Mathematics Item Specifications

GRADE 3

Arizona Department of Education with Pearson - 2021

Table of Contents

Introduction

Arizona's Academic Standards Assessment (AASA) of English Language Arts and Mathematics is Arizona's statewide achievement test. AASA assesses the Arizona English Language Arts Standards and Arizona Mathematics Standards adopted by the Arizona State Board of Education in December 2016. AASA will inform students, teachers, and parents about preparedness for college and careers upon graduating from high school. AASA tests are computer-based, meaning that they can better assess students' critical thinking skills and provide them with opportunities to demonstrate a deeper understanding of the materials. Computer-based testing also allows for the use of a variety of innovative items types.

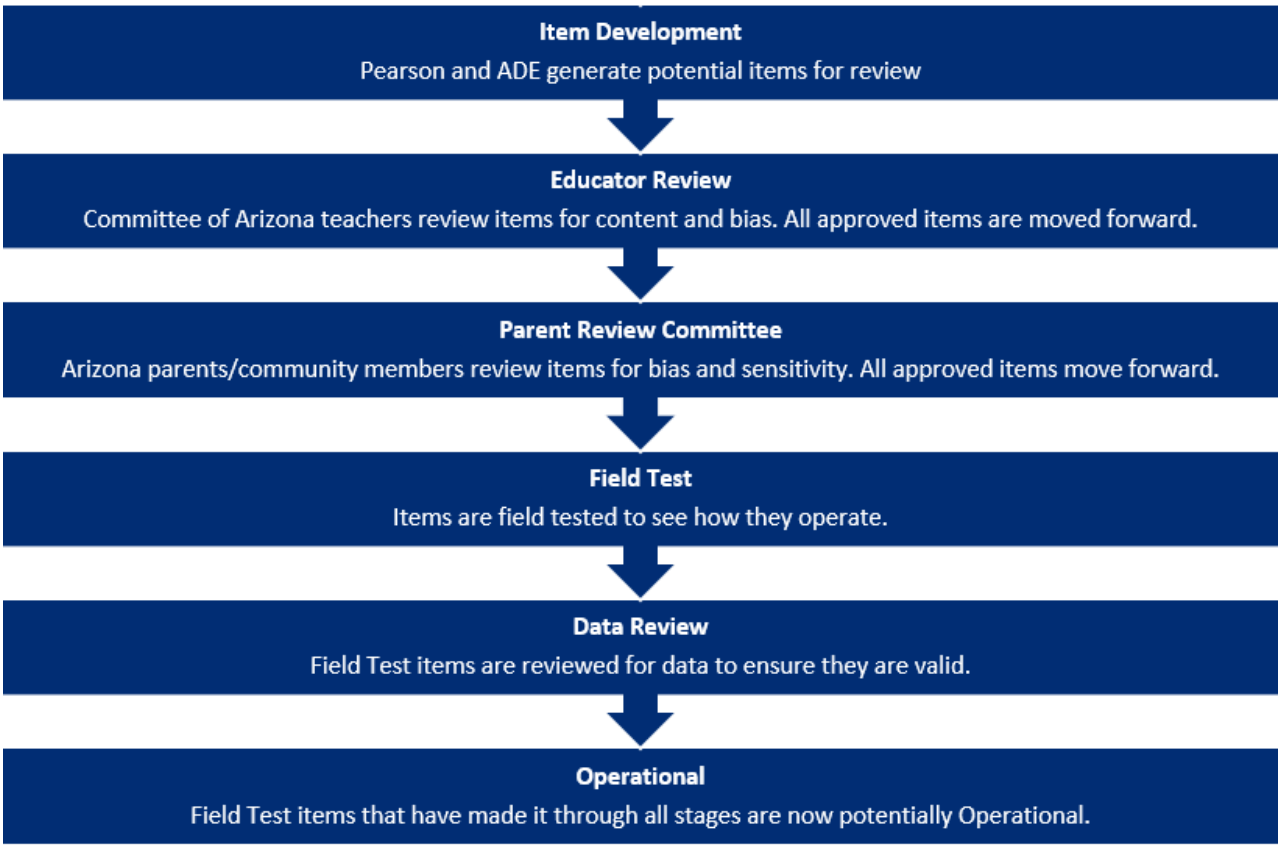
During the item-development process, all AASA items are written in accordance with the Item Specifications and are reviewed and approved by a committee of Arizona educators to confirm alignment and appropriateness for inclusion in the test. AASA items are generally representative of Arizona's geographic regions and culturally diverse population. Items are reviewed for the following kinds of bias: gender, racial, ethnic, linguistic, religious, geographic, and socioeconomic. Item reviews also include consideration of issues related to individuals with disabilities. Arizona community members also have an opportunity to review items for issues of potential concern to members of the community at large. Reviewers are asked to consider the variety of cultural, regional, philosophical, political, and religious backgrounds throughout Arizona, and then to determine whether the subject matter will be acceptable to Arizona students, families, and other members of Arizona communities.

This *AASA Item Specifications* is a resource document that defines the content and format of the test and test items for item writers and reviewers. Each *Item Specifications* document indicates the alignment of items with the Arizona Mathematics Standards. It also serves to provide all stakeholders with information about the scope and function of assessment items. This document can also serve to assist educators to understand how assessment items are developed in alignment with the standards for English language arts and math. These item specifications for AASA are intended to provide information regarding standards, item formats and response types. The descriptions of blueprints, and depth of knowledge in this document are meant to provide an overview of the test. Item specifications are meant for the purposes of assessment, not instruction. They are not intended to be tools for instruction or the basis for curricula. AASA has a test blueprint that was developed by Arizona and is different from any other state or consortium test blueprint.

For the math portion of AASA, all of the test questions are aligned to the mathematic content standards for these subject areas. Any item specifications that are absent for standards listed in this document may be under development. This document does not endorse the exclusion of the instruction of any grade-level content standards. The test will ask questions that check a student's conceptual understanding of math as well as their procedural skills. These items have been written to be free from bias and sensitivity, and widely vary in their degree of difficulty.

Item Development Process

AASA items go through a rigorous review before they are operational. When an item is "operational" it means it is used to determine a student's score on the assessment. This is a description of the process every item must go through before it is operational on AASA.



Sample tests are available online for the math portion of AASA. To access the AASA Sample Tests, go to: https://home.testnav.com/, click on "Arizona", then click on "Mic Check and Sample Tests".

Test Construction Guidelines

The construction of the AASA assessment is guided by the depth and rigor of the Arizona College and Career Ready Standards. Items are created to address key components of the standards and assess a range of important skills. The AASA Blueprint provides an overview of the distribution of items on the AASA according to the standards. The standards for Math Practices are embedded within all AASA items. Further, the AASA blueprint outlines the Depth of Knowledge distribution of items.

Blueprint

Grade 3 AASA Blueprint 2016 Standards		
Reporting Category	**Min.**	**Max.**
Operations and Algebraic Thinking, and Numbers in Base Ten	**49%**	**53%**
Operations and Algebraic Thinking	38%	42%
Numbers in Base Ten	9%	13%
Numbers and Operations-Fractions	**18%**	**22%**
Measurement, Data, and Geometry	**26%**	**30%**
Measurement & Data and Geometry	26%	28%
Geometry	1%	4%

Depth of Knowledge (DOK)

DOK refers to the level of rigor or sophistication of the task in a given item, designed to reflect the complexity of the Arizona Mathematics Standards. Items at DOK level 1 focus on the recall of information, such as definitions, terms, and simple procedures. Items at DOK 2 require students to make decisions, solve problems, or recognize patterns; in general, they require a greater degree of engagement and cognitive processing than items at DOK 1. Items at DOK 3 feature higher-order cognitive tasks that assess students' capacities to approach abstract or complex problems.

Percentage of Points by Depth of Knowledge (DOK) Level			
Grade 3	DOK Level 1	DOK Level 2	DOK Level 3
	10% - 20%	60% - 70%	12% - 30%

For more information on DOK go to https://www.azed.gov/assessment/aasa.

Calculators

Arizona Desmos Graphing Calculator is not permitted for the paper-based and computer-based assessment for Grade 3 Math.

Item Formats

The AASA Assessments are composed of item formats that include traditional multiple-choice response items and technology-enhanced response items (TEI). TEIs are computer-delivered response items that require students to interact with test content to select, construct, and/or support their responses. TEIs are better able to assess a deeper level of understanding.

These are the different types of items, including TEIs, that may appear on the Math computer-based assessment for AASA:

- Bar Graph
- Choice

- Equation Editor
- Fraction Model
- Gap Match
- Hot Spot
- Inline Choice
- Match Table Grid
- Point Graph
- Shape Transformation

For paper-based assessments (including those for students with an IEP or 504 plan that specifies a paper-based accommodation), TEIs will be modified so that they can be scanned and scored electronically or human-scored.

See the table below for a description of each item type. In addition, for examples of each response item format described, see the AASA Sample Tests. To access the AASA Sample Tests, go to: https://home.testnav.com/, click on “Arizona”, then click on “Mic Check and Sample Tests”.

Item Format	Description
Bar Graph	Bar Graph Interaction allows the student to drag bars vertically or horizontally along numerical values. Individual bars, histograms, and clusters are supported.
Choice	Choice (also called Multiple Choice or Choice Interaction) allows the student to choose the correct answer(s) from pre-set responses.
Equation Editor	Equation Editor allows the student to use a palette of buttons to enter a numerical response or to create mathematical expressions.

Item Format	Description
Fraction Model	Fraction Model allows the student to divide a shape (circle or rectangle) into varying numbers of segments by clicking a 'Fewer' or 'More' button and select those segments, which shades those segments with a solid color.
Gap Match	Gap Match allows the student to drag text or images (also called choices) to a gap (a location on a background image).
Hot Spot	Hot Spot allows the student to select one or more areas called hot spots on an image.
Inline Choice	An Inline Choice item is like a fill-in-the-blank item where the student selects a single text option from a drop-down menu within a table or inline text. The item may contain multiple blanks.
Match Table Grid	The Match Table Grid interaction allows students to select radio buttons or check checkboxes in cells to indicate a match between the column and row labels.
Point Graph	Point Graph allows the test-taker to plot points, line segments, continuous lines, and/or polygons. Point Graph items can use one or multiple graph interactions (composite graphs).

Item Format	Description
Shape Transformation	Shape Transformation allows the test-taker to choose one of four variants of a single shape, drag it onto a four-quadrant grid, and position it on the grid.

Arizona Math Standards

Operations and Algebraic Thinking (OA) *Note: Grade 3 expectations in this domain are limited to whole number multiplication through 10 x 10 and whole number division with both quotients and divisors less than or equal to 10.*		
3.OA.A **Represent and solve problems involving whole number multiplication and division.**	**3.OA.A.1**	Interpret products of whole numbers as the total number of objects in equal groups (e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each).
	3.OA.A.2	Interpret whole number quotients of whole numbers (e.g., interpret 56 ÷ 8 as the number of objects in each group when 56 objects are partitioned equally into 8 groups, or as a number of groups when 56 objects are partitioned into equal groups of 8 objects each). *See Table 2.*
	3.OA.A.3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. *See Table 2.*
	3.OA.A.4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers *For example, determine the unknown number that makes the equation true in each of the equations 8 x ☐ = 48, 5 = ☐ ÷ 3, 6 x 6 = ☐. See Table 2.*
3.OA.B **Understand properties of multiplication and the relationship between multiplication and division.**	**3.OA.B.5**	Apply properties of operations as strategies to multiply and divide. Properties include commutative and associative properties of multiplication and the distributive property. (Students do not need to use the formal terms for these properties.)
	3.OA.B.6	Understand division as an unknown-factor problem (e.g., find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8).
3.OA.C **Multiply and divide within 100.**	**3.OA.C.7**	Fluently multiply and divide within 100. By the end of Grade 3, know from memory all multiplication products through 10 x 10 and division quotients when both the quotient and divisor are less than or equal to 10.
3.OA.D **Solve problems involving the four operations, and identify and explain patterns in arithmetic.**	**3.OA.D.8**	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Utilize understanding of the Order of Operations when there are no parentheses.
	3.OA.D.9	Identify patterns in the addition table and the multiplication table and explain them using properties of operations (e.g. observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends).
	3.OA.D.10	When solving problems, assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Number and Operations in Base Ten (NBT) *Note: A range of algorithms may be used.*		
3.NBT.A **Use place value understanding and properties of operations to perform multi-digit arithmetic.**	**3.NBT.A.1**	Use place value understanding to round whole numbers to the nearest 10 or 100.
	3.NBT.A.2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
	3.NBT.A.3	Multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 using strategies based on place value and the properties of operations (e.g., 9 x 80, 5 x 60).
Number and Operations – Fractions (NF) *Note: Grade 3 expectations are limited to fractions with denominators: 2,3,4,6,8.*		
3.NF.A **Understand fractions as numbers.**	**3.NF.A.1**	Understand a fraction (1/*b*) as the quantity formed by one part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by *a* parts of size 1/*b*.
	3.NF.A.2	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Understand that each part has size 1/*b* and that the end point of the part based at 0 locates the number 1/*b* on the number line. b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Understand that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line including values greater than 1. c. Understand a fraction 1/*b* as a special type of fraction that can be referred to as a unit fraction (e.g. 1/2, 1/4).
	3.NF.A.3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent if they have the same relative size compared to 1 whole. b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Understand that comparisons are valid only when the two fractions refer to the same whole. Record results of comparisons with the symbols >, =, or <, and justify conclusions.

Measurement and Data (MD)		
3.MD.A **Solve problems involving measurement.**	**3.MD.A.1a**	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes (e.g., representing the problem on a number line diagram).
	3.MD.A.1b	Solve word problems involving money through $20.00, using symbols $, ".", ¢.
	3.MD.A.2	Measure and estimate liquid volumes and masses of objects using metric units. (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. Excludes multiplicative comparison problems (problems involving notions of "times as much"). *See Table 2.*
3.MD.B **Represent and interpret data.**	**3.MD.B.3**	Create a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *See Table 1.*
	3.MD.B.4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch to the nearest quarter-inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
3.MD.C **Geometric measurement: Understand concepts of area and perimeter.**	**3.MD.C.5**	Understand area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.
	3.MD.C.6	Measure areas by counting unit squares (e.g., square cm, square m, square in, square ft, and improvised units).
	3.MD.C.7	Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show that the area of a rectangle with whole-number side lengths *a* and *b* + *c* is the sum of *a* × *b* and *a* × *c*. Use area models to represent the distributive property in mathematical reasoning. d. Understand that rectilinear figures can be decomposed into non-overlapping rectangles and that the sum of the areas of these rectangles is identical to the area of the original rectilinear figure. Apply this technique to solve problems in real-world contexts.

3.MD.C (cont.)	**3.MD.C.8**	Solve real-world and mathematical problems involving perimeters of plane figures and areas of rectangles, including finding the perimeter given the side lengths, finding an unknown side length. Represent rectangles with the same perimeter and different areas or with the same area and different perimeters.
Geometry (G)		
3.G.A **Reason with shapes and their attributes.**	**3.G.A.1**	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others)may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples quadrilaterals that do not belong to any of these subcategories.
	3.G.A.2	Partition shapes into *b* parts with equal areas. Express the area of each part as a unit fraction 1/*b* of the whole. (Grade 3 expectations are limited to fractions with denominators *b* = 2,3,4,6,8.)

Grade 3 Item Specifications

Operations and Algebraic Thinking

3.OA.A.1

Content Standards	Interpret products of whole numbers as the total number of objects in equal groups (e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each).
Explanations	Students recognize multiplication as a means to determine the total number of objects when there are a specific number of groups with the same number of objects in each group. Multiplication requires students to think in terms of groups of things rather than individual things. Students learn that the multiplication symbol 'x' means "groups of" and problems such as 5 x 7 refer to 5 groups of 7. To further develop this understanding, students interpret a problem situation requiring multiplication using pictures, objects, words, numbers, and equations. Then, given a multiplication expression (e.g., 5 x 6) students interpret the expression using a multiplication context. (See Table 2) They should begin to use the terms, factor and product, as they describe multiplication.
Content Limits	Products within 100. Whole number factors.
Context	Context is allowed.

Sample Task Demands	Common Item Formats
Students will be required to interpret and/or describe what factor pairs represent in a given arrangement.	• Equation Response • Multiple Choice Response • Multi-Select Response • Table Response
Students will be required to create a multiplication problem that describes a given arrangement.	
Students will be required to create multiple pairs of factors to create a given arrangement.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Identify whole number products with visual support.	Interpret whole number products with visual support.
Proficient	**Highly Proficient**
Interpret products of whole numbers as the total number of objects in equal groups (e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each).	Interpret products of whole numbers within 100, representing context using pictures, numbers, and words.

3.OA.A.2

Content Standards	Interpret whole number quotients of whole numbers (e.g., interpret 56 ÷ 8 as the number of objects in each group when 56 objects are partitioned equally into 8 groups, or as a number of groups when 56 objects are partitioned into equal groups of 8 objects each).
Explanations	Students recognize the operation of division in two different types of situations. One situation requires determining how many groups and the other situation requires sharing (determining how many in each group). Students should be exposed to appropriate terminology (quotient, dividend, divisor, and factor). To develop this understanding, students interpret a problem situation requiring division using pictures, objects, words, numbers, and equations. Given a division expression (e.g., 24 ÷ 6) students interpret the expression in contexts that require both interpretations of division.
Content Limits	Dividends up to 100. Whole number dividends. Whole number quotients.
Context	Context is allowed.

Sample Task Demands	Common Item Formats
Students will be required to identify the quotient for a given problem.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response
Students will be required to find a number to answer a question based on the interpretation of a quotient within a context.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Identify whole number quotients with visual support.	Interpret whole number quotients with visual support.
Proficient	**Highly Proficient**
Interpret whole number quotients of whole numbers (e.g., interpret 56 ÷ 8 as the number of objects in each group when 56 objects are partitioned equally into 8 groups, or as a number of groups when 56 objects are partitioned into equal groups of 8 objects each).	Interpret quotients of whole numbers within 100, representing context using pictures, numbers, and words.

3.OA.A.3

Content Standards	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.
Explanations	Students use a variety of representations for creating and solving one-step word problems, i.e., numbers, words, pictures, physical objects, or equations. They use multiplication and division of whole numbers up to 10 x10. Students explain their thinking, show their work by using at least one representation, and verify that their answer is reasonable.
Content Limits	All numbers must be 100 or less. Use whole numbers only. Give only one unknown per equation. Unknown may be in any position. Do not use letter variables for the unknown in this standard. Instead, use a box or other symbol to represent the unknown. Do not use the words "times as much/many."
Context	Context is required.

Sample Task Demands	**Common Item Formats**
Students will be required to solve a simple word problem involving multiplication or division.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response
Students will be required to create an equation to model a simple situation with multiplication or division.	
Students will be required to model multiplication and division equations by sorting objects into equal groups.	
Students will be required to create an equation to model a complex situation with multiplication or division.	
Students will be required to create a model using a multiplication or division equation that represents a complex situation.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Identify products and quotients within 100 to solve word problems involving equal groups and arrays when a visual model is given.	Multiply and divide within 100 to solve word problems involving equal groups and arrays when a visual model is given.
Proficient	**Highly Proficient**
Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.	Multiply and divide within 100 to solve multi-step word problems involving equal groups, arrays, and measurement quantities.

3.OA.A.4

Content Standards	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x □ = 48, 5 = □ ÷ 3, 6 x 6 = □.
Explanations	This standard is strongly connected to 3.AO.3 when students solve problems and determine unknowns in equations. Students should also experience creating story problems for given equations. When crafting story problems, they should carefully consider the question(s) to be asked and answered to write an appropriate equation. Students may approach the same story problem differently and write either a multiplication equation or division equation. Students apply their understanding of the meaning of the equal sign as "the same as" to interpret an equation with an unknown. Equations in the form of *a* x *b* = *c* and *c* = *a* x *b* should be used interchangeably, with the unknown in different positions.
Content Limits	Product is less than 100. Whole number factors and quotients. Equation must be given, and not created.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to find the unknown number in a given multiplication or division equation.	• Equation Response • Multiple Choice Response

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Recognize the unknown whole number in a multiplication or division equation, when the unknown number is the solution using visual support/arrays.	Determine the unknown whole number in a multiplication or division equation, when the unknown number is the product or quotient using visual support/arrays.
Proficient	**Highly Proficient**
Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x □ = 48, 5 = □ ÷ 3, 6 x 6 = □ .	Determine an unknown whole number in a multiplication and division equation. Students will use the given context to generate an equation.

3.OA.B.5

Content Standards	Apply properties of operations as strategies to multiply and divide. Properties include commutative and associative properties of multiplication and the distributive property. (Students do not need to use the formal terms for these properties.)
Explanations	Students represent expressions using various objects, pictures, words and symbols in order to develop their understanding of properties. They multiply by 1 and 0 and divide by 1. They change the order of numbers to determine that the order of numbers does not make a difference in multiplication (but does make a difference in division). Given three factors, they investigate changing the order of how they multiply the numbers to determine that changing the order does not change the product. They also decompose numbers to build fluency with multiplication. Students are introduced to the distributive property of multiplication over addition as a strategy for using products they know to solve products they don't know. To further develop understanding of properties related to multiplication and division, students use different representations and their understanding of the relationship between multiplication and division to determine if the following types of equations
Content Limits	Whole numbers. Product or dividend must be 100 or less. Factors, divisors, and quotients should be 10 or less.
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to create an equivalent expression and/or equation based on applying a particular property (i.e., Commutative, Associative, Distributive).	• Equation Response • Graphic Response • Multiple Choice Response • Matching Item Response • Multi-Select Response

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Apply properties of operations as strategies to multiply and divide. Properties include commutative properties of multiplication. (Students do not need to use the formal terms for these properties.)	Apply properties of operations as strategies to multiply and divide. Properties include commutative and associative properties of multiplication. Students do not need to use the formal terms for these properties.)
Proficient	**Highly Proficient**
Apply properties of operations as strategies to multiply and divide. Properties include commutative and associative properties of multiplication and the distributive property. (Students do not need to use the formal terms for these properties.)	Use multiple strategies of operations to multiply and divide within a word problem.

3.OA.B.6

Content Standards	Understand division as an unknown-factor problem (e.g., find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8).
Explanations	Multiplication and division are inverse operations and that understanding can be used to find the unknown. Fact family triangles demonstrate the inverse operations of multiplication and division by showing the two factors and how those factors relate to the product and/or quotient. Students use their understanding of the meaning of the equal sign as "the same as" to interpret an equation with an unknown. Equations in the form of $a \div b = c$ and $c = a \div b$ need to be used interchangeably, with the unknown in different positions.
Content Limits	Whole numbers. Quotients up to 100.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to write division problems as equivalent multiplication problems.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Identify division as unknown factor problems by finding missing number in the second factor position with visual support/ arrays.	Solve division as unknown factor problems by finding missing number in the second factor position with visual support/arrays.
Proficient	**Highly Proficient**
Understand division as an unknown-factor problem (e.g., find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8).	Solve division as unknown factor problems by using the relationship between multiplication and division. Model multiplication and division in a variety of ways.

3.OA.C.7

Content Standards	Fluently multiply and divide within 100. By the end of Grade 3, know from memory all multiplication products through 10 x 10 and division quotients when both the quotient and divisor are less than or equal to 10.
Explanations	By studying patterns and relationships in multiplication facts and relating multiplication and division, students build a foundation for fluency with multiplication and division facts. Students demonstrate fluency with multiplication facts through 10 and the related division facts. Multiplying and dividing fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. General Note: Students should have exposure to multiplication and division problems presented in both vertical and horizontal forms.
Content Limits	Whole numbers. Multiply and divide within 100. Factors, divisors, and quotients should be 10 or less.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to find the product or dividend.	• Equation Response • Multiple Choice Response • Multi-Select Response • Table Response

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Multiply and divide within 100 using visual support/arrays.	Organize expressions to multiply and divide within 100 using visual support/ arrays.
Proficient	**Highly Proficient**
Fluently multiply and divide within 100. By the end of Grade 3, know from memory all multiplication products through 10 x 10 and division quotients when both the quotient and divisor are less than or equal to 10.	Fluently multiply and divide within 100 within range of contexts.

3.OA.D.8

Content Standards	Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Utilize understanding of Order of Operations when there are no parentheses.
Explanations	Students should be exposed to multiple problem-solving strategies (using any combination of words, numbers, diagrams, physical objects or symbols) and be able to choose which ones to use. When students solve word problems, they use various estimation skills which include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of solutions.
Content Limits	Dividends up to 100. Whole number dividends. Whole number quotients.
Context	Context is required.

Sample Task Demands	Common Item Formats
Students will be required to determine a solution to a two-step word problem.	• Equation Response • Graphic Response • Multiple Choice Response
Students will be required to determine whether an answer is reasonable based on estimation and/or rounding.	
Students will be required to construct an equation that models a multi-step word problem.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Solve one-step word problems using the four operations with visual support/arrays. Represent these problems using equations with a letter standing for the unknown quantity. Utilize understanding of the Order of Operations when there are no parentheses.	Solve two-step word problems using the four operations using visual support. Represent these problems using equations with a letter standing for the unknown quantity. Utilize understanding of the Order of Operations when there are no parentheses.
Proficient	**Highly Proficient**
Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Utilize understanding of the Order of Operations when there are no parentheses.	Solve two-step word problems with large whole numbers and using multiple operations.

3.OA.D.9

Content Standards	Identify patterns in the addition table and the multiplication table and explain them using properties of operations (e.g. observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends).
Explanations	Students need ample opportunities to observe and identify important numerical patterns related to operations. They should build on their previous experiences with properties related to addition and subtraction. Students investigate addition and multiplication tables in search of patterns and explain why these patterns make sense mathematically. Students also investigate a hundreds chart in search of addition and subtraction patterns. They record and organize all the different possible sums of a number and explain why the pattern makes sense.
Content Limits	Adding and subtracting whole numbers within 1,000. Multiplying and dividing whole numbers within 100.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to identify numbers in a well-known pattern, such as an addition or multiplication table.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response • Table Response
Students will be required to identify unknown numbers in a pattern.	
Students will be required to identify the pattern in a sequence of numbers**.**	
Students will be required to determine characteristics or trends across numerical situations such as sum, doubles, and/or multiples.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Identify addition patterns using visual supports.	Identify multiplication and subtraction patterns using visual supports.
Proficient	**Highly Proficient**
Identify patterns in the addition table and the multiplication table and explain them using properties of operations (e.g. observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends).	Create and extend arithmetic patterns, explain patterns using properties of operations.

3.OA.D.10

Content Standards	When solving problems, assess the reasonableness of answers using mental computation and estimation strategies including rounding.
Explanations	Solve problems involving the four operations and identify and explain patterns in arithmetic.
Content Limits	Multiplication through 10 x 10 Division with quotients and divisors less than or equal to 10 Addition and subtraction is limited to 1,000. Rounding is to the nearest 10 or the nearest 100. Operations are only with whole numbers.
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to determine the best estimation strategy given the context of a situation.	• Equation Response • Graphic Response • Multiple Choice Response • Table Response
Students will be required to determine whether an answer is appropriate in a given context.	
Students will be required to recognize when an estimation strategy is or is not appropriate.	
Students will be required to use estimation strategies to solve a problem.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Recognize whether an answer is reasonable or not when rounding.	Use rounding to determine the reasonableness of answers when using the four operations to solve problems.
Proficient	**Highly Proficient**
When solving problems, assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Recognize the reasonableness of answers using different types of estimation strategies when using the four operations to solve problems. Choose the best estimation strategy for a specific purpose.

Operations and Algebraic Thinking & Numbers in Base Ten

3.NBT.A.1

Content Standards	Use place value understanding to round whole numbers to the nearest 10 or 100.
Explanations	Students learn when and why to round numbers. They identify possible answers and halfway points. Then they narrow where the given number falls between the possible answers and halfway points. They also understand that by convention if a number is exactly at the halfway point of the two possible answers, the number is rounded up.
Content Limits	Whole numbers up to 1000. Avoid situations where the place the student rounded to is ambiguous. For example, asking a student to round 697 to the nearest ten is not a good item, as the student would get the exact same answer if he or she mistakenly rounded to the nearest hundred.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to identify the value of a given number rounded to the nearest 10 or 100.	• Equation Response • Graphic Response • Matching Item Response • Multi-Select Response • Table Response
Students will be required to identify the numbers that round to a given value.	
Students will be required to plot points to represent values that round to a given value.	
Students will be required to interpret and distinguish between different rounding procedures used in rounding to a number in order to create a number that fits certain parameters.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Use place value understanding to round a two-digit number to the nearest 10.	Use place value understanding to round a three-digit number to the nearest 100.
Proficient	**Highly Proficient**
Use place value understanding to round whole numbers to the nearest 10 or 100.	Use rounding strategies in real-world situations.

3.NBT.A.2

Content Standards	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
Explanations	Problems should include both vertical and horizontal forms, including opportunities for students to apply the commutative and associative properties. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students explain their thinking and show their work by using strategies and algorithms, and verify that their answer is reasonable. An interactive whiteboard or document camera may be used to show and share student thinking.
Content Limits	Addends and sums are less than or equal to 1000. Minuends, subtrahends, and differences are less than or equal to 1000.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to calculate the sum or difference of two or more numbers.	• Equation Response • Multi-Select Response

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Fluently add and subtract within 1000 using strategies and algorithms based on the relationship between addition and subtraction.	Fluently add and subtract within 1000 using strategies and algorithms based on place value and/or the relationship between addition and subtraction.
Proficient	**Highly Proficient**
Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Explain the method used in finding the sum or difference; recognize and identify an error and shows the correct answer.

3.NBT.A.3

Content Standards	Multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 using strategies based on place value and the properties of operations (e.g., 9 x 80, 5 x 60).
Explanations	Students use base ten blocks, diagrams, or hundreds charts to multiply one-digit numbers by multiples of 10 from 10-90. They apply their understanding of multiplication and the meaning of the multiples of 10.
Content Limits	Largest product is 810 (9 x 90 = 810)
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to calculate the product of a one-digit number by a multiple of 10 without context.	• Equation Response • Matching Item Response • Multi-Select Response
Students will be required to calculate the product of a one-digit number by a multiple of 10 within the context of a word problem.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Skip count by 10, 20 or 50 to multiply single-digit whole numbers by multiples of 10 in the range 10-90.	Use grouping strategies (associative property) to multiply single-digit whole numbers by multiples of 10 in the range 10-90.
Proficient	**Highly Proficient**
Multiply one-digit whole numbers by multiples of 10 in the range 10 to 90 using strategies based on place value and the properties of operations (e.g., 9 x 80, 5 x 60).	Show product of single-digit whole numbers by multiples of 10 using multiple strategies.

Numbers and Operations – Fractions

3.NF.A.1

Content Standards	Understand a fraction (1/*b*) as the quantity formed by one part when a whole is partitioned into b equal parts; understand a fraction *a*/*b* as the quantity formed by *a* parts of size 1/*b*.
Explanations	Students express fractions as fair sharing, parts of a whole, and parts of a set. They use various contexts (candy bars, fruit, and cakes) and a variety of models (circles, squares, rectangles, fraction bars, and number lines) to develop understanding of fractions and represent fractions. Students need many opportunities to solve word problems that require fair sharing. To develop understanding of fair shares, students first participate in situations where the number of objects is greater than the number of children and then progress into situations where the number of objects is less than the number of children.
Content Limits	Denominators limited to 2, 3, 4, 6, and 8. Combining or putting together unit fractions rather than formal addition or subtraction of fractions. Maintain concept of a whole as one entity that can be equally partitioned in various ways when working with unit fractions. Limit usage of the words numerator and denominator in items—focus should not be on assessing vocabulary terms. Fractions *a*/*b* can be improper fractions and students should not be guided to put fractions in lowest terms or to simplify. Focus more on area models since 3.NF.2 uses number lines exclusively.
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to identify a model given a fraction.	• Equation Response • Graphic Response • Multiple Choice Response • Matching Item Response • Multi-Select Response
Students will be required to identify a fraction given a model.	
Students will be required to partition a whole into equal parts and identify that each part is a unit fraction.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Identify a fraction (1/*b*) as the quantity formed by one part when a whole is partitioned into *b* equal parts given visual support.	Understand a fraction (1/*b*) as the quantity formed by one part when a whole is partitioned into *b* equal parts.
Proficient	**Highly Proficient**
Understand a fraction (1/*b*) as the quantity formed by one part when a whole is partitioned into *b* equal parts; understand a fraction *a*/*b* as the quantity formed by a parts of size 1/*b*.	Apply understanding of unit fractions to real world, multi-step problems.

3.NF.A.2, 3.NF.A.2a, 3.NF.A.2b, and 3.NF.A.2c

Content Standards	**3.NF.A.2** Understand a fraction as a number on the number line; represent fractions on a number line diagram. **3.NF.A.2a** Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Understand that each part has size 1/*b* and that the end point of the part based at 0 locates the number 1/*b* on the number line. **3.NF.A.2b** Represent a fraction *a*/*b* on a number line diagram by marking off a lengths 1/*b* from 0. Understand that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line including values greater than 1. **3.NF.A.2c** Understand a fraction 1/*b* as a special type of fraction that can be referred to as a unit fraction (e.g. 1/2, 1/4).
Explanations	Students transfer their understanding of parts of a whole to partition a number line into equal parts. New is the inclusion of fractions greater than one, and the emphasis on the importance of understanding unit fractions.
Content Limits	Denominators limited to 2, 3, 4, 6, and 8 Models restricted to number lines starting at 0. Part A: number line interval from 0 to 1. Part B: number lines can extend from 0 to 1+.
Common Item Formats	The Item Formats section on pages 10 through 12 provides a list of item formats that may be used to assess this standard. The common item formats include, but are not limited to, those shown with the sample task demands.
Context	Context is not allowed.

Sample Task Demands	Common Item Formats
Students will be required to identify and represent unit fractions of 1/*b* on a number line.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response
Students will be required to identify and represent fractions of size *a*/*b* as "*a*" 1/*b* sized segments on the number line starting from 0.	
Students will be required to identify and interpret fractional values on number lines.	
Students will be required to reason and draw conclusions about partitioning wholes and constructing fractional models, and will be required to compare fractions and justify decisions using number line representations.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Identify a unit fraction as being between 0 and 1 on a number line. b. Recognize a partition that creates 1/2 or 1/4 on a number line. c. Recognize that if 1 is in the numerator of a fraction, then it is a unit fraction.	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Identify 1/2 and 1/3 on a number line. b. Identify the partitions on a number line that would represent common fractions. c. Identify unit fractions.
Proficient	**Highly Proficient**
Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Understand that each part has size 1/*b* and that the end point of the part based at 0 locates the number 1/*b* on the number line. b. Represent a fraction *a*/*b* on a number line diagram by marking off a lengths 1/*b* from 0. Understand that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line including values greater than 1. c. Understand a fraction 1/*b* as a special type of fraction that can be referred to as a unit fraction (e.g. 1/2, 1/4).	Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Create a number line to locate any unit fraction that represents a real-world value b. Create a number line to locate fractions greater than 1 that represents a real world value c. Create unit fractions to compare values in multi-step, real world contexts

3.NF.A.3, 3.NF.A.3a, 3.NF.A.3b, 3.NF.A.3c, and 3.NF.A.3d.

Content Standards	**3.NF.A.3** Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **3.NF.A.3a** Understand two fractions as equivalent if they have the same relative size compared to 1 whole. **3.NF.A.3b** Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. **3.NF.A.3c** Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. **3.NF.A.3d** Compare two fractions with the same numerator or the same denominator by reasoning about their size. Understand that comparisons are valid only when the two fractions refer to the same whole. Record results of comparisons with the symbols >, =, or <, and justify conclusions.
Explanations	An important concept when comparing fractions is to look at the size of the parts and the number of the parts. Students recognize when examining fractions with common denominators, the wholes have been divided into the same number of equal parts. So the fraction with the larger numerator has the larger number of equal parts. To compare fractions that have the same numerator but different denominators, students understand that each fraction has the same number of equal parts but the size of the parts are different. They can infer that the same number of smaller pieces is less
Content Limits	Denominators limited to 2, 3, 4, 6, and 8. Fractions must refer to the same whole unless intent of item is to assess reasoning about wholes. The vocabulary of lowest terms or simplify should not be used. Limit to a maximum of 3 when ordering fractions. Visual models primarily used include number lines and area models (circles, rectangles, regular polygons - see shapes from geometry standards).
Context	Context is allowed.

Sample Task Demands	Common Item Formats
Students will be required to represent equivalent fractions.	• Graphic Response • Multiple Choice Response • Matching Item Response • Multi-Select Response • Table Response
Students will be required to compare fractions with the same denominator.	
Students will be required to express whole numbers as fractions (over 1) and recognize equivalent fraction forms of whole numbers (n*p/0p).	
Students will be required to represent and explain equivalent fractions by creating fraction models.	
Students will be required to compare fractions with the same numerator and unlike denominators.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a. Understand equivalent fractions using denominators of 2, 4 and 8 given visual models. b. Recognize and generate equivalent fractions using denominators of 2, 4 and 8 given visual models. c. Express and recognize fractions that are equivalent to 1. d. Compare two fractions with the same denominator and records results using symbols.	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a. Understand equivalent fractions using denominators of 2, 4 and 8. b. Recognize and generate equivalent fractions using denominators of 2, 4 and 8. c. Express and recognize fractions that are equivalent to whole numbers. d. Compare two fractions with the same numerator and records results using symbols.

Proficient	Highly Proficient
Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a. Understand two fractions as equivalent if they have the same relative size compared to 1 whole. b. Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. c. Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Understand that comparisons are valid only when the two fractions refer to the same whole. Record results of comparisons with the symbols >, =, or <, and justify conclusions.	Explain equivalence of fractions in special cases and compare fractions by reasoning about their size. a. Identify equivalent fractions by creating fraction models to compare fractions that pertain to the same whole. b. Explain why two fractions are equivalent. Identify equivalent fractions by creating fraction models to compare fractions that pertain to the same whole. c. Express whole numbers as fractions with denominators greater than 1. d. Create and compare two fractions that have the same numerator or same denominator using symbols within a context.

Measurement and Data & Geometry

3.MD.A.1a and 3.MD.A.1b

Content Standards	**3.MD.A.1a** Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes (e.g., representing the problem on a number line diagram). **3.MD.A.1b** Solve word problems involving money through $20.00, using symbols $, ".", ¢.
Explanations	Students in second grade learned to tell time to the nearest five minutes. In third grade, they extend telling time in minute intervals and measure elapsed time using clocks and number lines in an abstract sense or within a larger context. Students in second grade learn to solve problems involving collections of dollar bills, dimes, nickels, and pennies as well as recoring totals using $ and ¢. In third grade, they extend beyond finding totals of money collections to solving a wider variety of problems involving money through $20.00.
Content Limits	Times should be to the nearest minute. Addition and subtraction Problems involving money are limited to $20.00.
Context	Context is allowed.

Sample Task Demands	Common Item Formats
Students will be required to recognize and identify a time shown to a single-minute increment on a clock.	• Equation Response • Graphic Response • Multiple Choice Response • Table Response
Students will be required to calculate a change of time.	
Students will be required to show change of time on a number line or clock.	
Students will be required to construct a schedule by adding and subtracting time intervals.	
Students will be required to determine the sum and/or difference of values using symbols $, ".", ¢.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Solve problems involving measurement. a. Tell, write, and measure time to the nearest minute. b. Can add money using symbols $, ".", ¢.	Solve problems involving measurement. a. Solve one-step word problems involving addition or subtraction of time intervals in minutes with scaffolding. b. Can add money using symbols $, ".", ¢.
Proficient	**Highly Proficient**
Solve problems involving measurement. a. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes (e.g., representing the problem on a number line diagram). b. Solve word problems involving money through $20.00, using symbols $, ".", ¢.	Solve problems involving measurement. a. Create and solve multi-step time interval problems. b. Solve two-step word problems involving money through $20 using symbols $, ".", ¢.

3.MD. A.2

Content Standards	Measure and estimate liquid volumes and masses of objects using metric units. (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. Excludes multiplicative comparison problems (problems involving notions of “times as much”).
Explanations	Students need multiple opportunities weighing classroom objects and filling containers to help them develop a basic understanding of the size and weight of a liter, a gram, and a kilogram. Milliliters may also be used to show amounts that are less than a liter.
Content Limits	Excludes compound units such as cm^3 and finding the geometric volume of a container. Excludes multiplicative comparison problems (problems involving notions of "times as much").
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to identify a given measured amount.	• Equation Response • Multiple Choice Response
Students will be required to estimate an unknown quantity by comparing it with a given measurement.	
Students will be required to interpret and calculate a one-step word problem involving measurement.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Using grams, kilograms or liters, measure and estimate liquid volumes and masses of objects using models.	Using grams, kilograms or liters, solve simple one-step measurement word problems using either addition or subtraction.
Proficient	**Highly Proficient**
Measure and estimate liquid volumes and masses of objects using metric units. (Excludes compound units such as cm^3 and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units. Excludes multiplicative comparison problems (problems involving notions of “times as much”).	Using grams, kilograms or liters, estimate and solve multi-step measurement word problems involving any of the four operations.

3.MD.B.3

Content Standards	Create a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
Explanations	Students should have opportunities reading and solving problems using scaled graphs before being asked to draw one. The following graphs all use five as the scale interval, but students should experience different intervals to further develop their understanding of scale graphs and number facts.
Content Limits	Categories are five or fewer and use multiplication and division within 100.
Context	Context is required.

Sample Task Demands	**Common Item Formats**
Students will be required to compare two or more data values from a given graph to solve one- and two-step word problems.	• Equation Response • Graphic Response • Table Response
Students will be required to construct a scaled bar or picture graph based on given data.	
Students will be required to create a scale for given data and construct a graph.	
Students will be required to construct a scaled bar or picture graph based on parameters.	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Complete a scaled picture graph or bar graph (with a scale factor of 1 or 5) to represent data set with support.	Complete a scaled picture graph or bar graph to represent a data set with support. Solve one-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
Proficient	**Highly Proficient**
Create a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.	Create own scale and graph based on given data parameters.

3.MD.B.4

Content Standards	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch to the nearest quarter-inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
Explanations	Students in second grade measured length in whole units using both metric and U.S. customary systems. It's important to review with students how to read and use a standard ruler including details about halves and quarter marks on the ruler. Students should connect their understanding of fractions to measuring to one-half and one-quarter inch. Third graders need many opportunities measuring the length of various objects in their environment. Some important ideas related to measuring with a ruler are: The starting point of where one places a ruler to begin measuring; Measuring is approximate (Items that students measure will not always measure exactly 1/4, 1/2 or one whole inch. Students will need to decide on an appropriate estimate length); Making paper rulers and folding to find the half and quarter marks will help students develop a stronger understanding of measuring length. Students generate data by measuring and create a line plot to display their findings.
Content Limits	Units are limited to whole numbers, halves, or quarters. Standard rulers should not be used - only special rulers that are marked off in halves or quarters. Measurements are limited to inches.
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to measure the length of a given object.	• Equation Response • Graphic Response • Matching Item Response • Multi-Select Response
Students will be required to classify and/or sort objects based on their measure.	
Students will be required to construct a line plot for given data.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Generate measurement data by measuring lengths to the nearest half-inch. Show the data by making a line plot, where the horizontal scale is marked by whole numbers or halves with supports.	Generate measurement data by measuring lengths to the nearest quarter-inch. Show the data by making a line plot, where the horizontal scale is marked by whole numbers, halves, or quarters with supports.
Proficient	**Highly Proficient**
Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch to the nearest quarter-inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	Show the data by making a line plot, where the student decides whether the horizontal scale is marked by whole numbers, halves, or quarters based on the given data.

3.MD.C.5, 3.MD.C.5a, and 3.MD.C.5b

Content Standards	**3.MD.C.5** Understand area as an attribute of plane figures and understand concepts of area measurement. **3.MD.C.5a** A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. **3.MD.C.5b** A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.
Explanations	Students develop understanding of using square units to measure area by: Using different sized square units, filling in an area with the same sized square units and counting the number of square units. Using different sized graph paper, students can explore the areas measured in square centimeters and square inches.
Content Limits	Plane figures that can be covered by unit squares. Note: Exponential notation is not expected at this grade level (square cm is acceptable, but cm^2 is not)
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to identify what the area of a figure means and represents. (5a/5b)	• Equation Response • Multiple Choice Response • Multi-Select Response
Students will be required to recognize a square with side length 1 unit as a unit square. (5a)	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Understand area as an attribute of plane figures and understand concepts of area measurement. a. Can identify a square unit. b. Can distinguish area from length and width.	Understand area as an attribute of plane figures and understand concepts of area measurement. a. Understand area is measured using square units. b. Recognize overlapping and gaps in square unit place on a figure would not accurately describe area
Proficient	**Highly Proficient**
Understand area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.	Understand area as an attribute of plane figures and understand concepts of area measurement. a. Can identify and use different unit squares. b. Cover a plane figure with unit squares of different sizes to show that the area of the same figure can be expressed as different numbers in different units.

3.MD.C.6

Content Standards	Measure areas by counting unit squares (e.g., square cm, square m, square in, square ft, and improvised units).
Explanations	Students develop understanding of using square units to measure area by: Using different sized square units, filling in an area with the same sized square units and counting the number of square units. Using different sized graph paper, students can explore the areas measured in square centimeters and square inches.
Content Limits	Plane figures that can be covered by unit squares. Note: Exponential notation is not expected at this grade level (square cm is acceptable, but cm^2 is not)
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to find the area of a rectilinear figure by counting squares.	• Equation Response • Multiple Choice Response • Multi-Select Response

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Find the area of a rectangle by counting squares covering the rectangle and expresses the area without units.	Find area of a rectangle by counting unit squares.
Proficient	**Highly Proficient**
Measure areas by counting unit squares (e.g., square cm, square m, square in, square ft, and improvised units).	Find the area of 2 plane figures by creating and counting unit squares.

3.MD.C.7, 3.MD.C.7a, 3.MD.C.7b, 3.MD.C.7c, and 3.MD.C.7d

Content Standards	**3.MD.C.7** Relate area to the operations of multiplication and addition. **3.MD.C.7a** Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths. **3.MD.C.7b** Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning. **3.MD.C.7c** Use tiling to show that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. **3.MD.C.7d** Understand that rectilinear figures can be decomposed into non-overlapping rectangles and that the sum of the areas of these rectangles is identical to the area of the original rectilinear figure. Apply this technique to solve problems in real-world contexts.
Explanations	Students tile areas of rectangles, determine the area, record the length and width of the rectangle, investigate the patterns in the numbers, and discover that the area is the length times the width.
Content Limits	Rectangles and shapes that can be decomposed into rectangles. Whole-number side lengths Multiplication is within 100.
Context	Context is allowed.

Sample Task Demands	Common Item Formats
Students will be required to find the area of a rectangle using various strategies, such as multiplying side lengths and using tiling to demonstrate the distributive property as it relates to area.	• Equation Response • Graphic Response • Matching Item Response • Multi-Select Response
Students will be required to find the area of rectilinear figures by decomposing them into non-overlapping rectangles.	
Students will be required to draw conclusions about unknown side lengths in order to calculate the area of a rectilinear figure.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Relate area to the operations of multiplication and addition. a. Find the area of one rectangles by tiling. b. Multiply side lengths with both sides less than or equal to 5 to find area. c. Determine a missing value in an area model that represents the distributive property where all values are less than of equal to 5. d. Find the area of a rectilinear figure that is composed of two rectangles with side lengths less than or equal to 5 in a mathematical context.	Relate area to the operations of multiplication and addition. a. Show that the area of a rectangle found by tiling is the same as would be found by multiplying the side lengths. b. Multiply side lengths with one side less than or equal to 5 to find area. c. Determines a missing value in an area model that represents the distributive property. d. Find the area of a simple decomposition.
Proficient	**Highly Proficient**
Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. d. Understand that rectilinear figures can be decomposed into non-overlapping rectangles and that the sum of the areas of these rectangles is identical to the area of the original rectilinear figure. Apply this technique to solve problems in real-world contexts.	Relate area to the operations of multiplication and addition. a. Confirm tiling and multiplication of side lengths in self-created example. b. Compare the area of 2 plane figures by multiplying their side lengths and compares their sizes. c. Create a word problem using the distributive property to find the area of rectangles. d. Design area problems in which decomposition is integral to understanding and solving the problem.

3.MD.C.8

Content Standards	Solve real-world and mathematical problems involving perimeters of plane figures and areas of rectangles, including finding the perimeter given the side lengths, finding an unknown side length. Represent rectangles with the same perimeter and different areas or with the same area and different perimeters.
Explanations	Students develop an understanding of the concept of perimeter by walking around the perimeter of a room, using rubber bands to represent the perimeter of a plane figure on a geoboard. They find the perimeter of objects; use addition to find perimeters; and recognize the patterns that exist when finding the sum of the lengths and widths of rectangles.
Content Limits	Polygons that can be tiled with square units. Whole-number side lengths Multiplication is within 100.
Context	Context is allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to construct a polygon with a given perimeter or area.	• Equation Response • Graphic Response • Multiple Choice Response • Multi-Select Response
Students will be required to find the perimeter of a polygon given the side lengths.	
Students will be required to find an unknown side length of a polygon given the perimeter.	
Students will be required to construct a rectangle with a given perimeter based on area (or a given area based on perimeter).	

Performance Level Descriptors

Minimally Proficient	**Partially Proficient**
Find the perimeter of plane figures (given the side lengths).	Solve mathematical problems involving perimeters of plane figures, understand the difference in area and perimeter.
Proficient	**Highly Proficient**
Solve real-world and mathematical problems involving perimeters of plane figures and areas of rectangles, including finding the perimeter given the side lengths, finding an unknown side length. Represent rectangles with the same perimeter and different areas or with the same area and different perimeters.	Construct rectangles that have the same perimeter but different areas and the reverse.

Measurement and Data & Geometry

3.G.A.1

Content Standards	Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples quadrilaterals that do not belong to any of these subcategories.
Explanations	In third grade, students identify and draw triangles, quadrilaterals, pentagons, and hexagons. Third graders build on this experience and further investigate quadrilaterals (technology may be used during this exploration). Students recognize shapes that are and are not quadrilaterals by examining the properties of the geometric figures. They conceptualize that a quadrilateral must be a closed figure with four straight sides and begin to notice characteristics of the angles and the relationship between opposite sides. Students should be encouraged to provide details and use proper vocabulary when describing the properties of quadrilaterals. They sort geometric figures and identify squares, rectangles, and rhombuses as quadrilaterals.
Content Limits	Shapes include two dimensional shapes and the following quadrilaterals in particular: rhombus, rectangle, and square. Attributes include: number of sides, number of angles, whether the shape has a right angle or not, whether sides are the same length or not, whether the sides are straight lines or not. Do not include references to parallel or perpendicular sides - this is assessed in grade 4.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to select attributes that are shared by a set of shapes.	• Graphic Response • Multiple Choice Response • Matching Item Response • Multi-Select Response • Open Response
Students will be required to select shapes that belong to the same sub-categories.	
Students will be required to use a set of attributes to construct a shape.	
Students will be required to use a set of attributes to name a shape.	
Students will be required to classify shapes based on attributes.	
Students will be required to explain why the shapes were classified in a given way, given a set of shapes in two groups.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Identify properties of squares.	Understand the properties of quadrilaterals and the subcategories of quadrilaterals.
Proficient	**Highly Proficient**
Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples quadrilaterals that do not belong to any of these subcategories.	Recognize and sort examples of quadrilaterals that have shared attributes and that the shared attributes can define a larger category; draw examples and non-examples of quadrilaterals that are not rhombuses, rectangles, or squares.

3.G.A.2

Content Standards	Partition shapes into b parts with equal areas. Express the area of each part as a unit fraction 1/*b* of the whole. (Grade 3 expectations are limited to fractions with denominators *b* = 2,3,4,6,8.)
Explanations	Given a shape, students partition it into equal parts, recognizing that these parts all have the same area. They identify the fractional name of each part and are able to partition a shape into parts with equal areas in several different ways.
Content Limits	Fractions can have denominators of 2, 3, 4, 6, and 8 (per 3.NF). The fractions must be unit fractions. Shapes include quadrilateral (rhombus, rectangle, square, isosceles trapezoid), isosceles triangle, regular hexagon, circle (these are all the shapes covered in geometry standards K-3). The shape used and the number of partitions should be suitable for this grade. For example, having a student partition a hexagon into 6 parts is acceptable, but 8 is not.
Context	Context is not allowed.

Sample Task Demands	**Common Item Formats**
Students will be required to recognize the fraction an area of a shape represents.	• Equation Response • Graphic Response • Multi-Select Response • Table Response
Students will be required to identify the shapes that are divided into equal parts.	
Students will be required to partition a shape into equal areas.	
Students will be required to shade a fraction of shape.	
Students will be required to match given partitions with the fraction each represents.	
Students will be required to construct a complete shape given only one of the partitioned areas of the whole shape.	

Performance Level Descriptors

Minimally Proficient	Partially Proficient
Partition shapes into b parts with equal areas. Express the area of each part as a unit fraction 1/*b* of the whole. (limited to halves and quarters).	Partition shapes into b parts with equal areas. Express the area of each part as a unit fraction 1/*b* of the whole. (limited to halves, quarters, and eighths).
Proficient	**Highly Proficient**
Partition shapes into b parts with equal areas. Express the area of each part as a unit fraction 1/*b* of the whole. (Grade 3 expectations are limited to fractions with denominators *b* = 2,3,4,6,8.)	Partition shapes into parts with equal areas and expresses the area as a unit fraction of the whole to answer questions presented in a context.