ☐ an introduction that states the topic/cause ☐ a body that relates the effect to the provided cause ☐ a conclusion that states the essay is about a cause **and** its effect	The essay includes at a minimum: ☐ an introduction that states the topic/cause ☐ a body that includes an effect that **may not** relate to the provided cause ☐ a conclusion that states a cause **or** the effect	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, cause/effect relationship, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes details to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** relevant detail to describe the effect	The essay includes at a minimum: ☐ **one** effect with **no** relevant detail	The essay includes at a minimum: ☐ **one** idea related to the topic	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence** and at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 7 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified topic and is organized with an effect related directly to a cause (cause/effect).	The essay includes at a minimum: ☐ an introduction that presents the cause **and** its effects ☐ a body that includes **two** effects **and** refers them to the cause ☐ a conclusion that states the essay is about a cause **and** its effects	The essay includes at a minimum: ☐ an introduction that presents a topic ☐ a body that includes **one** effect **and** refers it to the cause ☐ a conclusion that states the topic	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, on-topic cause/effect relationship, or conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development– The essay develops a topic, includes details and transitional words to promote meaning and create clarity.	The essay includes at a minimum: ☐ **two** effects, **each** with a relevant detail ☐ transitional words to connect the cause to **each** of the **two** effects	The essay includes at a minimum: ☐ **one** effect **with** a relevant detail ☐ transitional word to **connect one** cause/effect relationship	The essay includes at a minimum: ☐ **one** detail that describes the cause **or** effect **OR** ☐ **one** transition word	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

February 28, 2018

Grade 8 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses the specified topic and is organized with a solution related directly to the problem (e.g., problem/solution).	The essay includes at a minimum: ☐ an introduction that states **both** parts of the problem ☐ a body that relates **how** the solution can be applied to the problem ☐ a conclusion that states the problem **and** the solution	The essay includes at a minimum: ☐ an introduction that states the problem ☐ **one** solution that **may not** relate to the problem ☐ a conclusion that states the problem **or** the solution	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, on-topic problem/solution relationship, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes details to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** relevant detail to describe the problem ☐ **one** relevant detail to describe the solution	The essay includes at a minimum: ☐ **one** relevant detail to describe the problem **or** the solution	The essay includes at a minimum: ☐ **one** detail **or** word that describes the problem **or** the solution	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	0 ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 8 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses the specified topic and is organized with a solution related directly to the problem (problem/solution).	The essay includes at a minimum: ☐ an introduction that states **both** parts of the problem ☐ body that includes a solution **and** refers to the problem ☐ a conclusion that states the problem **and** its solution	The essay includes at a minimum: ☐ an introduction that states **one** part of the problem ☐ a body that includes a **related** solution ☐ a conclusion that states the problem **or** the solution	The essay includes at a minimum: ☐ **some** evidence related to the specified topic (i.e., introduction, on-topic problem/solution relationship, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The essay develops a topic, includes details and transitional words to promote meaning and create clarity.	The essay includes at a minimum: ☐ **one** problem **with** a relevant detail ☐ **one** solution **with** a relevant detail ☐ **one** transitional word(s) that connects the problem to the solution	The essay includes at a minimum: ☐ **one** problem **or** solution **with** a relevant detail ☐ **one** transitional word(s) that is in relation to the problem **or** the solution	The essay includes at a minimum: ☐ **one** detail **or** word that describes the problem **or** the solution	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

February 28, 2018

Grade 11 Writing Scoring Rubrics
Tier 2

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified claim supported with organized complex ideas.	The essay includes at a minimum: ☐ an introduction that states the claim **and** a rational reason ☐ a conclusion that states the claim **and** the rational reason	The essay includes at a minimum: ☐ an introduction that states the claim **or** a reason ☐ a conclusion that states the claim **or** the reason	The essay includes at a minimum: ☐ **some** evidence related to the specified claim/topic (i.e., introduction, claim/topic, **or** conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The defended claim includes relevant evidence, and uses words, phrases, and clauses to clarify the relationship among claim, reasons and evidence	The essay includes at a minimum: ☐ a body with **two** relevant facts **or** examples ☐ words **or** phrases to connect the reason with **one** relevant fact **or** example	The essay includes at a minimum: ☐ a body with **one** relevant fact **or** example ☐ **one** word **or** phrase to connect the reason with **one** fact or example	The essay includes at a minimum: ☐ **one** word related to the reason	**0** ☐ **no** evidence of idea development	5 ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., end punctuation, subject-verb agreement).	The essay includes **more than one sentence** and at a minimum: ☐ end punctuation for **more than one** thought unit ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with or without** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no** evidence of standard English conventions	

February 28, 2018

Grade 11 Writing Scoring Rubrics
Tier 3

Rubric Elements	Full Evidence 3	Partial Evidence 2	Limited Evidence 1	Unrelated Evidence 0 or 5	
Organization – The essay addresses a specified claim supported with organized complex ideas.	The essay includes at a minimum: ☐ an introduction that states the claim **and** is supported by **two** rational reasons ☐ a body that includes **two** reasons related to the claim ☐ a conclusion that states the claim **and** is supported by **two** rational reasons	The essay includes at a minimum: ☐ an introduction that states the claim ☐ a body that includes **one** reason related to the claim ☐ a conclusion that states the claim **with one** rational reason **or** relevant evidence	The essay includes at a minimum: ☐ **some** evidence related to the specified claim/topic (i.e., introduction, claim/topic, or conclusion)	**0** ☐ **no** evidence of organization	**5** ☐ evidence is **off topic**
Idea Development – The defended claim includes relevant evidence, and uses words, phrases, and clauses to clarify the relationship among claim, reasons and evidence.	The essay includes at a minimum: ☐ **one** piece of **relevant** evidence follows **each of the two** provided reasons ☐ words **or** phrases that **connect each of the two** reasons **with relevant** evidence	The essay includes at a minimum: ☐ a body with **one** reason **and one** piece of relevant evidence ☐ word **or** phrase that connects **one** reason **with one** piece of **relevant** evidence	The essay includes at a minimum: ☐ **one** word related to the reason **or** a connecting word or phrase	**0** ☐ **no** evidence of idea development	**5** ☐ evidence is **off topic**
Conventions – Students use standard English conventions (e.g., capitalization, end punctuation, subject-verb agreement).	The essay includes **more than one sentence and** at a minimum: ☐ capitalization at the beginning of the **majority** of thought units ☐ end punctuation for **majority** of thought units ☐ **one** complete sentence that expresses an idea **with** subject-verb agreement Ex: "The dog runs."	The essay includes at a minimum: ☐ capitalization at the beginning of **one** thought unit ☐ end punctuation for **one** thought unit ☐ **one** complete sentence **with** subject-verb agreement	The essay includes at a minimum: ☐ **one** use of standard English conventions (capitalization at the beginning of **one** thought unit, end punctuation for **one** thought unit **or one** thought unit **with or without** subject-verb agreement)	**0** ☐ **no evidence** of standard English conventions	

February 28, 2018

Appendix B
Performance Level Descriptors

Performance Level Descriptors for ELA and Mathematics

MSAA developed Performance Level Descriptors for ELA and mathematics at grades 3-8 and 11 through an iterative process involving multiple stakeholder groups. The MSAA partnership developed grade-level PLDs to summarize the knowledge, skills, and abilities (KSAs) prioritized for the MSAA that students need to attain at each level of achievement (Level 1- Level 4). Each performance level is understood to include the knowledge, skills and abilities of the preceding performance levels.

The performance descriptors included in this appendix provide a detailed description for teachers, parents, and the public to see not only what grade-level content a student should know and be able to do in order to meet high expectations, but also the depth, breadth, and complexity of that content.

By using the PLDs, test results become multi-dimensional. Test results in the form of scale scores are one way educators, parents, and guardians find out where a student's performance is in relation to other students. The PLDs provide another dimension that completes the description of how a student interacts with the standards the test measures. Both of the scale score and the PLDs provide information that helps teachers, schools, parents and guardians build a path to student learning.

Grade 3 ELA Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2*</th><th>Level 3*</th><th>Level 4*</th></tr>
<tr><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td rowspan="4">In reading, the student is able to:
• identify the topic of a literary text
• identify a detail from a literary text
• identify a character or setting in a literary text
• identify the topic of an informational text
• identify a title, caption, or heading in an informational text
• identify an illustration related to a given topic
• identify a topic presented by an illustration
• identify the meaning of words (i.e., nouns)</td><td>In reading, the student is able to:
• determine the central idea and supporting details in literary text
• determine the main idea and identify supporting details in informational text
• determine the main idea of visually presented information
• identify the purpose of text features in informational text
• use information from charts, graphs, diagrams, or timelines in informational text to answer questions
• use context to identify the meaning of multiple meaning words</td><td>In reading, the student is able to:
• determine the central idea and supporting details in literary text
• determine the main idea and identify supporting details in informational text
• determine the main idea of visually presented information
• identify the purpose of text features in informational text
• use information from charts, graphs, diagrams, or timelines in informational text to answer questions
• use context to identify the meaning of multiple meaning words</td><td rowspan="4">In reading, the student is able to:
• determine the central idea and supporting details in literary text
• determine the main idea and identify supporting details in informational text
• determine the main idea of visually presented information
• identify the purpose of text features in informational text
• use information from charts, graphs, diagrams, or timelines in informational text to answer questions
• use context to identify the meaning of multiple meaning words</td></tr>
<tr><td>AND with Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>AND with High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td>• use details from a literary text to answer specific questions
• describe the relationship between characters, and character and setting in literary text</td><td>• use details from a literary text to answer specific questions
• describe the relationship between characters, and character and setting in literary text</td></tr>
<tr><td>AND with accuracy, the student is able to:
• identify simple words (i.e., words with a consonant at the beginning, a consonant at the end, and a short vowel in the middle)</td><td>AND with accuracy, the student is able to:
• identify grade level words</td></tr>
<tr><td>AND in writing, the student is able to:
• identify a statement related to an everyday topic
• use the writing process to create a narrative product and demonstrate minimal (or no) command of organization, idea development and/or conventions</td><td>AND in writing, the student is able to:
• identify elements of a narrative text to include beginning, middle, and end
• identify the category related to a set of facts
• use the writing process to create a narrative product and demonstrate limited command of organization, idea development and/or conventions</td><td>AND in writing, the student is able to:
• identify a text feature (e.g., captions, graphs or diagrams) to present information in explanatory text
• use the writing process to create a narrative product and demonstrate partial command of organization, idea development and/or conventions</td><td>AND in writing, the student is able to:
• use the writing process to create a narrative product and demonstrate overall command of organization, idea development and/or conventions</td></tr>
</table>

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 4 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a topic of a literary text • identify a detail from a literary text • identify a character in a literary text • identify charts, graphs, diagrams, or timelines in an informational text • identify a topic of an informational text • use context to identify the meaning of multiple meaning words • identify general academic words	**In reading, the student is able to:** • determine the theme of literary text and identify supportive details • describe character traits using text-based details in literary text • determine the main idea of informational text • locate information in charts, graphs, diagrams, or timelines • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words	**In reading, the student is able to:** • determine the theme of literary text and identify supportive details • determine the main idea of informational text • explain how the information provided in charts, graphs, diagrams, or timelines contributes to an understanding of informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words	**In reading, the student is able to:** • determine the theme of literary text and identify supportive details • determine the main idea of informational text • explain how the information provided in charts, graphs, diagrams, or timelines contributes to an understanding of informational text • use information from charts, graphs, diagrams, or timelines in informational text to answer questions • use general academic words
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.* • use details from a literary text to answer specific questions • use context to identify the meaning of multiple meaning words	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.* • use details from a literary text to answer specific questions • describe character traits using text-based details in literary text • use context to identify the meaning of multiple meaning words	
	AND with accuracy, the student is able to: • identify simple words (i.e., words with a consonant at the beginning, a consonant at the end, and a short vowel in the middle)	**AND with accuracy, the student is able to:** • identify grade level words	
AND in writing, the student is able to: • identify the concluding sentence in a short explanatory text • use the writing process to create a narrative product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of a narrative text to include beginning, middle, and end • identify a concluding sentence related to information in explanatory text • use the writing process to create a narrative product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify a text feature (e.g., headings, charts, or diagrams) to present information in explanatory text • use the writing process to create a narrative product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create a narrative product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 5 ELA Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2*</th><th>Level 3*</th><th>Level 4*</th></tr>
<tr>
<td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td>
<td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td>
<td>Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td>
<td>High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td>
</tr>
<tr>
<td rowspan="3">In reading, the student is able to:
• identify an event from the beginning of a literary text
• identify a detail from a literary text
• identify a character, setting and event in a literary text
• identify the topic of an informational text
• identify the main idea of an informational text
• identify the difference in how information is presented in two sentences</td>
<td>In reading, the student is able to:
• compare characters, settings, and events in literary text
• determine the main idea and identify supporting details in informational text
• use details from the text to support an author’s point in informational text
• compare and contrast how information and events are presented in two informational texts
• use context to identify the meaning of multiple meaning words</td>
<td>In reading, the student is able to:
• compare characters, settings, and events in literary text
• determine the main idea and identify supporting details in informational text
• use details from the text to support an author’s point in informational text
• compare and contrast how information and events are presented in two informational texts
• use context to identify the meaning of multiple meaning words</td>
<td rowspan="3">In reading, the student is able to:
• compare characters, settings, and events in literary text
• determine the main idea and identify supporting details in informational text
• use details from the text to support an author’s point in informational text
• compare and contrast how information and events are presented in two informational texts
• use context to identify the meaning of multiple meaning words</td>
</tr>
<tr>
<td>AND with Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td>
<td>AND with High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td>
</tr>
<tr>
<td>• summarize a literary text from beginning to end
• use details from a literary text to answer specific questions</td>
<td>• summarize a literary text from beginning to end
• use details from a literary text to answer specific questions</td>
</tr>
<tr>
<td>AND in writing, the student is able to:
• identify the category related to a set of common nouns
• use the writing process to create a narrative product and demonstrate minimal (or no) command of organization, idea development and/or conventions</td>
<td>AND in writing, the student is able to:
• identify elements of a narrative text to include beginning, middle, and end
• identify a sentence that is organized for a text structure such as comparison/contrast
• use the writing process to create a narrative product and demonstrate limited command of organization, idea development and/or conventions</td>
<td>AND in writing, the student is able to:
• support an explanatory text topic with relevant information
• use the writing process to create a narrative product and demonstrate partial command of organization, idea development and/or conventions</td>
<td>AND in writing, the student is able to:
• use the writing process to create a narrative product and demonstrate overall command of organization, idea development and/or conventions</td>
</tr>
</table>

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 6 ELA Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2*</th><th>Level 3*</th><th>Level 4*</th></tr>
<tr><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Low text complexity -
Brief text with straightforward ideas and relationships; short, simple sentences.</td><td>Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td rowspan="3">In reading, the student is able to:
identify an event from the beginning or end of a literary text
identify a detail from a literary text
identify a character in a literary text
identify the topic of an informational text
identify the main idea of an informational text
identify a fact from an informational text
identify a description of an individual or event in an informational text
use context to identify the meaning of multiple meaning words
identify the meaning of general academic words</td><td>In reading, the student is able to:
summarize a literary text from beginning to end without including personal opinions
support inferences about characters using details in literary text
use details from the text to elaborate a key idea in informational text</td><td>In reading, the student is able to:
summarize a literary text from beginning to end without including personal opinions
support inferences about characters using details in literary text
summarize an informational text without including personal opinions
use details from the text to elaborate a key idea in informational text
use evidence from the text to support an author's claim in informational text
summarize information presented in two informational texts
use domain specific words accurately</td><td rowspan="3">In reading, the student is able to:
summarize a literary text from beginning to end without including personal opinions
use details from a literary text to answer specific questions
support inferences about characters using details in literary text
use details from the text to elaborate a key idea in an informational text
use evidence from the text to support an author's claim in informational text
use domain specific words accurately</td></tr>
<tr><td>AND with Moderate text complexity -
Text with clear, complex ideas and relationships and simple; compound sentences.</td><td>AND with High text complexity -
Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.</td></tr>
<tr><td>use details from a literary text to answer specific questions
use context to identify the meaning of multiple meaning words</td><td>use details from a literary text to answer specific questions
use context to identify the meaning of multiple meaning words</td></tr>
<tr><td>AND in writing, the student is able to:
identify an everyday order of events
use the writing process to create an explanatory product and demonstrate minimal (or no) command of organization, idea development and/or conventions</td><td>AND in writing, the student is able to:
identify elements of an explanatory text to include introduction, body, and conclusion
identify the next event in a brief narrative
use the writing process to create an explanatory product and demonstrate limited command of organization, idea development and/or conventions</td><td>AND in writing, the student is able to:
identify transition words and phrases to convey a sequence of events in narrative text
use the writing process to create an explanatory product and demonstrate partial command of organization, idea development and/or conventions</td><td>AND in writing, the student is able to:
use the writing process to create an explanatory product and demonstrate overall command of organization, idea development and/or conventions</td></tr>
</table>

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 7 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a theme from a literary text • identify an inference from a literary text • identify a conclusion from an informational text • identify a claim the author makes in an informational text • compare and contrast two statements related to the same topic • use context to identify the meaning of words	**In reading, the student is able to:** • identify the relationship between individuals or events in an informational text • use evidence from the text to support an author's claim in informational text	**In reading, the student is able to:** • use details to support a conclusion from informational text • use details to explain how the interactions between individuals, events or ideas in informational texts are influenced by each other • use evidence from the text to support an author's claim in informational text • compare and contrast how two authors write about the same topic in informational texts • use context to identify the meaning of grade-level phrases	**In reading, the student is able to:** • use details to support a conclusion from informational text • use details to explain how the interactions between individuals, events or ideas in informational texts are influenced by each other • use evidence from the text to support an author's claim in informational text • compare and contrast how two authors write about the same topic in informational texts • use context to identify the meaning of grade-level phrases
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.* • use details to support themes from literary text • use details to support inferences from literary text	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.* • use details to support themes from literary text • use details to support inferences from literary text	
AND in writing, the student is able to: • identify a graphic that includes an event as described in a text • use the writing process to create an explanatory product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an explanatory text to include introduction, body, and conclusion • identify the next event in a brief narrative • use the writing process to create an explanatory product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify a sentence that provides a conclusion in narrative text • use the writing process to create an explanatory product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an explanatory product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 8 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a theme from a literary text • identify an inference from a literary text • identify a fact related to a presented argument in informational text • identify a similar topic in two informational texts • use context to identify the meaning of multiple meaning words • identify the meaning of general academic words	**In reading, the student is able to:** • use details to support a conclusion from literary text • identify an inference drawn from an informational text • identify the portion of text which contains specific information • identify an argument the author makes in informational text • examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation • use domain specific words or phrases accurately	**In reading, the student is able to:** • use details to support a conclusion from literary text • use details to support an inference from informational text • identify the information (e.g., facts or quotes) in a section of text that contributes to the development of an idea • identify an argument the author makes in informational text • examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation • use domain specific words and phrases accurately	**In reading, the student is able to:** • use details to support a conclusion from literary text • use details to support an inference from informational text • identify the information (e.g., facts or quotes) in a section of text that contributes to the development of an idea • identify an argument the author makes in informational text • examine parts of two informational texts to identify where the texts disagree on matters of fact or interpretation • use domain specific words and phrases accurately
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.*	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*	
	• analyze the development of a theme including the relationship between a character and an event in literary text • use context to identify the meaning of grade-level words and phrases	• analyze the development of a theme including the relationship between a character and an event in literary text • use context to identify the meaning of grade-level words and phrases	
AND in writing, the student is able to: • identify a writer's opinion • use the writing process to create an explanatory product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an explanatory text to include introduction, body, and conclusion • identify an idea relevant to a claim • use the writing process to create an explanatory product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify relevant information to support a claim • use the writing process to create an explanatory product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an explanatory product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 11 ELA Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low text complexity - *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Low text complexity -** *Brief text with straightforward ideas and relationships; short, simple sentences.*	**Moderate text complexity -** *Text with clear, complex ideas and relationships and simple; compound sentences.*	**High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.*
In reading, the student is able to: • identify a summary of a literary text • identify an event from a literary text • identify the central idea of an informational text • identify facts from an informational text • identify what an author tells about a topic in informational text • use context to identify the meaning of multiple meaning words • identify a word used to describe a person, place, thing, action or event	**In reading, the student is able to:** • use details to support a summary of literary text • identify a conclusion from an informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts	**In reading, the student is able to:** • use details to support a summary of literary text • use details to support a conclusion presented in informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts	**In reading, the student is able to:** • use details to support a summary of literary text • use details to support a conclusion presented in informational text • identify key details that support the development of a central idea of an informational text • use details presented in two informational texts to answer a question • explain why an author uses specific word choices within texts
	AND with Moderate text complexity - *Text with clear, complex ideas and relationships and simple; compound sentences.* • evaluate how the author's use of specific details in literary text contributes to the text • determine an author's point of view about a topic in informational text • use context to identify the meaning of grade-level phrases	**AND with High text complexity -** *Text with detailed and implied complex ideas and relationships; a variety of sentence types including phrases and transition words.* • evaluate how the author's use of specific details in literary text contributes to the text • determine an author's point of view about a topic in informational text • use context to identify the meaning of grade-level phrases	
AND in writing, the student is able to: • identify information which is unrelated to a given topic • use the writing process to create an argumentative product and demonstrate minimal (or no) command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify elements of an argument to include introduction, claim, evidence, and conclusion • identify how to group information for a specific text structure • use the writing process to create an argumentative product and demonstrate limited command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • identify relevant information to address a given topic and support the purpose of a text • use the writing process to create an argumentative product and demonstrate partial command of organization, idea development and/or conventions	**AND in writing, the student is able to:** • use the writing process to create an argumentative product and demonstrate overall command of organization, idea development and/or conventions

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 080918

Grade 3 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • solve addition problems • identify growing number patterns • identify an object showing a specified number of parts shaded • identify which object has the greater number of parts shaded • identify an object equally divided in two parts • identify the number of objects to be represented in a pictograph	**The student is able to:** • solve addition and subtraction word problems • identify an arrangement of objects which represents factors in a problem • solve multiplication equations in which both numbers are equal to or less than five • identify multiplication patterns • identify a set of objects as nearer to 1 or 10 • identify a representation of the area of a rectangle	**The student is able to:** • solve addition and subtraction word problems • check the correctness of an answer in the context of a scenario • solve multiplication equations in which both numbers are equal to or less than five • identify multiplication patterns • match fraction models to unitary fractions • compare fractions with different numerators and the same denominator • transfer data from an organized list to a bar graph	**The student is able to:** • solve addition and subtraction word problems • check the correctness of an answer in the context of a scenario • solve multiplication equations in which both numbers are equal to or less than five • identify multiplication patterns • match fraction models to unitary fractions • compare fractions with different numerators and the same denominator • transfer data from an organized list to a bar graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify geometric figures which are divided into equal parts	• round numbers to nearest 10 • identify geometric figures which are divided into equal parts • count unit squares to compute the area of a rectangle	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Final Approved PLD Updated 081618

Grade 4 Mathematics Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2*</th><th>Level 3*</th><th>Level 4*</th></tr>
<tr><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>High task complexity -
Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements</td></tr>
<tr><td rowspan="3">The student is able to:
identify an array with the same number of objects in each row
identify values rounded to nearest tens place
identify equivalent representations of a fraction (e.g., shaded diagram)
compare representations of a fraction (e.g., shaded diagram)
identify a rectangle with the larger or smaller perimeter
identify a given attribute of a shape
identify the data drawn in a bar graph that represents the greatest value</td><td>The student is able to:
match a model to an multiplication expression using two single digit numbers
identify a model of a multiplicative comparison
show division of objects into equal groups
round numbers to nearest 10, 100 or 1000
differentiate parts and wholes
compute the perimeter of a rectangle</td><td>The student is able to:
solve multiplication word problems
show division of objects into equal groups
round numbers to nearest 10, 100, or 1000
compare two fractions with different denominators
sort a set of 2-dimensional shapes
compute the perimeter of a rectangle
transfer data to a graph</td><td rowspan="3">The student is able to:
solve multiplication word problems
show division of objects into equal groups
round numbers to nearest 10, 100 or 1000
compare two fractions with different denominators
sort a set of 2-dimensional shapes
compute the perimeter of a rectangle
transfer data to a graph</td></tr>
<tr><td>AND with Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>AND with High task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td></tr>
<tr><td>identify equivalent fractions
select a 2-dimensional shape with a given attribute</td><td>solve a multiplicative comparison word problem using up to two-digit numbers
check the correctness of an answer in the context of a scenario
identify equivalent fractions</td></tr>
</table>

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Grade 5 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • solve one-step subtraction word problems • divide sets (no greater than 6) into two equal parts • identify values in the tenths place • identify a number in the ones, tens or hundreds place • identify a given axis of a coordinate plan • match the conversion of 3 feet to 1 yard to a model • calculate elapsed time (i.e., hours) • identify whether the values increase or decrease in a line graph	**The student is able to:** • identify if the total will increase or decrease when combining sets • perform operations with decimals • identify a symbolic representation of the addition of two fractions • identify place values to the hundredths place • convert standard measurements	**The student is able to:** • solve multiplication and division word problems • perform operations with decimals • solve word problems involving fractions • identify place values to the hundredths place • locate a given point on a coordinate plane when given an ordered pair • convert standard measurements • convert between minutes and hours • make quantitative comparisons between data sets shown as line graphs	**The student is able to:** • solve multiplication and division word problems • perform operations with decimals • solve word problems involving fractions • identify place values to the hundredths place • locate a given point on a coordinate plane when given an ordered pair • convert standard measurements • convert between minutes and hours • make quantitative comparisons between data sets shown as line graphs
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols* • compare the values of two products based upon multipliers • round decimals to nearest whole number	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols* • compare the values of two products based upon multipliers • round decimals to nearest whole number	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Grade 6 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • identify a model of a given percent • match a given unit rate to a model • identify a representation of two equal sets • identify a number less than zero on a number line • identify the meaning of an unknown in a modeled equation • count the number of grids or tiles inside a rectangle to find the area of a rectangle • identify the object that appears most frequently in a set of data (mode) • identify a representation of a set of data arranged into even groups (mean)	**The student is able to:** • match a given ratio to a model • recognize a representation of the sum of two halves • solve real world measurement problems involving unit rates • identify a representation of a value less than zero • identify the median or the equation needed to determine the mean of a set of data	**The student is able to:** • perform operations using up to three-digit numbers • solve real world measurement problems involving unit rates • identify positive and negative values on a number line • determine the meaning of a value from a set of positive and negative integers • solve word problems with expressions including variables • compute the area of a parallelogram • identify the median or the equation needed to determine the mean of a set of data	**The student is able to:** • solve real world measurement problems involving unit rates • identify positive and negative values on a number line • solve word problems with expressions including variables • compute the area of a parallelogram • identify the median or the equation needed to determine the mean of a set of data
	AND with Moderate task complexity *- Common problems presented in mathematical context using various mathematical terms and symbols* • perform one-step operations with two decimal numbers • solve word problems using a percent	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols* • perform one-step operations with two decimal numbers • solve word problems using a percent • solve word problems using ratios and rates	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Grade 7 Mathematics Performance Level Descriptors

<table>
<tr><th>Level 1</th><th>Level 2*</th><th>Level 3*</th><th>Level 4*</th></tr>
<tr><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Low task complexity -
Simple problems using common mathematical terms and symbols</td><td>Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>High task complexity -
Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements</td></tr>
<tr><td rowspan="3">The student is able to:
identify a representation which represents a negative number and its multiplication or division by a positive number
identify representations of area and circumference of a circle
identify representations of surface area
make qualitative comparisons when interpreting a data set presented on a bar graph or in a table</td><td>The student is able to:
match a given ratio to a model
identify the meaning of an unknown in a modeled equation
describe a directly proportional relationship (i.e., increases or decreases)
find the surface area of three-dimensional right prism</td><td>The student is able to:
solve division problems with positive/negative whole numbers
solve word problems involving ratios
use a proportional relationship to solve a percentage problem
identify proportional relationships between quantities represented in a table
identify unit rate (constant of proportionality) in tables and graphs of proportional relationships
compute the area of a circle
find the surface area of a three-dimensional right prism</td><td rowspan="3">The student is able to:
solve division problems with positive/negative whole numbers
solve word problems involving ratios
identify proportional relationships between quantities represented in a table
compute the area of a circle
find the surface area of a three-dimensional right prism</td></tr>
<tr><td>AND with Moderate task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td><td>AND with High task complexity -
Common problems presented in mathematical context using various mathematical terms and symbols</td></tr>
<tr><td>solve multiplication problems with positive/negative whole numbers
interpret graphs to qualitatively contrast data sets</td><td>solve multiplication problems with positive/negative whole numbers
evaluate variable expressions that represent word problems
interpret graphs to qualitatively contrast data sets</td></tr>
</table>

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

Grade 8 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • locate a given decimal number on a number line • identify the relatively larger data set when given two data sets presented in a graph • identify congruent rectangles • identify similar rectangles • identify an attribute of a cylinder • identify a rectangle with the larger or smaller area as compared to another rectangle • identify an ordered pair and its point on a graph	**The student is able to:** • identify the solution to an equation which contains a variable • identify the y-intercept of a linear graph • match a given relationship between two variables to a model • identify a data display that represents a given situation • interpret data presented in graphs to identify associations between variables	**The student is able to:** • locate approximate placement of an irrational number on a number line • solve a linear equation which contains a variable • identify the relationship shown on a linear graph • calculate slope of a positive linear graph • compute the change in area of a figure when its dimensions are changed • solve for the volume of a cylinder • plot provided data on a graph	**The student is able to:** • locate approximate placement of an irrational number on a number line • solve a linear equation which contains a variable • identify the relationship shown on a linear graph • compute the change in area of a figure when its dimensions are changed • plot provided data on a graph
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify congruent figures • use properties of similarity to identify similar figures • interpret data tables to identify the relationship between variables	• interpret data presented in graphs to identify associations between variables • interpret data tables to identify the relationship between variables • use properties of similarity to identify similar figures • identify congruent figures	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Grade 11 Mathematics Performance Level Descriptors

Level 1	Level 2*	Level 3*	Level 4*
Low task complexity - *Simple problems using common mathematical terms and symbols*	**Low task complexity -** *Simple problems using common mathematical terms and symbols*	**Moderate task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	**High task complexity -** *Multiple mathematical ideas presented in problems using various mathematical terms and symbolic representations of numbers, variables, and other item elements*
The student is able to: • arrange a given number of objects into two sets in multiple combinations • match an equation with a variable to a provided real world situation • determine whether a given point is or is not part of a data set shown on a graph • identify an extension of a linear graph • use a table to match a unit conversion • complete the formula for area of a figure	**The student is able to:** • identify the model that represents a square number • identify variable expressions which represent word problems • identify the hypotenuse of a right triangle • identify the greatest or least value in a set of data shown on a number line • identify the missing label on a histogram • calculate the mean and median of a set of data	**The student is able to:** • compute the value of an expression that includes an exponent • identify variable expressions which represent word problems • solve real world measurement problems that require unit conversions • find the missing attribute of a three-dimensional figure • determine two similar right triangles when a scale factor is given • make predictions from data tables and graphs to solve problems • plot data on a histogram • calculate the mean and median of a set of data	**The student is able to:** • identify variable expressions which represent word problems • solve real world measurement problems that require unit conversions • determine two similar right triangles when a scale factor is given • make predictions from data tables and graphs to solve problems • plot data on a histogram • calculate the mean and median of a set of data
	AND with Moderate task complexity - *Common problems presented in mathematical context using various mathematical terms and symbols*	**AND with High task complexity -** *Common problems presented in mathematical context using various mathematical terms and symbols*	
	• identify the linear representation of a provided real world situation • use an equation or a linear graphical representation to solve a word problem	• identify the linear representation of a provided real world situation • use an equation or a linear graphical representation to solve a word problem • identify a histogram which represents a provided data set	

*Levels 2, 3, and 4 include demonstration of skills described in previous performance levels.

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Appendix C
Scale Score Ranges

Table 1 –2019 Performance-Level Scale Score Ranges by Content Area and Grade

Performance Level	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11
English Language Arts							
Level 4	1254-1290	1259-1290	1256-1290	1251-1290	1255-1290	1250-1290	1255-1290
Level 3	1240-1253	1240-1258	1240-1255	1237-1250	1240-1254	1238-1249	1240-1254
Level 2	1234-1239	1234-1239	1232-1239	1231-1236	1236-1239	1230-1237	1236-1239
Level 1	1200-1233	1200-1233	1200-1231	1200-1230	1200-1235	1200-1229	1200-1235
Mathematics							
Level 4	1254-1290	1251-1290	1253-1290	1251-1290	1254-1290	1251-1290	1250-1290
Level 3	1242-1253	1239-1250	1240-1252	1239-1250	1240-1253	1240-1250	1240-1249
Level 2	1235-1241	1232-1238	1232-1239	1233-1238	1234-1239	1234-1239	1235-1239
Level 1	1200-1234	1200-1231	1200-1231	1200-1232	1200-1233	1200-1233	1200-1234

Appendix D
Individual Student Report Sample

CONFIDENTIAL

msaa
Multi-State Alternate Assessment

Name: First1 LastName1
ID: 10021
School: Demonstration School 1
Test Date: Spring 2019
Grade: 03

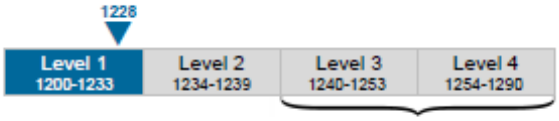
What Is In This Report?
Page 1: Contains a summary of your child's performance on this year's test.
Page 2: Contains an introductory letter from MSAA and next steps to support your child.

Performance Summary

First1's performance in English Language Arts and Mathematics is described below.

English Language Arts

Performance Level: **Level 1**
Score: **1228**



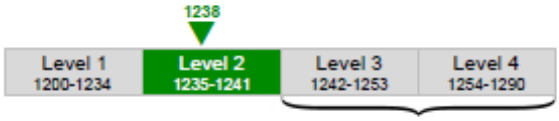
A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1225 and 1232.

English Language Arts consists of Reading and Writing. See below for percent of possible points earned in each area.

Reading 35% **Writing 19%**

Mathematics

Performance Level: **Level 2**
Score: **1238**



A student's test score can vary. If your child were to be tested again, it is likely that they would receive a score between 1235 and 1241.

Performance Level Descriptors

The scale score and performance level for each content area above summarize First1's performance on the English Language Arts (ELA) and Mathematics tests. The performance level descriptors below describe the knowledge and skills that children who perform at this level generally demonstrate.

English Language Arts

- ✓ use brief literary text with simple sentences to identify topic, characters, settings, and details, and define the meaning of words (nouns)
- ✓ use brief informational text with simple sentences to identify topic, title, captions, headings, and illustrations related to a topic, and identify the meaning of words (nouns)
- ✓ identify a statement related to an everyday topic
- ✓ write a narrative with minimal (or no) command of organization, idea development and/or conventions

Mathematics

- ✓ solve simple addition, subtraction, and multiplication problems using mathematical language and symbolic representations (e.g., <, >, =)
- ✓ use objects to represent a multiplication problem
- ✓ identify the next term in a list of numbers that follow a pattern
- ✓ identify a number nearer to 1 or 10
- ✓ identify a rectangle that is divided into equal parts

Dear Parents and Guardians,

This report summarizes your child's performance on the online 2019 Multi-State Alternate Assessment (MSAA). This report shows the scaled score and performance levels in English Language Arts (ELA) and Mathematics. Also shown is the percent of possible points earned in Reading and Writing. The performance level descriptors describe the knowledge and skills that children who perform at this level generally demonstrate.

The MSAA is designed to assess students in grades 3-8 and 11 with significant cognitive disabilities and measures academic content that is aligned to and derived from your state's content standards. The test contains many built-in supports that allow students to take the test using materials they are most familiar with and to communicate what they know and can do. These are some of the built-in supports found in the MSAA:

- shortened ELA reading passages
- pictures, charts, tables, and maps to help students understand the reading passages
- models and examples that explain important ideas and concepts
- smaller numbers on the mathematics tests

To support communication independence to the greatest extent possible, the MSAA is designed to work with different communication modes and systems. Please discuss the supports your child used on the MSAA with your child's teacher.

More information and resources for helping your child are available at your state's alternate assessment web page or by talking with your child's teacher. If you require this letter or your child's report in a different format, please contact your state's department of education.

What skills can be worked on next?

English Language Arts

+ Determine the main idea and supporting details of text
+ Use information from charts, graphs, diagrams to answer questions
+ Use general academic words in reading and writing
+ Produce writing that expresses real or imaginary experiences and ideas

Mathematics

+ Use mathematical terms and symbols (<, >, =)
+ Round numbers to the nearest ten, hundred, or thousand
+ Solve single digit multiplication problems including arrays, models, and word problems
+ Compare fractions with different denominators; identify equivalent fractions
+ Identify perimeter of a rectangle
+ Analyze data in bar graphs
+ Sort two-dimensional shapes

What now?

Bring this report to your next conference with First1's teachers.
You can ask First1's teachers:

- What is First1 learning in ELA and Mathematics this year?
- How is First1 doing?
- How can I use this information to work with First1 this year?
- What resources should I use to support First1?

APPENDIX H—MSAA QUALIFICATION RATES

Table H-1 summarizes the qualifications rates for this MSAA. Rates of success during qualification varied. Multiple factors determine the success of a scorer during qualification. These include familiarity with the assessment, the grade levels, and the variation of item types.

Table H-1. Qualification Summary

Grade 3	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	5	4	9	4	22	26
Total Failed	5	1		24	2	
Grade 4	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	5	4	9	10	19	29
Total Failed	5	1		21	2	
Grade 5	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	5	0	5	21	1	22
Total Failed	5	5		7	6	
Grade 6	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	9	1	10	21	5	26
Total Failed	1	0		5	0	
Grade 7	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified
Total Passed	8	2	10	13	7	20
Total Failed	2	0		13	6	
Grade 8	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	8	2	10	9	10	19
Total Failed	2	0		16	6	
Grade 11	W R C C 0 0 2 Qual 1	W R C C 0 0 2 Qual 2	Scorers Qualified WRCC002	W R C C 0 0 3 Qual 1	W R C C 0 0 3 Qual 2	Scorers Qualified WRCC003
Total Passed	9	1	10	19	7	26
Total Failed	1	0		8	1	

Note: For identification purposes in iScore, Level 2 items were designated as WRCC002 across all grades and Level 3 items were designated WRCC003.

APPENDIX I—DIFFERENTIAL ITEM FUNCTIONING RESULTS

Table I-1. DIF by Path— ELA Grade 3

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	41	4	3	1	1	1	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	41	9	3	6	1	1	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	41	6	5	1	0	0	0
			OR	3	1	1	0	0	0	0
	White	Black or African American	MC	41	8	6	2	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	41	2	2	0	0	0	0
			OR	3	1	1	0	0	0	0
B	Male	Female	MC	41	3	1	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	41	8	3	5	3	0	3
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	27	5	5	0	0	0	0
			OR	3	1	0	1	0	0	0
	White	Black or African American	MC	41	7	4	3	4	1	3
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	41	6	4	2	0	0	0
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	41	2	2	0	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	41	10	4	6	1	0	1
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	27	5	5	0	0	0	0
			OR	3	1	0	1	0	0	0
	White	Black or African American	MC	41	5	4	1	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	41	9	7	2	0	0	0
			OR	3	0	0	0	0	0	0

Table I-2. DIF by Path— ELA Grade 4

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	40	7	6	1	0	0	0
			OR	3	1	0	1	0	0	0
	Non-EconDis	EconDis	MC	40	5	1	4	2	0	2
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	40	8	6	2	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	40	5	4	1	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	40	4	2	2	0	0	0
			OR	3	0	0	0	0	0	0
B	Male	Female	MC	40	3	3	0	1	0	1
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	40	6	1	5	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	35	5	5	0	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	40	10	7	3	2	0	2
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	40	5	3	2	0	0	0
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	40	3	3	0	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	40	5	1	4	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	35	5	5	0	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	40	8	6	2	2	0	2
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	40	6	2	4	0	0	0
			OR	3	0	0	0	0	0	0

Table I-3. DIF by Path— ELA Grade 5

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	37	4	3	1	1	1	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	37	6	1	5	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	37	5	3	2	2	1	1
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	37	4	2	2	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	37	6	3	3	0	0	0
			OR	3	0	0	0	0	0	0
B	Male	Female	MC	37	2	1	1	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	37	4	0	4	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	37	4	2	2	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	37	1	1	0	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	37	5	4	1	0	0	0
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	37	4	2	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	37	4	0	4	1	1	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	32	3	1	2	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	37	1	0	1	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	37	4	3	1	0	0	0
			OR	3	0	0	0	0	0	0

Table I-4. DIF by Path— ELA Grade 6

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	38	3	1	2	1	1	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	7	3	4	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	23	4	3	1	1	1	0
			OR	-	-	-	-	-	-	-
	White	Black or African American	MC	38	2	1	1	0	0	0
			OR	3	1	0	1	0	0	0
		Hispanic or Latino	MC	38	6	3	3	1	1	0
			OR	3	0	0	0	0	0	0
B	Male	Female	MC	38	2	0	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	7	3	4	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	38	9	6	3	2	2	0
			OR	3	1	0	1	0	0	0
	White	Black or African American	MC	38	4	3	1	1	1	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	3	2	1	1	1	0
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	38	1	0	1	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	6	2	4	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	34	8	6	2	1	1	0
			OR	3	1	0	1	0	0	0
	White	Black or African American	MC	38	4	4	0	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	4	2	2	1	1	0
			OR	3	0	0	0	0	0	0

Table I-5. DIF by Path— ELA Grade 7

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	38	1	1	0	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	6	4	2	0	0	0
			OR	3	1	0	1	0	0	0
	Non-LEP	LEP	MC	34	7	4	3	0	0	0
			OR	2	0	0	0	0	0	0
	White	Black or African American	MC	38	1	0	1	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	1	1	0	0	0	0
			OR	3	0	0	0	0	0	0
B	Male	Female	MC	38	1	1	0	0	0	0
			OR	3	1	0	1	0	0	0
	Non-EconDis	EconDis	MC	28	5	3	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	28	3	3	0	0	0	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	3	3	0	1	1	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	2	2	0	0	0	0
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	38	0	0	0	2	2	0
			OR	3	1	0	1	0	0	0
	Non-EconDis	EconDis	MC	38	6	4	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	38	3	3	0	0	0	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	2	2	0	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	2	2	0	0	0	0
			OR	3	0	0	0	0	0	0

Table I-6. DIF by Path— ELA Grade 8

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	38	2	0	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	2	1	1	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	38	12	7	5	0	0	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	1	1	0	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	4	3	1	0	0	0
			OR	3	0	0	0	0	0	0
B	Male	Female	MC	38	4	2	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	3	0	3	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	33	9	4	5	0	0	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	2	2	0	1	0	1
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	7	6	1	1	0	1
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	38	4	1	3	1	1	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	2	0	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	33	9	4	5	0	0	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	2	0	2	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	5	4	1	0	0	0
			OR	3	0	0	0	0	0	0

Table I-7. DIF by Path— ELA Grade 11

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	38	1	0	1	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	29	5	1	4	0	0	0
			OR	-	-	-	-	-	-	-
	Non-LEP	LEP	MC	29	5	4	1	1	1	0
			OR	-	-	-	-	-	-	-
	White	Black or African American	MC	38	2	2	0	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	6	3	3	0	0	0
			OR	3	1	1	0	0	0	0
B	Male	Female	MC	38	2	0	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	7	3	4	1	0	1
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	29	5	4	1	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	1	0	1	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	10	6	4	0	0	0
			OR	3	0	0	0	0	0	0
C	Male	Female	MC	38	3	1	2	0	0	0
			OR	3	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	38	7	3	4	0	0	0
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	24	5	4	1	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	38	1	0	1	0	0	0
			OR	3	0	0	0	0	0	0
		Hispanic or Latino	MC	38	6	5	1	0	0	0
			OR	3	0	0	0	0	0	0

Table I-8. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—ELA

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
						Favoring			Favoring	
	Reference	Focal			Total	Reference	Focal	Total	Reference	Focal
03	Male	Female	MC	69	9	6	3	1	1	0
			OR	6	0	0	0	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	69	15	6	9	5	1	4
			OR	6	0	0	0	0	0	0
	Non-LEP	LEP	MC	41	6	5	1	0	0	0
			OR	6	2	1	1	0	0	0
	White	Black or African American	MC	69	12	8	4	4	1	3
			OR	6	0	0	0	0	0	0
		Hispanic or Latino	MC	69	13	9	4	0	0	0
			OR	6	1	1	0	0	0	0
04	Male	Female	MC	60	8	7	1	1	0	1
			OR	6	1	0	1	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	60	9	3	6	2	0	2
			OR	6	0	0	0	0	0	0
	Non-LEP	LEP	MC	50	9	7	2	2	2	0
			OR	6	0	0	0	0	0	0
	White	Black or African American	MC	60	12	9	3	2	0	2
			OR	6	0	0	0	0	0	0
		Hispanic or Latino	MC	60	9	4	5	0	0	0
			OR	6	0	0	0	0	0	0
05	Male	Female	MC	51	6	4	2	1	1	0
			OR	6	0	0	0	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	51	8	1	7	1	1	0
			OR	6	0	0	0	0	0	0
	Non-LEP	LEP	MC	46	7	5	2	2	1	1
			OR	6	0	0	0	0	0	0
	White	Black or African American	MC	51	6	3	3	0	0	0
			OR	6	0	0	0	0	0	0
		Hispanic or Latino	MC	51	9	6	3	0	0	0
			OR	6	0	0	0	0	0	0
06	Male	Female	MC	57	5	1	4	1	1	0
			OR	6	0	0	0	0	0	0

continued

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
06	Non-EconDis	Economically Disadvantaged	MC	57	11	4	7	0	0	0
			OR	6	0	0	0	0	0	0
	Non-LEP	LEP	MC	38	9	6	3	2	2	0
			OR	3	1	0	1	0	0	0
	White	Black or African American	MC	57	7	5	2	1	1	0
			OR	6	1	0	1	0	0	0
		Hispanic or Latino	MC	57	8	4	4	3	3	0
			OR	6	0	0	0	0	0	0
07	Male	Female	MC	58	2	2	0	2	2	0
			OR	6	1	0	1	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	48	7	5	2	0	0	0
			OR	6	1	0	1	0	0	0
	Non-LEP	LEP	MC	44	7	4	3	0	0	0
			OR	5	0	0	0	0	0	0
	White	Black or African American	MC	58	6	5	1	1	1	0
			OR	6	0	0	0	0	0	0
		Hispanic or Latino	MC	58	3	3	0	0	0	0
			OR	6	0	0	0	0	0	0
08	Male	Female	MC	52	7	3	4	1	1	0
			OR	6	0	0	0	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	52	4	1	3	0	0	0
			OR	6	0	0	0	0	0	0
	Non-LEP	LEP	MC	42	13	7	6	0	0	0
			OR	6	0	0	0	0	0	0
	White	Black or African American	MC	52	5	3	2	1	0	1
			OR	6	0	0	0	0	0	0
		Hispanic or Latino	MC	52	10	8	2	1	0	1
			OR	6	0	0	0	0	0	0
11	Male	Female	MC	61	4	1	3	0	0	0
			OR	6	0	0	0	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	52	11	5	6	1	0	1
			OR	3	0	0	0	0	0	0
	Non-LEP	LEP	MC	29	5	4	1	1	1	0
			OR	3	0	0	0	0	0	0
	White	Black or African American	MC	61	4	2	2	0	0	0
			OR	6	0	0	0	0	0	0
		Hispanic or Latino	MC	61	15	10	5	0	0	0
			OR	6	1	1	0	0	0	0

Table I-9. Number of Items Classified as "Low" or "High" DIF, Overall and by Group Favored—Mathematics

Grade	Group		Item Type	Number of Items	Number "Low"			Number "High"		
	Reference	Focal			Total	Favoring		Total	Favoring	
						Reference	Focal		Reference	Focal
03	Male	Female	MC	66	9	7	2	0	0	0
	Non-EconDis	EconDis	MC	66	15	6	9	1	0	1
	Non-LEP	LEP	MC	39	15	10	5	1	1	0
	White	Black or African American	MC	66	10	4	6	1	1	0
		Hispanic or Latino	MC	66	15	7	8	2	2	0
04	Male	Female	MC	62	6	2	4	1	1	0
	Non-EconDis	EconDis	MC	51	20	8	12	2	0	2
	Non-LEP	LEP	MC	27	4	3	1	0	0	0
	White	Black or African American	MC	62	7	1	6	1	0	1
		Hispanic or Latino	MC	62	8	5	3	1	1	0
05	Male	Female	MC	66	8	4	4	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	66	12	6	6	1	0	1
	Non-LEP	LEP	MC	38	9	3	6	0	0	0
	White	Black or African American	MC	66	5	3	2	0	0	0
		Hispanic or Latino	MC	66	10	7	3	0	0	0
06	Male	Female	MC	59	10	5	5	1	1	0
	Non-EconDis	Economically Disadvantaged	MC	59	16	6	10	2	1	1
	Non-LEP	LEP	MC	31	4	2	2	1	1	0
	White	Black or African American	MC	59	6	1	5	2	2	0
		Hispanic or Latino	MC	59	8	4	4	0	0	0
07	Male	Female	MC	61	6	2	4	0	0	0
	Non-EconDis	Economically Disadvantaged	MC	49	6	3	3	0	0	0
	Non-LEP	LEP	MC	49	8	4	4	2	1	1
	White	Black or African American	MC	61	8	5	3	0	0	0
		Hispanic or Latino	MC	61	6	3	3	0	0	0
08	Male	Female	MC	64	3	2	1	0	0	0
	Non-EconDis	EconDis	MC	64	13	4	9	1	0	1
	Non-LEP	LEP	MC	40	8	4	4	1	0	1
	White	Black or African American	MC	64	7	4	3	0	0	0
		Hispanic or Latino	MC	64	10	3	7	0	0	0
11	Male	Female	MC	63	6	2	4	0	0	0
	Non-EconDis	EconDis	MC	63	15	6	9	1	0	1
	Non-LEP	LEP	MC	27	2	1	1	1	0	1
	White	Black or African American	MC	63	10	3	7	0	0	0
		Hispanic or Latino	MC	63	10	2	8	1	1	0

Table I-10. DIF by Path— Mathematics Grade 3

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	2	1	1	0	0	0
	Non-EconDis	EconDis	MC	35	6	0	6	1	0	1
	Non-LEP	LEP	MC	35	13	10	3	1	1	0
	White	Black or African American	MC	35	6	3	3	0	0	0
		Hispanic or Latino	MC	35	7	3	4	0	0	0
B	Male	Female	MC	35	3	2	1	0	0	0
	Non-EconDis	EconDis	MC	35	8	4	4	0	0	0
	Non-LEP	LEP	MC	24	9	7	2	0	0	0
	White	Black or African American	MC	35	6	2	4	1	1	0
		Hispanic or Latino	MC	35	7	4	3	0	0	0
C	Male	Female	MC	35	4	4	0	0	0	0
	Non-EconDis	EconDis	MC	35	6	3	3	0	0	0
	Non-LEP	LEP	MC	19	8	6	2	0	0	0
	White	Black or African American	MC	35	3	2	1	0	0	0
		Hispanic or Latino	MC	35	8	4	4	2	2	0

Table I-11. DIF by Path— Mathematics Grade 4

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	3	2	1	0	0	0
	Non-EconDis	EconDis	MC	24	9	4	5	0	0	0
	Non-LEP	LEP	MC	24	3	2	1	0	0	0
	White	Black or African American	MC	35	3	0	3	1	0	1
		Hispanic or Latino	MC	35	2	0	2	0	0	0
B	Male	Female	MC	35	1	0	1	0	0	0
	Non-EconDis	EconDis	MC	35	12	6	6	0	0	0
	Non-LEP	LEP	MC	27	4	3	1	0	0	0
	White	Black or African American	MC	35	2	0	2	0	0	0
		Hispanic or Latino	MC	35	3	2	1	0	0	0
C	Male	Female	MC	35	2	0	2	1	1	0
	Non-EconDis	EconDis	MC	35	15	6	9	2	0	2
	Non-LEP	LEP	MC	19	3	2	1	0	0	0
	White	Black or African American	MC	35	4	1	3	0	0	0
		Hispanic or Latino	MC	35	4	4	0	1	1	0

Table I-12. DIF by Path— Mathematics Grade 5

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	3	3	0	0	0	0
	Non-EconDis	EconDis	MC	35	7	4	3	1	0	1
	Non-LEP	LEP	MC	18	4	2	2	0	0	0
	White	Black or African American	MC	35	0	0	0	0	0	0
		Hispanic or Latino	MC	35	5	5	0	0	0	0
B	Male	Female	MC	35	2	0	2	0	0	0
	Non-EconDis	EconDis	MC	35	4	1	3	0	0	0
	Non-LEP	LEP	MC	24	4	2	2	0	0	0
	White	Black or African American	MC	35	2	1	1	0	0	0
		Hispanic or Latino	MC	35	3	2	1	0	0	0
C	Male	Female	MC	35	3	1	2	0	0	0
	Non-EconDis	EconDis	MC	35	6	2	4	0	0	0
	Non-LEP	LEP	MC	35	8	3	5	0	0	0
	White	Black or African American	MC	35	4	2	2	0	0	0
		Hispanic or Latino	MC	35	6	4	2	0	0	0

Table I-13. DIF by Path— Mathematics Grade 6

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	7	2	5	1	1	0
	Non-EconDis	EconDis	MC	35	8	2	6	2	1	1
	Non-LEP	LEP	MC	22	2	2	0	1	1	0
	White	Black or African American	MC	35	3	0	3	0	0	0
		Hispanic or Latino	MC	35	3	1	2	0	0	0
B	Male	Female	MC	35	4	3	1	1	1	0
	Non-EconDis	EconDis	MC	35	5	0	5	0	0	0
	Non-LEP	LEP	MC	31	4	2	2	1	1	0
	White	Black or African American	MC	35	2	0	2	1	1	0
		Hispanic or Latino	MC	35	4	2	2	0	0	0
C	Male	Female	MC	35	3	2	1	0	0	0
	Non-EconDis	EconDis	MC	35	8	4	4	0	0	0
	Non-LEP	LEP	MC	24	3	1	2	0	0	0
	White	Black or African American	MC	35	3	1	2	1	1	0
		Hispanic or Latino	MC	35	3	2	1	0	0	0

Table I-14. DIF by Path— Mathematics Grade 7

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	4	1	3	0	0	0
	Non-EconDis	EconDis	MC	23	3	1	2	0	0	0
	Non-LEP	LEP	MC	23	4	2	2	0	0	0
	White	Black or African American	MC	35	4	4	0	0	0	0
		Hispanic or Latino	MC	35	3	2	1	0	0	0
B	Male	Female	MC	35	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	35	3	1	2	0	0	0
	Non-LEP	LEP	MC	35	6	3	3	1	0	1
	White	Black or African American	MC	35	2	2	0	0	0	0
		Hispanic or Latino	MC	35	2	1	1	0	0	0
C	Male	Female	MC	35	2	1	1	0	0	0
	Non-EconDis	EconDis	MC	35	5	3	2	0	0	0
	Non-LEP	LEP	MC	35	7	4	3	1	1	0
	White	Black or African American	MC	35	4	1	3	0	0	0
		Hispanic or Latino	MC	35	2	1	1	0	0	0

Table I-15. DIF by Path— Mathematics Grade 8

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	35	8	3	5	0	0	0
	Non-LEP	LEP	MC	20	6	4	2	0	0	0
	White	Black or African American	MC	35	5	4	1	0	0	0
		Hispanic or Latino	MC	35	4	1	3	0	0	0
B	Male	Female	MC	35	2	1	1	0	0	0
	Non-EconDis	EconDis	MC	35	5	1	4	1	0	1
	Non-LEP	LEP	MC	26	7	4	3	0	0	0
	White	Black or African American	MC	35	2	2	0	0	0	0
		Hispanic or Latino	MC	35	2	1	1	0	0	0
C	Male	Female	MC	35	1	1	0	0	0	0
	Non-EconDis	EconDis	MC	35	5	1	4	0	0	0
	Non-LEP	LEP	MC	35	7	3	4	1	0	1
	White	Black or African American	MC	35	2	0	2	0	0	0
		Hispanic or Latino	MC	35	4	1	3	0	0	0

Table I-16. DIF by Path— Mathematics Grade 11

Path	*Group*		*Item Type*	*Number of Items*	*Number "Low"*			*Number "High"*		
	Reference	*Focal*			*Total*	*Favoring*		*Total*	*Favoring*	
						Reference	*Focal*		*Reference*	*Focal*
A	Male	Female	MC	35	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	35	12	4	8	1	0	1
	Non-LEP	LEP	MC	21	2	1	1	1	0	1
	White	Black or African American	MC	35	7	3	4	0	0	0
		Hispanic or Latino	MC	35	4	0	4	1	1	0
B	Male	Female	MC	35	0	0	0	0	0	0
	Non-EconDis	EconDis	MC	35	4	0	4	0	0	0
	Non-LEP	LEP	MC	27	2	1	1	1	0	1
	White	Black or African American	MC	35	3	1	2	0	0	0
		Hispanic or Latino	MC	35	3	1	2	0	0	0
C	Male	Female	MC	35	6	2	4	0	0	0
	Non-EconDis	EconDis	MC	35	6	2	4	0	0	0
	Non-LEP	LEP	MC	21	2	1	1	0	0	0
	White	Black or African American	MC	35	3	1	2	0	0	0
		Hispanic or Latino	MC	35	4	1	3	0	0	0

APPENDIX J—ITEM RESPONSE THEORY PARAMETERS

Table J-1. IRT Parameters for ELA Grade 3

IREF	*a*	*SE (a)*	*b*	*SE (b)*
114737A	0.5703	0.0433	-0.0303	0.0551
114735A	0.8574	0.0555	-0.6623	0.0472
114738A	0.4504	0.0410	-0.5984	0.0809
121799B	0.3655	0.0380	0.9209	0.1250
114736A	1.1457	0.0654	-0.5496	0.0346
528721	0.7761	0.0659	-1.3017	0.0822
528734	0.7369	0.0525	-0.4844	0.0611
528746	0.5947	0.0459	-0.4261	0.0725
120922A	0.3924	0.0229	-0.0349	0.0595
116203A	0.6700	0.0286	-0.0880	0.0378
116202A	0.3834	0.0230	-0.3624	0.0616
116205A	0.7288	0.0350	-1.1560	0.0465
116204A	1.0521	0.0412	-0.5850	0.0273
455461	0.4801	0.0374	0.4821	0.0888
455485	0.4664	0.0371	0.1481	0.0836
455498	0.3398	0.0338	-0.3424	0.1090
455511	0.4403	0.0369	-0.1868	0.0852
448821	0.8543	0.0394	-1.1367	0.0402
124170A	0.4648	0.0222	-0.2909	0.0470
124175A	0.7416	0.0316	-1.0952	0.0403
124181A	0.8883	0.0646	0.0787	0.0605
121423A	1.0048	0.0858	-1.4811	0.0489
120785A	1.1328	0.0922	-1.5128	0.0457
120787A	1.0546	0.0873	-1.3953	0.0435
120786A	0.5526	0.0674	-0.6291	0.0806
538024	0.7200	0.0646	-1.4661	0.0980
538036	1.1647	0.0860	-0.9566	0.0471
538072	1.1895	0.0969	-1.1861	0.0530
538048	1.3254	0.1013	-1.0302	0.0437
538060	1.1057	0.0948	-1.3119	0.0625
120902A	0.8114	0.0763	-1.2585	0.0494
116009A	0.5700	0.0668	-1.0599	0.0639
116011A	0.8119	0.0762	-1.1546	0.0470
116012A	0.9242	0.0825	-1.5130	0.0540
116010A	0.9464	0.0819	-1.2813	0.0438
125942A	0.6235	0.0304	-0.9757	0.0484
125943A	0.2908	0.0222	-1.2128	0.1090
125945A	0.6016	0.0305	-1.1279	0.0541
125947B	0.7793	0.0350	-0.9367	0.0391
125948A	0.5817	0.0274	-0.4831	0.0434
125949B	0.5086	0.0276	-1.1071	0.0621
120879A	0.4567	0.0347	0.7961	0.0679
120880A	0.1795	0.0273	0.2618	0.1622
115985A	0.9206	0.0552	-0.3644	0.0474
115987A	0.5016	0.0388	-0.3379	0.0798
115986A	0.9288	0.0542	-0.2681	0.0442
451474	0.5007	0.0277	-1.1918	0.0659
451486	0.3960	0.0240	-0.8393	0.0689
451498	0.4855	0.0251	-0.3906	0.0500
451521	0.3631	0.0226	1.0831	0.0910
451534	0.7748	0.0318	-0.3372	0.0336
120926A	0.4646	0.0665	-0.4006	0.0842
120927A	0.3322	0.0598	-0.5797	0.1260
113747A	0.5979	0.0711	-0.0303	0.0705
113746A	0.7091	0.0582	-0.7106	0.0741
121184A	0.3680	0.0416	-1.1380	0.1508
117670A	0.8643	0.0615	-0.6410	0.0556
122067A	0.3211	0.0398	1.7300	0.2329
117671B	0.2166	0.0333	0.5143	0.1908
120912A	0.8560	0.0514	-0.2831	0.0478
120914A	0.4471	0.0356	0.0719	0.0719
113682A	0.5979	0.0427	-0.4173	0.0716
113681A	0.7059	0.0490	-0.6095	0.0711
113685A	0.8598	0.0639	-0.5824	0.0576
113683A	0.7441	0.0554	-0.0035	0.0583
114008A	0.9691	0.0369	-0.8202	0.0284
121726A	0.5821	0.0253	-0.6434	0.0413
121545A	0.6380	0.0256	-0.2524	0.0359
114010A	0.6774	0.0294	-1.0504	0.0425

Table J-2. IRT Parameters for ELA Grade 4

IREF	*a*	*SE (a)*	*b*	*SE (b)*
116618A	0.4346	0.0243	-0.4226	0.0552
116619A	0.3470	0.0391	0.2273	0.1107
116621A	0.5658	0.0271	-0.4077	0.0433
121580A	0.4480	0.0239	0.5439	0.0563
116620A	0.3727	0.0232	-0.4654	0.0645
451867	0.3520	0.0233	-0.8356	0.0795
451881	0.7569	0.0311	-0.2510	0.0328
451895	0.4888	0.0247	0.0510	0.0469
451913	0.3829	0.0228	0.2734	0.0600
451925	0.7779	0.0315	-0.2096	0.0320
121550A	0.6179	0.0284	-0.4497	0.0405
121551A	0.3307	0.0225	-0.5145	0.0734
113280A	0.7088	0.0316	-0.6638	0.0388
113281A	0.6958	0.0298	-0.3230	0.0355
113283A	0.7148	0.0315	-0.6251	0.0379
449675	0.6158	0.0279	-0.3205	0.0394
124199A	0.5869	0.0517	0.4122	0.0687
530081	0.7248	0.0372	-0.2425	0.0411
528759	0.6728	0.0560	-0.9276	0.0803
528771	1.1963	0.0908	-0.9107	0.0478
528783	0.4934	0.0437	-0.4551	0.0867
116574A	0.9684	0.0470	-1.2771	0.0436
121279A	1.2578	0.0562	-1.0735	0.0302
121426A	1.2592	0.0530	-0.9089	0.0270
116576A	0.8738	0.0447	-1.4147	0.0526
113096A	1.2451	0.0808	-0.4212	0.0400
121988C	0.2084	0.0354	2.2832	0.4166
121567A	0.3654	0.0425	-0.9255	0.1419
121569A	1.1949	0.0767	-0.2889	0.0403
113055A	1.1136	0.0724	-0.2680	0.0423
113095A	1.0861	0.0735	-0.5134	0.0455
455543	1.3222	0.0643	-0.9047	0.0260
455556	1.1343	0.0593	-1.0327	0.0322
455569	0.5505	0.0406	-1.0812	0.0625
455581	0.9195	0.0556	-1.3539	0.0501
455593	0.4798	0.0414	-1.7606	0.1149
126141A	0.6840	0.0323	-0.9134	0.0453
126142A	0.6383	0.0355	-1.5475	0.0728
126143A	0.4414	0.0267	-1.2523	0.0809
126144B	0.8886	0.0356	-0.4878	0.0301
451550	0.9336	0.0683	-0.7464	0.0545
451562	0.9829	0.0629	-0.2143	0.0472
451574	0.5719	0.0449	0.0543	0.0722
451586	0.6534	0.0478	0.7328	0.0766
451598	0.5396	0.0449	-0.3025	0.0771
114056A	1.0773	0.1400	-0.5590	0.1629
114053A	1.2446	0.1325	-0.1814	0.0976
114054A	0.7895	0.0789	0.1982	0.0911
122582A	0.2527	0.0472	-0.2231	0.2964
114055A	0.5288	0.0614	0.4581	0.1045
113090A	0.6276	0.0674	0.3423	0.0980
121985A	0.3563	0.0512	1.1767	0.1118
113088A	1.1291	0.1206	-0.1876	0.1040
113087A	1.2030	0.1185	-0.0298	0.0835
113089A	1.2181	0.1162	0.0357	0.0769
451634	0.6707	0.0486	0.0443	0.0626
451646	0.3748	0.0379	-0.0215	0.1031
451663	0.6251	0.0467	0.0764	0.0664
451679	0.4744	0.0408	0.3858	0.0877
451694	0.3095	0.0353	0.2793	0.1254

Table J-3. IRT Parameters for ELA Grade 5

IREF	*a*	*SE (a)*	*b*	*SE (b)*
540011	0.9120	0.0633	-0.7265	0.0497
540053	1.3369	0.0939	-0.9069	0.0387
540068	0.5383	0.0453	-0.4921	0.0736
540096	0.8001	0.0567	-0.6325	0.0539
540124	0.8307	0.0566	-0.5164	0.0505
449342	0.3218	0.0220	0.1649	0.0678
449348	0.2162	0.0205	0.9393	0.1325
449385	0.2855	0.0216	0.8195	0.0967
449387	0.6284	0.0275	-0.1142	0.0364
449391	0.6229	0.0272	0.0344	0.0371
117523A	0.5179	0.0259	-0.4262	0.0447
117524A	0.3405	0.0223	0.3433	0.0675
117525A	0.5922	0.0266	0.0506	0.0388
120909A	0.6388	0.0286	-0.4729	0.0375
120910A	0.6048	0.0283	-0.6044	0.0411
530710	0.5290	0.0320	-0.4680	0.0538
530789	1.0012	0.0438	-0.2983	0.0309
449808	0.7940	0.0319	-0.3970	0.0307
120211B	0.1956	0.0205	1.8665	0.2215
120212A	0.2042	0.0205	1.6198	0.1916
120209A	0.5575	0.0281	-0.8609	0.0498
120210A	0.8834	0.0336	-0.2666	0.0278
121325A	0.5429	0.0259	-0.1704	0.0412
121326B	0.3748	0.0230	0.9285	0.0794
455685	0.6932	0.0700	-1.2466	0.0585
455697	1.1407	0.0835	-0.7781	0.0319
455709	1.1391	0.0856	-1.1581	0.0349
455721	0.6555	0.0718	-1.6781	0.0936
114329A	0.3801	0.0588	-0.1800	0.1364
121733A	0.3678	0.0579	-0.2768	0.1288
114331A	0.3676	0.0583	-0.0889	0.1516
121735A	0.5109	0.0637	-0.4379	0.0836
114332A	0.9170	0.0797	-0.2564	0.0597
126984B	0.7402	0.0350	-1.1253	0.0454
126985B	0.8252	0.0339	-0.6446	0.0318
126986A	0.4937	0.0310	-1.7612	0.0975
126987B	1.1186	0.0447	-0.8476	0.0269
451036	0.4221	0.0710	-0.0875	0.0983
452001	0.5010	0.0430	-0.5498	0.0756
452013	0.8624	0.0895	0.1998	0.0560
452038	1.1935	0.1090	-0.5286	0.0485
114320A	0.4875	0.0363	0.4676	0.0574
121720B	0.0895	0.0197	5.4198	1.1170
121730A	0.4985	0.0384	-0.1680	0.0707
114322A	0.2578	0.0314	-0.0763	0.1244
114323A	0.9288	0.0534	-0.2408	0.0424
121457A	0.4941	0.0565	-0.1754	0.1340
121458A	0.2478	0.0415	0.5627	0.1555
121459A	0.8972	0.0744	0.0699	0.0671
114072A	1.0476	0.0993	-0.4202	0.0960
114075A	0.5998	0.0483	0.7611	0.0848

Table J-4. IRT Parameters for ELA Grade 6

IREF	*a*	*SE (a)*	*b*	*SE (b)*
121802A	0.7181	0.0350	-0.4762	0.0390
121803A	1.0319	0.0468	-0.6885	0.0335
121804A	0.8541	0.0366	-0.1950	0.0287
114382A	1.0457	0.0455	-0.5644	0.0299
114380A	1.1772	0.0514	-0.6517	0.0291
119997A	0.2420	0.0243	1.3010	0.1362
119998A	0.4175	0.0268	0.3788	0.0519
119999A	0.4427	0.0274	0.9197	0.0627
120000A	0.3056	0.0251	0.7236	0.0794
121349A	0.2201	0.0248	2.4915	0.2669
121353A	1.0490	0.0405	-0.0476	0.0232
113614A	0.8586	0.0359	-0.0357	0.0273
121225A	0.6660	0.0324	-0.2146	0.0361
121226A	0.6894	0.0323	-0.0667	0.0332
113612A	0.6834	0.0322	-0.0619	0.0334
530821	1.3909	0.1060	-0.6410	0.0436
530910	0.3250	0.0430	0.2543	0.1107
530845	0.8463	0.0652	-0.4930	0.0572
113537A	0.6037	0.0461	-0.1466	0.0419
121764A	1.1590	0.0589	-0.2414	0.0236
121768A	1.1266	0.0589	-0.3836	0.0253
113536A	0.9552	0.0538	0.0815	0.0300
121775A	0.5777	0.0275	-0.6350	0.0441
120389A	1.1286	0.1053	-1.1495	0.0594
120390A	1.0702	0.1022	-1.1460	0.0616
121482A	1.5439	0.1169	-0.7971	0.0299
121483A	1.6421	0.1176	-0.5268	0.0240
120391A	1.7941	0.1255	-0.6735	0.0236
455849	1.6688	0.1162	-0.9494	0.0330
455873	1.5766	0.1025	-0.8534	0.0324
455885	1.2550	0.0994	-1.2116	0.0554
455898	1.0560	0.0775	-1.1003	0.0562
455910	1.7561	0.1191	-0.9009	0.0304
127272B	0.8406	0.0373	-0.3519	0.0314
127273A	1.0015	0.0428	-0.4594	0.0288
127274A	0.5632	0.0348	-1.0972	0.0766
127276A	0.3379	0.0265	-0.4796	0.0786
127277B	1.1982	0.0469	-0.3096	0.0226
540822	0.5352	0.0481	-0.1081	0.0717
540836	1.4752	0.1107	-0.6639	0.0406
540872	0.4748	0.0465	-0.2661	0.0853
540908	0.3336	0.0398	0.6726	0.1183
452299	0.8056	0.0544	-0.4186	0.0614
452311	0.7776	0.0464	0.2012	0.0385
452335	0.2950	0.0367	2.7710	0.2747
452348	1.1084	0.0602	-0.0805	0.0342
452360	1.1494	0.0643	-0.2012	0.0370
452219	0.8633	0.0369	-0.2101	0.0286
452231	0.7620	0.0329	0.2957	0.0301
452243	0.5106	0.0286	0.0723	0.0423
452257	0.7340	0.0326	0.1801	0.0306
452269	1.7311	0.0643	-0.3150	0.0170
452282	1.1468	0.0725	-0.4889	0.0505
540986	0.2501	0.0391	1.5617	0.2522
541015	0.4557	0.0479	0.0305	0.0841
541043	0.7159	0.0564	0.3071	0.0569
541060	0.3910	0.0447	0.8187	0.1166

Table J-5. IRT Parameters for ELA Grade 7

IREF	*a*	*SE (a)*	*b*	*SE (b)*
114594A	0.7417	0.0338	-0.7062	0.0390
114593A	1.2156	0.0492	-0.7565	0.0262
121997A	0.6112	0.0288	-0.2820	0.0385
114596A	0.9353	0.0378	-0.5422	0.0292
113801A	1.5013	0.1257	-0.9388	0.0289
122038A	1.1001	0.1111	-1.2162	0.0477
122037A	1.3293	0.1182	-0.9383	0.0320
113802B	1.4693	0.1257	-1.0446	0.0312
114646A	0.9779	0.0423	-0.8514	0.0335
114643A	1.2018	0.0469	-0.6303	0.0247
121871A	0.8170	0.0349	-0.5710	0.0333
114644A	0.8638	0.0343	-0.2533	0.0285
121874A	0.6132	0.0295	-0.4861	0.0413
114645A	0.9916	0.0377	-0.2991	0.0258
531700	1.0756	0.0822	-0.8977	0.0551
531774	0.4019	0.0432	-0.1347	0.0969
531738	0.3056	0.0399	0.7019	0.1478
531798	0.6594	0.0508	0.0352	0.0620
120098A	1.3051	0.1235	-1.3066	0.0463
121493A	1.8282	0.1405	-0.9196	0.0244
121497A	0.7072	0.0925	-1.2605	0.0731
120099A	1.4701	0.1304	-1.2343	0.0383
121509A	1.5407	0.1283	-0.9994	0.0291
121512A	1.1618	0.0465	-0.9249	0.0267
115431A	1.1313	0.0430	-0.4875	0.0245
115433A	0.9827	0.0381	-0.3975	0.0266
121313A	0.8461	0.0347	-0.4261	0.0304
115432A	0.7658	0.0322	-0.2919	0.0318
537297	1.2127	0.0835	-0.5802	0.0442
537309	0.9892	0.0727	-0.6620	0.0547
537369	0.6695	0.0577	-0.7926	0.0833
537354	0.5686	0.0500	-0.2953	0.0754
127690A	0.3940	0.0245	0.2098	0.0554
127691A	0.7156	0.0347	-0.9392	0.0467
127692B	0.6279	0.0320	-0.9243	0.0518
127693A	0.6352	0.0306	-0.6312	0.0429
127694A	0.6338	0.0323	-0.9373	0.0518
127695B	0.7539	0.0368	-1.0352	0.0478
452456	0.7056	0.0448	-0.0937	0.0532
452468	0.5899	0.0412	-0.0801	0.0615
452480	0.9777	0.0585	-0.5384	0.0440
452492	0.7643	0.0514	-0.7257	0.0583
120072A	0.5198	0.0758	-0.0173	0.0749
120073A	0.5367	0.0768	0.2335	0.0867
121491A	0.4324	0.0720	0.3621	0.1183
123649A	0.3890	0.0690	0.0574	0.1022
121495A	0.5529	0.0804	0.7320	0.1371
121507A	0.4662	0.0734	-0.0149	0.0831
452506	0.7938	0.0596	-0.5637	0.0597
452518	0.6943	0.0529	-0.2291	0.0605
452530	0.8873	0.0594	-0.1158	0.0491
452542	0.7424	0.0560	-0.4234	0.0600
120060A	0.4867	0.0541	0.2221	0.0960
120061A	0.6697	0.0605	0.2999	0.0676
121490A	0.5771	0.0563	0.4119	0.0711
123641A	0.4100	0.0503	0.4456	0.0955
121494A	0.5110	0.0523	1.0536	0.0678
121513A	0.6067	0.0568	0.4882	0.0644

Table J-6. IRT Parameters for ELA Grade 8

IREF	*a*	*SE (a)*	*b*	*SE (b)*
456179	1.3733	0.0939	-1.0424	0.0391
456191	1.7997	0.1287	-1.0826	0.0324
456203	1.4447	0.0940	-0.9512	0.0346
456215	1.2394	0.0852	-1.0438	0.0427
115286A	0.9709	0.0385	-0.5399	0.0267
121075A	1.0153	0.0463	-1.0679	0.0362
121078A	1.5050	0.0631	-0.9308	0.0234
115288A	0.6272	0.0322	-0.9527	0.0500
122562A	1.2197	0.0474	-0.6822	0.0236
115285A	0.9085	0.0357	-0.3480	0.0267
114229A	0.3485	0.0244	-0.0517	0.0601
114230A	0.6296	0.0295	-0.3395	0.0364
114231A	0.5792	0.0278	0.1613	0.0390
121805A	0.4229	0.0255	-0.0031	0.0503
114228A	0.3988	0.0250	0.1770	0.0546
531863	0.9797	0.0808	-1.1155	0.0665
531890	0.6273	0.0494	-0.3424	0.0639
531849	0.4029	0.0431	-0.3171	0.0950
121030A	1.5847	0.1217	-1.1698	0.0305
121031A	0.8682	0.0935	-0.5360	0.0515
121032A	0.6931	0.0852	-1.3214	0.0734
121106B	0.4432	0.0245	-0.7373	0.0564
121107A	1.2178	0.1037	-0.8974	0.0306
114876A	0.8388	0.0355	-0.6004	0.0311
114877A	0.3043	0.0238	0.6949	0.0870
122082A	0.5107	0.0272	-0.2543	0.0431
114879A	0.9771	0.0383	-0.4851	0.0261
118798A	0.8383	0.0393	-1.0195	0.0408
118800A	0.6057	0.0285	-0.0426	0.0365
121202A	0.9249	0.0350	-0.0782	0.0258
121203A	1.0122	0.0411	-0.6904	0.0277
121205A	0.9945	0.0393	-0.5610	0.0264
127781A	0.4890	0.0293	-1.0883	0.0683
127782A	0.8555	0.0410	-1.1143	0.0433
127783A	1.3609	0.0611	-1.0792	0.0290
127784A	0.2808	0.0237	-0.5357	0.0835
127785A	0.6651	0.0327	-0.8648	0.0447
127786B	1.3713	0.0633	-1.1369	0.0306
121040A	0.4818	0.0884	0.5076	0.1482
121041A	0.8522	0.1044	0.0643	0.0568
121042A	0.9439	0.1092	-0.3141	0.0473
121148A	0.3695	0.0786	0.6045	0.1968
121149A	0.6131	0.0969	-0.5631	0.0889
537758	0.6254	0.0516	-0.4340	0.0638
537740	0.5869	0.0488	-0.0345	0.0643
537726	0.4705	0.0454	0.3438	0.0865
537774	0.6752	0.0523	-0.2652	0.0573
121036A	0.5286	0.0539	0.7408	0.0625
121037A	0.8452	0.0692	0.1117	0.0582
121038A	0.9506	0.0713	0.2466	0.0464
121164A	0.3329	0.0499	-0.3098	0.1828
121165A	0.3926	0.0505	0.3754	0.0953

Table J-7. IRT Parameters for ELA Grade 11

IREF	*a*	*SE (a)*	*b*	*SE (b)*
113726A	0.3987	0.0254	-0.0932	0.0554
121745A	0.5061	0.0273	-0.1383	0.0447
113727A	0.2645	0.0231	0.3283	0.0860
113728A	1.1082	0.0460	-0.7240	0.0275
121746A	0.9324	0.0400	-0.6907	0.0313
539025	0.7683	0.0609	-0.6038	0.0622
539013	0.9120	0.0632	-0.1870	0.0482
539041	0.5464	0.0495	-0.3798	0.0772
539058	0.8337	0.0591	-0.0286	0.0517
539072	0.9019	0.0702	-0.7586	0.0587
453006	0.7456	0.0329	-0.3923	0.0335
453019	0.7789	0.0349	-0.6074	0.0351
453033	0.5760	0.0287	-0.1850	0.0401
453047	0.8230	0.0359	-0.5693	0.0328
531967	1.0030	0.0810	-1.0061	0.0623
531979	0.7445	0.0593	-0.5632	0.0627
531943	0.6273	0.0510	0.1504	0.0666
531955	0.5804	0.0480	-0.2844	0.0693
119078A	1.2307	0.0468	-0.4739	0.0228
122000A	0.8994	0.0372	-0.4680	0.0293
119081A	1.1701	0.0486	-0.7603	0.0268
119080A	1.0733	0.0450	-0.7382	0.0285
119079A	1.2119	0.0472	-0.5608	0.0237
114205A	1.6452	0.1386	-1.1381	0.0313
121718A	0.7253	0.0911	-1.1484	0.0629
121719A	0.8715	0.0991	-0.8431	0.0460
114207A	1.4143	0.1258	-1.1090	0.0343
114208A	1.0841	0.1087	-0.8734	0.0377
116351A	1.3875	0.0910	-1.2400	0.0373
116348A	1.3659	0.0870	-1.1432	0.0336
116349A	1.4379	0.0845	-0.9285	0.0260
116350A	1.5627	0.0931	-1.0550	0.0273
126773A	1.1379	0.0524	-1.0376	0.0337
126774B	1.4300	0.0657	-1.0383	0.0281
126775A	0.6151	0.0315	-0.7728	0.0474
126776B	0.5384	0.0286	-0.4651	0.0459
126777B	1.0083	0.0476	-1.0723	0.0382
126778B	1.0757	0.0481	-0.9383	0.0325
114193A	0.5578	0.0888	-0.5013	0.0866
121702A	0.4036	0.0786	-0.0008	0.1176
121703A	1.0315	0.1119	-0.6403	0.0561
121875A	0.6834	0.0951	-0.5399	0.0740
114194A	0.9850	0.1108	-0.6973	0.0621
114993A	0.4493	0.0414	-0.5739	0.0900
114995A	1.5486	0.0985	-0.7239	0.0324
114996A	1.0413	0.0638	-0.4253	0.0405
121794A	0.8753	0.0546	-0.1540	0.0449
538950	0.7269	0.0525	-0.1349	0.0559
538962	0.5520	0.0463	-0.1169	0.0706
538974	0.7462	0.0548	-0.3545	0.0565
538986	0.6396	0.0488	0.0044	0.0621
539001	0.2457	0.0362	1.6387	0.2701
114166A	0.5936	0.0518	1.4636	0.0787
121695A	0.6893	0.0541	0.6136	0.0491
121714A	0.9381	0.0676	0.0910	0.0497
121711A	0.7382	0.0588	0.1596	0.0582
114167A	0.5260	0.0539	-0.2220	0.1067
116326A	0.6554	0.0572	0.0073	0.0730
122538A	0.2751	0.0416	0.2120	0.1389
116324A	1.3098	0.1027	-0.3647	0.0607
116323A	1.7697	0.1428	-0.4024	0.0524

Table J-8. IRT Parameters for Mathematics Grade 3

IREF	*a*	*SE (a)*	*b*	*SE (b)*
112564A	0.8249	0.0398	-0.6405	0.0342
111386A	0.8485	0.0389	-0.2020	0.0293
111013A	0.4210	0.0426	0.3201	0.0979
110842A	1.0789	0.0460	-0.4419	0.0251
463081	1.4861	0.1000	-0.1208	0.0333
112586A	0.5009	0.0319	0.8650	0.0730
110862A	0.4447	0.0264	-0.6208	0.0574
442130	0.5504	0.0326	-0.5857	0.0475
110873A	0.5030	0.0318	0.8301	0.0711
110928A	0.4302	0.0299	0.6783	0.0744
111434A	0.9859	0.0472	-0.9776	0.0369
529126	0.7420	0.0663	-0.4056	0.0579
112551A	0.7557	0.0382	-0.7103	0.0384
529697	0.5311	0.0565	0.7399	0.1144
112595A	1.1017	0.0458	-0.2651	0.0238
451071	0.6109	0.0951	0.4547	0.2034
111377A	0.9462	0.0595	-0.5460	0.0311
110864A	0.1254	0.0276	0.2728	0.2836
110871A	0.6824	0.0980	0.2827	0.1625
110934B	0.2883	0.0394	0.4305	0.1458
528614	1.4313	0.0970	-0.2181	0.0332
111432A	0.6351	0.0955	0.3650	0.1834
112559A	0.9014	0.0954	-0.4260	0.0605
442166	0.5695	0.0903	0.4330	0.2071
110923A	1.5128	0.0774	-0.6452	0.0217
112600A	1.2905	0.1133	-0.5129	0.0403
111389A	0.5070	0.0524	-1.0427	0.1207
110855A	0.8243	0.1021	0.0101	0.1075
451074	0.6218	0.0615	-1.1351	0.0948
110964A	1.2636	0.1049	-0.8321	0.0343
451098	0.7903	0.0691	-0.9123	0.0677
111883A	0.5453	0.0889	0.4930	0.2232
111390A	0.6919	0.0542	-0.1458	0.0484
442416	1.5361	0.1296	-0.4423	0.0374
112569A	1.3287	0.1111	-0.6600	0.0348
112565A	0.3552	0.0728	0.9847	0.2609
110975A	0.6175	0.0466	-0.0875	0.0489
111426A	0.8288	0.0506	0.2772	0.0357
111416A	0.6603	0.0895	-0.5982	0.0765
111429A	0.7052	0.0601	-0.6590	0.0712
442035	0.5151	0.0486	0.1307	0.0755
110966A	0.3736	0.0417	-0.6737	0.1178
112566A	0.5751	0.0438	0.5266	0.0539
441770	0.4945	0.0499	-0.3446	0.0744
111650A	1.4199	0.1150	-0.1630	0.0295
112585A	0.6787	0.0912	0.4365	0.0978
529146	0.6324	0.0602	-0.5768	0.0732
112616A	0.5321	0.0431	0.9346	0.0749
110967A	0.4940	0.0508	0.3883	0.0940
112553A	0.8603	0.0483	0.3491	0.0333
442037	1.6343	0.1588	-0.3362	0.0627
112552A	1.0803	0.1020	-0.1340	0.0653
110876A	0.7589	0.0734	0.4943	0.0545
111391A	0.5015	0.0268	-0.2081	0.0448
120682A	0.9715	0.1141	-0.6051	0.1217
451116	0.8295	0.0625	0.5754	0.0681
112615A	0.6660	0.0702	0.4226	0.0630
110929A	0.3747	0.0476	0.0404	0.1088
112601A	1.1957	0.1076	-0.0861	0.0570
463225	1.6529	0.0991	-0.2850	0.0272
110920A	0.5875	0.0652	0.9807	0.0761
111387A	0.7487	0.0484	0.3223	0.0394
111420A	0.8734	0.0807	0.2786	0.0532
111381A	0.8272	0.0632	-0.3103	0.0540
111410A	0.6883	0.0543	0.4748	0.0685
111400A	0.6150	0.0714	0.0440	0.0883

Table J-9. IRT Parameters for Mathematics Grade 4

IREF	*a*	*SE (a)*	*b*	*SE (b)*	*IREF*	*a*	*SE (a)*	*b*	*SE (b)*
455024	0.9339	0.0828	-0.7306	0.0643	111685A	0.8267	0.0740	-0.8335	0.0510
111135A	0.3342	0.0284	-0.5663	0.0779	111720A	0.4384	0.0485	-1.4004	0.1585
531547	0.5351	0.0562	1.0202	0.1192	111162A	1.0591	0.0938	0.0722	0.0574
446443	0.5420	0.0332	-0.7542	0.0567	111145A	0.3196	0.0451	1.0697	0.1840
530175	0.9173	0.0736	0.6373	0.0601	111728A	0.1087	0.0259	-1.9813	0.4395
121691A	0.5026	0.0314	0.6249	0.0554	111658A	0.7666	0.0861	-0.9555	0.1018
111663A	0.9174	0.0443	-0.9057	0.0409	529973	0.3135	0.0562	0.5937	0.1488
122260A	1.0914	0.0784	0.0240	0.0371	463042	0.7275	0.0589	1.0291	0.0869
445572	0.7405	0.0595	-0.5979	0.0602	112839A	0.3350	0.0485	1.2514	0.1275
111711A	0.2024	0.0252	0.9002	0.1502	445528	0.6542	0.0789	1.0194	0.1068
111686A	0.6952	0.0349	0.2981	0.0346	111139A	0.0796	0.0194	-2.3845	0.5968
112824A	0.6185	0.0335	0.4350	0.0410	463067	1.0888	0.0862	-0.3811	0.0436
454751	0.9462	0.0655	0.1166	0.0417	121661A	0.4662	0.0406	0.7196	0.0660
111700A	0.5945	0.0610	-0.4156	0.0752	111712A	0.5350	0.0421	0.4193	0.0503
111166A	0.9450	0.0405	-0.0001	0.0249	446178	0.3179	0.0383	1.7850	0.1901
111726A	0.3099	0.0453	-0.7314	0.1600	111687A	0.2871	0.0204	0.0728	0.0652
111703B	0.1975	0.0348	2.7210	0.5019	112783A	1.5906	0.1235	0.3894	0.0332
111716A	1.1081	0.0591	-0.1341	0.0251	112817A	0.6493	0.0720	1.1362	0.0731
111136A	1.4302	0.0677	-0.2780	0.0200	111707B	0.6351	0.0718	0.8846	0.0655
111705A	0.2645	0.0233	0.1777	0.0768	463027	0.6444	0.0617	1.0410	0.1049
531682	0.8151	0.0690	0.3811	0.0568	112838B	0.9023	0.0838	0.6589	0.0473
463049	0.7911	0.0629	1.0219	0.0835	445822	0.4313	0.0674	1.9213	0.2583
445588	1.0890	0.0586	-0.1385	0.0254	111722A	0.5059	0.0552	0.6653	0.1005
112794A	0.9206	0.0544	-0.0926	0.0300	111678A	1.9017	0.1399	0.4341	0.0279
112807A	0.3621	0.0215	0.3639	0.0560	112812A	0.6775	0.0731	1.1848	0.0728
111730A	0.5145	0.0539	0.4005	0.0818	122153A	0.7463	0.0903	-0.1852	0.1129
111123A	1.1882	0.0608	-0.2455	0.0232	112837B	0.4713	0.0652	0.8220	0.0853
454863	0.2119	0.0451	0.8681	0.3526	445558	0.5269	0.0495	0.4019	0.0783
446780	0.3077	0.0585	1.3868	0.3848	111681A	0.6200	0.0587	0.5721	0.0777
122357A	0.7779	0.0644	1.4119	0.1019	112788A	0.5535	0.0705	0.4563	0.0813
111667A	0.3980	0.0282	-1.6006	0.1118	446769	0.1885	0.0325	1.6229	0.3321

Table J-10. IRT Parameters for Mathematics Grade 5

IREF	*a*	*SE (a)*	*b*	*SE (b)*
113884B	0.5550	0.0299	-0.9320	0.0572
111243A	0.8098	0.0334	0.1138	0.0296
112359A	0.4379	0.0261	1.1846	0.0785
111303A	0.4152	0.0251	-0.1631	0.0530
112346A	0.6942	0.0326	-0.7008	0.0411
450093	0.5288	0.0276	0.9476	0.0586
450187	0.3356	0.0432	-1.3647	0.1975
111295A	0.6265	0.0291	0.2940	0.0380
533097	1.0095	0.0687	0.8061	0.0574
112372A	0.9185	0.0399	-0.8250	0.0350
532547	0.4901	0.0457	1.1722	0.1234
112377A	0.5380	0.0305	-1.1966	0.0695
113882A	0.2440	0.0366	2.1716	0.3470
112363A	0.4964	0.0266	0.6923	0.0543
111276A	0.6220	0.0290	0.1139	0.0368
112352A	0.6796	0.0751	-0.4842	0.0694
112368A	0.8437	0.0522	0.1008	0.0410
450015	0.5185	0.0552	-1.4666	0.1514
112335A	1.0801	0.0903	-0.7059	0.0411
113853A	0.8386	0.0895	-0.0821	0.0826
113889A	1.2556	0.0982	-0.7229	0.0362
113862A	0.5908	0.0821	0.3902	0.1688
111228A	0.3382	0.0407	0.4458	0.1222
112404B	0.2266	0.0378	2.5980	0.4512
450200	0.9112	0.0904	-0.2272	0.0665
112397A	0.1995	0.0341	1.2492	0.2764
112374B	0.4366	0.0000	-0.1249	0.0000
121515A	1.1544	0.0751	0.6937	0.0490
111242A	1.0739	0.0898	-0.7269	0.0412
111233A	0.2106	0.0341	0.8914	0.2184
532921	0.4982	0.0471	-0.0500	0.0750
450180	0.4836	0.0489	1.1642	0.1561
113843B	0.8655	0.0885	-0.1956	0.0717
450210	1.0910	0.0908	-0.7035	0.0408
111309A	0.3713	0.0435	1.4884	0.1877
111302A	0.6634	0.0603	-1.0720	0.0960
113873A	0.3535	0.0397	0.2165	0.1094
450230	0.1767	0.0325	2.2997	0.4534
112364A	0.5334	0.0345	0.9513	0.0594
112342A	0.4044	0.0602	0.1253	0.0908
112415A	0.2650	0.0381	1.1923	0.2184
112358A	0.6208	0.0365	0.6536	0.0453
113892A	0.7706	0.0409	0.2627	0.0350
112391A	0.1947	0.0286	1.0038	0.2024
450274	0.5186	0.0708	1.0960	0.1682
120730A	1.2775	0.0822	0.6282	0.0438
112384A	0.9329	0.0457	0.2064	0.0300
112408A	0.7861	0.0756	0.4665	0.0660
449994	0.4519	0.0434	-0.0459	0.0788
450055	0.4980	0.0653	0.5453	0.1065
111277A	0.7146	0.0396	0.2375	0.0374
450284	0.5273	0.0526	-0.9297	0.1029
112392A	0.5191	0.0519	1.6097	0.0953
112410A	0.8167	0.0688	0.2119	0.0637
533108	1.1688	0.0775	0.7568	0.0498
112373A	0.5367	0.0583	-0.0774	0.1150
112385A	0.7365	0.0636	0.3235	0.0643
112354A	0.5659	0.0531	1.3469	0.0759
113877A	0.3314	0.0456	1.9677	0.1755
112409A	0.6700	0.0313	0.5374	0.0390
113872A	0.8190	0.0624	0.9432	0.0481
113902A	0.7015	0.0577	1.1867	0.0586
112348A	0.9649	0.0700	0.6555	0.0428
111294A	1.1593	0.0856	0.2550	0.0456
532968	0.9434	0.0664	0.8223	0.0627
113856A	0.4276	0.0486	1.1911	0.0908

Table J-11. IRT Parameters for Mathematics Grade 6

IREF	*a*	*SE (a)*	*b*	*SE (b)*
111497A	0.7732	0.0563	-0.1535	0.0497
120494A	0.6823	0.0312	-0.3571	0.0345
453771	0.7687	0.0564	0.1304	0.0515
111630A	1.0195	0.0460	-0.9837	0.0360
110991A	0.6089	0.0286	0.3270	0.0381
534048	0.6110	0.0507	0.0799	0.0618
111446A	0.7552	0.0555	0.4842	0.0594
110891A	0.9555	0.0418	-0.8316	0.0336
110986A	0.6455	0.0307	-0.4357	0.0374
453707	0.6151	0.0287	0.2908	0.0373
534796	0.8120	0.0611	-0.2295	0.0505
442813	0.7936	0.0386	-1.0389	0.0460
442566	0.9551	0.0417	-0.8212	0.0334
111514A	0.7931	0.0332	-0.2197	0.0291
442711	0.6317	0.0325	-0.8916	0.0499
112656A	1.3162	0.0886	-0.8557	0.0283
111025A	0.9853	0.0568	-0.5038	0.0281
112673A	0.7787	0.0598	-0.3558	0.0548
111487A	0.7031	0.0686	-0.5577	0.0467
112633A	0.8444	0.0772	-0.1250	0.0573
442369	0.7087	0.0505	-0.2159	0.0398
112692A	1.4268	0.1271	-0.6957	0.0782
450436	1.3192	0.0884	-0.7924	0.0272
112663A	0.5985	0.0684	-0.0420	0.0846
450459	0.6830	0.0525	0.2772	0.0616
453780	1.0781	0.0960	-1.0729	0.0688
112689A	0.4522	0.0437	0.0884	0.0831
110990A	1.1600	0.0630	-0.5708	0.0241
534840	0.8053	0.0571	-0.0823	0.0478
111508A	0.8869	0.0756	-0.4013	0.0414
442631	0.6068	0.0497	0.1775	0.0624
112677A	0.8228	0.0537	-0.4607	0.0407
453730	0.4592	0.0677	0.6667	0.1998
450365	0.5667	0.0501	-0.0933	0.0683
110977A	0.8027	0.0531	-0.1180	0.0378
111022A	1.1308	0.0574	0.4508	0.0272
534783	0.7433	0.0564	-0.0997	0.0518
112658A	0.6767	0.0470	-0.0151	0.0513
112697A	1.0364	0.0581	-0.3926	0.0268
111518A	0.8735	0.0507	0.2868	0.0346
112645A	0.8393	0.0513	0.0834	0.0395
112666A	0.6155	0.0561	-0.9326	0.0889
111456A	0.8413	0.0483	0.5457	0.0348
111035A	0.5762	0.0487	-0.0967	0.0663
112672A	0.9204	0.0605	0.1623	0.0410
111479A	1.2106	0.0688	-0.1529	0.0343
112657A	0.7545	0.0334	-0.4948	0.0328
121487A	1.1850	0.0639	0.0390	0.0300
112655A	0.5151	0.0525	1.1047	0.0711
442641	0.9345	0.0727	0.2884	0.0504
111465A	0.8413	0.0651	0.5677	0.0460
534823	0.8308	0.0632	-0.3483	0.0508
111455A	1.0820	0.0790	0.3067	0.0436
112699A	0.8667	0.0671	0.4730	0.0471
453664	0.7256	0.0653	0.1614	0.0704
442356	1.1560	0.0884	0.0994	0.0501
442538	0.9091	0.0674	0.5862	0.0426
111445A	1.3221	0.0870	0.4508	0.0331
112679A	1.2317	0.1004	-0.0842	0.0586

Table J-12. IRT Parameters for Mathematics Grade 7

IREF	*a*	*SE (a)*	*b*	*SE (b)*
112881A	0.7141	0.0454	0.3490	0.0489
111769A	0.8368	0.0389	-0.5259	0.0310
112899A	0.5851	0.0332	-0.6698	0.0467
112909B	0.8304	0.0424	-0.9539	0.0428
446673	1.0397	0.0509	-1.0200	0.0380
111059B	0.7624	0.0328	0.0435	0.0291
111750A	0.6058	0.0558	0.0647	0.0668
111127A	0.8094	0.0358	0.0564	0.0292
111076A	0.6049	0.0313	0.4972	0.0447
111784A	0.6954	0.0553	0.3448	0.0630
111080A	0.6614	0.0324	0.1776	0.0358
111734A	0.9864	0.0420	-0.3861	0.0253
111798A	0.7916	0.0725	-0.5990	0.0621
112882A	0.6542	0.0294	-0.0006	0.0317
111055A	0.7079	0.0335	0.1048	0.0331
111113A	0.6650	0.0325	0.2464	0.0366
111100A	0.8327	0.1207	-0.2825	0.0948
111745A	0.4712	0.0456	0.3169	0.0877
111086B	0.5148	0.0454	0.3033	0.0783
111092A	0.7658	0.1061	-1.1051	0.0723
446901	0.9238	0.0951	-1.2464	0.0947
111074A	1.2338	0.1085	-0.8419	0.0521
530795	0.8243	0.0653	-0.0442	0.0506
112604A	1.1752	0.0935	-0.9258	0.0537
112853A	0.4886	0.0950	0.0129	0.1915
112900A	0.4444	0.0447	0.2108	0.0898
111104A	1.0466	0.0622	-0.4457	0.0264
111130A	0.8853	0.1133	-0.9755	0.0589
446838	0.3848	0.0471	0.2098	0.1018
111804A	0.7920	0.0563	-0.2593	0.0356
112605A	0.9491	0.0601	-0.2760	0.0300
111054A	1.5626	0.0974	-0.5441	0.0242
111779A	0.8496	0.0581	-0.1650	0.0355
453976	0.4092	0.0494	0.5791	0.1337
111119A	0.7787	0.1169	-0.2675	0.1018
530309	0.4930	0.0519	-0.1762	0.0799
112911A	0.6908	0.0385	0.1371	0.0360
531101	0.6899	0.0590	0.2140	0.0631
111841A	0.4681	0.0326	0.3370	0.0504
111795A	0.8991	0.0429	0.3059	0.0301
111765A	0.8080	0.0412	0.1581	0.0316
446474	0.6105	0.0492	0.4720	0.0715
446824	0.9088	0.0692	0.1421	0.0495
111754B	0.5720	0.0361	0.0892	0.0425
454054	0.7051	0.0743	-0.8834	0.0726
446543	0.9592	0.0446	0.2361	0.0280
111048A	0.8283	0.0433	-0.1510	0.0318
112887A	0.7903	0.0410	0.0868	0.0320
111071A	0.8319	0.0427	-0.0453	0.0308
446722	0.9667	0.0681	-0.0537	0.0409
111085A	0.4620	0.0555	0.4815	0.0848
112523B	0.6127	0.0619	0.3371	0.0703
531205	0.7896	0.0615	-0.1092	0.0475
111106A	0.7662	0.0646	1.2406	0.0621
113101A	1.2046	0.0885	0.2932	0.0395
111075A	1.7380	0.1381	-0.0921	0.0424
454049	0.9044	0.0735	0.3599	0.0486
111764B	1.0802	0.0886	0.0351	0.0540
111067A	0.4759	0.0550	1.2462	0.0947
111796A	0.9118	0.0742	0.3312	0.0491
111766A	1.2842	0.0919	0.3144	0.0369

Table J-13. IRT Parameters for Mathematics Grade 8

IREF	*a*	*SE (a)*	*b*	*SE (b)*
112509A	0.4422	0.0259	-0.3579	0.0499
111565A	0.8572	0.0363	-0.6385	0.0313
112467A	0.9401	0.0563	-0.1793	0.0349
113927A	0.6617	0.0504	0.2778	0.0604
112470A	0.4719	0.0272	-0.8252	0.0581
113963A	0.9255	0.0363	0.1863	0.0268
112464A	0.6901	0.0329	-0.8814	0.0437
113973A	0.7089	0.0315	-0.3075	0.0324
112516A	0.9144	0.0361	0.0190	0.0260
111247A	1.1085	0.0444	-0.7409	0.0270
111560A	0.7106	0.0311	0.1661	0.0330
112519A	0.3917	0.0436	-0.8751	0.1258
111352A	0.9443	0.0406	-0.9249	0.0344
117072A	0.7401	0.0318	0.1742	0.0319
113933A	1.1749	0.0654	0.4309	0.0269
112474B	1.0159	0.0857	-1.3911	0.0875
112499A	1.4544	0.0997	-0.9545	0.0289
113978A	0.5544	0.0463	-0.0175	0.0620
113922A	0.8769	0.0351	-0.0855	0.0260
532183	0.4574	0.0457	-0.7564	0.0999
111581A	0.9072	0.0803	-0.6164	0.0459
111597A	0.4562	0.0248	0.3821	0.0476
113942A	0.8689	0.0857	-0.2382	0.0684
454069	0.9955	0.0966	-0.1184	0.0705
111335A	0.7951	0.0592	-0.1846	0.0456
471660	0.0913	0.0215	0.7497	0.4480
111331A	0.5818	0.0497	0.2038	0.0708
111620B	0.4140	0.0349	0.1274	0.0703
113909A	1.4906	0.1030	-0.8153	0.0278
112505A	0.3236	0.0202	0.1339	0.0569
532339	1.0216	0.0699	-0.0483	0.0412
113938A	0.5311	0.0275	0.4854	0.0466
113908A	0.8314	0.0622	-0.0473	0.0498
112491A	0.5327	0.0696	-0.0360	0.1249
111588A	0.9585	0.0664	0.0147	0.0430
113917A	1.3635	0.0745	-0.4208	0.0309
113937A	0.8058	0.0441	0.4812	0.0349
532355	1.0534	0.0716	-0.0210	0.0403
112486A	0.6520	0.0402	0.6298	0.0442
112500A	0.4725	0.0995	0.5246	0.1812
446979	0.8018	0.0489	-0.2338	0.0413
111286A	0.7312	0.0616	0.1832	0.0704
111583A	0.5564	0.0381	0.6844	0.0521
112475A	0.6852	0.1127	-0.5730	0.0842
113943A	0.9770	0.1267	0.0683	0.0585
120571A	0.6225	0.0582	0.2967	0.0896
111622A	1.0445	0.0530	0.0916	0.0274
113932A	0.8210	0.0452	0.2988	0.0331
532471	0.8822	0.0623	0.1647	0.0487
112511A	0.7101	0.0525	0.0870	0.0546
532251	0.6684	0.0542	-0.3366	0.0597
111281A	0.4192	0.0449	0.1029	0.0869
120568A	0.7194	0.0555	0.0636	0.0540
462215	1.1529	0.0700	0.2043	0.0323
111339A	0.6403	0.0492	0.6965	0.0501
447047	0.8352	0.0561	0.4326	0.0394
113964A	1.2516	0.0746	0.1742	0.0306
120572A	0.4486	0.0368	0.8482	0.0940
117075A	0.3071	0.0400	1.8762	0.2609
112490A	0.7746	0.0584	-0.0080	0.0534
446958	0.4768	0.0449	0.3916	0.0819
111594A	0.7063	0.0539	0.1871	0.0506
122051A	1.0422	0.0533	0.0627	0.0277
113959A	0.5816	0.0473	1.0401	0.0633

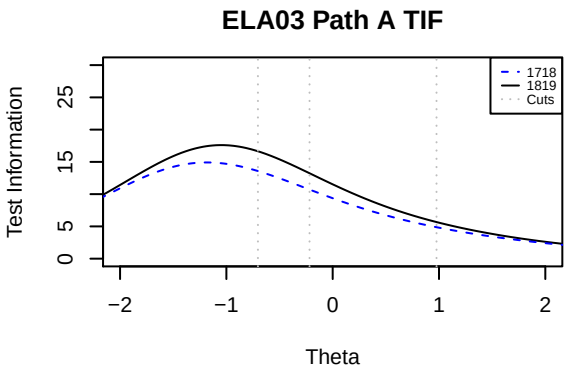
Table J-14. IRT Parameters for Mathematics Grade 11

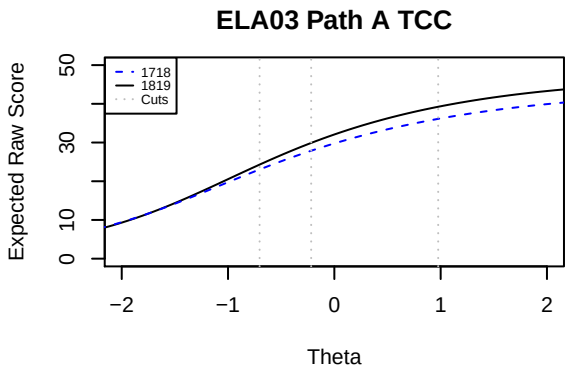
IREF	*a*	*SE (a)*	*b*	*SE (b)*
443515	0.7927	0.0772	-0.9048	0.0816
112946A	0.6735	0.0399	0.0474	0.0331
110846A	1.4142	0.1114	-0.0031	0.0306
111024A	0.6047	0.0431	-0.9811	0.0715
111539A	1.0369	0.0479	0.0999	0.0231
533908	0.4718	0.0596	0.8441	0.1268
111828A	0.7022	0.0404	0.4906	0.0405
110881A	1.0059	0.0472	0.0541	0.0234
443575	1.3301	0.0603	-0.4817	0.0229
462343	0.6414	0.0390	0.3410	0.0394
533341	0.7229	0.0714	0.3014	0.0607
112727A	1.3513	0.0577	-0.2201	0.0188
110936A	0.9782	0.0486	-0.3419	0.0265
111815A	1.4788	0.0596	0.0721	0.0172
111833A	0.5918	0.0381	0.3176	0.0417
454987	1.4228	0.0862	-0.1285	0.0216
442914	0.5986	0.0944	-1.2268	0.1209
110917A	1.0011	0.0839	0.1358	0.0415
111840A	0.9533	0.0749	0.0209	0.0361
112717A	0.6628	0.0680	0.2022	0.0628
111824A	1.2481	0.1347	-0.2656	0.0439
111549A	0.3107	0.0499	1.0556	0.1987
111834A	0.7697	0.0767	-0.0986	0.0513
111533A	1.6310	0.1448	-0.6562	0.0297
443494	1.2647	0.1442	-0.0740	0.0572
112701A	2.2221	0.1760	-0.6054	0.0227
111830A	1.1039	0.1188	-0.7722	0.0451
110970A	0.4336	0.0458	0.0480	0.0929
443381	0.7800	0.0806	-0.3685	0.0568
112722A	1.3590	0.0835	-0.1938	0.0216
111033A	0.7914	0.0676	-0.0996	0.0576
454925	0.6500	0.0647	-0.2075	0.0424
112925A	0.6072	0.0531	0.3851	0.0768
111016A	0.8532	0.0735	0.1413	0.0464
443573	0.5611	0.0568	0.2395	0.0734
111544A	0.3932	0.0306	1.0380	0.0970
111829A	0.8900	0.0540	0.3837	0.0315
112708A	0.6011	0.0661	0.2401	0.0716
110858A	0.6462	0.0502	-0.0164	0.0415
533840	0.4555	0.0597	0.2973	0.0922
112718A	0.8461	0.0742	0.5149	0.0617
111538A	1.1342	0.0603	0.3606	0.0255
111002A	0.9691	0.0594	-0.0697	0.0293
112703B	0.8383	0.0462	0.4096	0.0420
111548A	0.5457	0.0462	0.7377	0.0630
111838A	0.9920	0.1068	-0.8092	0.0797
110921A	1.0006	0.0580	0.1560	0.0265
112733A	0.7089	0.0499	0.3516	0.0378
110913A	1.2011	0.0628	0.2442	0.0231
111810A	2.0282	0.1454	0.1144	0.0258
112744A	1.1403	0.0948	0.1751	0.0399
111537A	0.9360	0.0798	0.5621	0.0402
112702A	1.5777	0.1088	0.3728	0.0262
111000A	1.1446	0.0941	0.2062	0.0386
112940A	0.9619	0.0821	0.4358	0.0395
112709A	1.2416	0.0890	0.8731	0.0373
110914A	1.5761	0.1160	0.1840	0.0297
112728A	0.8366	0.0769	0.0926	0.0471
443287	0.4429	0.0624	0.9531	0.0966
110968A	0.4094	0.0541	0.4509	0.0833
533370	0.5330	0.0627	0.3556	0.0812
533133	0.8769	0.0843	-0.2748	0.0473
111534A	1.0062	0.0871	0.3228	0.0492

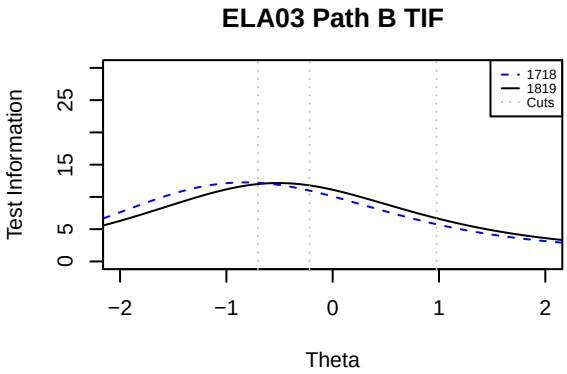
Table J-15. IRT Polytomous Item Parameters for ELA Writing Prompts

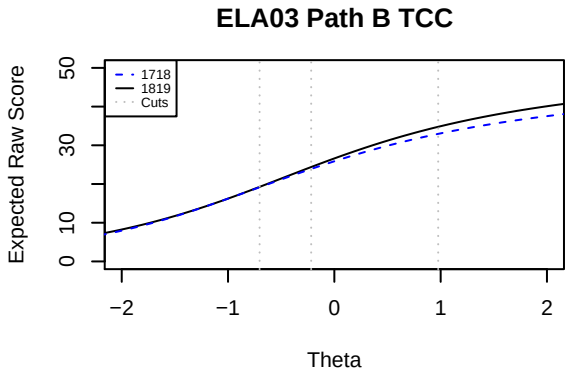
Content Area	*Grade*	*ID*	*a*	*b*	*d0*	*d1*	*b-d0*	*b-d1*
ELA–Writing	3	464856C	0.7418	-0.0199	0.8126	-0.8126	-0.8325	0.7926
		464856I	0.7059	0.1523	0.6606	-0.6606	-0.5083	0.8129
		464856O	0.6394	0.1897	1.3501	-1.3501	-1.1604	1.5397
		125971C	0.6840	0.5211	1.0771	-1.0771	-0.5561	1.5982
		125971I	0.7126	1.8053	1.0042	-1.0042	0.8011	2.8095
		125971O	0.7834	1.5921	1.6280	-1.6280	-0.0360	3.2201
	4	469093C	0.8509	-0.1571	0.7724	-0.7724	-0.9295	0.6153
		469093I	0.7407	0.3089	0.5270	-0.5270	-0.2181	0.8359
		469093O	0.7416	0.3488	1.0937	-1.0937	-0.7448	1.4425
		126163C	0.7045	0.5089	1.0087	-1.0087	-0.4997	1.5176
		126163I	0.7447	1.7838	0.4723	-0.4723	1.3115	2.2561
		126163O	0.7374	2.0440	1.3395	-1.3395	0.7045	3.3835
	5	471924C	0.8713	-0.3914	0.6892	-0.6892	-1.0806	0.2978
		471924I	0.8418	0.3436	0.9387	-0.9387	-0.5951	1.2823
		471924O	0.8010	-0.0543	0.9881	-0.9881	-1.0425	0.9338
		126972C	0.8106	0.3210	0.8910	-0.8910	-0.5700	1.2120
		126972I	0.8932	1.6482	0.8692	-0.8692	0.7790	2.5174
		126972O	0.9110	1.3556	0.7726	-0.7726	0.5830	2.1283
	6	471934C	0.8835	-0.0342	0.6401	-0.6401	-0.6743	0.6059
		471934I	0.9852	0.0006	0.4699	-0.4699	-0.4693	0.4705
		471934O	0.7926	0.3549	1.2038	-1.2038	-0.8489	1.5587
		127286C	0.8353	0.4033	0.7377	-0.7377	-0.3344	1.1409
		127286I	0.7846	0.8985	0.9704	-0.9704	-0.0719	1.8689
		127286O	0.8372	1.5394	1.3975	-1.3975	0.1419	2.9369
	7	471948C	0.6427	0.1409	0.7419	-0.7419	-0.6010	0.8828
		471948I	0.8558	-0.1643	0.5405	-0.5405	-0.7049	0.3762
		471948O	0.8977	0.2850	1.1199	-1.1199	-0.8349	1.4049
		127658C	0.8392	0.2944	0.8990	-0.8990	-0.6046	1.1934
		127658I	0.8735	1.3833	1.0378	-1.0378	0.3455	2.4211
		127658O	1.0541	1.3370	1.6467	-1.6467	-0.3097	2.9836
	8	471958C	0.8053	-0.2635	0.5480	-0.5480	-0.8115	0.2845
		471958I	0.7503	0.4558	0.7508	-0.7508	-0.2950	1.2065
		471958O	0.6934	0.9647	1.3724	-1.3724	-0.4077	2.3371
		127794C	0.9048	-0.1088	0.8878	-0.8878	-0.9966	0.7790
		127794I	1.2151	0.6522	1.1176	-1.1176	-0.4654	1.7697
		127794O	1.2725	0.6348	1.2348	-1.2348	-0.6000	1.8695
	11	471963C	0.8138	-0.3419	0.5427	-0.5427	-0.8846	0.2008
		471963I	0.7729	0.5071	0.9274	-0.9274	-0.4203	1.4345
		471963O	0.7428	0.3829	1.1897	-1.1897	-0.8069	1.5726
		126858C	0.8108	0.1786	0.9382	-0.9382	-0.7596	1.1169
		126858I	0.6797	1.6778	1.2315	-1.2315	0.4462	2.9093
		126858O	0.8016	0.9870	1.6437	-1.6437	-0.6567	2.6307

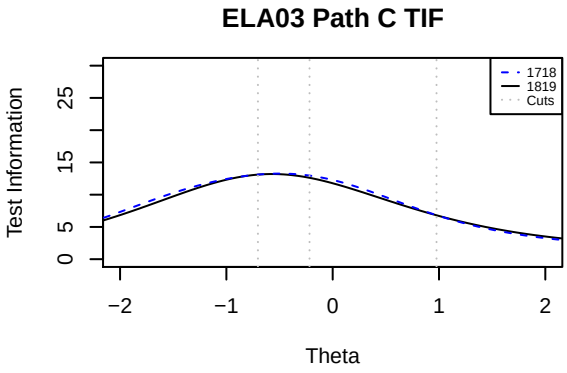
APPENDIX K—TEST CHARACTERISTIC CURVES & TEST INFORMATION FUNCTIONS


ELA03 Path A TIF
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA03 Path A TCC
Expected Raw Score
0
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA03 Path B TIF
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA03 Path B TCC
Expected Raw Score
0
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta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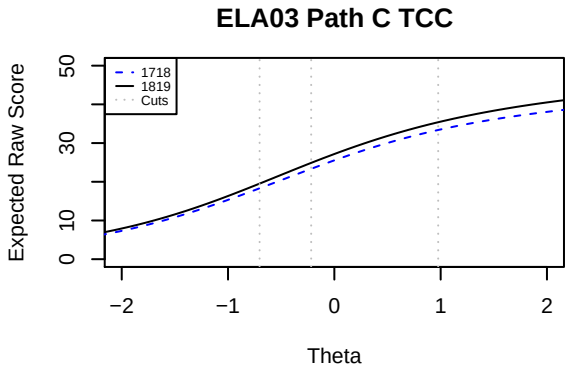
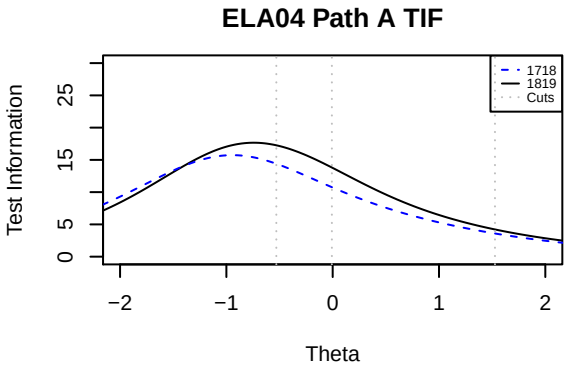
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA03 Path C TCC
Expected Raw Score
0
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA04 Path A TIF
Test Information
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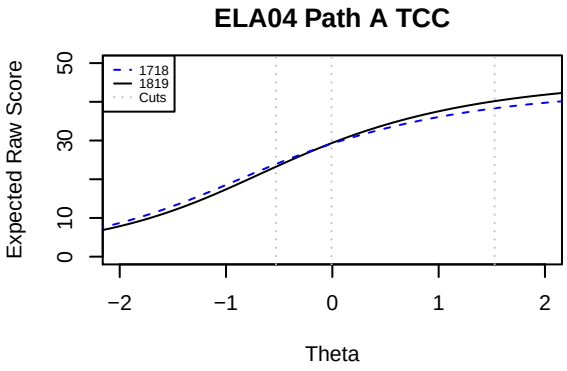
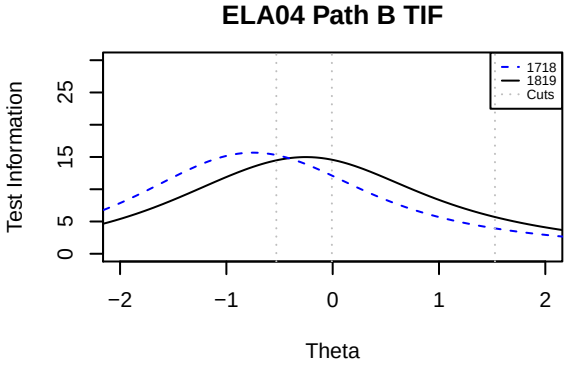
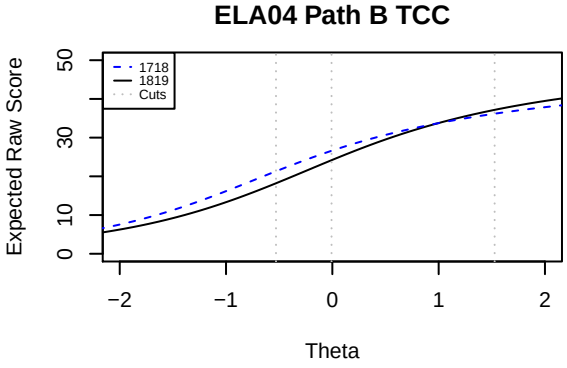
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA04 Path A TCC
Expected Raw Score
0
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA04 Path B TIF
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA04 Path B TCC
Expected Raw Score
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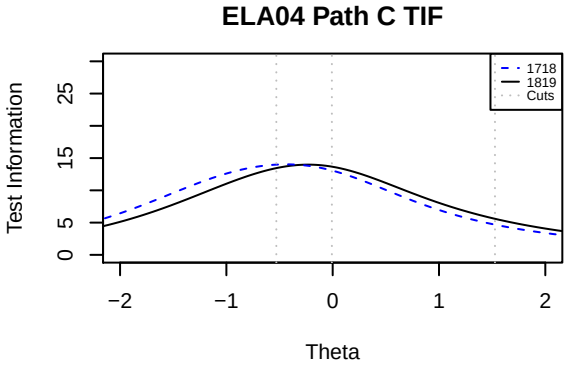
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta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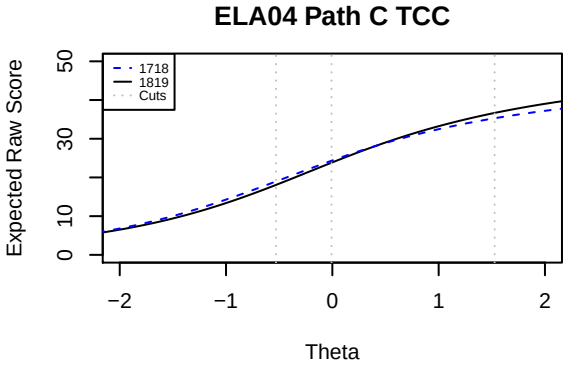
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA04 Path C TCC
Expected Raw Score
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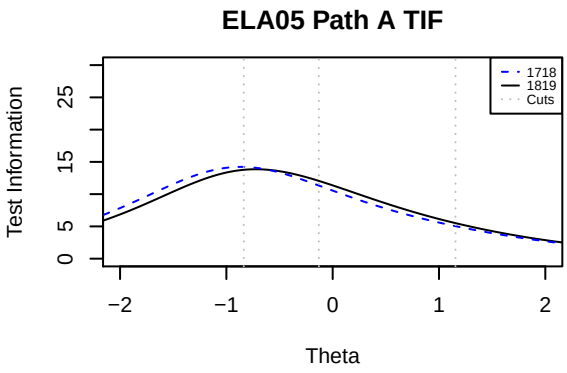
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta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Test Information
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5
15
25
1718
1819
Cuts
−2
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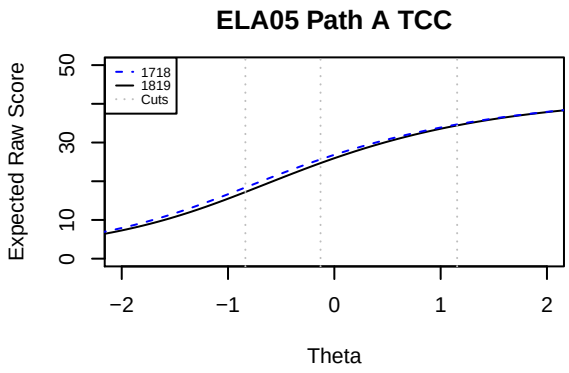
0
1
2
Theta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Expected Raw Score
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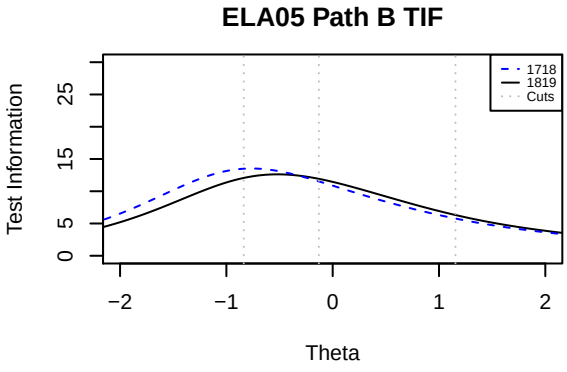
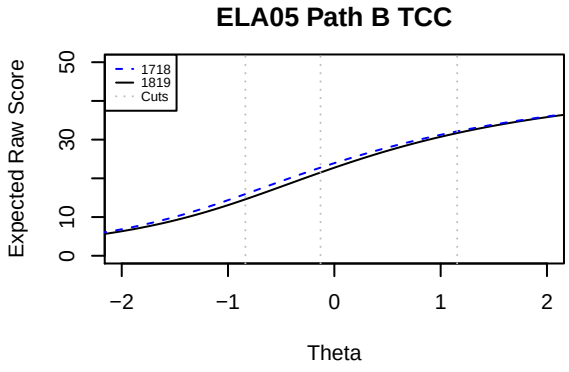
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA05 Path B TIF
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA05 Path B TCC
Expected Raw Score
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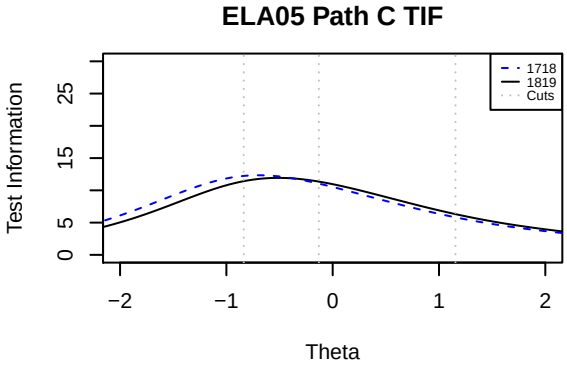
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA05 Path C TIF
Test Information
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5
15
25
1718
1819
Cuts
−2
−1
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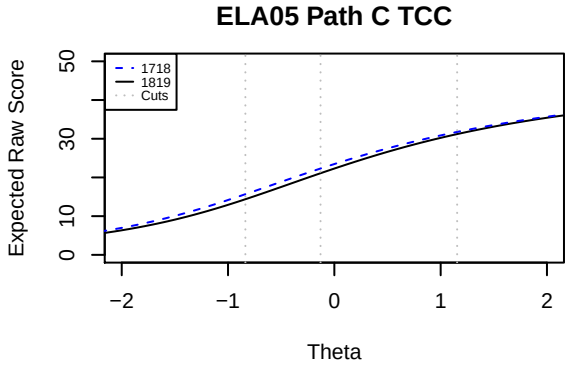
1
2
Theta


ELA05 Path C TCC
Expected Raw Score
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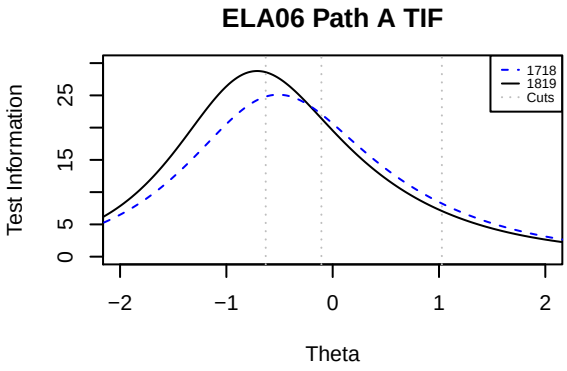
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA06 Path A TIF
Test Information
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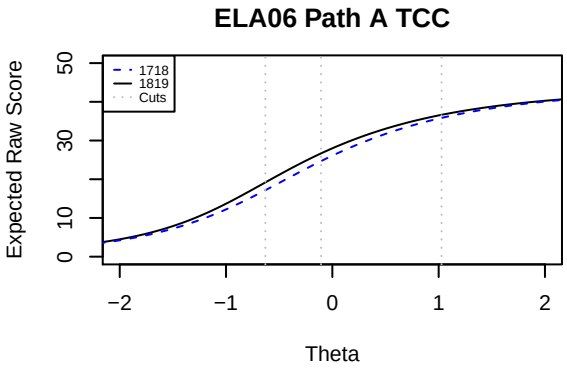
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA06 Path A TCC
Expected Raw Score
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50
1718
1819
Cuts
−2
−1
0
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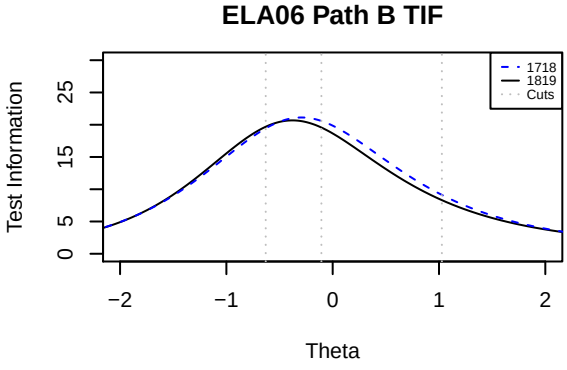
2
Theta


ELA06 Path B TIF
Test Information
0
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15
25
1718
1819
Cuts
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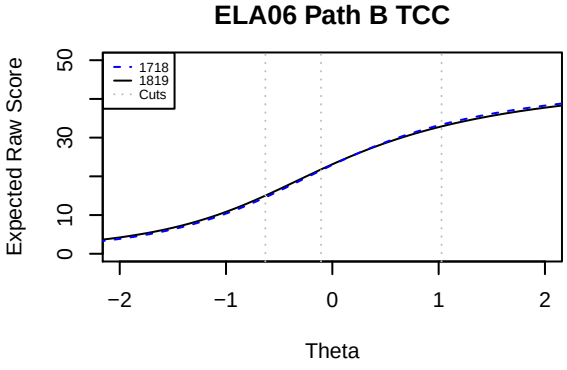
2
Theta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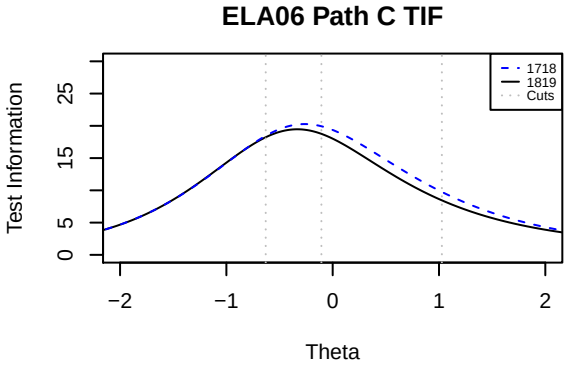
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta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Test Information
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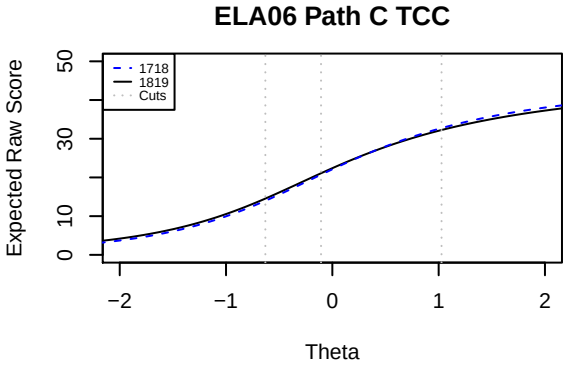
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA06 Path C TCC
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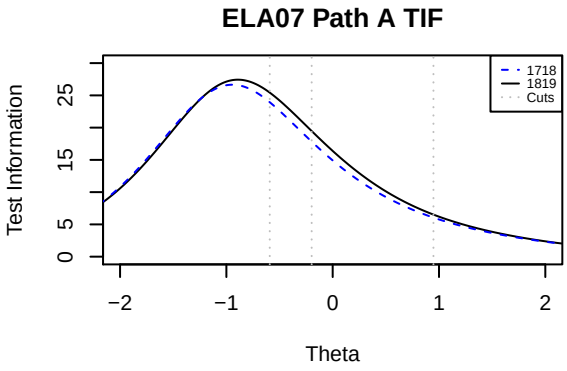
0
10
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA07 Path A TIF
Test Information
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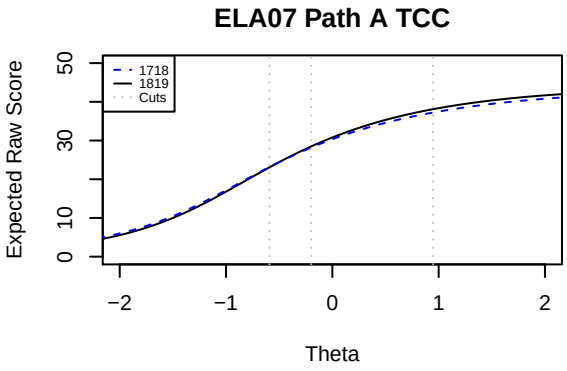
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA07 Path A TCC
Expected Raw Score
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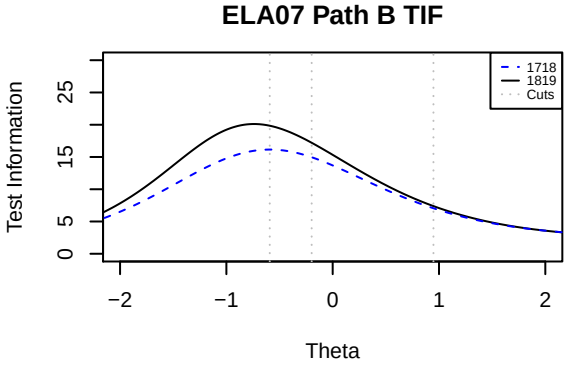
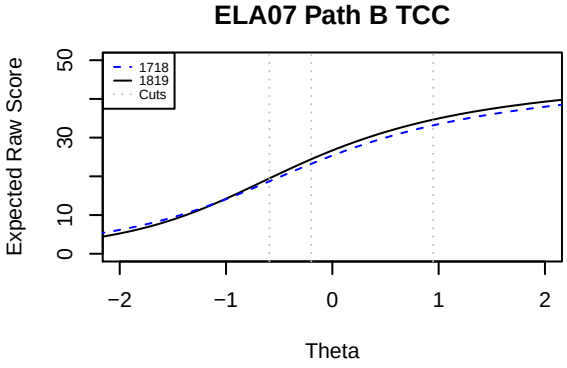
30
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA07 Path B TIF
Test Information
0
5
15
25
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA07 Path B TCC
Expected Raw Score
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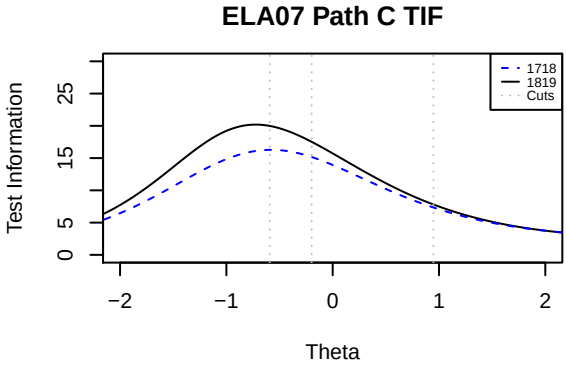
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA07 Path C TIF
Test Information
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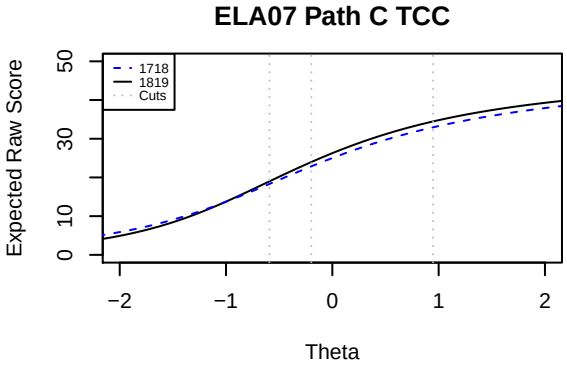
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA07 Path C TCC
Expected Raw Score
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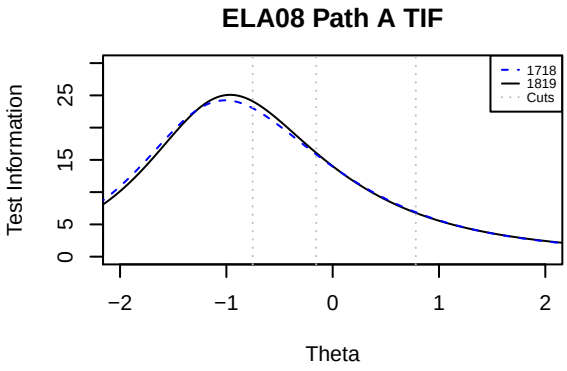
50
1718
1819
Cuts
−2
−1
0
1
2
Theta


ELA08 Path A TIF
Test Information
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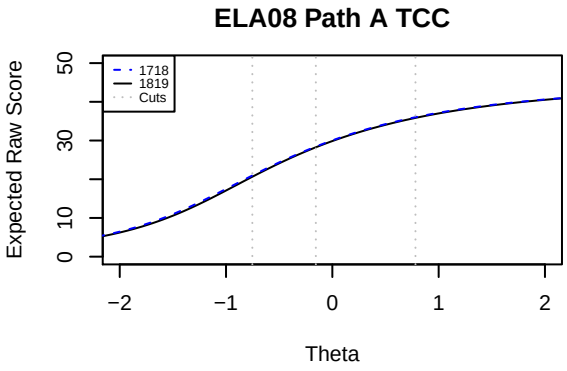
25
−2
−1
0
1
2
Theta
1718
1819
Cuts


ELA08 Path A TCC
Expected Raw Score
0
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Theta
1718
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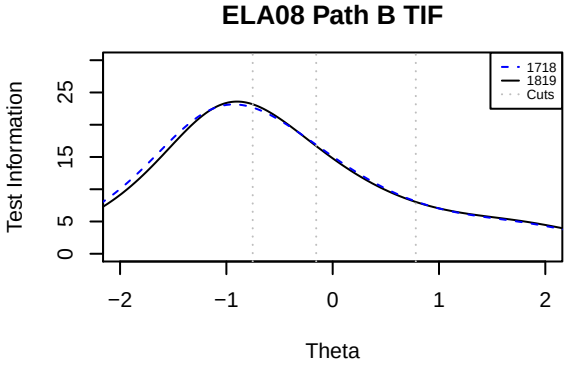
Cuts


ELA08 Path B TIF
Test Information
0
5
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−2
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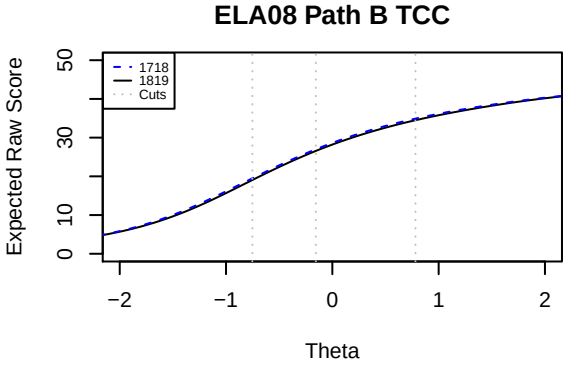
0
1
2
Theta
1718
1819
Cuts


ELA08 Path B TCC
Expected Raw Score
0
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Theta
1718
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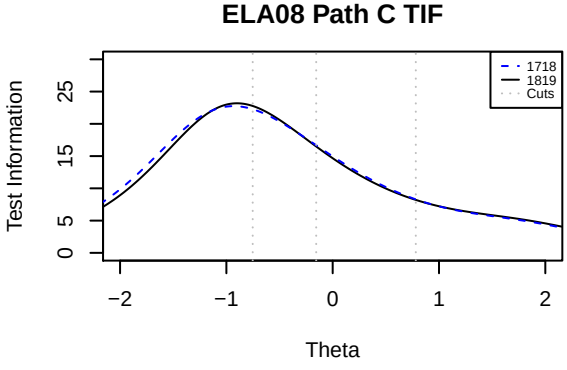
Cuts


ELA08 Path C TIF
Test Information
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Theta
1718
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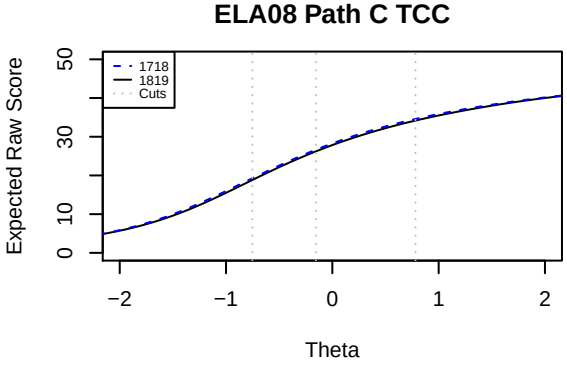
Cuts


ELA08 Path C TCC
Expected Raw Score
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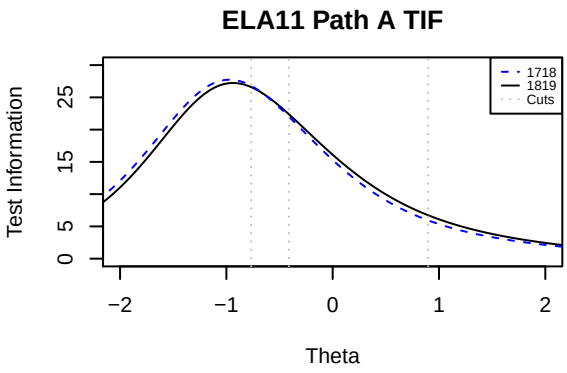
Cuts


ELA11 Path A TIF
Test Information
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Cuts
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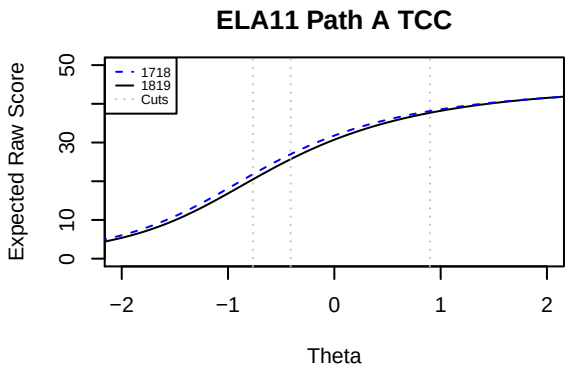
2
Theta


ELA11 Path A TCC
Expected Raw Score
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Cuts
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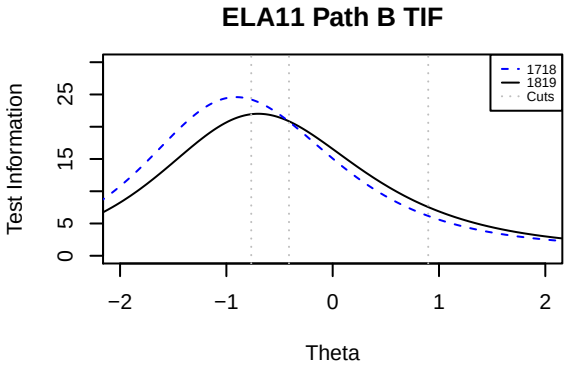
2
Theta


ELA11 Path B TIF
Test Information
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Cuts
−2
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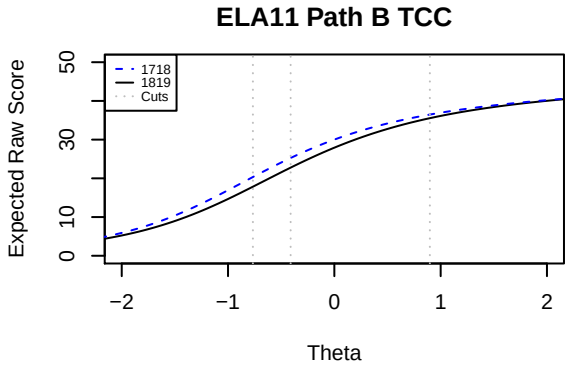
1
2
Theta


ELA11 Path B TCC
Expected Raw Score
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Cuts
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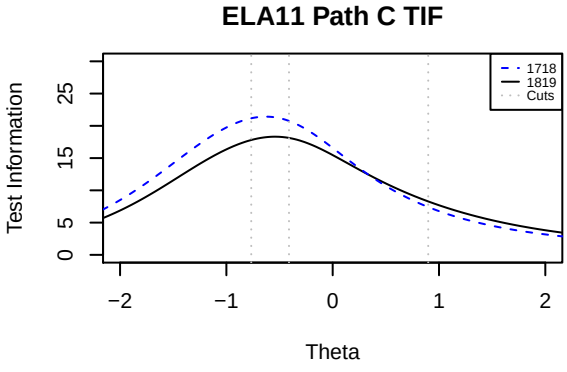
Theta


ELA11 Path C TIF
Test Information
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Cuts
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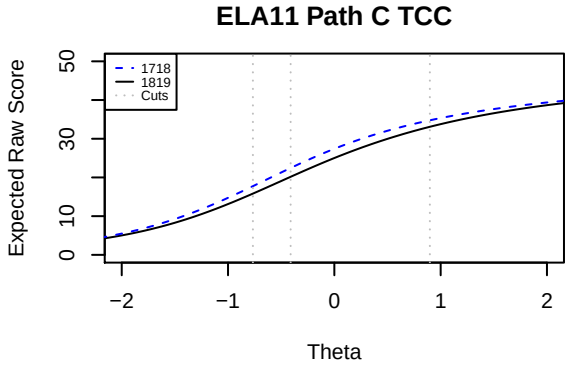
2
Theta


ELA11 Path C TCC
Expected Raw Score
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Cuts
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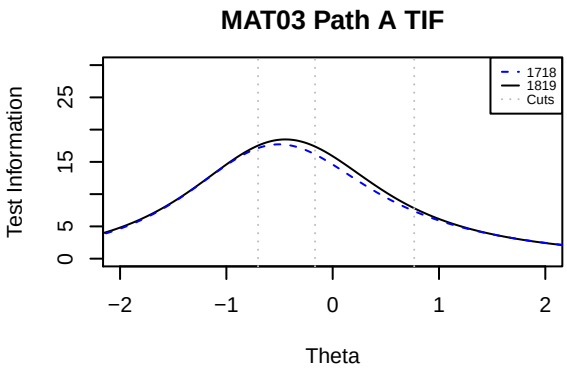
2
Theta


MAT03 Path A TIF
Test Information
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2
Theta
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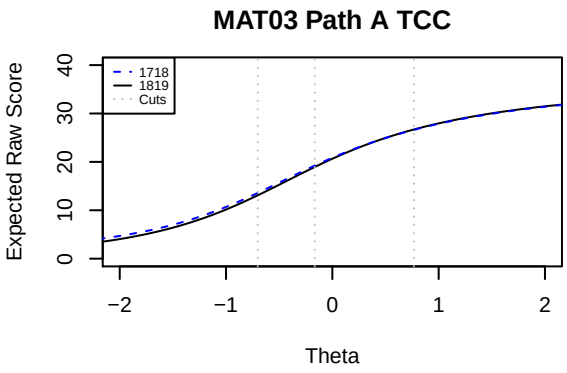
Cuts


MAT03 Path A TCC
Expected Raw Score
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Theta
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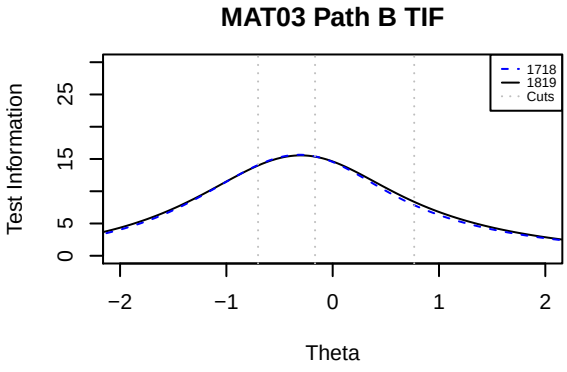
Cuts


MAT03 Path B TIF
Test Information
0
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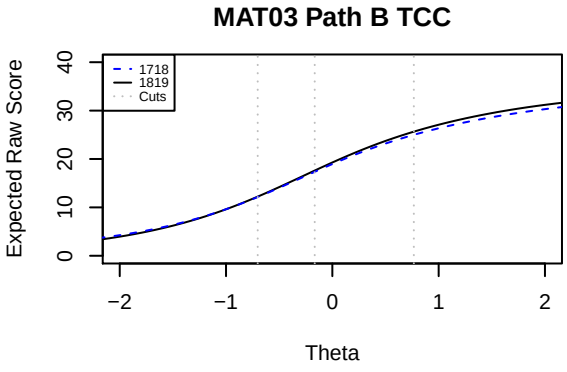
1
2
Theta
1718
1819
Cuts


MAT03 Path B TCC
Expected Raw Score
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Theta
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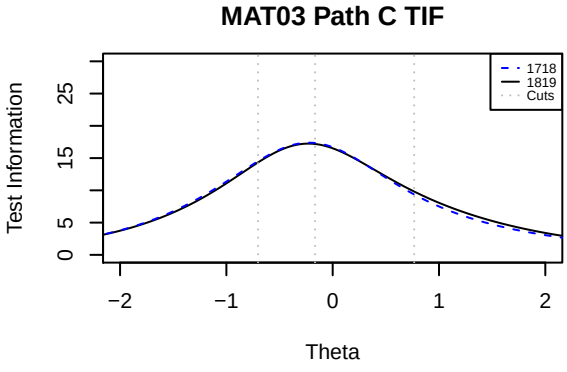
Cuts


MAT03 Path C TIF
Test Information
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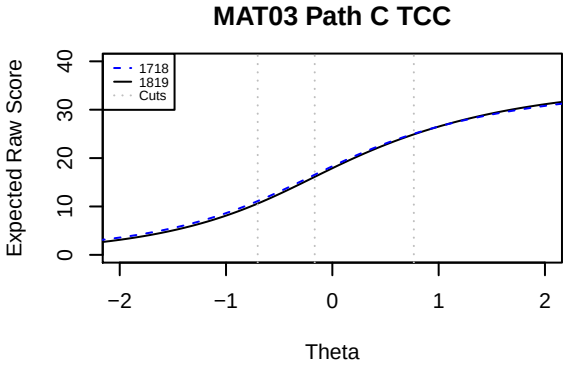
Cuts


MAT03 Path C TCC
Expected Raw Score
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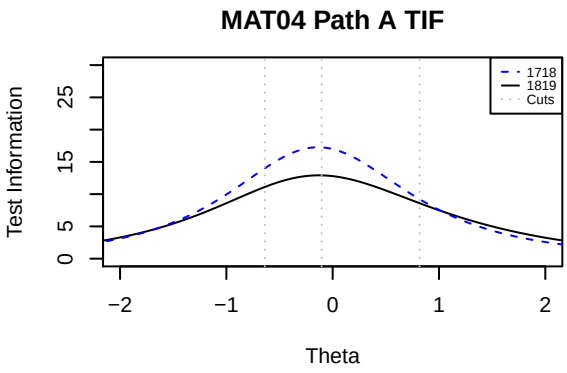
Cuts


MAT04 Path A TIF
Test Information
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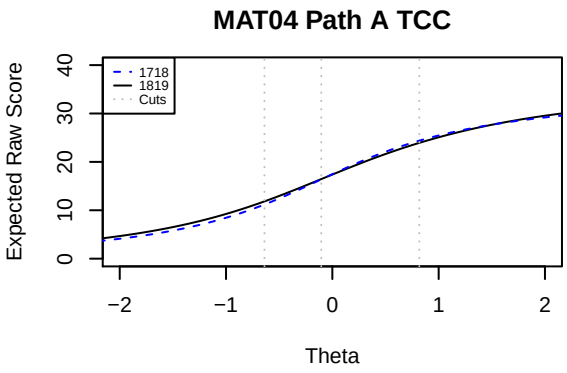
Cuts


MAT04 Path A TCC
Expected Raw Score
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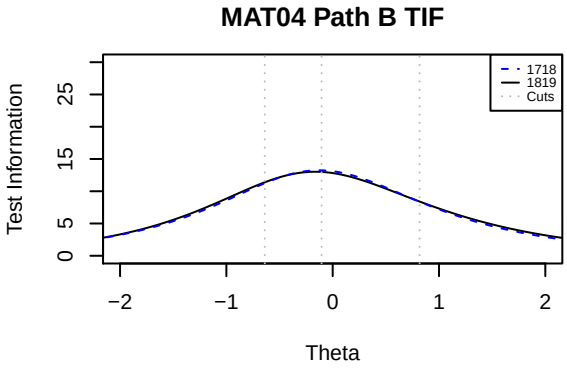
Cuts


MAT04 Path B TIF
Test Information
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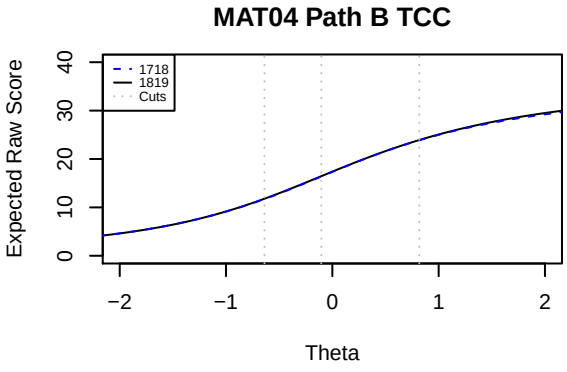
Cuts


MAT04 Path B TCC
Expected Raw Score
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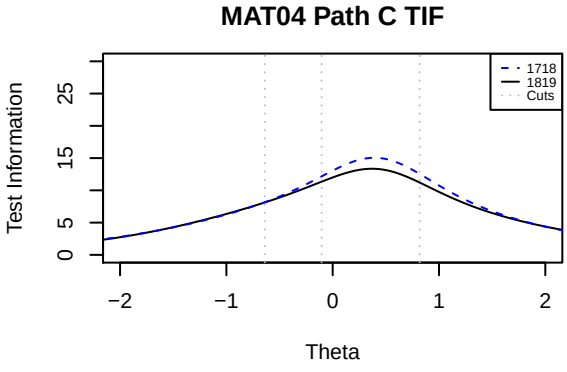
Cuts


MAT04 Path C TIF
Test Information
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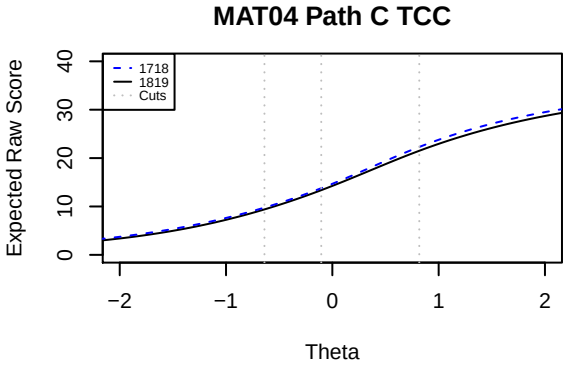
Cuts


MAT04 Path C TCC
Expected Raw Score
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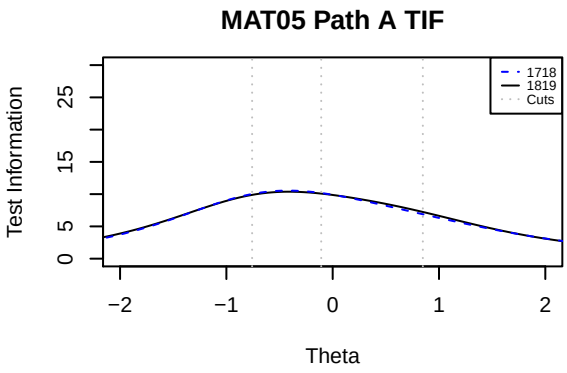
Cuts


MAT05 Path A TIF
Test Information
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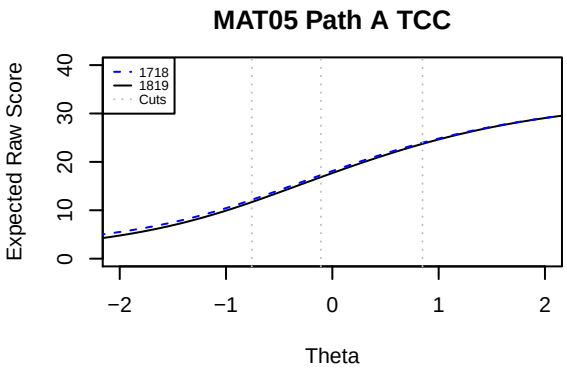
Cuts


MAT05 Path A TCC
Expected Raw Score
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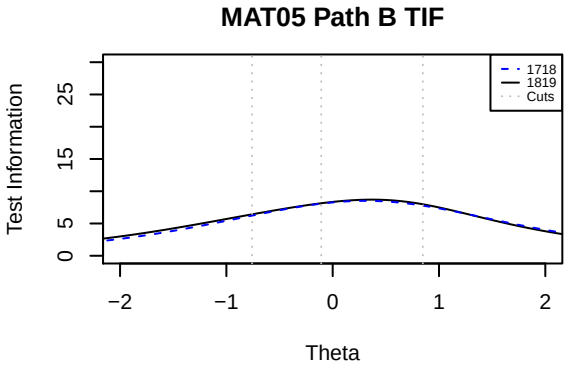
Cuts


MAT05 Path B TIF
Test Information
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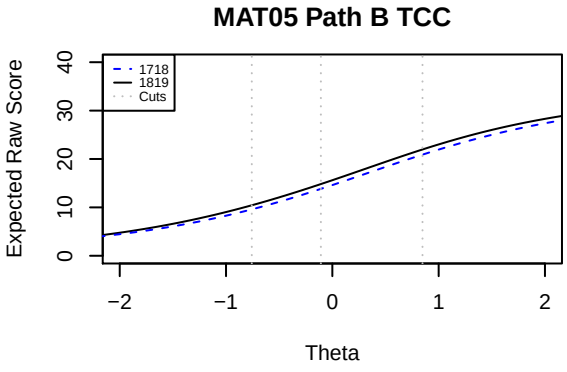
Cuts


MAT05 Path B TCC
Expected Raw Score
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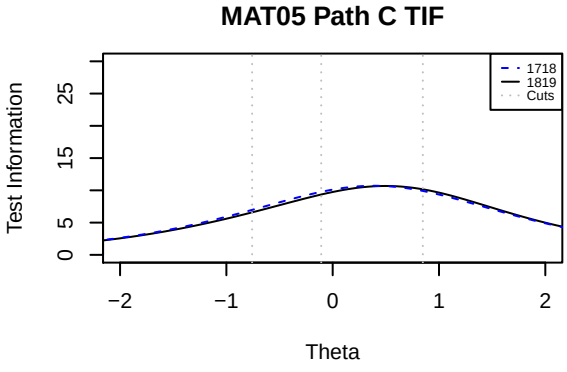
Cuts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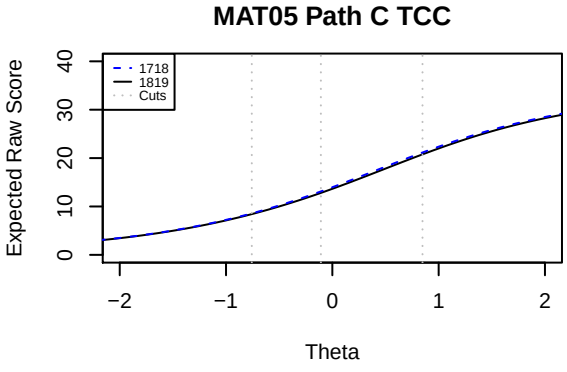
Cuts


MAT05 Path C TCC
Expected Raw Score
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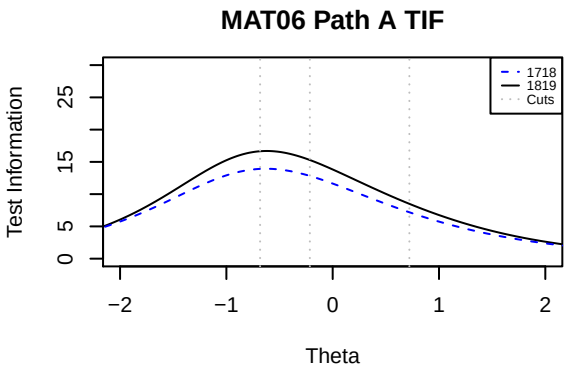
Cuts


MAT06 Path A TIF
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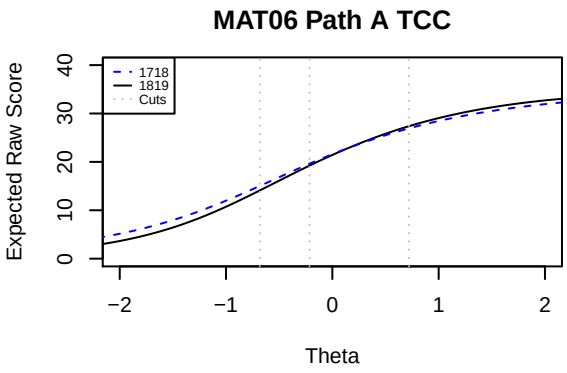
Cuts


MAT06 Path A TCC
Expected Raw Score
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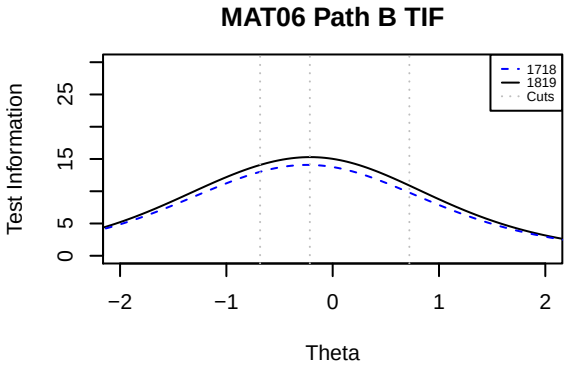
Cuts


MAT06 Path B TIF
Test Information
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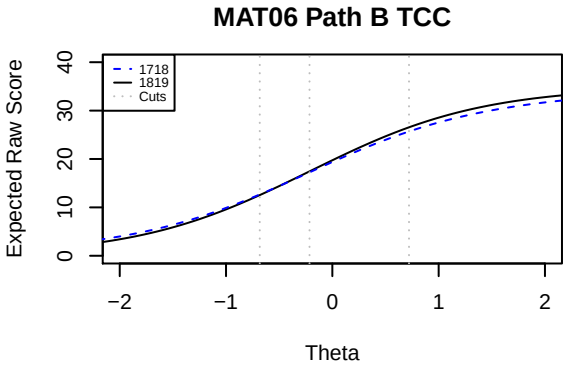
Cuts


MAT06 Path B TCC
Expected Raw Score
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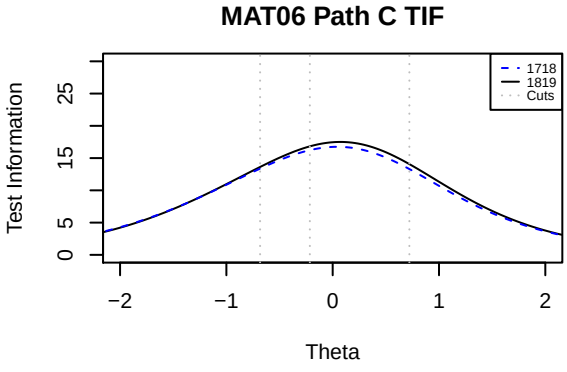
Cuts


MAT06 Path C TIF
Test Information
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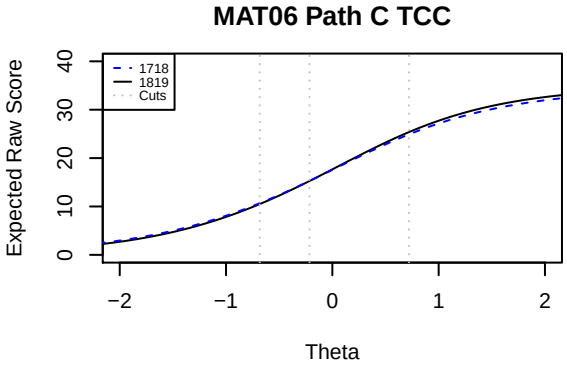
Cuts


MAT06 Path C TCC
Expected Raw Score
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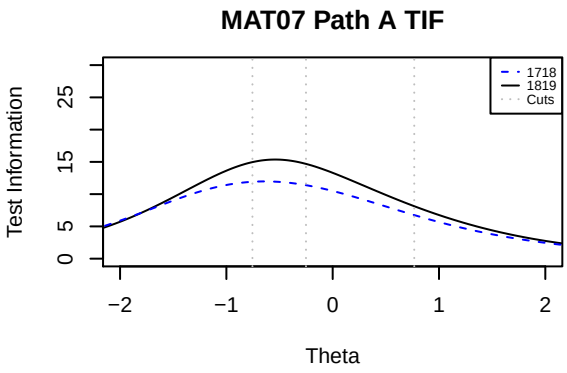
Cuts


MAT07 Path A TIF
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Cuts
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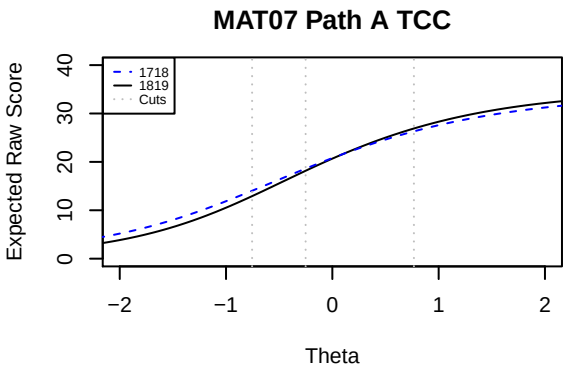
Theta


MAT07 Path A TCC
Expected Raw Score
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Cuts
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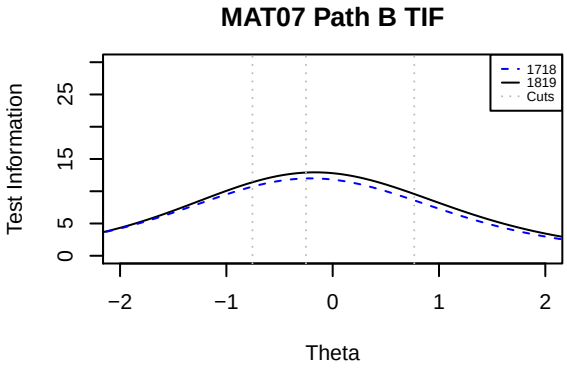
MAT07 Path B TIF
Test Information
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Cuts
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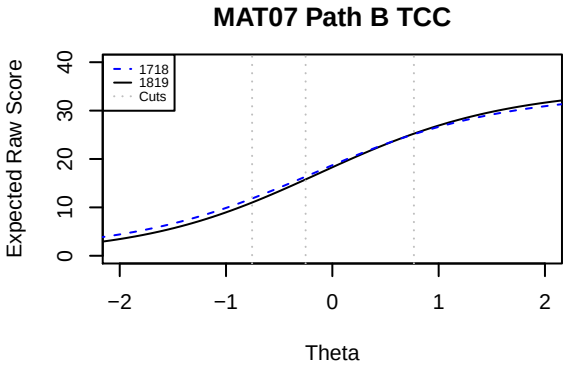
Theta


MAT07 Path B TCC
Expected Raw Score
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Cuts
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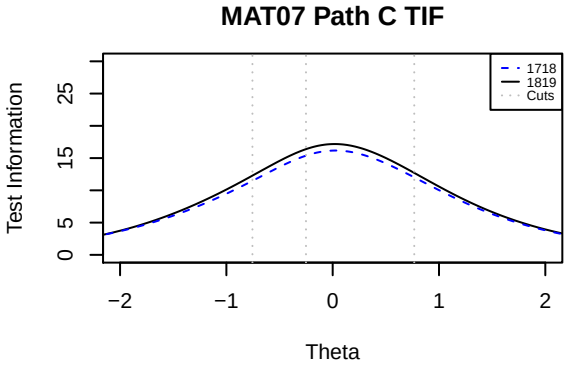
Theta


MAT07 Path C TIF
Test Information
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Cuts
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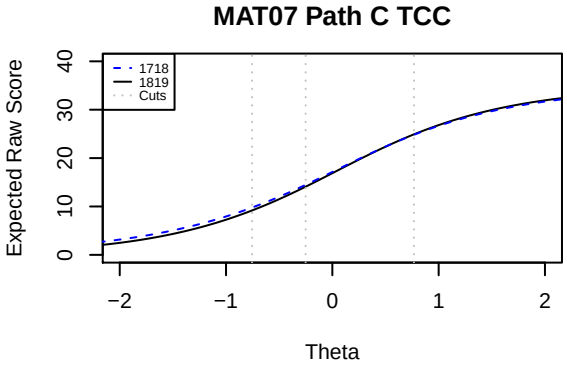
Theta


MAT07 Path C TCC
Expected Raw Score
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Cuts
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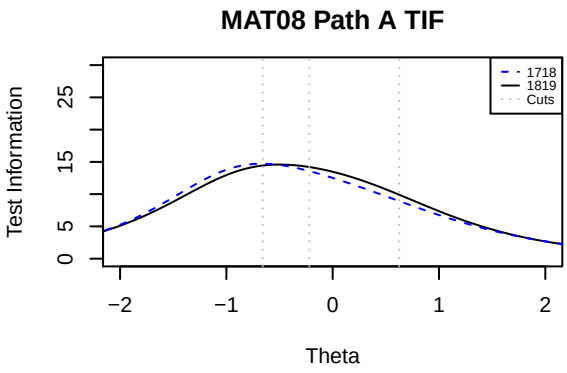
Theta


MAT08 Path A TIF
Test Information
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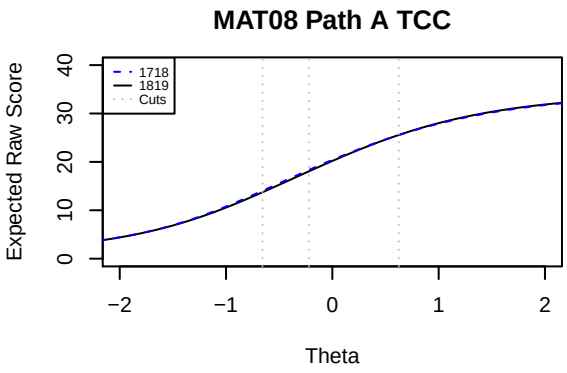
Theta
1718
1819
Cuts


MAT08 Path A TCC
Expected Raw Score
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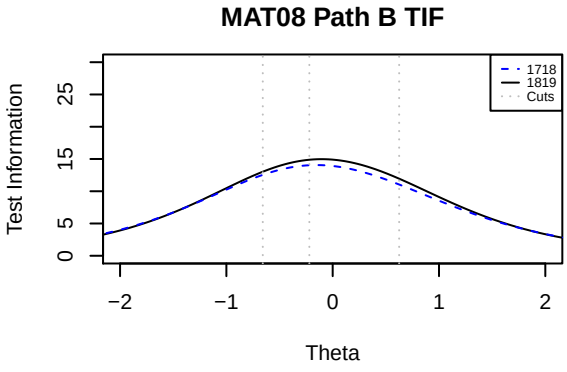
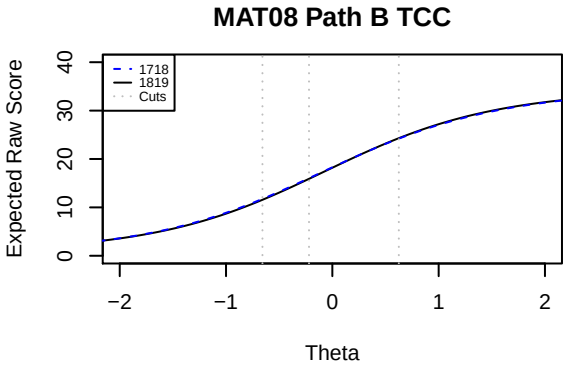
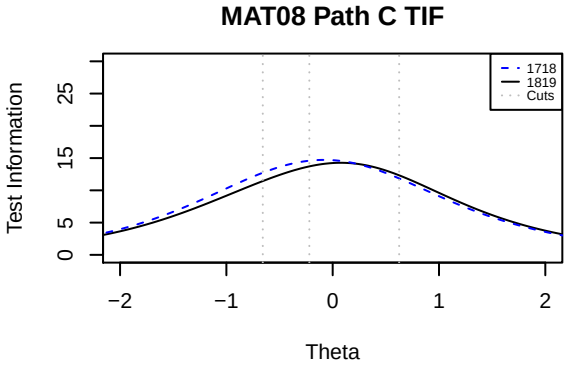
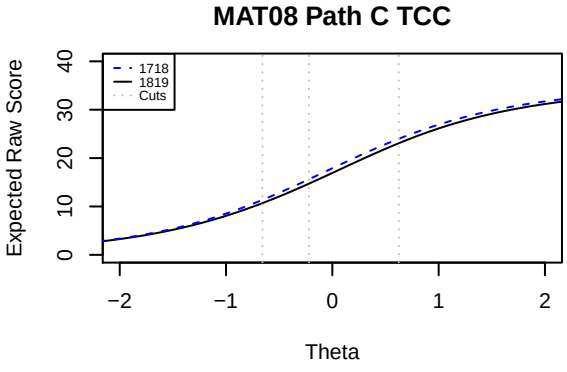
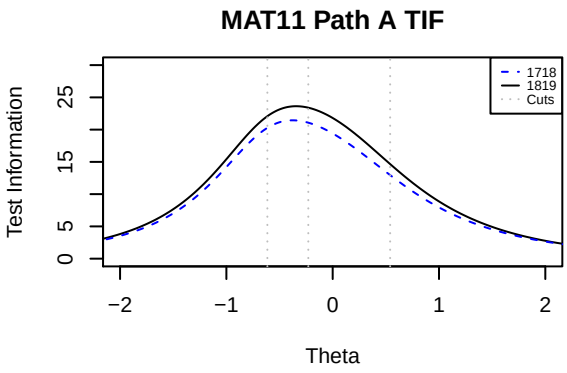
Theta
1718
1819
Cuts

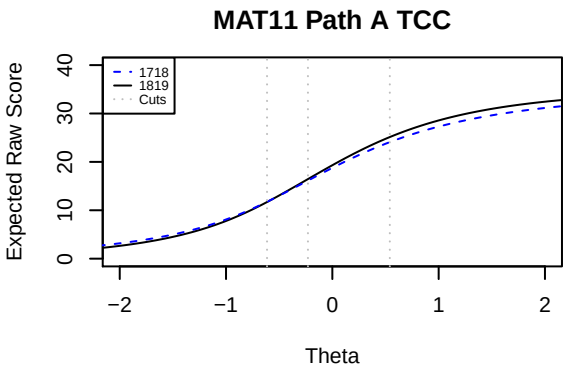

MAT08 Path B TIF
Test Information
0
5
15
25
−2
−1
0
1
2
Theta
1718
1819
Cuts

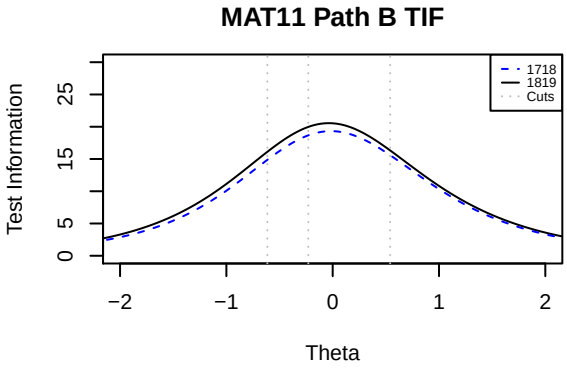

MAT08 Path B TCC
Expected Raw Score
0
10
20
30
40
−2
−1
0
1
2
Theta
1718
1819
Cuts

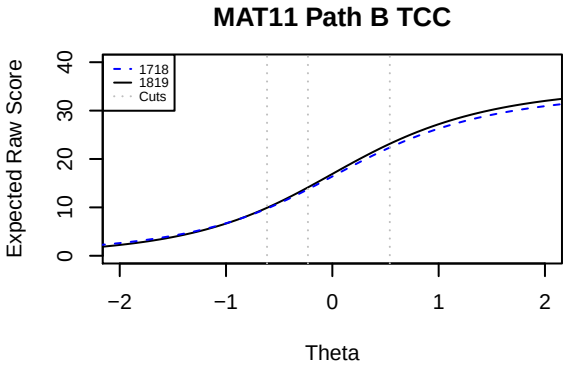

MAT08 Path C TIF
Test Information
0
5
15
25
−2
−1
0
1
2
Theta
1718
1819
Cuts

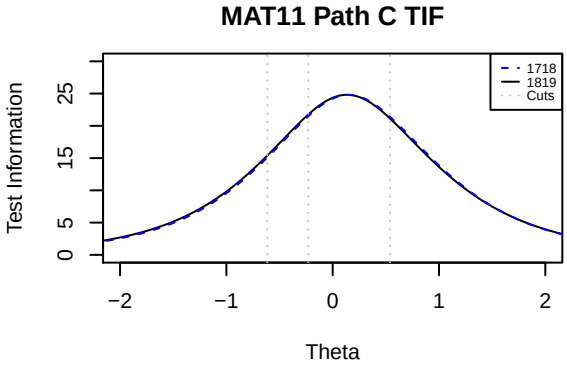

MAT08 Path C TCC
Expected Raw Score
0
10
20
30
40
−2
−1
0
1
2
Theta
1718
1819
Cuts

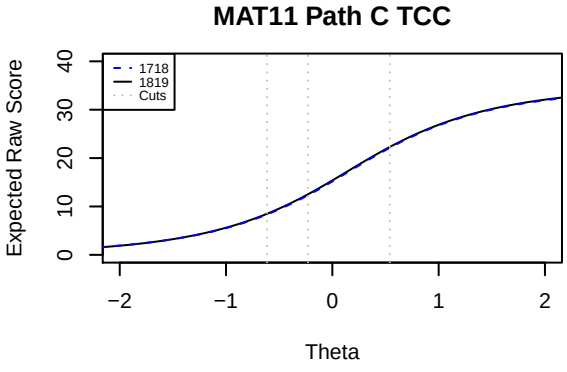

MAT11 Path A TIF
Test Information
0
5
15
25
−2
−1
0
1
2
Theta
1718
1819
Cuts


MAT11 Path A TCC
Expected Raw Score
0
10
20
30
40
−2
−1
0
1
2
Theta
1718
1819
Cuts


MAT11 Path B TIF
Test Information
0
5
15
25
−2
−1
0
1
2
Theta
1718
1819
Cuts


MAT11 Path B TCC
Expected Raw Score
0
10
20
30
40
−2
−1
0
1
2
Theta
1718
1819
Cuts


MAT11 Path C TIF
Test Information
0
5
15
25
−2
−1
0
1
2
Theta
1718
1819
Cuts


MAT11 Path C TCC
Expected Raw Score
0
10
20
30
40
−2
−1
0
1
2
Theta
1718
1819
Cuts

APPENDIX L—RAW TO SCALED SCORE LOOK-UP TABLES

Table L-1. Raw to Scaled Score Look-up Table—ELA Grade 3—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	14.75	1	1200	15.19	1
	1	1200	11.55	1	1200	12.04	1
	2	1200	8.43	1	1200	9.02	1
	3	1205	6.54	1	1204	6.87	1
	4	1208	5.49	1	1207	5.70	1
	5	1211	4.81	1	1210	4.96	1
	6	1213	4.34	1	1213	4.46	1
	7	1215	4.00	1	1215	4.10	1
	8	1217	3.73	1	1216	3.83	1
	9	1218	3.52	1	1218	3.62	1
	10	1220	3.36	1	1219	3.46	1
	11	1221	3.23	1	1221	3.34	1
	12	1222	3.12	1	1222	3.24	1
	13	1223	3.03	1	1223	3.17	1
	14	1224	2.96	1	1224	3.11	1
	15	1225	2.91	1	1225	3.08	1
	16	1226	2.86	1	1226	3.05	1
	17	1227	2.83	1	1227	3.04	1
	18	1228	2.81	1	1229	3.04	1
	19	1229	2.80	1	1230	3.04	1
	20	1230	2.79	1	1231	3.06	1
	21	1231	2.80	1	1232	3.09	1
	22	1232	2.81	1	1233	3.13	1
	23	1233	2.83	1	1233	3.18	1
	24	1233	2.86	1	1235	3.24	2
	25	1234	2.90	2	1236	3.31	2
	26	1235	2.95	2	1237	3.39	2
	27	1236	3.00	2	1238	3.49	2
	28	1237	3.07	2	1240	3.60	3
	29	1239	3.14	2	1241	3.72	3
	30	1240	3.23	3	1242	3.86	3
	31	1241	3.33	3	1244	4.03	3
	32	1242	3.44	3	1245	4.21	3
	33	1243	3.57	3	1247	4.42	3
	34	1245	3.72	3	1249	4.66	3
	35	1246	3.88	3	1251	4.94	3
	36	1248	4.07	3	1253	5.27	3
	37	1249	4.29	3	1256	5.66	4
	38	1251	4.55	3	1259	6.14	4
	39	1253	4.84	3	1262	6.76	4
	40	1255	5.20	4	1266	7.63	4
	41	1258	5.63	4	1271	8.97	4
	42	1261	6.19	4	1278	11.38	4
	43	1264	6.95	4	1289	16.21	4
	44	1269	8.09	4	1290	16.21	4
	45	1275	10.06	4	-	-	-
	46	1286	14.77	4	-	-	-
	47	1290	16.54	4	-	-	-

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	16.54	1	1200	17.52	1
	1	1200	13.45	1	1200	13.83	1
	2	1200	10.81	1	1200	10.45	1
	3	1202	8.39	1	1204	7.85	1
	4	1207	7.04	1	1208	6.44	1
	5	1211	6.16	1	1212	5.56	1
	6	1214	5.55	1	1214	4.97	1
	7	1216	5.10	1	1217	4.54	1
	8	1218	4.75	1	1219	4.23	1
	9	1220	4.47	1	1220	4.00	1
	10	1222	4.25	1	1222	3.82	1
	11	1223	4.06	1	1224	3.69	1
	12	1225	3.91	1	1225	3.58	1
	13	1226	3.78	1	1226	3.50	1
	14	1228	3.68	1	1228	3.44	1
	15	1229	3.59	1	1229	3.40	1
	16	1230	3.52	1	1230	3.37	1
	17	1231	3.46	1	1231	3.35	1
	18	1232	3.42	1	1232	3.35	1
	19	1233	3.39	1	1233	3.36	1
	20	1235	3.37	2	1235	3.37	2
	21	1236	3.36	2	1236	3.40	2
	22	1237	3.37	2	1237	3.44	2
	23	1238	3.38	2	1238	3.48	2
	24	1239	3.40	2	1240	3.54	3
	25	1240	3.44	3	1241	3.62	3
	26	1241	3.48	3	1242	3.70	3
	27	1243	3.54	3	1244	3.81	3
	28	1244	3.61	3	1245	3.93	3
	29	1245	3.70	3	1247	4.07	3
	30	1246	3.79	3	1248	4.23	3
	31	1248	3.91	3	1250	4.42	3
	32	1249	4.04	3	1252	4.64	3
	33	1251	4.20	3	1254	4.90	4
	34	1252	4.37	3	1256	5.19	4
	35	1254	4.58	4	1258	5.53	4
	36	1256	4.81	4	1261	5.92	4
	37	1258	5.08	4	1264	6.35	4
	38	1260	5.38	4	1267	6.84	4
	39	1262	5.73	4	1271	7.38	4
	40	1265	6.13	4	1276	8.01	4
	41	1268	6.57	4	1281	8.93	4
	42	1272	7.08	4	1288	10.78	4
	43	1276	7.70	4	1289	10.94	4
	44	1281	8.60	4	1290	10.94	4
	45	1288	10.31	4	-	-	-
	46	1289	10.56	4	-	-	-
	47	1290	10.56	4	-	-	-

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	16.64	1	1200	18.17	1
	1	1200	13.21	1	1200	13.94	1
	2	1200	10.08	1	1200	10.00	1
	3	1204	7.82	1	1206	7.52	1
	4	1208	6.57	1	1210	6.19	1
	5	1212	5.76	1	1213	5.37	1
	6	1214	5.20	1	1216	4.82	1
	7	1217	4.78	1	1218	4.43	1
	8	1219	4.46	1	1220	4.15	1
	9	1221	4.21	1	1222	3.93	1
	10	1222	4.01	1	1223	3.77	1
	11	1224	3.84	1	1225	3.64	1
	12	1225	3.70	1	1226	3.54	1
	13	1226	3.59	1	1227	3.46	1
	14	1228	3.50	1	1229	3.39	1
	15	1229	3.42	1	1230	3.34	1
	16	1230	3.36	1	1231	3.30	1
	17	1231	3.31	1	1232	3.27	1
	18	1232	3.27	1	1233	3.24	1
	19	1233	3.25	1	1235	3.23	2
	20	1234	3.23	2	1236	3.22	2
	21	1235	3.23	2	1237	3.22	2
	22	1236	3.23	2	1238	3.23	2
	23	1237	3.25	2	1239	3.25	2
	24	1239	3.27	2	1240	3.28	3
	25	1240	3.30	3	1241	3.32	3
	26	1241	3.35	3	1243	3.37	3
	27	1242	3.41	3	1244	3.44	3
	28	1243	3.47	3	1245	3.53	3
	29	1244	3.55	3	1246	3.64	3
	30	1245	3.65	3	1248	3.78	3
	31	1247	3.76	3	1249	3.94	3
	32	1248	3.89	3	1251	4.14	3
	33	1250	4.03	3	1253	4.38	3
	34	1251	4.21	3	1255	4.67	4
	35	1253	4.41	3	1257	5.02	4
	36	1255	4.64	4	1259	5.43	4
	37	1257	4.91	4	1262	5.91	4
	38	1259	5.22	4	1265	6.45	4
	39	1261	5.59	4	1269	7.06	4
	40	1264	6.01	4	1273	7.73	4
	41	1267	6.50	4	1279	8.60	4
	42	1271	7.05	4	1286	10.15	4
	43	1275	7.70	4	1289	11.17	4
	44	1280	8.60	4	1290	11.17	4
	45	1287	10.27	4	-	-	-
	46	1289	10.83	4	-	-	-
	47	1290	10.83	4	-	-	-

Table L-2. Raw to Scaled Score Look-up Table—ELA Grade 4—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	17.16	1	1200	15.31	1
	1	1200	13.48	1	1200	12.15	1
	2	1200	10.02	1	1200	9.16	1
	3	1202	7.70	1	1201	7.19	1
	4	1206	6.38	1	1205	6.07	1
	5	1209	5.52	1	1208	5.34	1
	6	1212	4.91	1	1211	4.82	1
	7	1214	4.47	1	1213	4.43	1
	8	1216	4.12	1	1215	4.13	1
	9	1218	3.85	1	1216	3.89	1
	10	1219	3.64	1	1218	3.69	1
	11	1221	3.46	1	1219	3.54	1
	12	1222	3.32	1	1221	3.41	1
	13	1223	3.21	1	1222	3.31	1
	14	1224	3.11	1	1223	3.22	1
	15	1226	3.04	1	1224	3.16	1
	16	1227	2.98	1	1225	3.11	1
	17	1228	2.93	1	1226	3.07	1
	18	1229	2.90	1	1227	3.05	1
	19	1230	2.88	1	1229	3.04	1
	20	1231	2.87	1	1230	3.04	1
	21	1232	2.87	1	1231	3.06	1
	22	1233	2.88	1	1232	3.09	1
A	23	1233	2.90	1	1233	3.13	1
	24	1234	2.93	2	1234	3.18	2
	25	1235	2.96	2	1235	3.25	2
	26	1236	3.01	2	1236	3.33	2
	27	1237	3.07	2	1237	3.42	2
	28	1239	3.13	2	1238	3.53	2
	29	1239	3.22	2	1239	3.66	2
	30	1241	3.31	3	1241	3.80	3
	31	1242	3.42	3	1243	3.96	3
	32	1243	3.55	3	1244	4.14	3
	33	1245	3.70	3	1246	4.35	3
	34	1246	3.87	3	1248	4.59	3
	35	1248	4.07	3	1250	4.87	3
	36	1249	4.31	3	1252	5.21	3
	37	1251	4.58	3	1254	5.62	3
	38	1253	4.90	3	1257	6.15	3
	39	1255	5.29	3	1261	6.89	4
	40	1258	5.78	3	1265	8.00	4
	41	1261	6.43	4	1272	9.99	4
	42	1265	7.33	4	1283	14.92	4
	43	1270	8.75	4	1290	18.45	4
	44	1277	11.39	4	-	-	-
	45	1288	16.87	4	-	-	-
	46	1290	16.87	4	-	-	-

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	19.33	1	1200	16.74	1
	1	1200	14.61	1	1200	13.01	1
	2	1200	10.42	1	1200	9.55	1
	3	1204	8.12	1	1203	7.45	1
	4	1209	6.80	1	1207	6.26	1
	5	1212	5.94	1	1210	5.47	1
	6	1215	5.33	1	1213	4.91	1
	7	1218	4.87	1	1215	4.49	1
	8	1220	4.51	1	1217	4.17	1
	9	1222	4.23	1	1219	3.91	1
	10	1223	4.00	1	1220	3.71	1
	11	1225	3.81	1	1222	3.54	1
	12	1226	3.66	1	1223	3.41	1
	13	1228	3.53	1	1224	3.30	1
	14	1229	3.43	1	1226	3.22	1
	15	1230	3.35	1	1227	3.15	1
	16	1231	3.28	1	1228	3.10	1
	17	1232	3.22	1	1229	3.07	1
	18	1233	3.18	1	1230	3.05	1
	19	1235	3.15	2	1231	3.05	1
	20	1236	3.13	2	1232	3.05	1
	21	1237	3.12	2	1233	3.07	1
	22	1238	3.12	2	1234	3.11	2
B	23	1239	3.13	2	1236	3.16	2
	24	1239	3.15	2	1237	3.22	2
	25	1241	3.19	3	1238	3.30	2
	26	1242	3.24	3	1239	3.40	2
	27	1243	3.30	3	1241	3.51	3
	28	1244	3.38	3	1242	3.65	3
	29	1245	3.47	3	1243	3.82	3
	30	1247	3.58	3	1245	4.02	3
	31	1248	3.71	3	1247	4.24	3
	32	1249	3.86	3	1248	4.50	3
	33	1251	4.03	3	1251	4.80	3
	34	1253	4.22	3	1253	5.15	3
	35	1254	4.45	3	1255	5.54	3
	36	1256	4.71	3	1258	5.99	3
	37	1258	5.00	3	1261	6.51	4
	38	1260	5.35	4	1265	7.13	4
	39	1263	5.75	4	1269	7.89	4
	40	1266	6.23	4	1274	8.87	4
	41	1269	6.81	4	1281	10.40	4
	42	1273	7.56	4	1288	12.60	4
	43	1278	8.59	4	1290	12.60	4
	44	1285	10.30	4	-	-	-
	45	1288	11.47	4	-	-	-
	46	1290	11.47	4	-	-	-

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	19.14	1	1200	18.28	1
	1	1200	14.83	1	1200	13.91	1
	2	1200	10.97	1	1200	9.97	1
	3	1203	8.55	1	1204	7.74	1
	4	1208	7.17	1	1208	6.49	1
	5	1212	6.25	1	1211	5.68	1
	6	1215	5.60	1	1214	5.10	1
	7	1217	5.11	1	1216	4.68	1
	8	1219	4.73	1	1218	4.35	1
	9	1221	4.43	1	1220	4.10	1
	10	1223	4.18	1	1222	3.90	1
	11	1225	3.98	1	1224	3.73	1
	12	1226	3.81	1	1225	3.60	1
	13	1228	3.68	1	1226	3.50	1
	14	1229	3.57	1	1228	3.42	1
	15	1230	3.47	1	1229	3.35	1
	16	1231	3.40	1	1230	3.30	1
	17	1232	3.34	1	1231	3.26	1
	18	1233	3.29	1	1233	3.24	1
	19	1235	3.26	2	1234	3.22	2
	20	1236	3.24	2	1235	3.22	2
	21	1237	3.23	2	1236	3.23	2
	22	1238	3.23	2	1237	3.24	2
C	23	1239	3.24	2	1238	3.27	2
	24	1240	3.27	3	1239	3.32	2
	25	1241	3.31	3	1241	3.38	3
	26	1242	3.36	3	1242	3.45	3
	27	1244	3.43	3	1243	3.55	3
	28	1245	3.51	3	1245	3.67	3
	29	1246	3.61	3	1246	3.82	3
	30	1247	3.73	3	1248	3.99	3
	31	1249	3.87	3	1249	4.20	3
	32	1250	4.02	3	1251	4.44	3
	33	1252	4.20	3	1253	4.73	3
	34	1253	4.41	3	1255	5.06	3
	35	1255	4.64	3	1258	5.45	3
	36	1257	4.91	3	1260	5.90	4
	37	1259	5.21	4	1263	6.43	4
	38	1262	5.56	4	1267	7.06	4
	39	1264	5.97	4	1271	7.83	4
	40	1267	6.45	4	1276	8.87	4
	41	1271	7.04	4	1283	10.54	4
	42	1275	7.79	4	1288	12.10	4
	43	1280	8.85	4	1290	12.10	4
	44	1287	10.65	4	-	-	-
	45	1288	11.22	4	-	-	-
	46	1290	11.22	4	-	-	-

Table L-3. Raw to Scaled Score Look-up Table—ELA Grade 5—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	19.32	1	1200	18.32	1
	1	1200	14.94	1	1200	14.37	1
	2	1200	10.97	1	1200	10.77	1
	3	1203	8.35	1	1202	8.18	1
	4	1207	6.90	1	1206	6.76	1
	5	1211	5.98	1	1210	5.85	1
	6	1214	5.34	1	1212	5.22	1
	7	1216	4.86	1	1215	4.76	1
	8	1218	4.50	1	1217	4.41	1
	9	1220	4.22	1	1219	4.14	1
	10	1222	4.00	1	1220	3.93	1
	11	1223	3.82	1	1222	3.76	1
	12	1225	3.68	1	1223	3.62	1
	13	1226	3.57	1	1225	3.51	1
	14	1227	3.49	1	1226	3.43	1
	15	1229	3.42	1	1227	3.37	1
	16	1230	3.38	1	1228	3.33	1
	17	1231	3.35	1	1230	3.30	1
	18	1232	3.34	2	1231	3.29	1
	19	1233	3.34	2	1232	3.30	2
	20	1234	3.35	2	1233	3.32	2
	21	1236	3.38	2	1234	3.35	2
	22	1237	3.42	2	1235	3.40	2
	23	1238	3.47	2	1237	3.46	2
	24	1239	3.53	2	1238	3.54	2
	25	1240	3.60	3	1239	3.63	2
	26	1242	3.69	3	1240	3.73	3
	27	1243	3.79	3	1242	3.85	3
	28	1244	3.91	3	1243	3.98	3
	29	1246	4.05	3	1245	4.13	3
	30	1247	4.21	3	1246	4.31	3
	31	1249	4.39	3	1248	4.50	3
	32	1251	4.60	3	1250	4.73	3
	33	1253	4.85	3	1252	4.99	3
	34	1255	5.15	3	1254	5.29	3
	35	1257	5.52	4	1257	5.66	4
	36	1260	5.98	4	1260	6.13	4
	37	1263	6.60	4	1263	6.76	4
	38	1267	7.48	4	1267	7.64	4
	39	1272	8.82	4	1272	8.99	4
	40	1279	11.09	4	1278	11.27	4
	41	1289	15.50	4	1289	15.70	4
	42	1290	16.68	4	1290	16.83	4
	43	1290	16.68	4	1290	16.83	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	22.88	1	1200	21.90	1
	1	1200	17.35	1	1200	16.69	1
	2	1200	12.50	1	1200	12.05	1
	3	1203	9.24	1	1203	8.79	1
	4	1209	7.50	1	1208	7.08	1
	5	1213	6.40	1	1212	6.02	1
	6	1216	5.65	1	1215	5.30	1
	7	1218	5.10	1	1217	4.79	1
	8	1221	4.69	1	1219	4.41	1
	9	1223	4.38	1	1221	4.12	1
	10	1224	4.14	1	1223	3.90	1
	11	1226	3.95	1	1224	3.73	1
	12	1228	3.80	1	1226	3.61	1
	13	1229	3.69	1	1227	3.51	1
	14	1230	3.61	1	1229	3.45	1
	15	1232	3.56	2	1230	3.40	1
	16	1233	3.52	2	1232	3.38	2
	17	1234	3.50	2	1233	3.38	2
	18	1236	3.50	2	1234	3.39	2
	19	1237	3.51	2	1235	3.42	2
	20	1238	3.54	2	1236	3.47	2
	21	1239	3.57	2	1238	3.53	2
	22	1241	3.62	3	1239	3.60	2
	23	1242	3.69	3	1240	3.68	3
	24	1243	3.76	3	1242	3.78	3
	25	1245	3.86	3	1243	3.89	3
	26	1246	3.96	3	1245	4.01	3
	27	1248	4.08	3	1246	4.15	3
	28	1249	4.22	3	1248	4.30	3
	29	1251	4.38	3	1250	4.47	3
	30	1253	4.57	3	1252	4.67	3
	31	1255	4.78	3	1254	4.89	3
	32	1257	5.02	4	1255	5.14	3
	33	1259	5.30	4	1258	5.42	4
	34	1261	5.62	4	1261	5.74	4
	35	1264	5.98	4	1263	6.10	4
	36	1267	6.40	4	1267	6.52	4
	37	1271	6.92	4	1270	7.03	4
	38	1275	7.67	4	1274	7.76	4
	39	1280	8.93	4	1280	9.01	4
	40	1287	11.48	4	1287	11.57	4
	41	1290	13.33	4	1290	13.52	4
	42	1290	13.33	4	1290	13.52	4
	43	1290	13.33	4	1290	13.52	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	23.35	1	1200	21.89	1
	1	1200	17.79	1	1200	16.90	1
	2	1200	12.94	1	1200	12.54	1
	3	1203	9.48	1	1202	9.14	1
	4	1208	7.66	1	1207	7.37	1
	5	1213	6.53	1	1211	6.28	1
	6	1216	5.75	1	1214	5.54	1
	7	1218	5.19	1	1217	5.02	1
	8	1221	4.77	1	1219	4.63	1
	9	1223	4.45	1	1221	4.33	1
	10	1225	4.21	1	1223	4.10	1
	11	1226	4.02	1	1225	3.93	1
	12	1228	3.88	1	1226	3.79	1
	13	1229	3.78	1	1228	3.69	1
	14	1231	3.70	1	1229	3.62	1
	15	1232	3.65	2	1230	3.57	1
	16	1233	3.61	2	1232	3.55	2
	17	1235	3.60	2	1233	3.54	2
	18	1236	3.60	2	1234	3.55	2
	19	1237	3.61	2	1236	3.57	2
	20	1239	3.64	2	1237	3.60	2
	21	1239	3.68	2	1238	3.65	2
	22	1241	3.74	3	1239	3.72	2
	23	1243	3.80	3	1241	3.79	3
	24	1244	3.88	3	1242	3.88	3
	25	1245	3.97	3	1244	3.98	3
	26	1247	4.08	3	1245	4.09	3
	27	1248	4.20	3	1247	4.22	3
	28	1250	4.34	3	1249	4.37	3
	29	1252	4.50	3	1250	4.54	3
	30	1254	4.69	3	1252	4.74	3
	31	1255	4.90	3	1254	4.96	3
	32	1258	5.14	4	1257	5.22	4
	33	1260	5.41	4	1259	5.50	4
	34	1262	5.72	4	1261	5.83	4
	35	1265	6.08	4	1264	6.20	4
	36	1268	6.50	4	1268	6.62	4
	37	1272	7.04	4	1271	7.16	4
	38	1276	7.84	4	1276	7.96	4
	39	1281	9.22	4	1281	9.33	4
	40	1289	12.03	4	1289	12.17	4
	41	1290	13.04	4	1290	13.35	4
	42	1290	13.04	4	1290	13.35	4
	43	1290	13.04	4	1290	13.35	4

Table L-4. Raw to Scaled Score Look-up Table—ELA Grade 6—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	26.94	1	1200	26.79	1
	1	1200	14.02	1	1200	13.45	1
	2	1203	8.01	1	1204	8.04	1
	3	1208	5.88	1	1209	6.06	1
	4	1212	4.78	1	1212	5.02	1
	5	1214	4.10	1	1215	4.37	1
	6	1216	3.64	1	1217	3.92	1
	7	1218	3.31	1	1219	3.58	1
	8	1219	3.06	1	1220	3.33	1
	9	1221	2.87	1	1222	3.13	1
	10	1222	2.72	1	1223	2.97	1
	11	1223	2.61	1	1224	2.85	1
	12	1224	2.51	1	1225	2.74	1
	13	1225	2.44	1	1226	2.66	1
	14	1226	2.39	1	1227	2.60	1
	15	1227	2.35	1	1228	2.55	1
	16	1227	2.32	1	1229	2.51	1
	17	1228	2.31	1	1230	2.48	1
	18	1229	2.30	1	1231	2.47	2
	19	1230	2.31	1	1232	2.47	2
	20	1231	2.32	2	1232	2.47	2
	21	1232	2.35	2	1233	2.49	2
A	22	1232	2.38	2	1234	2.51	2
	23	1233	2.42	2	1235	2.55	2
	24	1234	2.48	2	1236	2.59	2
	25	1235	2.54	2	1237	2.65	3
	26	1236	2.61	2	1238	2.71	3
	27	1237	2.70	3	1239	2.79	3
	28	1238	2.79	3	1240	2.88	3
	29	1239	2.91	3	1241	2.98	3
	30	1240	3.03	3	1242	3.10	3
	31	1241	3.18	3	1243	3.24	3
	32	1243	3.35	3	1244	3.40	3
	33	1244	3.54	3	1246	3.58	3
	34	1245	3.77	3	1247	3.79	3
	35	1247	4.05	3	1249	4.05	3
	36	1249	4.39	3	1251	4.35	4
	37	1251	4.81	4	1253	4.74	4
	38	1254	5.36	4	1255	5.24	4
	39	1257	6.11	4	1258	5.92	4
	40	1261	7.20	4	1262	6.90	4
	41	1267	8.99	4	1267	8.52	4
	42	1275	12.58	4	1275	11.73	4
	43	1287	19.11	4	1287	18.30	4
	44	1290	19.11	4	1290	18.30	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	26.79	1	1200	27.86	1
	1	1200	16.20	1	1200	14.35	1
	2	1202	9.66	1	1204	8.67	1
	3	1208	7.14	1	1210	6.56	1
	4	1212	5.80	1	1214	5.43	1
	5	1215	4.96	1	1216	4.72	1
	6	1218	4.39	1	1219	4.24	1
	7	1220	3.98	1	1221	3.88	1
	8	1222	3.67	1	1222	3.62	1
	9	1223	3.44	1	1224	3.40	1
	10	1224	3.25	1	1225	3.24	1
	11	1226	3.11	1	1226	3.10	1
	12	1227	3.00	1	1227	2.99	1
	13	1228	2.91	1	1228	2.90	1
	14	1229	2.84	1	1229	2.83	1
	15	1230	2.78	1	1231	2.78	2
	16	1231	2.75	2	1231	2.74	2
	17	1232	2.73	2	1232	2.71	2
	18	1233	2.72	2	1233	2.69	2
	19	1234	2.72	2	1234	2.69	2
	20	1235	2.74	2	1235	2.69	2
	21	1236	2.76	2	1236	2.71	2
B	22	1237	2.80	3	1237	2.74	3
	23	1238	2.85	3	1238	2.77	3
	24	1239	2.92	3	1239	2.82	3
	25	1240	3.00	3	1240	2.88	3
	26	1241	3.09	3	1241	2.96	3
	27	1242	3.20	3	1242	3.05	3
	28	1243	3.32	3	1243	3.15	3
	29	1244	3.47	3	1244	3.27	3
	30	1246	3.63	3	1245	3.41	3
	31	1247	3.83	3	1247	3.57	3
	32	1249	4.05	3	1248	3.77	3
	33	1251	4.31	4	1250	4.00	3
	34	1253	4.62	4	1252	4.27	4
	35	1255	4.98	4	1254	4.59	4
	36	1257	5.41	4	1256	4.99	4
	37	1260	5.92	4	1258	5.47	4
	38	1263	6.53	4	1262	6.07	4
	39	1267	7.29	4	1265	6.83	4
	40	1272	8.27	4	1270	7.80	4
	41	1278	9.76	4	1276	9.22	4
	42	1287	12.78	4	1284	12.02	4
	43	1287	12.78	4	1287	13.22	4
	44	1290	12.78	4	1290	13.22	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	27.41	1	1200	28.51	1
	1	1200	16.76	1	1200	14.36	1
	2	1202	9.87	1	1205	8.66	1
	3	1208	7.28	1	1210	6.56	1
	4	1212	5.91	1	1214	5.44	1
	5	1216	5.07	1	1217	4.74	1
	6	1218	4.49	1	1219	4.26	1
	7	1220	4.08	1	1221	3.91	1
	8	1222	3.77	1	1223	3.64	1
	9	1223	3.54	1	1224	3.43	1
	10	1225	3.35	1	1226	3.27	1
	11	1226	3.20	1	1227	3.13	1
	12	1227	3.09	1	1228	3.03	1
	13	1228	3.00	1	1229	2.94	1
	14	1229	2.92	1	1231	2.87	2
	15	1231	2.87	2	1231	2.82	2
	16	1232	2.83	2	1232	2.78	2
	17	1233	2.81	2	1233	2.76	2
	18	1233	2.80	2	1234	2.75	2
	19	1234	2.80	2	1235	2.74	2
	20	1235	2.82	2	1236	2.75	2
	21	1236	2.85	2	1237	2.77	3
C	22	1237	2.89	3	1238	2.80	3
	23	1238	2.94	3	1239	2.84	3
	24	1239	3.01	3	1240	2.90	3
	25	1241	3.09	3	1241	2.96	3
	26	1242	3.19	3	1242	3.03	3
	27	1243	3.30	3	1243	3.12	3
	28	1244	3.43	3	1244	3.22	3
	29	1245	3.58	3	1245	3.33	3
	30	1247	3.75	3	1246	3.46	3
	31	1248	3.95	3	1248	3.62	3
	32	1250	4.19	3	1249	3.80	3
	33	1252	4.45	4	1251	4.01	4
	34	1254	4.77	4	1253	4.26	4
	35	1256	5.14	4	1255	4.56	4
	36	1259	5.58	4	1257	4.92	4
	37	1262	6.10	4	1259	5.37	4
	38	1265	6.73	4	1262	5.93	4
	39	1269	7.50	4	1266	6.64	4
	40	1274	8.53	4	1270	7.60	4
	41	1281	10.19	4	1276	9.03	4
	42	1287	12.49	4	1285	11.85	4
	43	1287	12.49	4	1287	12.99	4
	44	1290	12.49	4	1290	12.99	4

Table L-5. Raw to Scaled Score Look-up Table—ELA Grade 7—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	20.41	1	1200	23.80	1
	1	1200	10.93	1	1200	14.85	1
	2	1207	7.08	1	1204	8.31	1
	3	1211	5.50	1	1210	6.08	1
	4	1214	4.60	1	1213	4.93	1
	5	1217	4.02	1	1216	4.22	1
	6	1219	3.62	1	1218	3.74	1
	7	1220	3.32	1	1220	3.40	1
	8	1222	3.09	1	1221	3.15	1
	9	1223	2.91	1	1222	2.96	1
	10	1224	2.77	1	1223	2.81	1
	11	1225	2.66	1	1225	2.69	1
	12	1226	2.57	1	1226	2.60	1
	13	1227	2.50	1	1227	2.53	1
	14	1228	2.45	1	1227	2.47	1
	15	1229	2.41	1	1228	2.43	1
	16	1229	2.38	1	1229	2.40	1
	17	1230	2.36	1	1230	2.39	1
	18	1231	2.35	1	1231	2.38	1
	19	1232	2.35	1	1232	2.39	1
	20	1233	2.36	1	1232	2.40	1
	21	1233	2.38	1	1233	2.43	1
A	22	1234	2.40	1	1234	2.46	1
	23	1235	2.44	1	1235	2.51	1
	24	1236	2.48	2	1236	2.56	2
	25	1237	2.53	2	1237	2.63	2
	26	1238	2.59	2	1238	2.70	2
	27	1239	2.66	2	1239	2.79	2
	28	1239	2.74	2	1239	2.89	2
	29	1241	2.84	3	1241	3.00	3
	30	1242	2.94	3	1242	3.13	3
	31	1243	3.06	3	1243	3.28	3
	32	1244	3.21	3	1245	3.46	3
	33	1245	3.37	3	1246	3.66	3
	34	1247	3.56	3	1248	3.89	3
	35	1248	3.78	3	1249	4.16	3
	36	1250	4.05	3	1251	4.49	3
	37	1252	4.37	3	1254	4.89	3
	38	1254	4.77	3	1256	5.39	4
	39	1256	5.28	4	1259	6.04	4
	40	1260	5.95	4	1263	6.96	4
	41	1264	6.94	4	1268	8.45	4
	42	1269	8.67	4	1276	11.58	4
	43	1279	13.13	4	1290	21.20	4
	44	1290	22.58	4	1290	21.20	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	20.96	1	1200	23.69	1
	1	1200	12.23	1	1200	17.02	1
	2	1206	7.93	1	1200	11.09	1
	3	1211	6.16	1	1207	8.03	1
	4	1215	5.17	1	1211	6.48	1
	5	1217	4.52	1	1215	5.53	1
	6	1219	4.07	1	1217	4.90	1
	7	1221	3.74	1	1220	4.45	1
	8	1223	3.49	1	1222	4.11	1
	9	1224	3.29	1	1223	3.86	1
	10	1226	3.14	1	1225	3.66	1
	11	1227	3.03	1	1226	3.50	1
	12	1228	2.94	1	1228	3.38	1
	13	1229	2.87	1	1229	3.28	1
	14	1230	2.81	1	1230	3.20	1
	15	1231	2.78	1	1231	3.15	1
	16	1232	2.75	1	1232	3.10	1
	17	1233	2.74	1	1233	3.08	1
	18	1234	2.74	1	1234	3.06	1
	19	1235	2.75	1	1236	3.06	2
	20	1236	2.77	2	1237	3.07	2
	21	1237	2.80	2	1238	3.09	2
B	22	1238	2.84	2	1239	3.12	2
	23	1239	2.88	2	1239	3.17	2
	24	1239	2.94	2	1241	3.22	3
	25	1241	3.00	3	1242	3.29	3
	26	1242	3.08	3	1243	3.38	3
	27	1243	3.17	3	1244	3.48	3
	28	1244	3.27	3	1246	3.60	3
	29	1245	3.39	3	1247	3.74	3
	30	1246	3.53	3	1249	3.90	3
	31	1248	3.69	3	1250	4.10	3
	32	1249	3.87	3	1252	4.32	3
	33	1251	4.09	3	1254	4.58	3
	34	1253	4.34	3	1256	4.89	4
	35	1255	4.63	4	1258	5.23	4
	36	1257	4.98	4	1261	5.63	4
	37	1260	5.38	4	1264	6.06	4
	38	1262	5.84	4	1267	6.51	4
	39	1266	6.35	4	1271	6.96	4
	40	1270	6.87	4	1276	7.45	4
	41	1275	7.44	4	1281	8.31	4
	42	1281	8.42	4	1289	10.62	4
	43	1290	11.70	4	1290	11.97	4
	44	1290	12.43	4	1290	11.97	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	21.51	1	1200	24.60	1
	1	1200	11.58	1	1200	17.15	1
	2	1208	7.56	1	1201	10.74	1
	3	1212	5.91	1	1208	7.77	1
	4	1216	4.98	1	1212	6.28	1
	5	1218	4.38	1	1215	5.38	1
	6	1220	3.96	1	1218	4.78	1
	7	1222	3.65	1	1220	4.35	1
	8	1223	3.42	1	1222	4.03	1
	9	1225	3.24	1	1224	3.79	1
	10	1226	3.10	1	1225	3.60	1
	11	1227	2.99	1	1227	3.45	1
	12	1228	2.90	1	1228	3.34	1
	13	1229	2.84	1	1229	3.24	1
	14	1230	2.80	1	1230	3.17	1
	15	1231	2.76	1	1232	3.12	1
	16	1232	2.74	1	1233	3.08	1
	17	1233	2.74	1	1234	3.06	1
	18	1234	2.74	1	1235	3.05	1
	19	1236	2.75	2	1236	3.05	2
	20	1236	2.77	2	1237	3.06	2
	21	1237	2.80	2	1238	3.08	2
C	22	1238	2.84	2	1239	3.12	2
	23	1239	2.88	2	1240	3.16	3
	24	1240	2.94	3	1241	3.22	3
	25	1241	3.00	3	1242	3.29	3
	26	1242	3.08	3	1244	3.38	3
	27	1243	3.16	3	1245	3.48	3
	28	1244	3.26	3	1246	3.60	3
	29	1246	3.38	3	1248	3.74	3
	30	1247	3.51	3	1249	3.90	3
	31	1248	3.66	3	1251	4.08	3
	32	1250	3.83	3	1252	4.30	3
	33	1251	4.04	3	1255	4.55	4
	34	1253	4.28	3	1256	4.84	4
	35	1255	4.55	4	1259	5.17	4
	36	1257	4.88	4	1261	5.55	4
	37	1260	5.26	4	1264	5.96	4
	38	1263	5.71	4	1267	6.39	4
	39	1266	6.20	4	1271	6.84	4
	40	1270	6.73	4	1276	7.35	4
	41	1275	7.32	4	1281	8.21	4
	42	1281	8.30	4	1289	10.47	4
	43	1290	11.45	4	1290	11.87	4
	44	1290	12.37	4	1290	11.87	4

Table L-6. Raw to Scaled Score Look-up Table—ELA Grade 8—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	21.14	1	1200	21.99	1
	1	1200	14.43	1	1200	14.90	1
	2	1200	8.88	1	1200	8.93	1
	3	1205	6.63	1	1205	6.56	1
	4	1209	5.39	1	1208	5.31	1
	5	1212	4.60	1	1211	4.53	1
	6	1214	4.06	1	1213	4.01	1
	7	1216	3.67	1	1215	3.63	1
	8	1217	3.38	1	1217	3.35	1
	9	1219	3.15	1	1218	3.14	1
	10	1220	2.98	1	1219	2.98	1
	11	1221	2.85	1	1221	2.85	1
	12	1222	2.74	1	1222	2.76	1
	13	1223	2.66	1	1223	2.68	1
	14	1224	2.60	1	1224	2.63	1
	15	1225	2.56	1	1225	2.59	1
	16	1226	2.53	1	1226	2.57	1
	17	1227	2.52	1	1226	2.56	1
	18	1228	2.52	1	1227	2.56	1
	19	1229	2.53	1	1228	2.58	1
	20	1229	2.55	1	1229	2.60	1
	21	1230	2.58	2	1230	2.63	2
	22	1231	2.62	2	1231	2.67	2
	23	1232	2.68	2	1232	2.72	2
	24	1233	2.74	2	1233	2.78	2
	25	1234	2.81	2	1234	2.85	2
	26	1235	2.90	2	1235	2.93	2
	27	1236	3.00	2	1236	3.02	2
	28	1237	3.11	2	1237	3.12	2
	29	1238	3.24	3	1238	3.24	3
	30	1240	3.39	3	1239	3.37	3
	31	1241	3.56	3	1241	3.52	3
	32	1242	3.75	3	1242	3.70	3
	33	1244	3.97	3	1244	3.91	3
	34	1246	4.23	3	1245	4.15	3
	35	1248	4.54	3	1247	4.44	3
	36	1250	4.90	4	1249	4.79	3
	37	1252	5.34	4	1252	5.23	4
	38	1255	5.89	4	1254	5.78	4
	39	1258	6.58	4	1258	6.48	4
	40	1262	7.48	4	1262	7.43	4
	41	1267	8.76	4	1267	8.77	4
	42	1274	10.84	4	1274	10.98	4
	43	1286	15.85	4	1287	16.39	4
	44	1290	17.77	4	1290	18.21	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	21.95	1	1200	22.20	1
	1	1200	14.15	1	1200	13.89	1
	2	1201	8.70	1	1201	8.36	1
	3	1206	6.51	1	1206	6.24	1
	4	1210	5.31	1	1210	5.10	1
	5	1213	4.56	1	1212	4.40	1
	6	1215	4.04	1	1215	3.92	1
	7	1217	3.66	1	1216	3.57	1
	8	1218	3.38	1	1218	3.32	1
	9	1220	3.17	1	1219	3.13	1
	10	1221	3.00	1	1221	2.98	1
	11	1222	2.88	1	1222	2.87	1
	12	1223	2.78	1	1223	2.78	1
	13	1224	2.71	1	1224	2.72	1
	14	1225	2.66	1	1225	2.67	1
	15	1226	2.62	1	1226	2.64	1
	16	1227	2.60	1	1227	2.63	1
	17	1228	2.60	1	1228	2.62	1
	18	1229	2.60	1	1229	2.62	1
	19	1229	2.62	1	1229	2.64	1
	20	1231	2.65	2	1230	2.66	2
	21	1232	2.68	2	1231	2.69	2
B	22	1233	2.73	2	1232	2.73	2
	23	1234	2.79	2	1233	2.78	2
	24	1235	2.86	2	1234	2.84	2
	25	1236	2.94	2	1235	2.90	2
	26	1237	3.03	2	1236	2.98	2
	27	1238	3.13	3	1238	3.07	3
	28	1239	3.25	3	1239	3.17	3
	29	1240	3.39	3	1240	3.29	3
	30	1242	3.54	3	1241	3.43	3
	31	1243	3.71	3	1243	3.58	3
	32	1245	3.90	3	1244	3.76	3
	33	1246	4.11	3	1246	3.97	3
	34	1248	4.33	3	1248	4.20	3
	35	1250	4.57	4	1250	4.45	4
	36	1253	4.80	4	1252	4.71	4
	37	1255	5.02	4	1254	4.98	4
	38	1258	5.24	4	1257	5.23	4
	39	1261	5.48	4	1260	5.49	4
	40	1264	5.87	4	1263	5.89	4
	41	1268	6.67	4	1268	6.70	4
	42	1274	8.57	4	1274	8.69	4
	43	1285	14.38	4	1285	15.27	4
	44	1290	18.16	4	1290	18.89	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	22.30	1	1200	22.57	1
	1	1200	14.92	1	1200	14.69	1
	2	1200	9.05	1	1200	8.70	1
	3	1206	6.71	1	1206	6.41	1
	4	1210	5.43	1	1210	5.21	1
	5	1213	4.63	1	1212	4.46	1
	6	1215	4.09	1	1214	3.96	1
	7	1217	3.70	1	1216	3.61	1
	8	1218	3.41	1	1218	3.35	1
	9	1220	3.19	1	1219	3.15	1
	10	1221	3.02	1	1221	3.00	1
	11	1222	2.90	1	1222	2.89	1
	12	1223	2.80	1	1223	2.80	1
	13	1224	2.73	1	1224	2.74	1
	14	1225	2.67	1	1225	2.69	1
	15	1226	2.64	1	1226	2.66	1
	16	1227	2.62	1	1227	2.65	1
	17	1228	2.62	1	1228	2.64	1
	18	1229	2.63	1	1229	2.65	1
	19	1230	2.65	2	1229	2.67	1
	20	1231	2.68	2	1231	2.69	2
	21	1232	2.72	2	1232	2.72	2
C	22	1233	2.77	2	1233	2.77	2
	23	1234	2.83	2	1234	2.82	2
	24	1235	2.90	2	1235	2.88	2
	25	1236	2.99	2	1236	2.95	2
	26	1237	3.08	2	1237	3.03	2
	27	1238	3.19	3	1238	3.12	3
	28	1240	3.31	3	1239	3.23	3
	29	1241	3.45	3	1240	3.35	3
	30	1242	3.60	3	1242	3.49	3
	31	1244	3.77	3	1243	3.64	3
	32	1245	3.95	3	1245	3.82	3
	33	1247	4.15	3	1246	4.02	3
	34	1249	4.36	3	1248	4.24	3
	35	1251	4.58	4	1250	4.48	4
	36	1253	4.80	4	1252	4.73	4
	37	1256	5.01	4	1255	4.97	4
	38	1258	5.21	4	1258	5.21	4
	39	1261	5.47	4	1261	5.48	4
	40	1265	5.89	4	1264	5.91	4
	41	1269	6.76	4	1268	6.78	4
	42	1275	8.76	4	1274	8.90	4
	43	1286	14.76	4	1286	15.69	4
	44	1290	17.81	4	1290	18.50	4

Table L-7. Raw to Scaled Score Look-up Table—ELA Grade 11—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	20.28	1	1200	19.16	1
	1	1204	10.07	1	1203	10.16	1
	2	1212	6.39	1	1211	6.45	1
	3	1216	4.93	1	1215	5.00	1
	4	1218	4.12	1	1217	4.20	1
	5	1221	3.61	1	1219	3.68	1
	6	1222	3.25	1	1221	3.32	1
	7	1224	2.99	1	1223	3.05	1
	8	1225	2.80	1	1224	2.85	1
	9	1226	2.65	1	1225	2.69	1
	10	1227	2.53	1	1226	2.57	1
	11	1228	2.44	1	1227	2.47	1
	12	1229	2.36	1	1228	2.39	1
	13	1230	2.31	1	1229	2.32	1
	14	1231	2.27	1	1230	2.27	1
	15	1231	2.24	1	1230	2.24	1
	16	1232	2.22	1	1231	2.21	1
	17	1233	2.21	1	1232	2.19	1
	18	1234	2.20	1	1233	2.18	1
	19	1234	2.21	1	1233	2.18	1
	20	1235	2.22	1	1234	2.19	1
	21	1236	2.24	2	1235	2.20	1
A	22	1237	2.27	2	1236	2.23	2
	23	1237	2.30	2	1236	2.25	2
	24	1238	2.34	2	1237	2.29	2
	25	1239	2.39	2	1238	2.34	2
	26	1240	2.45	3	1239	2.39	2
	27	1241	2.51	3	1240	2.45	3
	28	1242	2.59	3	1240	2.53	3
	29	1242	2.68	3	1241	2.61	3
	30	1243	2.78	3	1242	2.71	3
	31	1245	2.90	3	1243	2.83	3
	32	1246	3.03	3	1244	2.97	3
	33	1247	3.19	3	1246	3.13	3
	34	1248	3.37	3	1247	3.33	3
	35	1250	3.59	3	1248	3.56	3
	36	1251	3.86	3	1250	3.85	3
	37	1253	4.17	3	1252	4.21	3
	38	1255	4.57	4	1254	4.65	3
	39	1258	5.06	4	1257	5.23	4
	40	1261	5.72	4	1260	5.98	4
	41	1265	6.65	4	1264	7.05	4
	42	1270	8.21	4	1270	8.86	4
	43	1279	12.04	4	1281	13.57	4
	44	1290	19.86	4	1290	20.30	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	20.17	1	1200	19.42	1
	1	1203	11.31	1	1202	10.77	1
	2	1211	7.21	1	1210	6.77	1
	3	1215	5.58	1	1214	5.23	1
	4	1218	4.69	1	1217	4.39	1
	5	1221	4.11	1	1220	3.85	1
	6	1223	3.71	1	1221	3.47	1
	7	1224	3.42	1	1223	3.19	1
	8	1226	3.19	1	1224	2.99	1
	9	1227	3.02	1	1225	2.82	1
	10	1228	2.88	1	1227	2.69	1
	11	1229	2.77	1	1228	2.59	1
	12	1230	2.68	1	1229	2.51	1
	13	1231	2.61	1	1229	2.45	1
	14	1232	2.56	1	1230	2.40	1
	15	1233	2.51	1	1231	2.36	1
	16	1234	2.48	1	1232	2.34	1
	17	1235	2.46	1	1233	2.32	1
	18	1236	2.45	2	1234	2.32	1
	19	1236	2.45	2	1234	2.32	1
	20	1237	2.46	2	1235	2.33	1
	21	1238	2.47	2	1236	2.35	2
B	22	1239	2.49	2	1237	2.37	2
	23	1240	2.53	3	1238	2.41	2
	24	1241	2.57	3	1238	2.45	2
	25	1241	2.62	3	1239	2.51	2
	26	1242	2.68	3	1240	2.57	3
	27	1243	2.75	3	1241	2.64	3
	28	1244	2.83	3	1242	2.73	3
	29	1245	2.93	3	1243	2.84	3
	30	1246	3.05	3	1244	2.96	3
	31	1248	3.18	3	1245	3.10	3
	32	1249	3.34	3	1247	3.28	3
	33	1250	3.53	3	1248	3.49	3
	34	1252	3.75	3	1250	3.74	3
	35	1254	4.02	3	1251	4.04	3
	36	1255	4.34	4	1253	4.42	3
	37	1258	4.73	4	1256	4.88	4
	38	1260	5.22	4	1259	5.46	4
	39	1263	5.84	4	1262	6.18	4
	40	1267	6.61	4	1266	7.05	4
	41	1272	7.59	4	1272	8.09	4
	42	1278	9.00	4	1279	9.53	4
	43	1288	12.31	4	1289	13.19	4
	44	1290	13.29	4	1290	13.63	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
	0	1200	21.22	1	1200	20.44	1
	1	1201	12.62	1	1202	11.58	1
	2	1210	7.87	1	1210	7.22	1
	3	1215	6.06	1	1215	5.59	1
	4	1218	5.07	1	1218	4.71	1
	5	1221	4.44	1	1220	4.15	1
	6	1223	4.01	1	1222	3.76	1
	7	1225	3.70	1	1224	3.48	1
	8	1226	3.46	1	1225	3.26	1
	9	1228	3.28	1	1227	3.09	1
	10	1229	3.13	1	1228	2.95	1
	11	1230	3.02	1	1229	2.84	1
	12	1231	2.93	1	1230	2.75	1
	13	1233	2.86	1	1231	2.68	1
	14	1234	2.80	1	1232	2.62	1
	15	1235	2.76	1	1233	2.58	1
	16	1236	2.72	2	1234	2.54	1
	17	1236	2.70	2	1235	2.51	1
	18	1237	2.69	2	1236	2.49	2
	19	1238	2.69	2	1237	2.48	2
	20	1239	2.70	2	1237	2.48	2
	21	1240	2.72	3	1238	2.49	2
C	22	1241	2.75	3	1239	2.51	2
	23	1242	2.80	3	1240	2.54	3
	24	1243	2.85	3	1241	2.58	3
	25	1244	2.92	3	1242	2.63	3
	26	1245	3.00	3	1243	2.70	3
	27	1246	3.10	3	1244	2.78	3
	28	1247	3.20	3	1245	2.89	3
	29	1249	3.33	3	1246	3.00	3
	30	1250	3.46	3	1247	3.15	3
	31	1251	3.62	3	1248	3.31	3
	32	1253	3.79	3	1250	3.50	3
	33	1254	3.99	3	1251	3.73	3
	34	1256	4.22	4	1253	3.99	3
	35	1258	4.48	4	1255	4.30	4
	36	1260	4.79	4	1257	4.66	4
	37	1263	5.16	4	1260	5.08	4
	38	1265	5.61	4	1262	5.59	4
	39	1269	6.16	4	1266	6.20	4
	40	1272	6.85	4	1270	6.93	4
	41	1277	7.83	4	1275	7.88	4
	42	1284	9.55	4	1281	9.43	4
	43	1290	11.94	4	1290	12.59	4
	44	1290	11.94	4	1290	12.59	4

Table L-8. Raw to Scaled Score Look-up Table—Mathematics Grade 3—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	29.82	1	1200	30.67	1
	1	1200	16.62	1	1200	21.61	1
	2	1207	9.81	1	1200	13.38	1
	3	1213	7.33	1	1209	9.10	1
	4	1217	6.00	1	1215	6.98	1
	5	1221	5.16	1	1219	5.75	1
	6	1223	4.58	1	1222	4.96	1
	7	1225	4.17	1	1224	4.42	1
	8	1227	3.86	1	1226	4.04	1
	9	1229	3.62	1	1228	3.75	1
	10	1230	3.44	1	1230	3.54	1
	11	1232	3.30	1	1231	3.39	1
	12	1233	3.20	1	1232	3.27	1
	13	1234	3.12	1	1234	3.19	1
	14	1236	3.07	2	1235	3.13	2
	15	1237	3.04	2	1236	3.11	2
	16	1238	3.04	2	1237	3.10	2
	17	1239	3.05	2	1239	3.12	2
	18	1240	3.08	2	1240	3.16	2
	19	1242	3.14	3	1241	3.23	2
	20	1243	3.21	3	1243	3.32	3
	21	1244	3.32	3	1244	3.44	3
	22	1246	3.45	3	1245	3.59	3
	23	1247	3.62	3	1247	3.77	3
	24	1249	3.83	3	1249	3.99	3
	25	1250	4.09	3	1250	4.26	3
	26	1252	4.41	3	1252	4.58	3
	27	1254	4.80	4	1255	4.97	4
	28	1257	5.28	4	1257	5.44	4
	29	1260	5.89	4	1260	6.02	4
	30	1263	6.67	4	1263	6.78	4
	31	1267	7.72	4	1268	7.82	4
	32	1273	9.29	4	1273	9.40	4
	33	1281	12.04	4	1282	12.27	4
	34	1290	19.38	4	1290	19.45	4
	35	1290	19.47	4	1290	19.45	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	25.07	1	1200	28.88	1
	1	1200	14.02	1	1200	18.69	1
	2	1208	9.33	1	1204	11.31	1
	3	1214	7.35	1	1212	8.37	1
	4	1218	6.22	1	1217	6.78	1
	5	1221	5.47	1	1220	5.79	1
	6	1224	4.93	1	1223	5.12	1
	7	1226	4.53	1	1226	4.63	1
	8	1228	4.22	1	1228	4.27	1
	9	1230	3.97	1	1230	3.99	1
	10	1231	3.78	1	1231	3.78	1
	11	1233	3.63	1	1233	3.62	1
	12	1234	3.51	1	1234	3.49	1
	13	1236	3.43	2	1236	3.41	2
	14	1237	3.36	2	1237	3.34	2
	15	1238	3.33	2	1238	3.31	2
	16	1239	3.31	2	1240	3.30	2
	17	1241	3.32	2	1241	3.32	2
	18	1242	3.34	3	1242	3.36	3
	19	1243	3.40	3	1244	3.43	3
	20	1245	3.47	3	1245	3.53	3
	21	1246	3.58	3	1247	3.67	3
	22	1247	3.71	3	1248	3.85	3
	23	1249	3.88	3	1250	4.07	3
	24	1251	4.08	3	1252	4.34	3
	25	1252	4.33	3	1254	4.66	4
	26	1254	4.63	4	1256	5.05	4
	27	1257	4.98	4	1258	5.50	4
	28	1259	5.41	4	1261	6.05	4
	29	1262	5.93	4	1265	6.73	4
	30	1265	6.60	4	1268	7.60	4
	31	1269	7.50	4	1273	8.79	4
	32	1274	8.80	4	1280	10.59	4
	33	1281	10.97	4	1289	13.85	4
	34	1290	15.93	4	1290	16.89	4
	35	1290	17.63	4	1290	16.89	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	28.44	1	1200	28.01	1
	1	1202	13.31	1	1200	15.87	1
	2	1212	8.78	1	1208	9.98	1
	3	1217	6.90	1	1215	7.55	1
	4	1221	5.83	1	1219	6.21	1
	5	1224	5.12	1	1223	5.36	1
	6	1226	4.62	1	1225	4.78	1
	7	1229	4.24	1	1228	4.36	1
	8	1230	3.95	1	1229	4.04	1
	9	1232	3.72	1	1231	3.79	1
	10	1234	3.54	1	1233	3.59	1
	11	1235	3.40	2	1234	3.44	1
	12	1236	3.29	2	1236	3.32	2
	13	1238	3.22	2	1237	3.24	2
	14	1239	3.17	2	1238	3.18	2
	15	1240	3.15	2	1240	3.14	2
	16	1241	3.15	2	1241	3.13	2
	17	1243	3.17	3	1242	3.14	3
	18	1244	3.22	3	1243	3.18	3
	19	1245	3.29	3	1245	3.24	3
	20	1246	3.37	3	1246	3.33	3
	21	1248	3.49	3	1247	3.44	3
	22	1249	3.62	3	1249	3.59	3
	23	1251	3.78	3	1250	3.77	3
	24	1252	3.97	3	1252	3.99	3
	25	1254	4.19	4	1253	4.26	3
	26	1256	4.45	4	1256	4.58	4
	27	1258	4.75	4	1258	4.96	4
	28	1260	5.12	4	1260	5.42	4
	29	1263	5.57	4	1263	5.99	4
	30	1266	6.16	4	1267	6.72	4
	31	1269	6.95	4	1271	7.69	4
	32	1274	8.13	4	1276	9.12	4
	33	1280	10.12	4	1283	11.51	4
	34	1290	14.72	4	1290	16.87	4
	35	1290	17.39	4	1290	16.87	4

Table L-9. Raw to Scaled Score Look-up Table—Mathematics Grade 4—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	28.31	1	1200	31.98	1
	1	1200	20.78	1	1200	22.34	1
	2	1200	14.12	1	1200	14.08	1
	3	1204	10.28	1	1207	9.83	1
	4	1211	8.16	1	1213	7.60	1
	5	1215	6.85	1	1217	6.26	1
	6	1219	5.97	1	1221	5.38	1
	7	1222	5.35	1	1224	4.77	1
	8	1224	4.89	1	1226	4.32	1
	9	1226	4.54	1	1228	3.98	1
	10	1228	4.27	1	1230	3.73	1
	11	1230	4.06	1	1231	3.53	1
	12	1232	3.91	2	1233	3.39	2
	13	1233	3.79	2	1234	3.28	2
	14	1235	3.71	2	1235	3.21	2
	15	1236	3.67	2	1237	3.17	2
	16	1238	3.65	2	1238	3.15	2
	17	1239	3.65	3	1239	3.16	3
	18	1241	3.69	3	1241	3.20	3
	19	1242	3.75	3	1242	3.27	3
	20	1244	3.83	3	1243	3.37	3
	21	1245	3.94	3	1245	3.50	3
	22	1247	4.09	3	1246	3.67	3
	23	1249	4.27	3	1248	3.89	3
	24	1251	4.49	4	1250	4.18	3
	25	1253	4.76	4	1252	4.56	4
	26	1255	5.09	4	1254	5.05	4
	27	1258	5.51	4	1257	5.70	4
	28	1261	6.05	4	1261	6.60	4
	29	1264	6.77	4	1265	7.86	4
	30	1268	7.78	4	1271	9.74	4
	31	1273	9.31	4	1279	12.74	4
	32	1281	11.88	4	1290	18.30	4
	33	1290	16.84	4	1290	18.41	4
	34	1290	16.92	4	1290	18.41	4
	35	1290	16.92	4	-	-	-

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	38.43	1	1200	29.34	1
	1	1200	27.04	1	1200	21.22	1
	2	1200	17.38	1	1200	14.19	1
	3	1203	11.21	1	1204	10.27	1
	4	1210	8.48	1	1211	8.15	1
	5	1215	6.96	1	1215	6.85	1
	6	1218	6.00	1	1219	5.97	1
	7	1221	5.35	1	1222	5.34	1
	8	1224	4.87	1	1224	4.87	1
	9	1226	4.52	1	1227	4.51	1
	10	1228	4.25	1	1228	4.24	1
	11	1230	4.05	1	1230	4.03	1
	12	1232	3.89	2	1232	3.87	2
	13	1233	3.78	2	1234	3.75	2
	14	1235	3.71	2	1235	3.67	2
	15	1236	3.67	2	1237	3.62	2
	16	1238	3.66	2	1238	3.60	2
	17	1239	3.67	3	1239	3.61	3
	18	1241	3.71	3	1241	3.65	3
	19	1242	3.78	3	1242	3.71	3
	20	1244	3.88	3	1244	3.81	3
	21	1245	4.01	3	1245	3.93	3
	22	1247	4.17	3	1247	4.10	3
	23	1249	4.38	3	1249	4.30	3
	24	1251	4.63	4	1251	4.56	4
	25	1253	4.94	4	1253	4.89	4
	26	1255	5.32	4	1255	5.30	4
	27	1258	5.81	4	1258	5.82	4
	28	1261	6.45	4	1261	6.50	4
	29	1265	7.30	4	1265	7.42	4
	30	1269	8.48	4	1270	8.73	4
	31	1275	10.24	4	1276	10.71	4
	32	1283	13.08	4	1285	13.98	4
	33	1290	16.70	4	1290	17.15	4
	34	1290	16.70	4	1290	17.15	4
	35	1290	16.70	4	1290	17.15	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	32.27	1	1200	28.20	1
	1	1200	19.38	1	1200	18.14	1
	2	1203	11.67	1	1202	11.63	1
	3	1211	8.83	1	1210	8.97	1
	4	1216	7.36	1	1215	7.52	1
	5	1220	6.45	1	1219	6.59	1
	6	1223	5.83	1	1222	5.95	1
	7	1226	5.39	1	1225	5.48	1
	8	1228	5.04	1	1228	5.10	1
	9	1230	4.76	1	1230	4.79	1
	10	1232	4.53	2	1232	4.53	2
	11	1234	4.33	2	1234	4.29	2
	12	1236	4.15	2	1236	4.07	2
	13	1238	3.99	2	1237	3.89	2
	14	1239	3.86	3	1239	3.72	3
	15	1241	3.75	3	1240	3.59	3
	16	1242	3.67	3	1242	3.48	3
	17	1244	3.63	3	1243	3.41	3
	18	1245	3.62	3	1245	3.38	3
	19	1247	3.66	3	1246	3.38	3
	20	1248	3.75	3	1247	3.43	3
	21	1250	3.88	3	1249	3.52	3
	22	1251	4.06	4	1250	3.65	3
	23	1253	4.29	4	1252	3.83	4
	24	1255	4.56	4	1253	4.05	4
	25	1257	4.87	4	1255	4.31	4
	26	1259	5.23	4	1257	4.63	4
	27	1262	5.65	4	1259	4.99	4
	28	1265	6.16	4	1262	5.42	4
	29	1268	6.79	4	1264	5.95	4
	30	1272	7.63	4	1268	6.63	4
	31	1276	8.82	4	1272	7.56	4
	32	1283	10.73	4	1277	8.99	4
	33	1290	14.30	4	1284	11.58	4
	34	1290	14.30	4	1290	15.05	4
	35	1290	14.30	4	1290	15.05	4

Table L-10. Raw to Scaled Score Look-up Table—Mathematics Grade 5—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	26.36	1	1200	39.66	1
	1	1200	18.63	1	1200	29.52	1
	2	1200	12.29	1	1200	20.61	1
	3	1207	9.22	1	1200	12.98	1
	4	1212	7.51	1	1207	9.32	1
	5	1216	6.43	1	1213	7.42	1
	6	1219	5.70	1	1217	6.28	1
	7	1222	5.18	1	1220	5.54	1
	8	1224	4.82	1	1223	5.04	1
	9	1227	4.55	1	1225	4.69	1
	10	1228	4.36	1	1227	4.44	1
	11	1230	4.22	1	1229	4.26	1
	12	1232	4.14	2	1231	4.15	1
	13	1234	4.08	2	1233	4.07	2
	14	1235	4.06	2	1235	4.04	2
	15	1237	4.06	2	1236	4.03	2
	16	1239	4.09	2	1238	4.05	2
	17	1240	4.13	3	1239	4.09	2
	18	1242	4.18	3	1241	4.15	3
	19	1244	4.25	3	1243	4.23	3
	20	1245	4.33	3	1245	4.33	3
	21	1247	4.44	3	1247	4.46	3
	22	1249	4.56	3	1248	4.60	3
	23	1251	4.72	3	1250	4.78	3
	24	1253	4.92	4	1253	4.99	4
	25	1255	5.18	4	1255	5.25	4
	26	1258	5.52	4	1257	5.57	4
	27	1261	5.97	4	1260	5.99	4
	28	1264	6.56	4	1263	6.54	4
	29	1267	7.37	4	1267	7.32	4
	30	1272	8.49	4	1272	8.46	4
	31	1277	10.07	4	1278	10.28	4
	32	1285	12.50	4	1287	13.59	4
	33	1290	15.74	4	1290	16.75	4
	34	1290	15.74	4	1290	16.75	4
	35	1290	15.74	4	1290	16.75	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	25.92	1	1200	33.68	1
	1	1200	18.60	1	1200	22.93	1
	2	1200	12.75	1	1200	14.69	1
	3	1206	9.91	1	1206	10.69	1
	4	1212	8.35	1	1213	8.71	1
	5	1216	7.36	1	1218	7.51	1
	6	1220	6.67	1	1222	6.71	1
	7	1223	6.17	1	1225	6.14	1
	8	1226	5.79	1	1228	5.72	1
	9	1228	5.49	1	1230	5.39	1
	10	1231	5.25	1	1232	5.14	2
	11	1233	5.06	2	1235	4.95	2
	12	1235	4.90	2	1237	4.79	2
	13	1237	4.76	2	1238	4.68	2
	14	1239	4.66	2	1240	4.59	3
	15	1240	4.57	3	1242	4.53	3
	16	1242	4.50	3	1244	4.49	3
	17	1244	4.46	3	1246	4.48	3
	18	1246	4.44	3	1247	4.50	3
	19	1247	4.44	3	1249	4.54	3
	20	1249	4.47	3	1251	4.60	3
	21	1251	4.53	3	1253	4.70	4
	22	1253	4.63	4	1255	4.83	4
	23	1254	4.78	4	1257	5.01	4
	24	1256	4.97	4	1259	5.23	4
	25	1259	5.23	4	1261	5.51	4
	26	1261	5.56	4	1264	5.86	4
	27	1264	5.98	4	1266	6.32	4
	28	1267	6.52	4	1270	6.91	4
	29	1270	7.23	4	1273	7.70	4
	30	1274	8.18	4	1278	8.79	4
	31	1279	9.54	4	1284	10.39	4
	32	1286	11.67	4	1290	13.04	4
	33	1290	14.40	4	1290	13.72	4
	34	1290	14.40	4	1290	13.72	4
	35	1290	14.40	4	1290	13.72	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	28.67	1	1200	29.92	1
	1	1200	17.16	1	1200	17.80	1
	2	1205	11.28	1	1205	11.36	1
	3	1213	8.86	1	1213	8.83	1
	4	1218	7.51	1	1218	7.44	1
	5	1222	6.64	1	1222	6.55	1
	6	1225	6.03	1	1225	5.93	1
	7	1228	5.57	1	1228	5.47	1
	8	1231	5.22	1	1230	5.12	1
	9	1233	4.94	2	1232	4.84	2
	10	1235	4.71	2	1234	4.62	2
	11	1237	4.53	2	1236	4.45	2
	12	1239	4.38	2	1238	4.30	2
	13	1240	4.25	3	1239	4.19	2
	14	1242	4.16	3	1241	4.11	3
	15	1244	4.09	3	1243	4.05	3
	16	1245	4.04	3	1245	4.01	3
	17	1247	4.01	3	1246	4.00	3
	18	1248	4.00	3	1248	4.00	3
	19	1250	4.02	3	1249	4.03	3
	20	1251	4.06	3	1251	4.07	3
	21	1253	4.12	4	1252	4.14	3
	22	1254	4.21	4	1254	4.24	4
	23	1256	4.33	4	1256	4.36	4
	24	1258	4.49	4	1257	4.51	4
	25	1260	4.70	4	1259	4.71	4
	26	1262	4.96	4	1261	4.96	4
	27	1264	5.30	4	1264	5.27	4
	28	1267	5.73	4	1266	5.67	4
	29	1270	6.29	4	1269	6.19	4
	30	1273	7.05	4	1273	6.90	4
	31	1278	8.12	4	1277	7.91	4
	32	1283	9.77	4	1282	9.47	4
	33	1290	12.69	4	1290	12.26	4
	34	1290	13.54	4	1290	13.70	4
	35	1290	13.54	4	1290	13.70	4

Table L-11. Raw to Scaled Score Look-up Table—Mathematics Grade 6—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	24.61	1	1200	23.83	1
	1	1201	10.51	1	1200	16.02	1
	2	1209	7.18	1	1201	9.97	1
	3	1213	5.77	1	1208	7.55	1
	4	1217	4.97	1	1212	6.25	1
	5	1219	4.45	1	1215	5.44	1
	6	1221	4.08	1	1218	4.88	1
	7	1223	3.81	1	1220	4.48	1
	8	1225	3.61	1	1222	4.19	1
	9	1226	3.46	1	1224	3.96	1
	10	1227	3.35	1	1226	3.79	1
	11	1229	3.26	1	1227	3.66	1
	12	1230	3.20	1	1228	3.57	1
	13	1231	3.16	1	1230	3.50	1
	14	1232	3.14	1	1231	3.46	1
	15	1234	3.14	2	1232	3.44	1
	16	1235	3.15	2	1234	3.44	2
	17	1236	3.17	2	1235	3.45	2
	18	1237	3.21	2	1236	3.49	2
	19	1238	3.26	2	1238	3.54	2
	20	1239	3.33	3	1239	3.61	3
	21	1241	3.41	3	1240	3.70	3
	22	1242	3.50	3	1242	3.81	3
	23	1243	3.62	3	1243	3.94	3
	24	1245	3.75	3	1245	4.10	3
	25	1246	3.90	3	1247	4.29	3
	26	1248	4.08	3	1249	4.52	3
	27	1250	4.30	3	1251	4.80	4
	28	1252	4.57	4	1253	5.16	4
	29	1254	4.91	4	1256	5.62	4
	30	1256	5.36	4	1259	6.23	4
	31	1260	5.97	4	1262	7.10	4
	32	1263	6.90	4	1267	8.45	4
	33	1269	8.49	4	1274	10.91	4
	34	1278	12.21	4	1287	17.30	4
	35	1290	22.55	4	1290	20.61	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	24.69	1	1200	26.41	1
	1	1202	10.48	1	1200	13.62	1
	2	1210	7.32	1	1206	8.69	1
	3	1214	5.97	1	1212	6.82	1
	4	1217	5.21	1	1216	5.80	1
	5	1220	4.71	1	1219	5.16	1
	6	1222	4.35	1	1221	4.72	1
	7	1224	4.10	1	1223	4.39	1
	8	1226	3.90	1	1225	4.15	1
	9	1228	3.75	1	1227	3.96	1
	10	1229	3.62	1	1229	3.81	1
	11	1230	3.53	1	1230	3.69	1
	12	1232	3.45	1	1232	3.60	1
	13	1233	3.39	2	1233	3.53	2
	14	1234	3.35	2	1234	3.48	2
	15	1236	3.31	2	1236	3.44	2
	16	1237	3.29	2	1237	3.42	2
	17	1238	3.28	2	1238	3.42	2
	18	1239	3.28	3	1239	3.42	3
	19	1240	3.29	3	1241	3.44	3
	20	1242	3.32	3	1242	3.48	3
	21	1243	3.35	3	1243	3.53	3
	22	1244	3.40	3	1245	3.61	3
	23	1245	3.47	3	1246	3.70	3
	24	1247	3.55	3	1248	3.82	3
	25	1248	3.66	3	1249	3.97	3
	26	1250	3.80	3	1251	4.16	4
	27	1251	3.97	4	1253	4.41	4
	28	1253	4.19	4	1255	4.72	4
	29	1255	4.47	4	1257	5.15	4
	30	1257	4.85	4	1260	5.73	4
	31	1260	5.39	4	1264	6.58	4
	32	1263	6.20	4	1268	7.95	4
	33	1268	7.60	4	1275	10.50	4
	34	1276	10.85	4	1288	17.23	4
	35	1290	23.32	4	1290	19.89	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	27.61	1	1200	28.17	1
	1	1205	10.36	1	1203	11.19	1
	2	1212	7.26	1	1211	7.61	1
	3	1217	5.94	1	1216	6.15	1
	4	1220	5.18	1	1219	5.33	1
	5	1223	4.68	1	1222	4.79	1
	6	1225	4.33	1	1224	4.41	1
	7	1227	4.05	1	1226	4.13	1
	8	1229	3.84	1	1228	3.91	1
	9	1230	3.67	1	1230	3.73	1
	10	1232	3.53	1	1232	3.59	1
	11	1233	3.42	2	1233	3.47	2
	12	1235	3.32	2	1234	3.38	2
	13	1236	3.25	2	1236	3.30	2
	14	1237	3.19	2	1237	3.24	2
	15	1238	3.14	2	1238	3.19	2
	16	1239	3.10	3	1239	3.16	3
	17	1240	3.08	3	1241	3.14	3
	18	1242	3.07	3	1242	3.13	3
	19	1243	3.07	3	1243	3.14	3
	20	1244	3.08	3	1244	3.16	3
	21	1245	3.10	3	1245	3.19	3
	22	1246	3.14	3	1247	3.24	3
	23	1247	3.20	3	1248	3.31	3
	24	1249	3.28	3	1249	3.41	3
	25	1250	3.37	3	1251	3.53	4
	26	1251	3.50	4	1252	3.68	4
	27	1253	3.66	4	1254	3.88	4
	28	1255	3.87	4	1256	4.15	4
	29	1256	4.15	4	1258	4.50	4
	30	1259	4.52	4	1260	4.98	4
	31	1261	5.05	4	1263	5.68	4
	32	1264	5.85	4	1267	6.78	4
	33	1269	7.25	4	1273	8.79	4
	34	1277	10.57	4	1283	13.89	4
	35	1290	22.64	4	1290	20.13	4

Table L-12. Raw to Scaled Score Look-up Table—Mathematics Grade 7—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	24.86	1	1200	23.97	1
	1	1201	11.43	1	1200	15.86	1
	2	1210	7.68	1	1203	9.79	1
	3	1214	6.15	1	1209	7.44	1
	4	1218	5.29	1	1214	6.19	1
	5	1221	4.73	1	1217	5.43	1
	6	1223	4.34	1	1220	4.92	1
	7	1225	4.06	1	1222	4.56	1
	8	1227	3.84	1	1224	4.30	1
	9	1228	3.68	1	1226	4.12	1
	10	1230	3.55	1	1227	3.98	1
	11	1231	3.45	1	1229	3.88	1
	12	1232	3.38	1	1231	3.81	1
	13	1234	3.33	2	1232	3.77	1
	14	1235	3.30	2	1233	3.74	1
	15	1236	3.29	2	1235	3.73	2
	16	1237	3.30	2	1236	3.74	2
	17	1239	3.32	2	1238	3.76	2
	18	1239	3.36	2	1239	3.80	2
	19	1241	3.41	3	1241	3.85	3
	20	1242	3.48	3	1242	3.92	3
	21	1244	3.57	3	1244	4.01	3
	22	1245	3.67	3	1245	4.12	3
	23	1247	3.79	3	1247	4.25	3
	24	1248	3.94	3	1249	4.42	3
	25	1250	4.11	3	1250	4.62	3
	26	1251	4.31	3	1252	4.88	3
	27	1254	4.55	4	1255	5.19	4
	28	1255	4.86	4	1257	5.60	4
	29	1258	5.24	4	1260	6.13	4
	30	1261	5.75	4	1264	6.86	4
	31	1264	6.46	4	1268	7.91	4
	32	1268	7.54	4	1274	9.60	4
	33	1274	9.42	4	1282	12.78	4
	34	1284	13.87	4	1290	19.26	4
	35	1290	20.52	4	1290	19.26	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	26.00	1	1200	27.45	1
	1	1202	12.20	1	1200	17.41	1
	2	1211	8.29	1	1204	10.54	1
	3	1216	6.67	1	1211	8.00	1
	4	1219	5.76	1	1216	6.66	1
	5	1222	5.17	1	1219	5.83	1
	6	1225	4.77	1	1222	5.27	1
	7	1227	4.47	1	1225	4.87	1
	8	1229	4.24	1	1227	4.57	1
	9	1230	4.07	1	1229	4.34	1
	10	1232	3.93	1	1231	4.17	1
	11	1233	3.82	1	1232	4.03	1
	12	1235	3.74	2	1234	3.93	2
	13	1236	3.68	2	1235	3.85	2
	14	1238	3.64	2	1237	3.79	2
	15	1239	3.61	2	1238	3.75	2
	16	1240	3.59	3	1239	3.73	2
	17	1242	3.59	3	1241	3.73	3
	18	1243	3.60	3	1242	3.74	3
	19	1244	3.63	3	1244	3.77	3
	20	1245	3.67	3	1245	3.81	3
	21	1247	3.72	3	1246	3.87	3
	22	1248	3.79	3	1248	3.96	3
	23	1250	3.88	3	1250	4.07	3
	24	1251	3.99	3	1251	4.21	3
	25	1253	4.14	3	1253	4.38	3
	26	1254	4.31	4	1255	4.61	4
	27	1256	4.53	4	1257	4.90	4
	28	1258	4.81	4	1259	5.27	4
	29	1261	5.17	4	1262	5.79	4
	30	1263	5.66	4	1265	6.51	4
	31	1267	6.34	4	1270	7.61	4
	32	1271	7.38	4	1275	9.48	4
	33	1276	9.21	4	1284	13.42	4
	34	1286	13.56	4	1290	19.34	4
	35	1290	18.85	4	1290	19.34	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	29.75	1	1200	27.38	1
	1	1207	10.69	1	1201	13.17	1
	2	1215	7.44	1	1211	8.76	1
	3	1220	6.08	1	1217	6.94	1
	4	1223	5.30	1	1221	5.92	1
	5	1226	4.78	1	1224	5.26	1
	6	1228	4.41	1	1226	4.80	1
	7	1230	4.12	1	1229	4.45	1
	8	1232	3.90	1	1230	4.18	1
	9	1233	3.71	1	1232	3.96	1
	10	1235	3.56	2	1234	3.77	2
	11	1236	3.44	2	1235	3.62	2
	12	1237	3.34	2	1237	3.50	2
	13	1239	3.26	2	1238	3.40	2
	14	1239	3.19	2	1239	3.32	2
	15	1241	3.15	3	1241	3.26	3
	16	1242	3.12	3	1242	3.23	3
	17	1243	3.11	3	1243	3.21	3
	18	1245	3.12	3	1244	3.21	3
	19	1246	3.14	3	1245	3.23	3
	20	1247	3.18	3	1247	3.27	3
	21	1248	3.23	3	1248	3.32	3
	22	1249	3.30	3	1249	3.40	3
	23	1251	3.39	3	1251	3.49	3
	24	1252	3.50	3	1252	3.61	3
	25	1254	3.64	4	1254	3.75	4
	26	1255	3.80	4	1255	3.93	4
	27	1256	4.01	4	1257	4.16	4
	28	1258	4.27	4	1259	4.44	4
	29	1260	4.60	4	1261	4.80	4
	30	1263	5.04	4	1263	5.29	4
	31	1266	5.65	4	1266	5.97	4
	32	1269	6.57	4	1270	7.00	4
	33	1274	8.15	4	1276	8.79	4
	34	1283	11.86	4	1286	13.06	4
	35	1290	19.59	4	1290	18.91	4

Table L-13. Raw to Scaled Score Look-up Table—Mathematics Grade 8—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	29.54	1	1200	36.30	1
	1	1200	18.01	1	1200	21.11	1
	2	1204	10.24	1	1203	10.98	1
	3	1210	7.53	1	1210	7.68	1
	4	1215	6.14	1	1215	6.11	1
	5	1218	5.30	1	1218	5.19	1
	6	1221	4.73	1	1221	4.60	1
	7	1223	4.33	1	1223	4.20	1
	8	1225	4.05	1	1225	3.92	1
	9	1227	3.84	1	1227	3.72	1
	10	1228	3.68	1	1228	3.58	1
	11	1230	3.57	1	1230	3.49	1
	12	1231	3.50	1	1231	3.43	1
	13	1233	3.45	1	1232	3.40	1
	14	1234	3.42	2	1233	3.39	1
	15	1235	3.41	2	1235	3.40	2
	16	1237	3.41	2	1236	3.43	2
	17	1238	3.43	2	1238	3.47	2
	18	1239	3.45	2	1239	3.52	2
	19	1241	3.49	3	1240	3.58	3
	20	1242	3.54	3	1242	3.65	3
	21	1243	3.60	3	1243	3.73	3
	22	1245	3.67	3	1245	3.83	3
	23	1246	3.77	3	1246	3.95	3
	24	1248	3.89	3	1248	4.09	3
	25	1250	4.04	3	1250	4.25	3
	26	1251	4.23	4	1251	4.46	4
	27	1253	4.47	4	1253	4.72	4
	28	1255	4.79	4	1256	5.04	4
	29	1258	5.23	4	1258	5.48	4
	30	1261	5.84	4	1261	6.08	4
	31	1264	6.75	4	1265	6.96	4
	32	1269	8.23	4	1270	8.40	4
	33	1277	11.08	4	1277	11.24	4
	34	1290	19.52	4	1290	20.63	4
	35	1290	21.60	4	1290	21.44	4

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	34.08	1	1200	32.16	1
	1	1200	17.17	1	1200	15.54	1
	2	1207	9.83	1	1207	9.42	1
	3	1214	7.39	1	1214	7.26	1
	4	1218	6.13	1	1218	6.11	1
	5	1221	5.36	1	1221	5.39	1
	6	1224	4.84	1	1224	4.89	1
	7	1226	4.46	1	1226	4.53	1
	8	1228	4.18	1	1228	4.25	1
	9	1230	3.97	1	1230	4.04	1
	10	1231	3.80	1	1231	3.88	1
	11	1233	3.67	1	1233	3.75	1
	12	1234	3.57	2	1234	3.66	2
	13	1236	3.49	2	1236	3.58	2
	14	1237	3.43	2	1237	3.53	2
	15	1238	3.40	2	1238	3.49	2
	16	1240	3.37	3	1239	3.48	2
	17	1241	3.37	3	1241	3.47	3
	18	1242	3.37	3	1242	3.49	3
	19	1243	3.39	3	1243	3.51	3
	20	1245	3.42	3	1245	3.55	3
	21	1246	3.47	3	1246	3.61	3
	22	1247	3.54	3	1247	3.68	3
	23	1249	3.62	3	1249	3.77	3
	24	1250	3.73	3	1250	3.89	3
	25	1252	3.87	4	1252	4.04	4
	26	1253	4.04	4	1253	4.22	4
	27	1255	4.27	4	1255	4.44	4
	28	1257	4.55	4	1257	4.74	4
	29	1259	4.94	4	1260	5.12	4
	30	1262	5.47	4	1262	5.64	4
	31	1265	6.25	4	1266	6.39	4
	32	1270	7.51	4	1270	7.58	4
	33	1276	9.95	4	1276	9.81	4
	34	1290	17.48	4	1289	16.35	4
	35	1290	21.11	4	1290	20.29	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	27.98	1	1200	27.99	1
	1	1200	13.79	1	1200	13.60	1
	2	1209	9.07	1	1209	8.88	1
	3	1215	7.15	1	1215	6.98	1
	4	1219	6.09	1	1219	5.92	1
	5	1222	5.40	1	1222	5.25	1
	6	1225	4.93	1	1224	4.78	1
	7	1227	4.58	1	1226	4.43	1
	8	1229	4.32	1	1228	4.17	1
	9	1231	4.11	1	1230	3.97	1
	10	1233	3.94	1	1232	3.81	1
	11	1234	3.81	2	1233	3.69	1
	12	1236	3.71	2	1235	3.59	2
	13	1237	3.62	2	1236	3.52	2
	14	1239	3.55	2	1237	3.46	2
	15	1240	3.50	3	1239	3.42	2
	16	1241	3.47	3	1240	3.40	3
	17	1242	3.45	3	1241	3.39	3
	18	1244	3.45	3	1242	3.40	3
	19	1245	3.46	3	1244	3.42	3
	20	1246	3.49	3	1245	3.46	3
	21	1248	3.54	3	1246	3.51	3
	22	1249	3.61	3	1248	3.58	3
	23	1250	3.70	3	1249	3.67	3
	24	1252	3.82	4	1251	3.78	4
	25	1253	3.98	4	1252	3.93	4
	26	1255	4.17	4	1254	4.11	4
	27	1257	4.42	4	1256	4.34	4
	28	1259	4.74	4	1258	4.62	4
	29	1261	5.16	4	1260	5.00	4
	30	1264	5.73	4	1262	5.50	4
	31	1268	6.54	4	1266	6.19	4
	32	1272	7.79	4	1270	7.25	4
	33	1279	10.01	4	1275	9.09	4
	34	1290	15.45	4	1285	13.50	4
	35	1290	18.01	4	1290	19.31	4

Table L-14. Raw to Scaled Score Look-up Table—Mathematics Grade 11—2018-present

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
A	0	1200	30.27	1	1200	31.31	1
	1	1204	12.12	1	1200	15.59	1
	2	1213	7.94	1	1209	9.66	1
	3	1218	6.13	1	1216	7.21	1
	4	1222	5.08	1	1220	5.80	1
	5	1224	4.38	1	1223	4.89	1
	6	1226	3.89	1	1226	4.26	1
	7	1228	3.53	1	1228	3.80	1
	8	1230	3.26	1	1229	3.47	1
	9	1231	3.06	1	1231	3.23	1
	10	1233	2.92	1	1232	3.06	1
	11	1234	2.82	1	1234	2.95	1
	12	1235	2.75	2	1235	2.87	2
	13	1236	2.70	2	1236	2.83	2
	14	1237	2.68	2	1237	2.81	2
	15	1238	2.67	2	1238	2.81	2
	16	1239	2.68	2	1239	2.83	2
	17	1240	2.70	3	1240	2.86	3
	18	1241	2.73	3	1242	2.90	3
	19	1242	2.77	3	1243	2.96	3
	20	1243	2.82	3	1244	3.04	3
	21	1244	2.89	3	1245	3.14	3
	22	1245	2.97	3	1246	3.26	3
	23	1247	3.08	3	1248	3.41	3
	24	1248	3.21	3	1249	3.59	3
	25	1249	3.37	3	1251	3.82	4
	26	1251	3.57	4	1253	4.11	4
	27	1252	3.82	4	1255	4.48	4
	28	1254	4.14	4	1257	4.96	4
	29	1256	4.56	4	1260	5.59	4
	30	1259	5.11	4	1263	6.47	4
	31	1262	5.89	4	1268	7.75	4
	32	1266	7.06	4	1274	9.80	4
	33	1272	9.12	4	1283	13.71	4
	34	1283	14.06	4	1290	19.57	4
	35	1290	22.12	4	1290	19.57	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
B	0	1200	32.43	1	1200	37.59	1
	1	1207	11.38	1	1201	15.54	1
	2	1215	7.64	1	1212	9.29	1
	3	1220	6.05	1	1218	6.96	1
	4	1223	5.13	1	1223	5.70	1
	5	1226	4.54	1	1226	4.91	1
	6	1228	4.11	1	1228	4.38	1
	7	1230	3.80	1	1230	3.99	1
	8	1232	3.56	1	1232	3.71	1
	9	1233	3.37	1	1233	3.50	1
	10	1235	3.22	2	1235	3.33	2
	11	1236	3.11	2	1236	3.21	2
	12	1237	3.02	2	1237	3.11	2
	13	1238	2.96	2	1239	3.04	2
	14	1239	2.91	2	1240	3.00	3
	15	1240	2.88	3	1241	2.97	3
	16	1242	2.87	3	1242	2.96	3
	17	1243	2.87	3	1243	2.96	3
	18	1244	2.88	3	1244	2.98	3
	19	1245	2.91	3	1245	3.02	3
	20	1246	2.96	3	1247	3.08	3
	21	1247	3.02	3	1248	3.15	3
	22	1248	3.10	3	1249	3.25	3
	23	1249	3.20	3	1250	3.37	4
	24	1251	3.32	4	1252	3.52	4
	25	1252	3.48	4	1253	3.72	4
	26	1253	3.66	4	1255	3.96	4
	27	1255	3.90	4	1257	4.28	4
	28	1257	4.19	4	1259	4.69	4
	29	1259	4.57	4	1262	5.24	4
	30	1262	5.08	4	1265	6.04	4
	31	1265	5.78	4	1269	7.24	4
	32	1268	6.85	4	1275	9.30	4
	33	1274	8.71	4	1284	13.55	4
	34	1284	13.11	4	1290	19.50	4
	35	1290	20.12	4	1290	19.50	4

continued

Path	Raw Score	2019			2018		
		Scaled Score	Standard Error	Performance Level	Scaled Score	Standard Error	Performance Level
C	0	1200	35.49	1	1200	36.86	1
	1	1209	11.54	1	1208	12.28	1
	2	1217	7.65	1	1217	7.93	1
	3	1222	6.00	1	1222	6.12	1
	4	1225	5.05	1	1226	5.11	1
	5	1228	4.43	1	1228	4.46	1
	6	1230	3.99	1	1230	4.01	1
	7	1232	3.66	1	1232	3.67	1
	8	1234	3.41	1	1234	3.42	1
	9	1235	3.22	2	1235	3.22	2
	10	1237	3.06	2	1237	3.06	2
	11	1238	2.93	2	1238	2.93	2
	12	1239	2.83	2	1239	2.83	2
	13	1240	2.75	3	1240	2.75	3
	14	1241	2.69	3	1241	2.69	3
	15	1242	2.64	3	1242	2.65	3
	16	1243	2.62	3	1243	2.62	3
	17	1244	2.61	3	1244	2.61	3
	18	1245	2.61	3	1245	2.61	3
	19	1246	2.64	3	1246	2.64	3
	20	1247	2.67	3	1247	2.67	3
	21	1248	2.73	3	1248	2.73	3
	22	1249	2.80	3	1249	2.80	3
	23	1250	2.89	4	1250	2.89	4
	24	1251	3.01	4	1252	3.01	4
	25	1253	3.15	4	1253	3.15	4
	26	1254	3.33	4	1254	3.32	4
	27	1256	3.55	4	1256	3.55	4
	28	1257	3.82	4	1258	3.83	4
	29	1259	4.18	4	1260	4.20	4
	30	1262	4.66	4	1262	4.71	4
	31	1264	5.35	4	1265	5.45	4
	32	1268	6.42	4	1269	6.64	4
	33	1273	8.32	4	1274	8.83	4
	34	1283	12.87	4	1285	14.43	4
	35	1290	20.64	4	1290	20.75	4

APPENDIX M—SCORE DISTRIBUTIONS

Figure M-1. Performance Level Distributions Graph—ELA

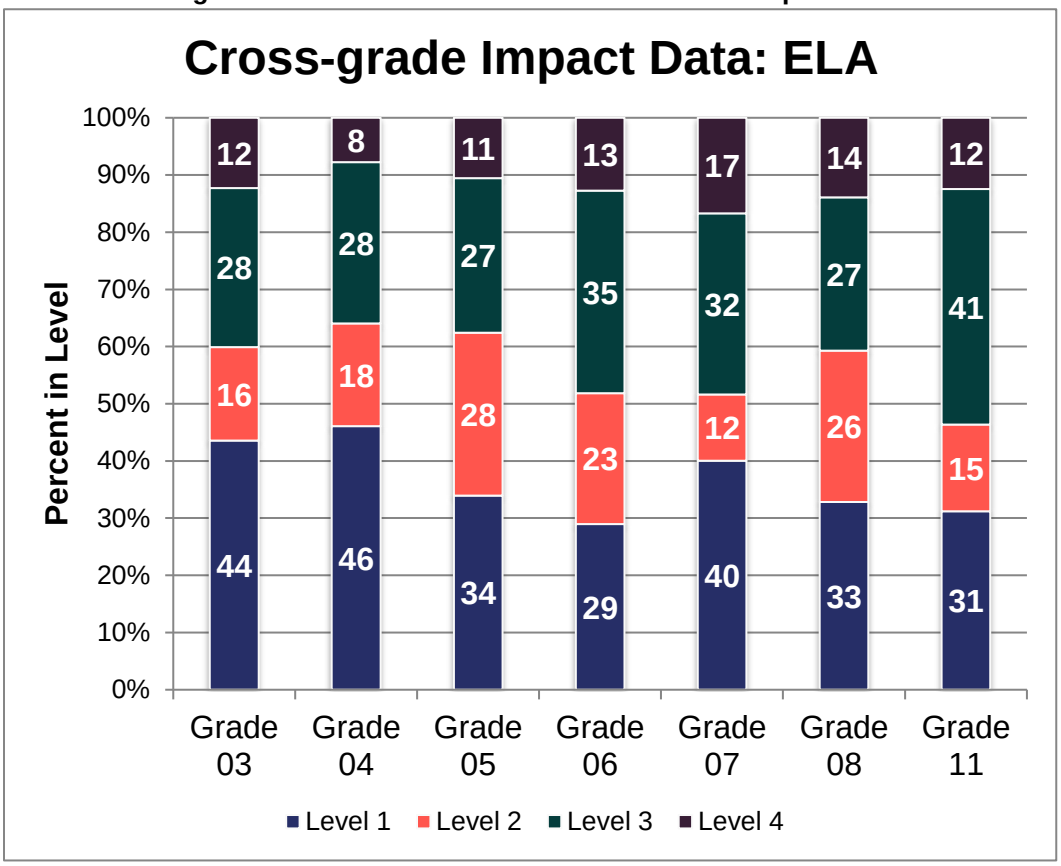


Figure M-2. Performance Level Distributions Graph—Mathematics

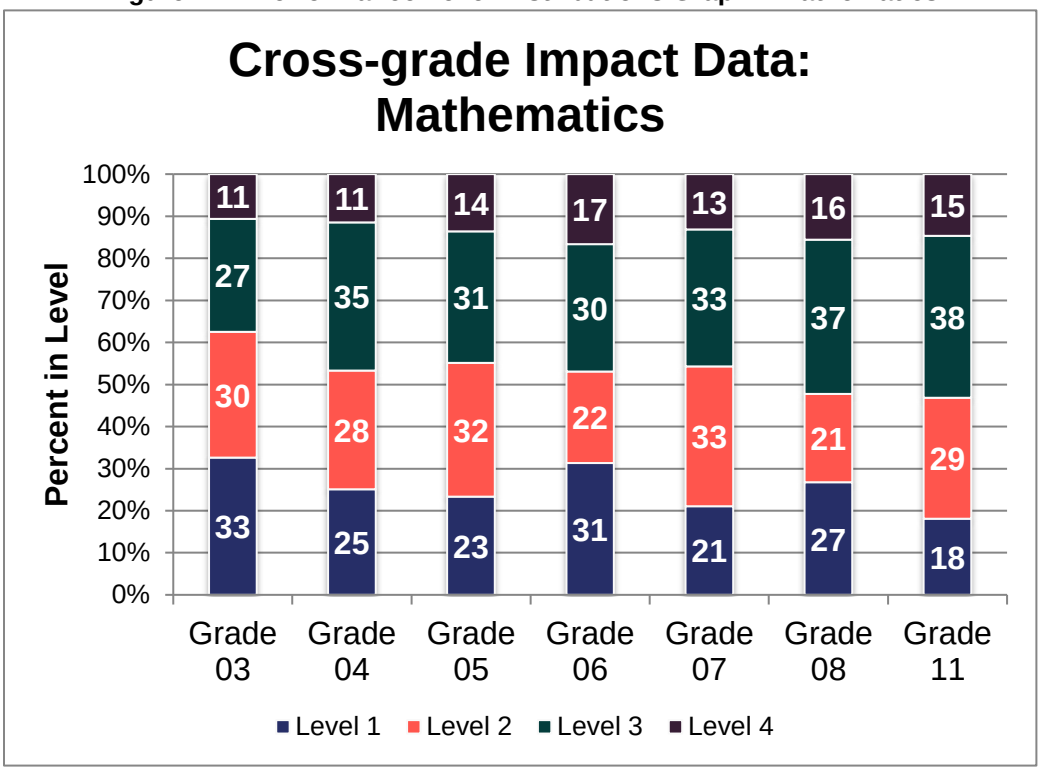
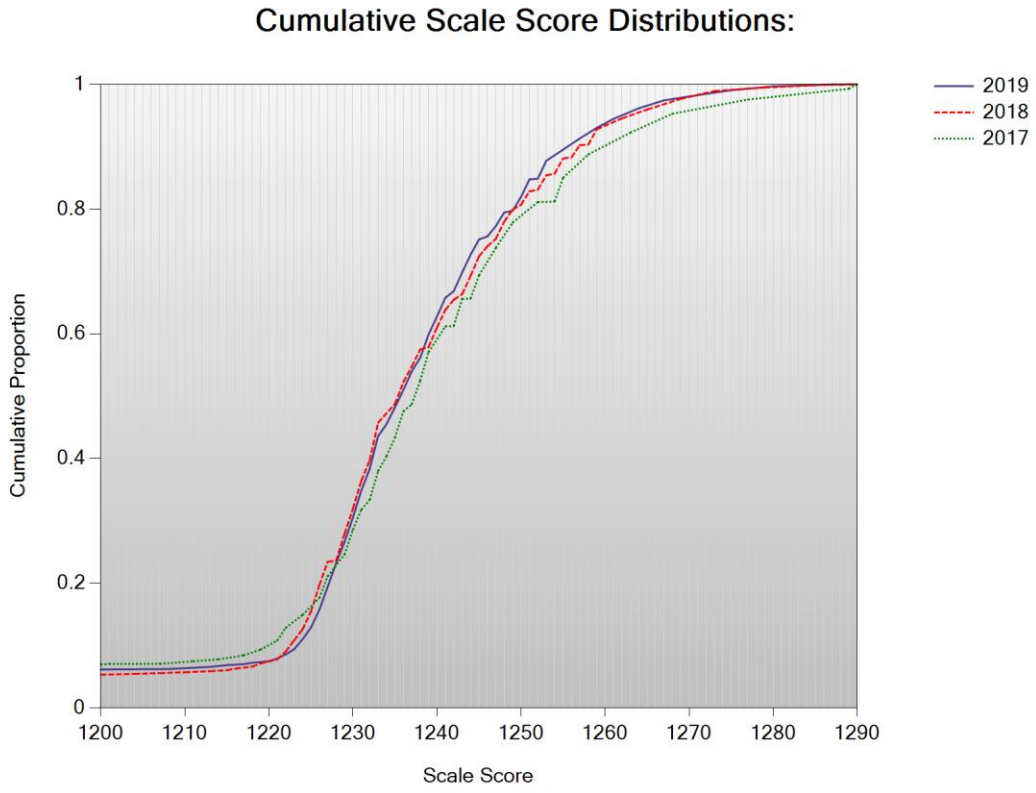


Figure M-3. Cumulative Score Distribution
Top: ELA Grade 3 Bottom: ELA Grade 4



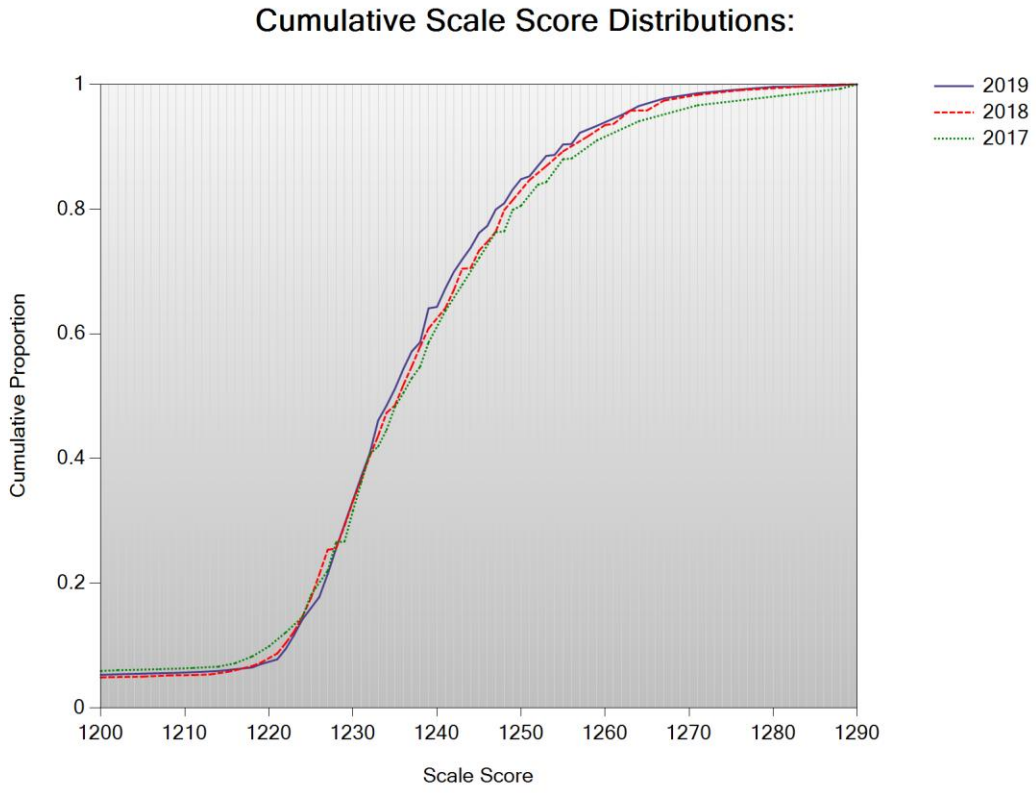
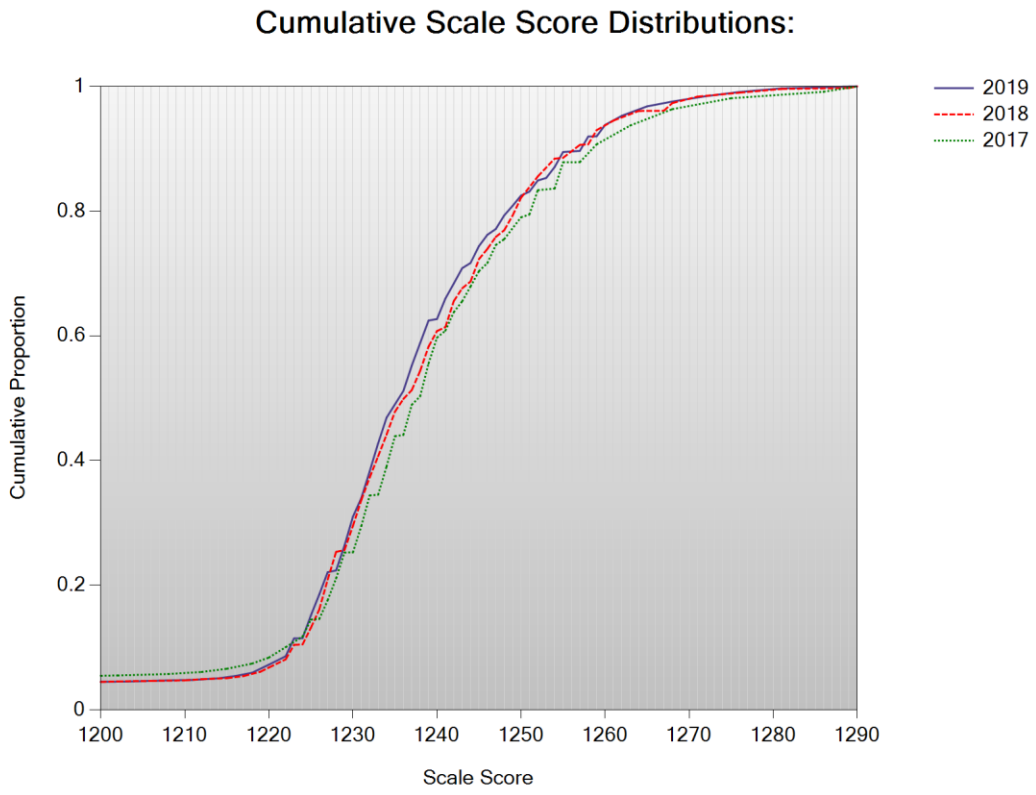


Figure M-4. Cumulative Score Distribution
Top: ELA Grade 5 Bottom: ELA Grade 6



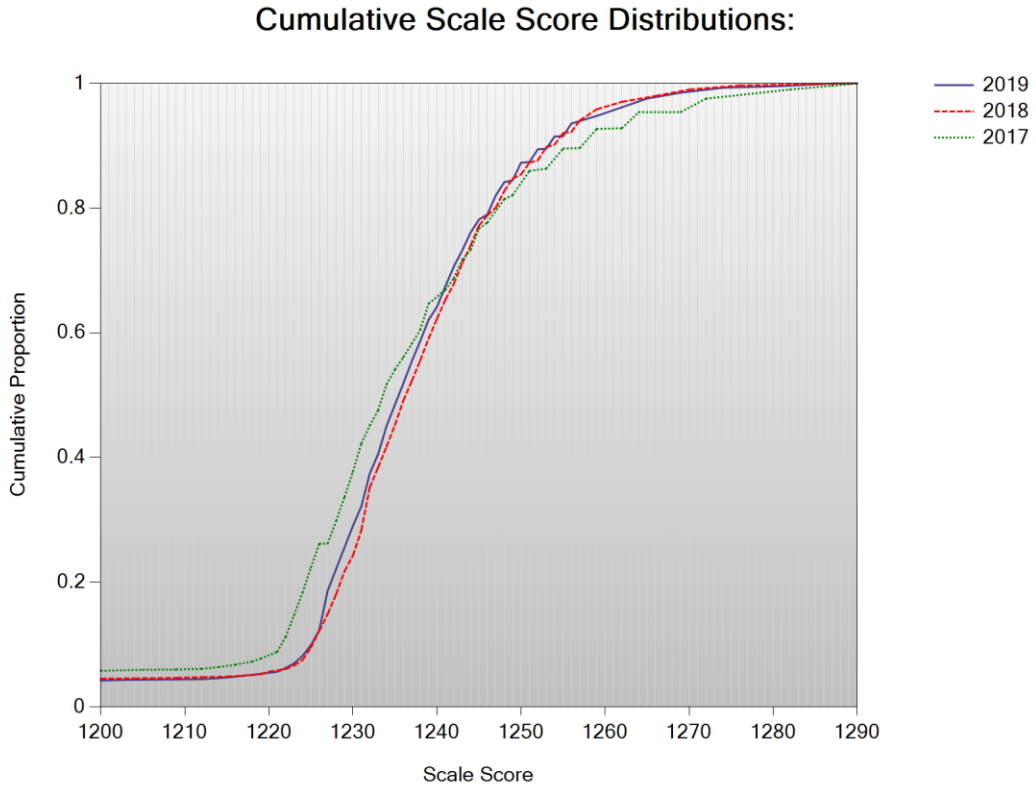
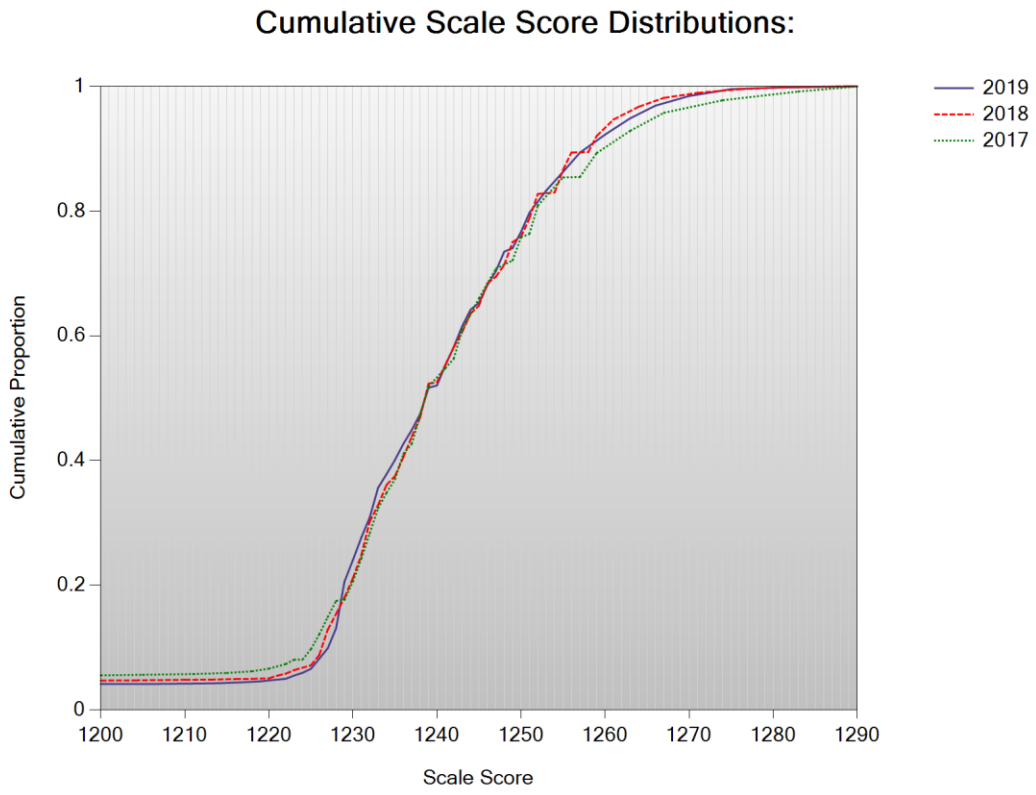


Figure M-5. Cumulative Score Distribution
Top: ELA Grade 7 Bottom: ELA Grade 8



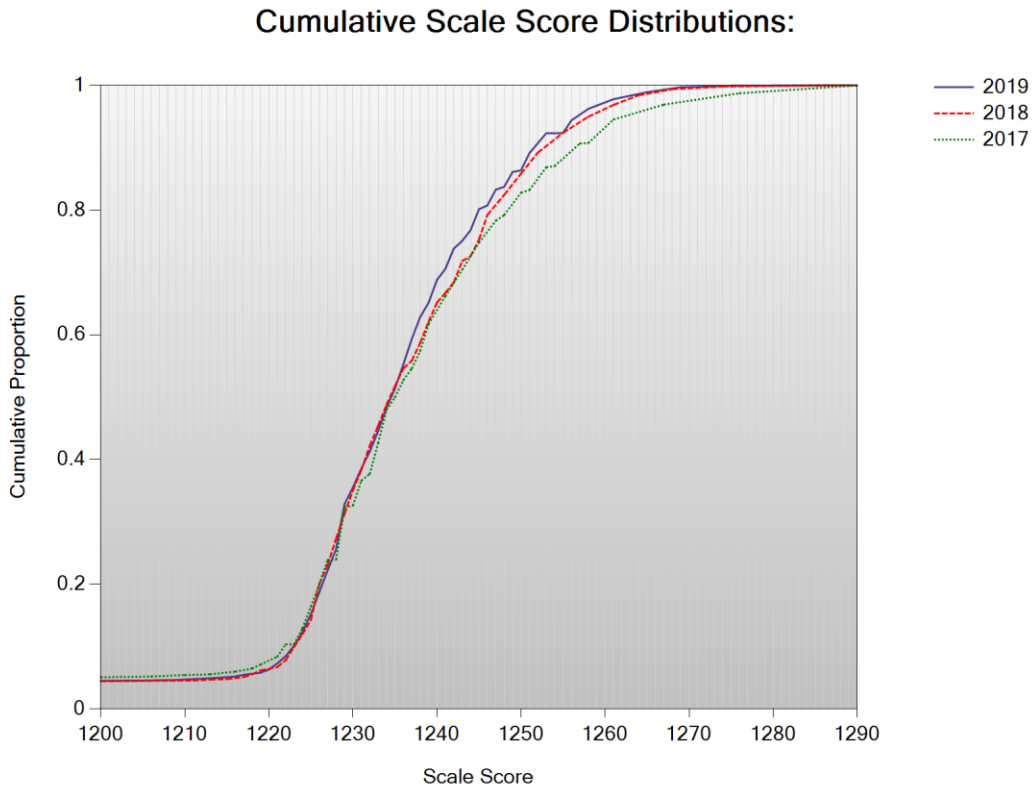


Figure M-6. Cumulative Score Distribution
ELA Grade 11

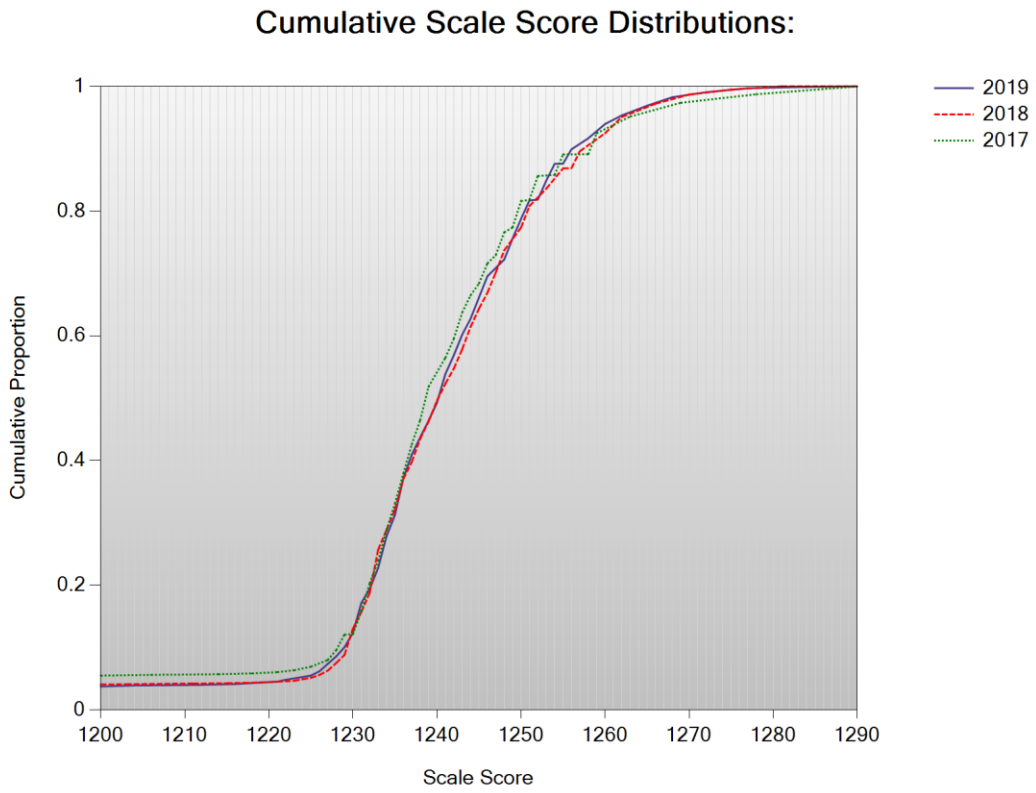
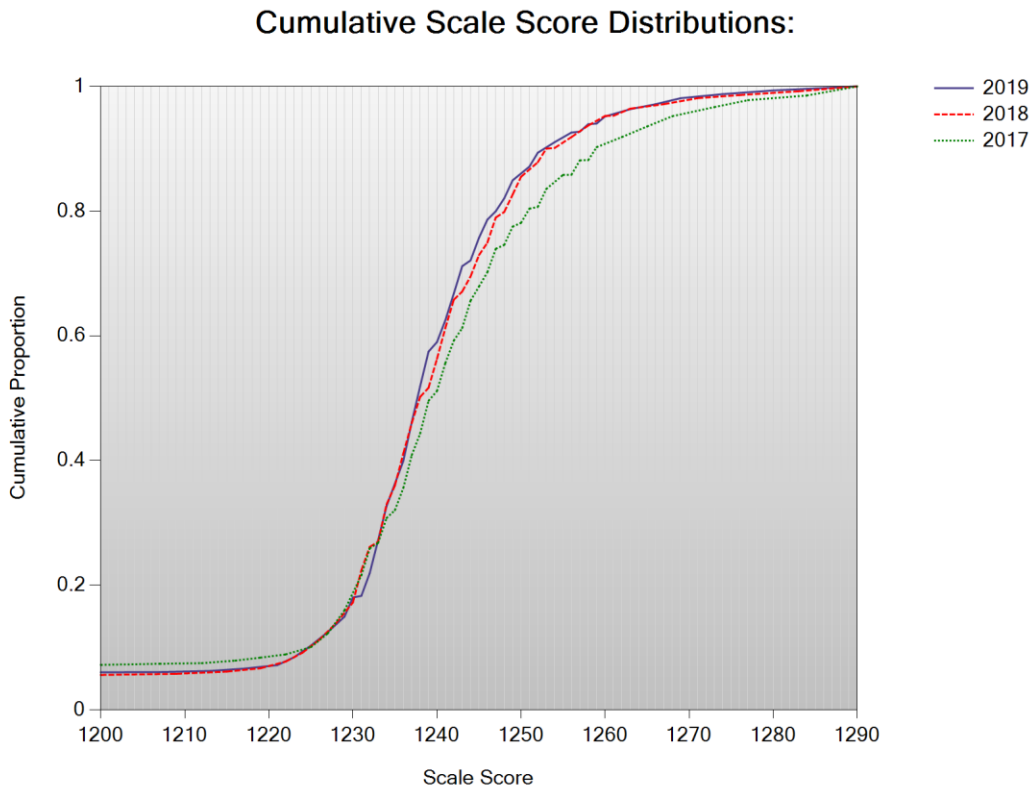


Figure M-7. Cumulative Score Distribution
Top: Mathematics Grade 3 Bottom: Mathematics Grade 4



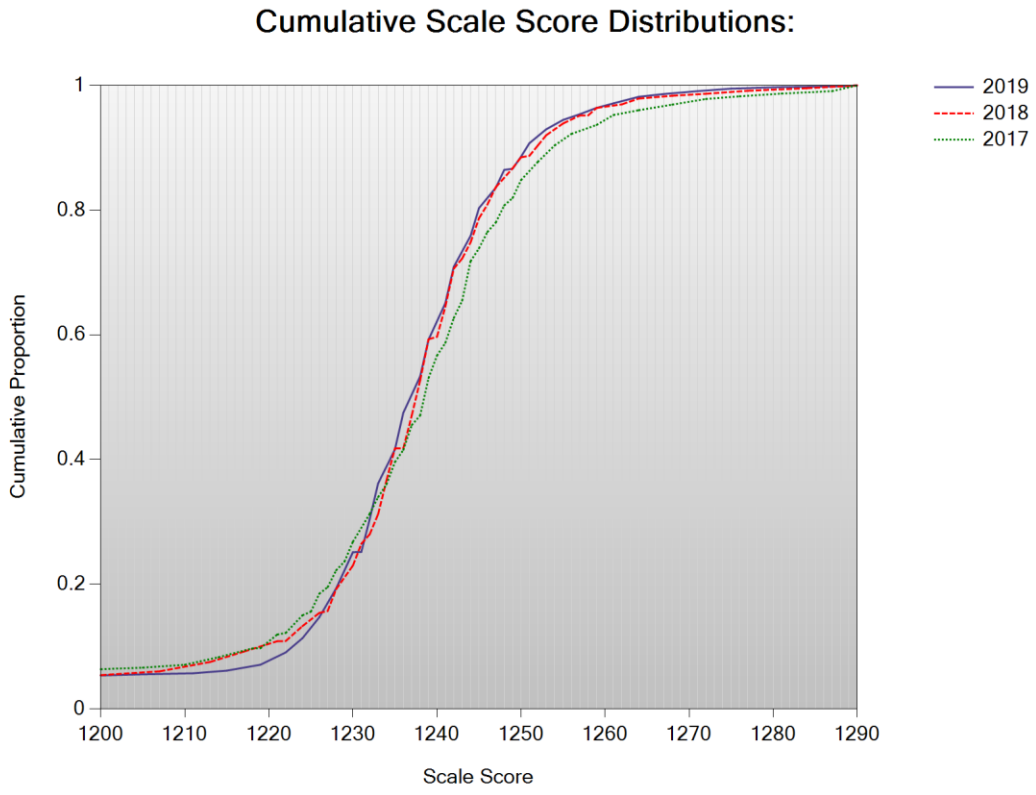
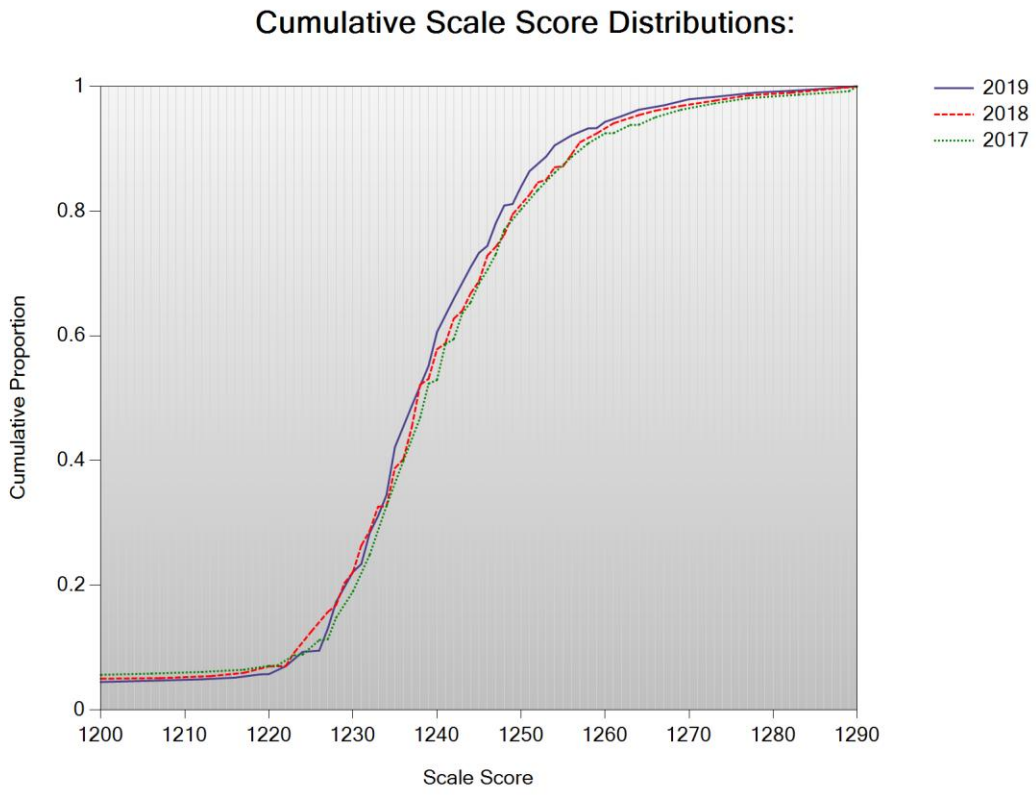


Figure M-8. Cumulative Score Distribution
Top: Mathematics Grade 5 Bottom: Mathematics Grade 6



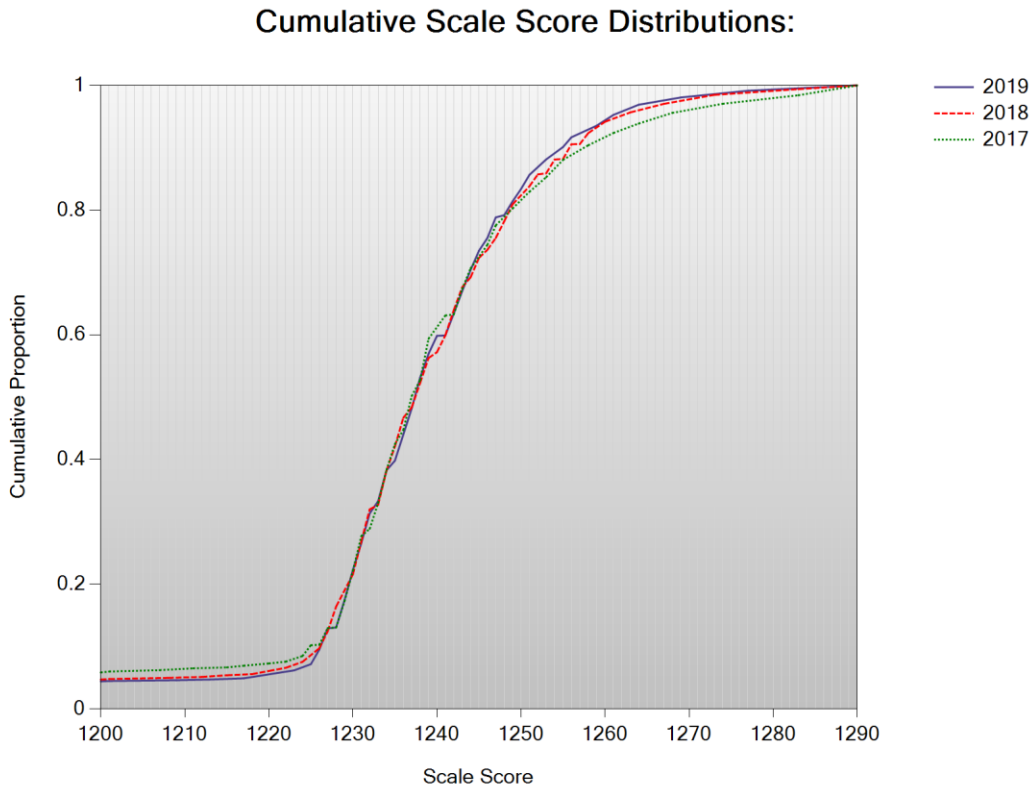
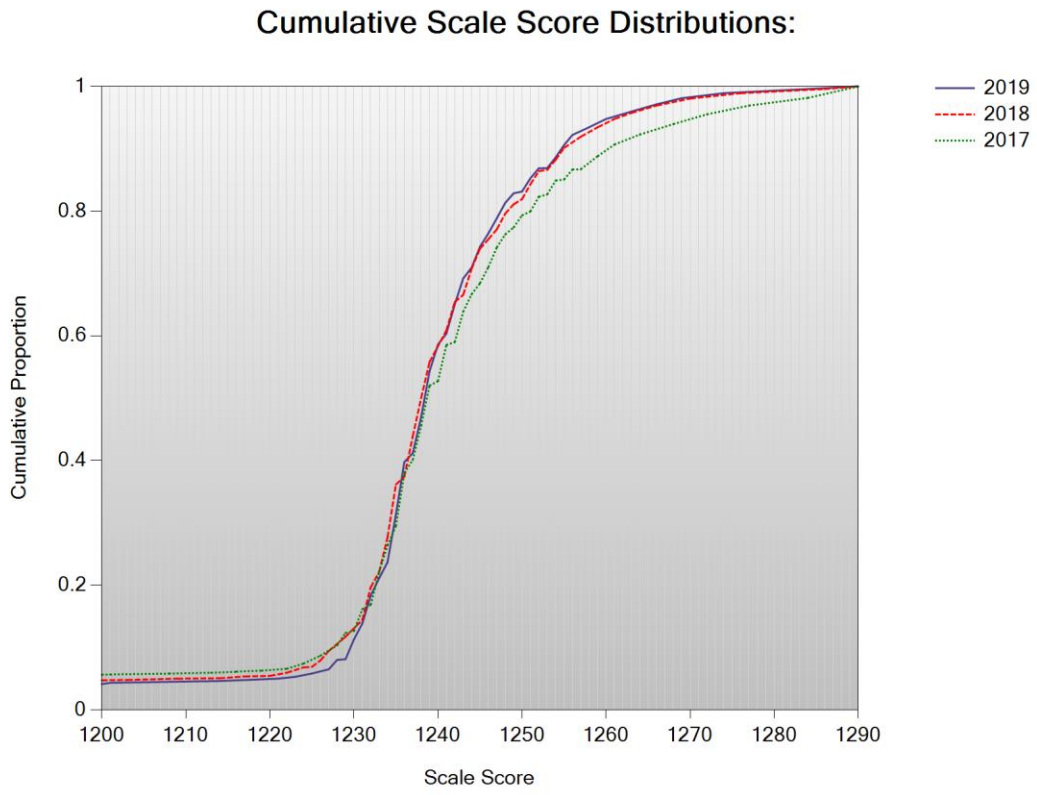


Figure M-9. Cumulative Score Distribution
Top: Mathematics Grade 7 Bottom: Mathematics Grade 8



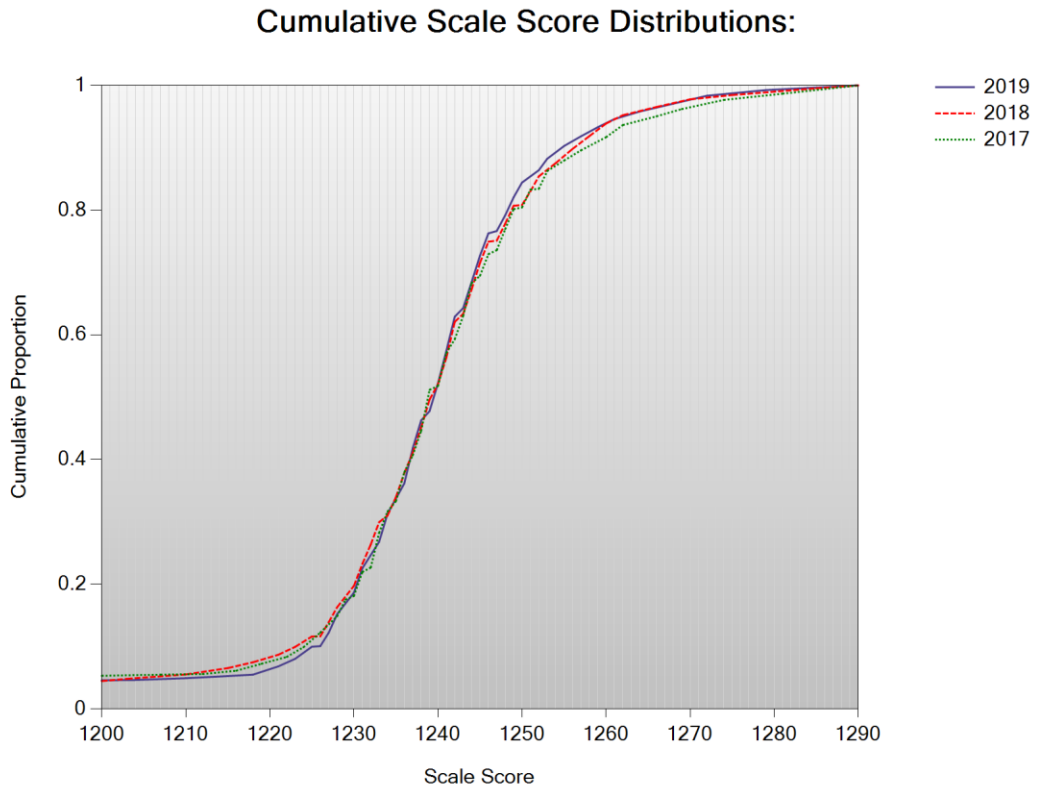
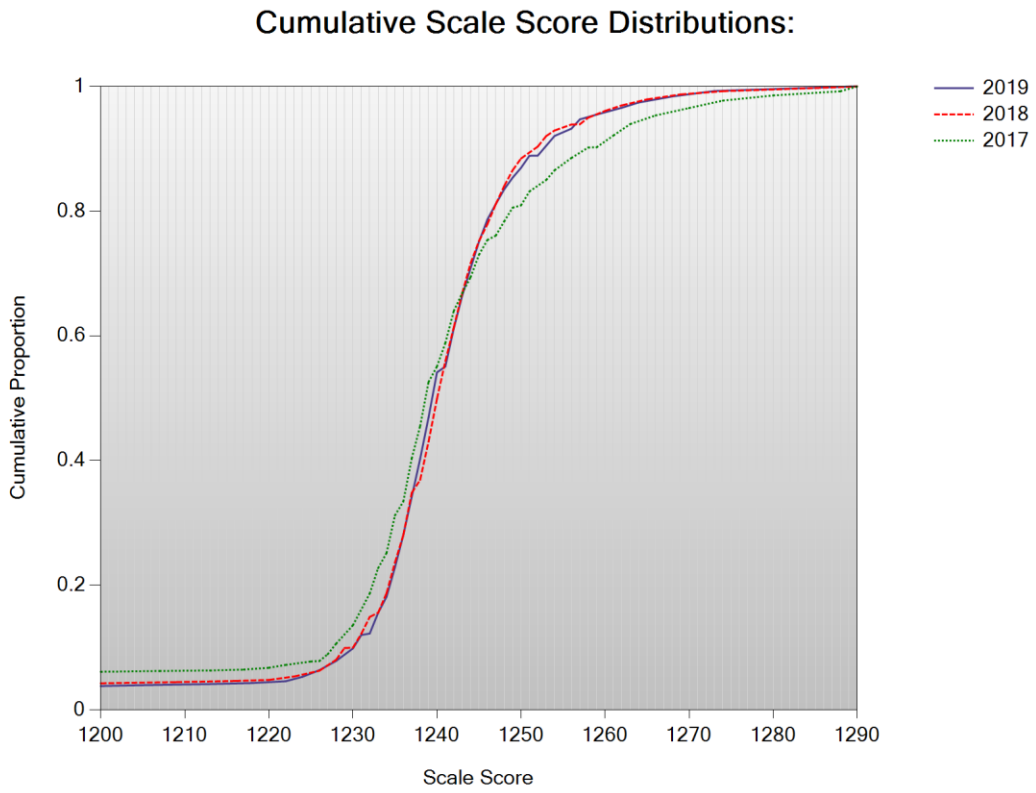


Figure M-10. Cumulative Score Distribution—
Mathematics Grade 11



APPENDIX N—IRT SUBGROUP RELIABILITY

Table N-1. IRT Subgroup Reliability: ELA Grade 3

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,268	1200	1289	1241.25	13.30	0.90	3.86
Female	733	1200	1287	1240.39	12.46	0.90	3.71
Male	1,386	1200	1289	1241.35	13.52	0.90	3.90
Gender Undefined	149	1200	1287	1244.57	14.69	0.91	4.16
Hispanic or Latino	441	1200	1287	1238.94	12.44	0.90	3.67
American Indian or Alaska Native	53	1221	1275	1240.85	12.00	NA	NA
Asian	75	1211	1275	1236.20	10.66	NA	NA
Black or African American	542	1200	1287	1241.89	13.69	0.91	3.92
Native Hawaiian or Pacific Islander	20	1225	1245	1234.65	7.01	NA	NA
White (non-Hispanic)	833	1200	1289	1242.16	13.64	0.90	3.97
Two or More Races (non-Hispanic)	44	1222	1267	1238.82	10.11	NA	NA
No Primary race/Ethnicity Undefined	545	1200	1289	1241.56	13.78	0.90	3.94
Currently receiving LEP services	179	1200	1280	1239.56	12.15	0.90	3.68
Not receiving LEP services	835	1200	1287	1244.12	14.05	0.90	4.10
LEP: All Other Students	1,254	1200	1289	1239.58	12.60	0.90	3.72
Economically Disadvantaged Students	417	1200	1287	1245.42	14.25	0.90	4.20
Non-economically Disadvantaged Students	463	1200	1287	1242.54	13.48	0.90	3.97
SES: All Other Students	1,388	1200	1289	1239.57	12.61	0.90	3.72
Non-migrant	880	1200	1287	1243.90	13.92	0.90	4.08
Undefined Migrant Status	1,388	1200	1289	1239.57	12.61	0.90	3.72
Augmentative Communication	416	1200	1287	1234.34	10.69	0.88	3.45
No Augmentative Communication	1,840	1200	1289	1242.80	13.33	0.90	3.95
Undefined Augmentative Communications	12	1225	1267	1242.50	14.39	NA	NA
Hearing Loss	64	1200	1280	1233.02	13.17	NA	NA
Within Normal Limits	2,194	1200	1289	1241.50	13.21	0.90	3.85
Undefined Hearing Loss	10	1200	1259	1238.10	16.56	NA	NA
Visual Impairment	78	1200	1267	1233.31	12.19	NA	NA
Within Normal Limits	2,182	1200	1289	1241.56	13.26	0.90	3.86
Undefined Visual Impairment	8	1226	1241	1233.88	5.51	NA	NA
Sensory Stimuli Response	168	1200	1259	1229.05	10.55	0.82	3.77
Follow Directions	2,100	1200	1289	1242.23	13.01	0.90	3.86
Special School	171	1200	1267	1232.32	11.40	0.86	3.65
Regular School Self-contained	1,411	1200	1287	1240.50	12.94	0.90	3.80
Regular School Primarily Self-contained	392	1211	1287	1244.07	13.20	0.90	3.95
Regular School Resource Room	205	1222	1289	1246.54	12.85	0.89	4.13
Regular School General Education	89	1221	1287	1245.62	13.37	NA	NA
Communicates Primarily Through Cries	150	1200	1259	1229.19	11.35	0.83	3.88
Uses Intentional Communication	537	1200	1275	1235.08	10.93	0.88	3.51
Uses Symbolic Language	1,581	1200	1289	1244.49	12.80	0.89	3.97

Note: Values are calculated only for subgroups with 100 or more students.

Table N-2. IRT Subgroup Reliability: ELA Grade 4

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,436	1200	1290	1240.14	13.25	0.91	3.74
Female	795	1200	1290	1240.00	13.05	0.91	3.72
Male	1,450	1200	1290	1239.97	13.21	0.91	3.73
Gender Undefined	191	1200	1290	1242.02	14.20	0.91	3.91
Hispanic or Latino	472	1202	1288	1239.25	12.52	0.91	3.58
American Indian or Alaska Native	72	1221	1267	1238.38	10.02	NA	NA
Asian	54	1216	1257	1237.52	9.75	NA	NA
Black or African American	579	1200	1290	1240.98	13.91	0.90	3.88
Native Hawaiian or Pacific Islander	18	1221	1262	1233.56	8.91	NA	NA
White (non-Hispanic)	892	1200	1288	1240.47	13.62	0.91	3.78
Two or More Races (non-Hispanic)	56	1221	1267	1237.38	9.51	NA	NA
No Primary race/Ethnicity Undefined	660	1200	1290	1239.57	13.54	0.91	3.78
Currently receiving LEP services	206	1202	1280	1239.45	12.00	0.91	3.57
Not receiving LEP services	877	1200	1290	1242.97	14.21	0.91	3.97
LEP: All Other Students	1,353	1200	1290	1238.42	12.45	0.90	3.61
Economically Disadvantaged Students	409	1200	1290	1245.32	15.06	0.91	4.21
Non-economically Disadvantaged Students	509	1200	1287	1240.66	13.22	0.91	3.76
SES: All Other Students	1,518	1200	1290	1238.58	12.34	0.90	3.60
Non-migrant	916	1200	1290	1242.72	14.26	0.91	3.96
Undefined Migrant Status	1,518	1200	1290	1238.58	12.34	0.90	3.60
Augmentative Communication	415	1200	1287	1232.68	10.93	0.89	3.37
No Augmentative Communication	2,009	1200	1290	1241.68	13.18	0.90	3.81
Undefined Augmentative Communications	12	1219	1257	1241.83	10.43	NA	NA
Hearing Loss	45	1200	1255	1231.98	11.77	NA	NA
Within Normal Limits	2,384	1200	1290	1240.31	13.23	0.91	3.74
Undefined Hearing Loss	7	1227	1253	1236.57	10.89	NA	NA
Visual Impairment	116	1200	1267	1231.40	13.42	0.84	4.20
Within Normal Limits	2,306	1200	1290	1240.58	13.10	0.91	3.72
Undefined Visual Impairment	14	1223	1257	1241.36	10.76	NA	NA
Sensory Stimuli Response	187	1200	1255	1227.90	9.87	0.80	3.67
Follow Directions	2,247	1200	1290	1241.15	12.98	0.90	3.74
Special School	207	1200	1280	1232.72	10.65	0.87	3.47
Regular School Self-contained	1,483	1200	1290	1239.37	13.10	0.91	3.68
Regular School Primarily Self-contained	415	1200	1288	1243.27	13.90	0.90	4.01
Regular School Resource Room	230	1216	1275	1244.11	11.78	0.89	3.82
Regular School General Education	99	1223	1287	1244.67	12.64	NA	NA
Communicates Primarily Through Cries	143	1200	1264	1226.66	11.01	0.79	4.04
Uses Intentional Communication	558	1200	1290	1233.98	10.46	0.89	3.34
Uses Symbolic Language	1,733	1200	1290	1243.23	12.83	0.90	3.84

Note: Values are calculated only for subgroups with 100 or more students.

Table N-3. IRT Subgroup Reliability: ELA Grade 5

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,677	1200	1290	1240.32	13.62	0.89	4.19
Female	885	1200	1289	1240.50	13.78	0.89	4.23
Male	1,602	1200	1290	1240.30	13.60	0.89	4.18
Gender Undefined	190	1200	1289	1239.66	12.95	0.89	4.11
Hispanic or Latino	523	1200	1289	1239.09	12.91	0.89	4.10
American Indian or Alaska Native	86	1200	1276	1238.10	12.48	NA	NA
Asian	72	1218	1272	1236.51	9.75	NA	NA
Black or African American	627	1200	1290	1241.17	14.13	0.89	4.28
Native Hawaiian or Pacific Islander	17	1200	1246	1230.53	11.68	NA	NA
White (non-Hispanic)	982	1200	1289	1241.28	14.08	0.90	4.25
Two or More Races (non-Hispanic)	58	1220	1276	1239.78	11.94	NA	NA
No Primary race/Ethnicity Undefined	686	1200	1289	1239.87	13.64	0.89	4.20
Currently receiving LEP services	245	1200	1289	1239.41	13.59	0.89	4.16
Not receiving LEP services	968	1200	1290	1243.03	14.49	0.90	4.35
LEP: All Other Students	1,464	1200	1289	1238.68	12.72	0.88	4.09
Economically Disadvantaged Students	457	1200	1290	1244.54	14.38	0.89	4.43
Non-economically Disadvantaged Students	577	1200	1289	1241.21	14.37	0.90	4.24
SES: All Other Students	1,643	1200	1289	1238.84	12.84	0.88	4.11
Non-migrant	1,033	1200	1290	1242.69	14.46	0.90	4.33
Undefined Migrant Status	1,643	1200	1289	1238.84	12.84	0.88	4.11
Augmentative Communication	438	1200	1281	1233.29	10.41	0.83	3.92
No Augmentative Communication	2,218	1200	1290	1241.70	13.77	0.89	4.25
Undefined Augmentative Communications	21	1225	1260	1241.24	11.38	NA	NA
Hearing Loss	74	1200	1258	1232.03	12.58	NA	NA
Within Normal Limits	2,595	1200	1290	1240.58	13.56	0.89	4.19
Undefined Hearing Loss	8	1207	1258	1234.12	17.11	NA	NA
Visual Impairment	107	1200	1281	1233.07	16.32	0.83	5.22
Within Normal Limits	2,553	1200	1290	1240.61	13.38	0.89	4.15
Undefined Visual Impairment	17	1207	1272	1243.24	17.24	NA	NA
Sensory Stimuli Response	189	1200	1265	1227.95	11.80	0.74	4.76
Follow Directions	2,487	1200	1290	1241.26	13.28	0.89	4.15
Special School	209	1200	1265	1232.21	10.94	0.84	3.98
Regular School Self-contained	1,589	1200	1290	1239.10	13.35	0.89	4.15
Regular School Primarily Self-contained	535	1200	1289	1244.19	13.32	0.89	4.30
Regular School Resource Room	248	1216	1289	1245.09	13.13	0.88	4.32
Regular School General Education	95	1207	1281	1244.23	14.27	NA	NA
Communicates Primarily Through Cries	159	1200	1265	1227.64	12.75	0.75	5.02
Uses Intentional Communication	546	1200	1276	1233.34	10.17	0.85	3.81
Uses Symbolic Language	1,971	1200	1290	1243.27	13.22	0.89	4.23

Note: Values are calculated only for subgroups with 100 or more students.

Table N-4. IRT Subgroup Reliability: ELA Grade 6

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,698	1200	1290	1240.04	11.89	0.89	3.48
Female	860	1200	1287	1240.43	11.36	0.88	3.49
Male	1,673	1200	1290	1239.80	12.01	0.89	3.47
Gender Undefined	165	1214	1287	1240.41	13.42	0.91	3.58
Hispanic or Latino	508	1203	1281	1238.72	11.08	0.90	3.29
American Indian or Alaska Native	73	1216	1265	1237.32	9.20	NA	NA
Asian	60	1221	1274	1238.77	10.91	NA	NA
Black or African American	677	1200	1281	1239.77	10.71	0.87	3.42
Native Hawaiian or Pacific Islander	13	1228	1246	1234.00	4.97	NA	NA
White (non-Hispanic)	1,036	1200	1290	1241.41	12.84	0.89	3.68
Two or More Races (non-Hispanic)	44	1227	1287	1239.34	11.07	NA	NA
No Primary race/Ethnicity Undefined	664	1200	1287	1239.99	12.37	0.91	3.48
Currently receiving LEP services	235	1203	1281	1238.94	10.71	0.89	3.30
Not receiving LEP services	1,003	1200	1290	1241.59	12.38	0.88	3.68
LEP: All Other Students	1,460	1200	1287	1239.15	11.63	0.90	3.38
Economically Disadvantaged Students	478	1200	1290	1242.41	12.66	0.89	3.74
Non-economically Disadvantaged Students	579	1200	1287	1240.89	12.18	0.88	3.64
SES: All Other Students	1,641	1200	1287	1239.04	11.44	0.90	3.36
Non-migrant	1,057	1200	1290	1241.58	12.42	0.88	3.68
Undefined Migrant Status	1,641	1200	1287	1239.04	11.44	0.90	3.36
Augmentative Communication	381	1200	1265	1232.47	8.43	0.85	2.92
No Augmentative Communication	2,303	1200	1290	1241.28	11.94	0.89	3.58
Undefined Augmentative Communications	14	1226	1256	1241.21	9.77	NA	NA
Hearing Loss	58	1200	1256	1232.38	8.57	NA	NA
Within Normal Limits	2,634	1200	1290	1240.21	11.91	0.89	3.49
Undefined Hearing Loss	6	1232	1247	1237.50	5.82	NA	NA
Visual Impairment	111	1200	1269	1235.64	11.33	0.87	3.34
Within Normal Limits	2,569	1200	1290	1240.24	11.91	0.89	3.49
Undefined Visual Impairment	18	1227	1254	1238.44	8.24	NA	NA
Sensory Stimuli Response	169	1200	1265	1230.12	10.73	0.77	3.51
Follow Directions	2,528	1200	1290	1240.70	11.67	0.89	3.48
Special School	244	1200	1287	1233.89	11.96	0.87	3.39
Regular School Self-contained	1,735	1200	1290	1239.27	11.11	0.89	3.36
Regular School Primarily Self-contained	454	1208	1287	1243.99	12.50	0.89	3.81
Regular School Resource Room	173	1226	1287	1244.03	11.70	0.88	3.76
Regular School General Education	91	1216	1287	1243.91	13.81	NA	NA
Communicates Primarily Through Cries	135	1200	1265	1229.01	10.95	0.73	3.69
Uses Intentional Communication	472	1200	1274	1234.34	9.72	0.88	3.01
Uses Symbolic Language	2,090	1200	1290	1242.04	11.59	0.89	3.58

Note: Values are calculated only for subgroups with 100 or more students.

Table N-5. IRT Subgroup Reliability: ELA Grade 7

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,848	1200	1290	1243.52	12.70	0.90	3.63
Female	948	1200	1290	1243.88	12.74	0.90	3.64
Male	1,691	1200	1290	1243.29	12.52	0.90	3.61
Gender Undefined	209	1200	1290	1243.81	13.89	0.90	3.80
Hispanic or Latino	496	1200	1290	1242.30	12.06	0.90	3.45
American Indian or Alaska Native	62	1224	1281	1243.71	11.28	NA	NA
Asian	66	1225	1275	1240.44	11.46	NA	NA
Black or African American	713	1200	1290	1243.44	12.35	0.90	3.61
Native Hawaiian or Pacific Islander	14	1217	1263	1237.64	12.60	NA	NA
White (non-Hispanic)	1,104	1200	1290	1244.41	13.05	0.89	3.77
Two or More Races (non-Hispanic)	45	1225	1270	1243.20	11.07	NA	NA
No Primary race/Ethnicity Undefined	694	1200	1290	1243.62	13.16	0.90	3.70
Currently receiving LEP services	241	1200	1290	1243.83	12.64	0.90	3.66
Not receiving LEP services	1,019	1200	1290	1245.47	12.58	0.89	3.78
LEP: All Other Students	1,588	1200	1290	1242.23	12.62	0.90	3.54
Economically Disadvantaged Students	467	1200	1290	1245.65	12.44	0.89	3.80
Non-economically Disadvantaged Students	610	1200	1290	1245.15	12.80	0.89	3.78
SES: All Other Students	1,771	1200	1290	1242.40	12.60	0.90	3.54
Non-migrant	1,077	1200	1290	1245.36	12.64	0.89	3.79
Undefined Migrant Status	1,771	1200	1290	1242.40	12.60	0.90	3.54
Augmentative Communication	377	1200	1281	1233.80	9.33	0.85	2.98
No Augmentative Communication	2,452	1200	1290	1244.98	12.48	0.89	3.73
Undefined Augmentative Communications	19	1226	1270	1248.16	13.78	NA	NA
Hearing Loss	59	1200	1281	1234.53	12.43	NA	NA
Within Normal Limits	2,779	1200	1290	1243.72	12.64	0.90	3.65
Undefined Hearing Loss	10	1225	1266	1241.50	11.62	NA	NA
Visual Impairment	105	1200	1275	1238.33	13.69	0.93	3.38
Within Normal Limits	2,724	1200	1290	1243.74	12.61	0.90	3.65
Undefined Visual Impairment	19	1222	1270	1241.37	13.25	NA	NA
Sensory Stimuli Response	132	1200	1257	1229.59	10.02	0.76	3.50
Follow Directions	2,714	1200	1290	1244.19	12.42	0.90	3.64
Special School	257	1200	1270	1233.89	11.59	0.84	3.47
Regular School Self-contained	1,810	1200	1290	1243.14	12.17	0.90	3.53
Regular School Primarily Self-contained	477	1200	1290	1247.17	12.40	0.88	3.93
Regular School Resource Room	222	1219	1281	1248.50	12.19	0.88	3.97
Regular School General Education	80	1226	1281	1247.25	12.77	NA	NA
Communicates Primarily Through Cries	115	1200	1275	1229.06	11.08	0.75	3.76
Uses Intentional Communication	483	1200	1290	1236.09	10.70	0.89	3.04
Uses Symbolic Language	2,248	1200	1290	1245.85	12.05	0.89	3.75

Note: Values are calculated only for subgroups with 100 or more students.

Table N-6. IRT Subgroup Reliability: ELA Grade 8

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,842	1200	1286	1238.54	11.44	0.88	3.56
Female	945	1200	1275	1238.73	11.25	0.89	3.53
Male	1,692	1200	1286	1238.41	11.44	0.88	3.55
Gender Undefined	205	1200	1269	1238.69	12.28	0.88	3.70
Hispanic or Latino	497	1200	1275	1237.47	10.93	0.87	3.50
American Indian or Alaska Native	68	1214	1265	1239.38	11.14	NA	NA
Asian	67	1220	1269	1234.78	9.31	NA	NA
Black or African American	676	1200	1286	1238.26	11.31	0.89	3.50
Native Hawaiian or Pacific Islander	18	1200	1238	1227.72	9.23	NA	NA
White (non-Hispanic)	1,149	1200	1286	1239.56	11.44	0.89	3.59
Two or More Races (non-Hispanic)	51	1216	1275	1240.25	12.71	NA	NA
No Primary race/Ethnicity Undefined	721	1200	1269	1238.02	11.56	0.88	3.59
Currently receiving LEP services	250	1217	1269	1238.33	10.60	0.89	3.41
Not receiving LEP services	1,011	1200	1286	1240.24	11.78	0.89	3.64
LEP: All Other Students	1,581	1200	1286	1237.48	11.21	0.87	3.53
Economically Disadvantaged Students	435	1209	1286	1241.98	11.96	0.89	3.77
Non-economically Disadvantaged Students	630	1200	1275	1239.03	11.46	0.89	3.54
SES: All Other Students	1,777	1200	1286	1237.52	11.12	0.87	3.51
Non-migrant	1,064	1200	1286	1240.22	11.75	0.89	3.64
Undefined Migrant Status	1,777	1200	1286	1237.52	11.12	0.87	3.51
Augmentative Communication	380	1200	1265	1229.43	9.24	0.78	3.32
No Augmentative Communication	2,445	1200	1286	1239.92	11.10	0.88	3.59
Undefined Augmentative Communications	17	1229	1265	1243.47	9.38	NA	NA
Hearing Loss	74	1209	1275	1233.47	12.34	NA	NA
Within Normal Limits	2,757	1200	1286	1238.69	11.37	0.88	3.56
Undefined Hearing Loss	11	1200	1253	1233.09	13.42	NA	NA
Visual Impairment	108	1200	1275	1232.50	13.50	0.86	3.81
Within Normal Limits	2,718	1200	1286	1238.75	11.30	0.88	3.55
Undefined Visual Impairment	16	1228	1256	1242.50	8.53	NA	NA
Sensory Stimuli Response	165	1200	1265	1225.96	9.65	0.68	3.77
Follow Directions	2,675	1200	1286	1239.30	11.08	0.88	3.54
Special School	255	1200	1275	1230.76	11.43	0.86	3.43
Regular School Self-contained	1,764	1200	1286	1237.97	11.02	0.88	3.48
Regular School Primarily Self-contained	500	1200	1275	1242.17	10.85	0.86	3.79
Regular School Resource Room	236	1220	1275	1242.09	10.56	0.87	3.70
Regular School General Education	85	1220	1275	1242.20	12.25	NA	NA
Communicates Primarily Through Cries	139	1200	1265	1225.04	11.14	0.65	4.35
Uses Intentional Communication	458	1205	1269	1231.78	8.89	0.88	2.97
Uses Symbolic Language	2,243	1200	1286	1240.74	10.79	0.87	3.63

Note: Values are calculated only for subgroups with 100 or more students.

Table N-7. IRT Subgroup Reliability: ELA Grade 11

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2585	1200	1290	1243.81	11.49	0.90	3.27
Female	830	1200	1290	1243.47	11.34	0.89	3.27
Male	1573	1200	1290	1243.89	11.54	0.90	3.26
Gender Undefined	182	1200	1284	1244.66	11.68	0.90	3.36
Hispanic or Latino	413	1200	1277	1241.51	10.57	0.87	3.17
American Indian or Alaska Native	70	1226	1272	1242.80	10.01	NA	NA
Asian	56	1204	1272	1240.43	12.97	NA	NA
Black or African American	654	1200	1284	1243.13	11.32	0.91	3.18
Native Hawaiian or Pacific Islander	12	1228	1251	1238.75	7.46	NA	NA
White (non-Hispanic)	1067	1200	1290	1245.09	11.86	0.90	3.37
Two or More Races (non-Hispanic)	42	1218	1265	1244.64	8.94	NA	NA
No Primary race/Ethnicity Undefined	603	1200	1284	1244.15	11.18	0.89	3.28
Currently receiving LEP services	183	1200	1272	1241.56	10.25	0.87	3.12
Not receiving LEP services	903	1200	1290	1244.68	11.66	0.90	3.32
LEP: All Other Students	1499	1200	1284	1243.56	11.48	0.90	3.26
Economically Disadvantaged Students	382	1200	1290	1245.42	11.53	0.90	3.38
Non-economically Disadvantaged Students	545	1204	1290	1244.06	11.71	0.91	3.26
SES: All Other Students	1658	1200	1284	1243.36	11.38	0.90	3.25
Non-migrant	926	1200	1290	1244.61	11.65	0.90	3.31
Undefined Migrant Status	1658	1200	1284	1243.36	11.38	0.90	3.25
Augmentative Communication	318	1200	1272	1236.14	9.41	0.84	2.95
No Augmentative Communication	2257	1200	1290	1244.88	11.33	0.90	3.31
Undefined Augmentative Communications	10	1221	1277	1246.50	15.17	NA	NA
Hearing Loss	88	1200	1277	1243.23	12.65	NA	NA
Within Normal Limits	2492	1200	1290	1243.84	11.45	0.90	3.27
Undefined Hearing Loss	91	1200	1277	1241.21	14.88	NA	NA
Visual Impairment	2477	1200	1290	1243.92	11.34	0.90	3.25
Within Normal Limits	17	1221	1260	1242.06	11.91	NA	NA
Undefined Visual Impairment	126	1200	1277	1231.55	13.23	0.81	3.85
Sensory Stimuli Response	2459	1200	1290	1244.44	11.03	0.90	3.24
Follow Directions	926	1200	1290	1244.61	11.65	0.90	3.31
Special School	320	1200	1277	1237.75	11.26	0.89	3.06
Regular School Self-contained	1601	1200	1290	1243.94	11.29	0.90	3.25
Regular School Primarily Self-contained	472	1200	1284	1245.67	10.58	0.88	3.35
Regular School Resource Room	139	1228	1290	1248.24	11.64	0.89	3.58
Regular School General Education	53	1230	1284	1248.26	12.36	NA	NA
Communicates Primarily Through Cries	103	1200	1258	1230.03	9.54	0.73	3.42
Uses Intentional Communication	412	1200	1277	1237.55	10.71	0.87	3.03
Uses Symbolic Language	2070	1204	1290	1245.74	10.80	0.89	3.31

Note: Values are calculated only for subgroups with 100 or more students.

Table N-8. IRT Subgroup Reliability: Mathematics Grade 3

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,431	1200	1290	1241.58	11.65	0.84	3.94
Female	747	1200	1290	1240.59	10.89	0.84	3.83
Male	1,516	1200	1290	1241.93	11.84	0.84	3.97
Gender Undefined	168	1200	1290	1242.85	12.96	0.83	4.23
Hispanic or Latino	459	1200	1290	1240.09	10.27	0.82	3.77
American Indian or Alaska Native	54	1229	1290	1243.74	11.09	NA	NA
Asian	86	1217	1269	1239.28	9.80	NA	NA
Black or African American	576	1200	1290	1242.69	12.99	0.87	4.07
Native Hawaiian or Pacific Islander	23	1223	1247	1237.74	6.02	NA	NA
White (non-Hispanic)	895	1200	1290	1241.74	11.71	0.82	4.01
Two or More Races (non-Hispanic)	52	1227	1269	1239.15	7.41	NA	NA
No Primary race/Ethnicity Undefined	594	1200	1290	1242.02	12.13	0.83	4.06
Currently receiving LEP services	196	1217	1274	1241.08	9.64	0.85	3.62
Not receiving LEP services	877	1200	1290	1243.75	12.40	0.85	4.10
LEP: All Other Students	1,358	1200	1290	1240.25	11.22	0.83	3.89
Economically Disadvantaged Students	432	1200	1290	1245.16	12.53	0.85	4.14
Non-economically Disadvantaged Students	492	1200	1290	1242.45	11.88	0.83	4.02
SES: All Other Students	1,507	1200	1290	1240.27	11.07	0.83	3.86
Non-migrant	924	1200	1290	1243.72	12.26	0.85	4.08
Undefined Migrant Status	1,507	1200	1290	1240.27	11.07	0.83	3.86
Augmentative Communication	502	1200	1290	1236.38	10.32	0.78	3.89
No Augmentative Communication	1,916	1200	1290	1242.95	11.59	0.84	3.96
Undefined Augmentative Communications	13	1221	1269	1239.77	13.19	NA	NA
Hearing Loss	69	1200	1260	1235.45	12.06	NA	NA
Within Normal Limits	2,353	1200	1290	1241.76	11.60	0.84	3.93
Undefined Hearing Loss	9	1231	1263	1242.67	11.18	NA	NA
Visual Impairment	93	1200	1290	1234.70	12.04	NA	NA
Within Normal Limits	2,327	1200	1290	1241.87	11.57	0.84	3.93
Undefined Visual Impairment	11	1227	1251	1237.45	7.01	NA	NA
Sensory Stimuli Response	213	1200	1280	1231.87	9.83	0.54	4.56
Follow Directions	2,218	1200	1290	1242.51	11.39	0.85	3.88
Special School	196	1200	1280	1234.28	9.95	0.72	4.07
Regular School Self-contained	1,533	1200	1290	1241.13	11.38	0.83	3.93
Regular School Primarily Self-contained	403	1207	1290	1243.55	11.63	0.87	3.87
Regular School Resource Room	209	1227	1290	1246.19	11.64	0.85	4.03
Regular School General Education	90	1227	1290	1245.62	11.39	NA	NA
Communicates Primarily Through Cries	188	1200	1280	1233.31	10.72	0.62	4.53
Uses Intentional Communication	610	1200	1290	1237.15	10.16	0.76	3.92
Uses Symbolic Language	1,633	1207	1290	1244.19	11.34	0.86	3.88

Note: Values are calculated only for subgroups with 100 or more students.

Table N-9. IRT Subgroup Reliability: Mathematics Grade 4

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2536	1200	1290	1239.45	11.31	0.83	4.27
Female	819	1200	1290	1239.26	11.45	0.83	4.28
Male	1512	1200	1290	1239.48	11.13	0.82	4.26
Gender Undefined	205	1200	1290	1239.91	12.12	0.86	4.31
Hispanic or Latino	495	1200	1290	1238.47	10.34	0.81	4.17
American Indian or Alaska Native	71	1200	1290	1239.75	10.87	NA	NA
Asian	64	1200	1268	1237.42	9.84	NA	NA
Black or African American	593	1200	1290	1241.19	12.64	0.85	4.40
Native Hawaiian or Pacific Islander	13	1226	1242	1234.54	6.21	NA	NA
White (non-Hispanic)	939	1200	1290	1239.12	11.02	0.82	4.25
Two or More Races (non-Hispanic)	56	1224	1265	1238.05	10.11	NA	NA
No Primary race/Ethnicity Undefined	683	1200	1290	1238.98	11.11	0.83	4.26
Currently receiving LEP services	217	1200	1276	1238.36	9.93	0.82	4.11
Not receiving LEP services	912	1200	1290	1241.61	12.44	0.84	4.41
LEP: All Other Students	1407	1200	1290	1238.21	10.52	0.81	4.21
Economically Disadvantaged Students	421	1200	1283	1243.15	13.64	0.85	4.58
Non-economically Disadvantaged Students	535	1200	1290	1240.19	11.13	0.82	4.26
SES: All Other Students	1580	1200	1290	1238.21	10.43	0.81	4.19
Non-migrant	954	1200	1290	1241.49	12.39	0.84	4.40
Undefined Migrant Status	1580	1200	1290	1238.21	10.43	0.81	4.19
Augmentative Communication	455	1200	1290	1234.78	10.17	0.81	4.25
No Augmentative Communication	2066	1200	1290	1240.49	11.32	0.83	4.28
Undefined Augmentative Communications	15	1228	1253	1237.73	6.53	NA	NA
Hearing Loss	51	1200	1257	1236.12	10.96	NA	NA
Within Normal Limits	2477	1200	1290	1239.52	11.33	0.83	4.27
Undefined Hearing Loss	8	1230	1244	1236.38	5.18	NA	NA
Visual Impairment	124	1200	1265	1233.09	11.85	0.62	5.28
Within Normal Limits	2396	1200	1290	1239.78	11.21	0.84	4.22
Undefined Visual Impairment	16	1222	1250	1238.56	7.92	NA	NA
Sensory Stimuli Response	218	1200	1255	1230.47	10.31	0.55	5.19
Follow Directions	2316	1200	1290	1240.29	11.04	0.84	4.19
Special School	223	1200	1276	1234.65	10.26	0.74	4.45
Regular School Self-contained	1553	1200	1290	1239.31	11.36	0.83	4.27
Regular School Primarily Self-contained	428	1200	1290	1239.94	10.89	0.82	4.24
Regular School Resource Room	236	1215	1290	1242.14	10.77	0.84	4.15
Regular School General Education	94	1222	1290	1244.10	12.25	NA	NA
Communicates Primarily Through Cries	177	1200	1259	1229.27	11.02	0.51	5.63
Uses Intentional Communication	599	1200	1276	1236.45	9.54	0.81	4.11
Uses Symbolic Language	1758	1200	1290	1241.49	11.13	0.84	4.19

Note: Values are calculated only for subgroups with 100 or more students.

Table N-10. IRT Subgroup Reliability: Mathematics Grade 5

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,648	1200	1290	1241.57	12.70	0.83	4.75
Female	898	1200	1290	1240.92	11.97	0.81	4.72
Male	1,560	1200	1290	1242.06	13.25	0.84	4.80
Gender Undefined	190	1200	1273	1240.54	11.19	0.82	4.54
Hispanic or Latino	517	1200	1290	1240.92	12.09	0.82	4.71
American Indian or Alaska Native	82	1200	1278	1240.32	11.32	NA	NA
Asian	77	1224	1262	1239.51	8.86	NA	NA
Black or African American	616	1200	1290	1243.32	14.61	0.85	4.98
Native Hawaiian or Pacific Islander	15	1207	1253	1236.53	11.54	NA	NA
White (non-Hispanic)	968	1200	1290	1241.61	12.41	0.83	4.73
Two or More Races (non-Hispanic)	55	1224	1278	1241.47	10.53	NA	NA
No Primary race/Ethnicity Undefined	680	1200	1290	1241.33	12.34	0.83	4.72
Currently receiving LEP services	244	1200	1283	1240.83	11.27	0.81	4.60
Not receiving LEP services	943	1200	1290	1243.41	13.82	0.86	4.84
LEP: All Other Students	1,461	1200	1290	1240.50	12.03	0.81	4.72
Economically Disadvantaged Students	456	1200	1290	1244.37	15.17	0.86	5.04
Non-economically Disadvantaged Students	550	1200	1290	1242.24	12.30	0.85	4.63
SES: All Other Students	1,642	1200	1290	1240.56	11.93	0.81	4.71
Non-migrant	1,005	1200	1290	1243.21	13.72	0.86	4.82
Undefined Migrant Status	1,642	1200	1290	1240.56	11.93	0.81	4.71
Augmentative Communication	449	1200	1278	1236.62	11.22	0.76	4.86
No Augmentative Communication	2,177	1200	1290	1242.58	12.78	0.84	4.73
Undefined Augmentative Communications	22	1227	1270	1242.18	10.21	NA	NA
Hearing Loss	77	1200	1264	1236.94	10.44	NA	NA
Within Normal Limits	2,564	1200	1290	1241.72	12.74	0.84	4.75
Undefined Hearing Loss	7	1222	1247	1236.71	9.48	NA	NA
Visual Impairment	112	1200	1290	1234.48	15.31	0.72	6.14
Within Normal Limits	2,518	1200	1290	1241.86	12.48	0.84	4.69
Undefined Visual Impairment	18	1222	1273	1244.61	12.68	NA	NA
Sensory Stimuli Response	193	1200	1264	1232.35	12.07	0.63	5.72
Follow Directions	2,454	1200	1290	1242.29	12.47	0.84	4.68
Special School	212	1200	1278	1235.13	11.22	0.75	4.94
Regular School Self-contained	1,588	1200	1290	1241.08	12.75	0.84	4.76
Regular School Primarily Self-contained	510	1200	1290	1243.64	12.09	0.83	4.66
Regular School Resource Room	239	1200	1290	1244.52	12.10	0.82	4.71
Regular School General Education	98	1200	1290	1245.42	13.70	NA	NA
Communicates Primarily Through Cries	158	1200	1278	1232.05	13.29	0.65	6.00
Uses Intentional Communication	548	1200	1290	1237.16	10.65	0.78	4.66
Uses Symbolic Language	1,941	1200	1290	1243.58	12.52	0.84	4.68

Note: Values are calculated only for subgroups with 100 or more students.

Table N-11. IRT Subgroup Reliability: Mathematics Grade 6

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,838	1200	1290	1241.45	12.35	0.86	3.89
Female	898	1200	1290	1240.89	11.55	0.86	3.73
Male	1,763	1200	1290	1241.77	12.84	0.86	3.98
Gender Undefined	177	1200	1290	1241.03	11.22	0.82	3.84
Hispanic or Latino	528	1200	1290	1240.62	11.28	0.86	3.68
American Indian or Alaska Native	76	1200	1290	1239.46	12.30	NA	NA
Asian	67	1219	1290	1239.67	11.94	NA	NA
Black or African American	729	1200	1290	1241.61	12.35	0.86	3.89
Native Hawaiian or Pacific Islander	13	1200	1242	1230.15	10.35	NA	NA
White (non-Hispanic)	1,077	1200	1290	1242.43	12.95	0.86	3.98
Two or More Races (non-Hispanic)	45	1226	1290	1241.49	11.03	NA	NA
No Primary race/Ethnicity Undefined	693	1200	1290	1240.66	11.25	0.85	3.73
Currently receiving LEP services	242	1225	1290	1240.89	10.38	0.85	3.59
Not receiving LEP services	1,044	1200	1290	1243.47	13.51	0.86	4.12
LEP: All Other Students	1,552	1200	1290	1240.17	11.63	0.85	3.78
Economically Disadvantaged Students	490	1200	1290	1244.75	13.57	0.85	4.23
Non-economically Disadvantaged Students	609	1200	1290	1242.41	13.37	0.87	4.05
SES: All Other Students	1,739	1200	1290	1240.18	11.38	0.85	3.74
Non-migrant	1,098	1200	1290	1243.47	13.50	0.86	4.13
Undefined Migrant Status	1,739	1200	1290	1240.18	11.38	0.85	3.74
Augmentative Communication	433	1200	1290	1233.96	9.49	0.81	3.61
No Augmentative Communication	2,390	1200	1290	1242.80	12.33	0.85	3.95
Undefined Augmentative Communications	15	1225	1264	1241.93	12.22	NA	NA
Hearing Loss	69	1200	1277	1234.13	11.31	NA	NA
Within Normal Limits	2,762	1200	1290	1241.64	12.33	0.86	3.89
Undefined Hearing Loss	7	1227	1246	1237.29	6.97	NA	NA
Visual Impairment	125	1200	1261	1235.70	10.78	0.85	3.66
Within Normal Limits	2,696	1200	1290	1241.72	12.37	0.86	3.91
Undefined Visual Impairment	17	1227	1261	1239.65	10.43	NA	NA
Sensory Stimuli Response	202	1200	1269	1231.03	11.29	0.77	4.15
Follow Directions	2,635	1200	1290	1242.25	12.06	0.85	3.87
Special School	273	1200	1290	1234.95	12.11	0.78	4.16
Regular School Self-contained	1,832	1200	1290	1240.81	11.63	0.86	3.77
Regular School Primarily Self-contained	463	1219	1290	1245.47	12.95	0.86	4.10
Regular School Resource Room	175	1200	1290	1245.32	12.77	0.84	4.13
Regular School General Education	94	1217	1290	1245.97	12.62	NA	NA
Communicates Primarily Through Cries	167	1200	1269	1230.40	11.83	0.74	4.41
Uses Intentional Communication	535	1200	1290	1236.24	10.14	0.85	3.57
Uses Symbolic Language	2,135	1200	1290	1243.62	12.04	0.85	3.93

Note: Values are calculated only for subgroups with 100 or more students.

Table N-12. IRT Subgroup Reliability: Mathematics Grade 7

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,864	1200	1290	1242.38	11.60	0.85	3.99
Female	935	1200	1290	1241.93	10.79	0.85	3.86
Male	1,721	1200	1290	1242.82	12.02	0.84	4.06
Gender Undefined	208	1200	1283	1240.71	11.45	0.84	4.01
Hispanic or Latino	515	1200	1290	1242.15	11.62	0.84	4.03
American Indian or Alaska Native	64	1223	1283	1242.00	10.05	NA	NA
Asian	75	1227	1290	1241.61	11.21	NA	NA
Black or African American	706	1200	1290	1242.54	11.91	0.85	4.04
Native Hawaiian or Pacific Islander	13	1228	1255	1240.77	7.56	NA	NA
White (non-Hispanic)	1,090	1200	1290	1242.82	11.62	0.85	3.99
Two or More Races (non-Hispanic)	49	1223	1283	1242.78	11.76	NA	NA
No Primary race/Ethnicity Undefined	697	1200	1290	1241.75	11.61	0.84	4.00
Currently receiving LEP services	249	1201	1290	1243.29	12.09	0.85	4.03
Not receiving LEP services	1,006	1200	1290	1243.72	11.75	0.85	4.01
LEP: All Other Students	1,609	1200	1290	1241.39	11.34	0.84	3.98
Economically Disadvantaged Students	458	1200	1290	1244.93	12.00	0.86	4.04
Non-economically Disadvantaged Students	611	1200	1290	1242.92	11.52	0.84	3.99
SES: All Other Students	1,795	1200	1290	1241.54	11.42	0.84	3.98
Non-migrant	1,069	1200	1290	1243.78	11.77	0.85	4.01
Undefined Migrant Status	1,795	1200	1290	1241.54	11.42	0.84	3.98
Augmentative Communication	416	1200	1290	1236.45	9.48	0.76	3.96
No Augmentative Communication	2,431	1200	1290	1243.37	11.62	0.85	4.00
Undefined Augmentative Communications	17	1228	1283	1245.76	13.17	NA	NA
Hearing Loss	54	1214	1274	1237.85	10.00	NA	NA
Within Normal Limits	2,800	1200	1290	1242.47	11.62	0.84	4.00
Undefined Hearing Loss	10	1231	1255	1241.10	7.37	NA	NA
Visual Impairment	104	1201	1290	1237.94	12.54	0.87	4.08
Within Normal Limits	2,740	1200	1290	1242.55	11.56	0.84	3.99
Undefined Visual Impairment	20	1230	1260	1241.45	7.69	NA	NA
Sensory Stimuli Response	152	1200	1256	1232.79	11.40	0.69	4.74
Follow Directions	2,710	1200	1290	1242.91	11.38	0.85	3.95
Special School	266	1200	1269	1236.21	11.16	0.77	4.27
Regular School Self-contained	1,823	1200	1290	1242.05	11.16	0.84	3.93
Regular School Primarily Self-contained	472	1200	1290	1244.74	11.46	0.85	3.97
Regular School Resource Room	218	1227	1290	1245.33	11.64	0.85	4.01
Regular School General Education	83	1230	1290	1247.92	14.20	NA	NA
Communicates Primarily Through Cries	131	1200	1269	1232.10	11.10	0.64	4.84
Uses Intentional Communication	492	1200	1283	1238.06	9.96	0.79	3.91
Uses Symbolic Language	2,239	1200	1290	1243.92	11.42	0.85	3.96

Note: Values are calculated only for subgroups with 100 or more students.

Table N-13. IRT Subgroup Reliability: Mathematics Grade 8

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,985	1200	1290	1242.11	12.47	0.85	4.12
Female	967	1200	1290	1242.10	12.17	0.86	4.06
Male	1,800	1200	1290	1242.16	12.54	0.85	4.13
Gender Undefined	218	1200	1290	1241.70	13.18	0.84	4.29
Hispanic or Latino	524	1200	1290	1242.59	12.66	0.85	4.16
American Indian or Alaska Native	72	1215	1279	1243.56	13.50	NA	NA
Asian	64	1200	1290	1239.55	11.74	NA	NA
Black or African American	712	1200	1290	1242.25	13.10	0.86	4.18
Native Hawaiian or Pacific Islander	17	1200	1241	1230.18	9.81	NA	NA
White (non-Hispanic)	1,209	1200	1290	1242.17	11.63	0.85	3.99
Two or More Races (non-Hispanic)	52	1221	1290	1243.96	14.25	NA	NA
No Primary race/Ethnicity Undefined	766	1200	1290	1241.45	12.27	0.84	4.15
Currently receiving LEP services	258	1200	1290	1242.59	12.58	0.87	4.09
Not receiving LEP services	1,039	1200	1290	1243.40	12.79	0.87	4.14
LEP: All Other Students	1,688	1200	1290	1241.24	12.18	0.84	4.11
Economically Disadvantaged Students	437	1204	1290	1245.42	13.03	0.88	4.19
Non-economically Disadvantaged Students	658	1200	1290	1242.18	12.43	0.86	4.10
SES: All Other Students	1,890	1200	1290	1241.32	12.22	0.84	4.11
Non-migrant	1,094	1200	1290	1243.47	12.78	0.87	4.13
Undefined Migrant Status	1,890	1200	1290	1241.32	12.22	0.84	4.11
Augmentative Communication	430	1200	1290	1234.48	10.29	0.68	4.32
No Augmentative Communication	2,539	1200	1290	1243.37	12.32	0.86	4.08
Undefined Augmentative Communications	16	1231	1290	1246.50	15.14	NA	NA
Hearing Loss	87	1200	1290	1239.60	12.56	NA	NA
Within Normal Limits	2,887	1200	1290	1242.19	12.41	0.86	4.10
Undefined Hearing Loss	11	1200	1290	1240.82	22.12	NA	NA
Visual Impairment	127	1200	1290	1236.03	13.71	0.76	4.77
Within Normal Limits	2,841	1200	1290	1242.34	12.30	0.86	4.08
Undefined Visual Impairment	17	1210	1290	1249.24	16.56	NA	NA
Sensory Stimuli Response	186	1200	1290	1231.14	12.17	0.58	5.29
Follow Directions	2,797	1200	1290	1242.82	12.11	0.86	4.03
Special School	292	1200	1290	1235.77	11.82	0.78	4.31
Regular School Self-contained	1,857	1200	1290	1241.70	12.26	0.85	4.08
Regular School Primarily Self-contained	508	1200	1290	1244.45	11.93	0.85	4.10
Regular School Resource Room	241	1215	1290	1246.11	12.13	0.86	4.15
Regular School General Education	85	1227	1290	1246.84	12.68	NA	NA
Communicates Primarily Through Cries	152	1200	1290	1230.72	13.38	0.52	5.96
Uses Intentional Communication	503	1200	1290	1236.96	10.92	0.84	3.93
Uses Symbolic Language	2,328	1200	1290	1243.94	11.97	0.87	4.03

Note: Values are calculated only for subgroups with 100 or more students.

Table N-14. IRT Subgroup Reliability: Mathematics Grade 11

Description	*Number of Students*	*Raw Score*				*IRT Marginal Reliability*	*Standard Error*
		Minimum	*Maximum*	*Mean*	*Standard Deviation*		
All	2,670	1200	1290	1242.52	9.98	0.83	3.34
Female	854	1200	1283	1241.92	9.57	0.79	3.36
Male	1,635	1200	1290	1242.71	10.10	0.85	3.32
Gender Undefined	181	1204	1290	1243.64	10.76	0.85	3.42
Hispanic or Latino	421	1200	1290	1241.95	9.73	0.79	3.41
American Indian or Alaska Native	72	1213	1283	1241.36	9.66	NA	NA
Asian	68	1200	1273	1241.28	12.95	NA	NA
Black or African American	678	1200	1290	1242.21	9.50	0.85	3.23
Native Hawaiian or Pacific Islander	10	1224	1264	1243.50	11.13	NA	NA
White (non-Hispanic)	1,104	1200	1290	1242.82	9.98	0.83	3.33
Two or More Races (non-Hispanic)	45	1204	1268	1241.60	9.59	NA	NA
No Primary race/Ethnicity Undefined	624	1200	1290	1242.09	9.93	0.83	3.35
Currently receiving LEP services	195	1200	1290	1242.11	9.61	0.81	3.31
Not receiving LEP services	914	1200	1290	1242.43	9.12	0.83	3.20
LEP: All Other Students	1,561	1200	1290	1242.63	10.50	0.83	3.43
Economically Disadvantaged Students	383	1200	1290	1242.74	8.42	0.82	3.14
Non-economically Disadvantaged Students	556	1200	1290	1242.21	9.66	0.85	3.25
SES: All Other Students	1,731	1200	1290	1242.57	10.40	0.83	3.41
Non-migrant	938	1200	1290	1242.43	9.18	0.84	3.21
Undefined Migrant Status	1,731	1200	1290	1242.57	10.40	0.83	3.41
Augmentative Communication	357	1200	1273	1237.44	8.53	0.71	3.40
No Augmentative Communication	2,304	1200	1290	1243.30	9.95	0.84	3.33
Undefined Augmentative Communications	9	1222	1268	1245.44	13.57	NA	NA
Hearing Loss	94	1200	1273	1243.23	11.81	NA	NA
Within Normal Limits	2,570	1200	1290	1242.50	9.91	0.83	3.33
Undefined Hearing Loss	6	1218	1257	1240.50	13.40	NA	NA
Visual Impairment	98	1200	1273	1238.97	12.00	NA	NA
Within Normal Limits	2,555	1200	1290	1242.65	9.85	0.84	3.31
Undefined Visual Impairment	17	1218	1268	1243.71	13.80	NA	NA
Sensory Stimuli Response	152	1200	1273	1234.92	11.63	0.64	4.40
Follow Directions	2,518	1200	1290	1242.98	9.69	0.84	3.28
Special School	363	1200	1283	1238.55	9.61	0.79	3.40
Regular School Self-contained	1,644	1200	1290	1242.70	9.87	0.83	3.32
Regular School Primarily Self-contained	467	1200	1290	1243.18	8.75	0.80	3.23
Regular School Resource Room	142	1213	1290	1246.63	11.84	0.86	3.65
Regular School General Education	54	1224	1290	1247.19	11.85	NA	NA
Communicates Primarily Through Cries	118	1200	1257	1233.65	10.66	0.49	4.57
Uses Intentional Communication	442	1200	1273	1239.13	9.20	0.77	3.37
Uses Symbolic Language	2,110	1200	1290	1243.73	9.69	0.85	3.27

Note: Values are calculated only for subgroups with 100 or more students.

APPENDIX O—DECISION ACCURACY AND CONSISTENCY RESULTS

Table O-1. Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Overall and Conditional on Performance Level

Content Area	*Grade*	*Overall*	*Kappa*	*Conditional on Level*			
				Level 1	*Level 2*	*Level 3*	*Level 4*
ELA	3	0.78 (0.70)	0.59	0.88 (0.83)	0.57 (0.44)	0.77 (0.70)	0.86 (0.77)
	4	0.81 (0.74)	0.63	0.89 (0.84)	0.62 (0.50)	0.85 (0.78)	0.82 (0.74)
	5	0.78 (0.69)	0.58	0.84 (0.77)	0.70 (0.59)	0.78 (0.70)	0.84 (0.74)
	6	0.79 (0.71)	0.6	0.82 (0.76)	0.70 (0.57)	0.80 (0.75)	0.86 (0.76)
	7	0.81 (0.73)	0.63	0.89 (0.85)	0.57 (0.43)	0.80 (0.73)	0.84 (0.77)
	8	0.78 (0.69)	0.59	0.87 (0.80)	0.70 (0.59)	0.74 (0.66)	0.85 (0.76)
	11	0.80 (0.73)	0.62	0.86 (0.80)	0.55 (0.42)	0.83 (0.80)	0.87 (0.76)
Mathematics	3	0.75 (0.65)	0.52	0.79 (0.71)	0.66 (0.54)	0.76 (0.66)	0.83 (0.76)
	4	0.72 (0.63)	0.48	0.81 (0.67)	0.58 (0.48)	0.76 (0.66)	0.83 (0.74)
	5	0.72 (0.62)	0.48	0.78 (0.64)	0.60 (0.50)	0.73 (0.64)	0.84 (0.76)
	6	0.76 (0.67)	0.56	0.79 (0.72)	0.58 (0.47)	0.80 (0.70)	0.87 (0.80)
	7	0.73 (0.64)	0.50	0.76 (0.62)	0.59 (0.49)	0.79 (0.69)	0.84 (0.79)
	8	0.75 (0.66)	0.54	0.83 (0.73)	0.55 (0.43)	0.74 (0.67)	0.90 (0.79)
	11	0.74 (0.65)	0.51	0.81 (0.63)	0.55 (0.47)	0.79 (0.70)	0.89 (0.80)

Table O-2. Summary of Decision Accuracy (and Consistency) Results by Content Area and Grade—Conditional on Cutpoint

Content Area	*Grade*	*Level 1/Level 2*				*Level 2/Level 3*				*Level 3/Level 4*			
		Accuracy	*Consistency*	*False*		*Accuracy*	*Consistency*	*False*		*Accuracy*	*Consistency*	*False*	
				Positive	*Negative*			*Positive*	*Negative*			*Positive*	*Negative*
ELA	3	0.92	0.89	0.04	0.04	0.91	0.88	0.04	0.04	0.94	0.92	0.04	0.02
	4	0.92	0.89	0.04	0.04	0.92	0.89	0.04	0.03	0.96	0.95	0.02	0.02
	5	0.91	0.88	0.04	0.04	0.92	0.88	0.04	0.04	0.95	0.93	0.03	0.02
	6	0.93	0.9	0.04	0.03	0.92	0.88	0.04	0.05	0.94	0.92	0.04	0.02
	7	0.94	0.91	0.03	0.03	0.93	0.9	0.03	0.04	0.93	0.91	0.04	0.03
	8	0.93	0.9	0.03	0.04	0.91	0.87	0.04	0.05	0.94	0.91	0.04	0.03
	11	0.93	0.9	0.03	0.04	0.93	0.9	0.03	0.04	0.94	0.92	0.04	0.02
Mathematics	3	0.89	0.85	0.06	0.05	0.89	0.85	0.05	0.05	0.96	0.94	0.02	0.02
	4	0.89	0.85	0.04	0.07	0.88	0.83	0.06	0.06	0.95	0.92	0.03	0.02
	5	0.89	0.85	0.04	0.07	0.88	0.83	0.06	0.07	0.94	0.92	0.03	0.03
	6	0.9	0.87	0.05	0.04	0.91	0.87	0.05	0.04	0.95	0.92	0.03	0.02
	7	0.89	0.85	0.04	0.06	0.87	0.82	0.07	0.06	0.96	0.94	0.02	0.02
	8	0.91	0.87	0.04	0.06	0.89	0.85	0.05	0.06	0.94	0.92	0.04	0.02
	11	0.91	0.88	0.02	0.06	0.87	0.82	0.07	0.06	0.95	0.93	0.03	0.02

Note: Due to the small sample size, students in Levels 3 and 4 were collapsed for purposes of the decision accuracy and consistency analysis.