

Differentiating Secondary Mathematics for Struggling Students



Grades
6 – 12

Differentiating Secondary Mathematics for Struggling Students

Presented by
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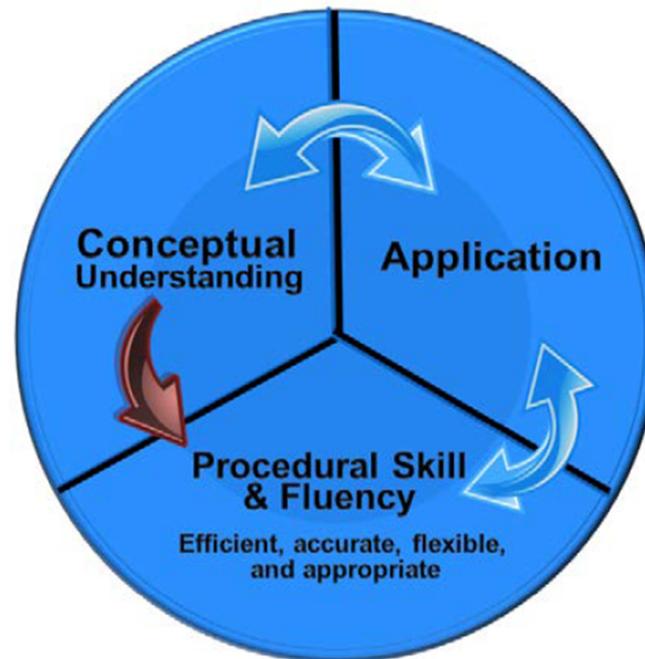


Objectives

- Standards
- Progressions
- Math
- Mathematical Practices
- Technology/IEP's

Draft Standards

Balanced approach to rigor found in the Arizona Mathematics Standards




$$\frac{7}{9} - \frac{2}{9} = \frac{5}{9}$$

Fraction Bars

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Focus

ARIZONA'S COLLEGE AND CAREER READY STANDARDS

K	1	2	3	4	5	6	7	8	HS
Geometry									Geometry
Measurement and Data					Statistics and Probability				Statistics & Probability
Number and Operations in Base Ten					The Number System				Number & Quantity
Operations and Algebraic Thinking					Expressions and Equations				Algebra
Counting and Cardinality			Number and Operations - Fractions			Ratios and Proportional Relationships	Functions	Functions	
									Modeling

Coherence Flows from Focus

**Operations and
Algebraic Thinking**



**Expressions
& Equations**



**Number and Operations-
Base Ten**



**The
Number
System**



**Number &
Operations-
Fractions**



Algebra

K

1

2

3

4

5

6

7

8

High School



Algebra

Required Fluencies in K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2 2.NBT.5	Add/subtract within 20 (know single-digit sums from memory) Add/subtract within 100
3	3.OA.7 3.NBT.2	Multiply/divide within 100 (know single-digit products from memory) Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division Multi-digit decimal operations

6.EE.A.3 and 4

- Begin $y + y + y = 3y$
- Next $2y + 3y = 5y$
- Next $3x + 2y + 2x + y = 5x + 3y$
- Next $2(3x + 2y) = 6x + 4y$

6.EE.B.7

$$x - 7 = 9$$

$$\underline{\quad + 7 = +7}$$

$$x = 16$$

7.EE.B.4 /HS.A-CED.A.1

$$2X - 17 = 21$$

$$\underline{\hspace{1.5cm} +17 \quad +17 \hspace{1.5cm}}$$

$$2X = 38$$

$$X = 19$$

$$2X - 8 = 12$$

$$\underline{\hspace{1.5cm} +8 \quad +8 \hspace{1.5cm}}$$

$$2X = 20$$

$$X = 10$$



8.EE.C.7

$$4x - 3 = 2x + 5$$

HS.A-APR.A.1

$$(x^2 + 2x + 6) + (x^2 + 3x + 5)$$

$$2x^2 + 5x + 11$$

HS.N-RN.A.2

$$(3 + 2i) + (5 + 3i)$$

$$8 + 5i$$



Algebra is the easiest...

But there are other
standards



8.G.C.9

$$V = (L)(W)(H)$$

6.G.A.1

- Area of Polygons



- $\frac{1}{2}(b_1 + b_2)h$

HS.A-REI.D.10

Which points are on the circle?

$$(x - 1)^2 + (y + 2)^2 = 5$$

- a) (1, -2) b) (2, 2)
c) (3, -1) d) (3, 4)

HS.A-REI.D.10

Which points are on the circle?

$$(x - 1)^2 + (y + 2)^2 = 5$$

- a) (1, -2) b) (2, 2)
c) (3, -1) d) (3, 4)



Mathematical Practices

Grouping the practice standards

1. Make sense of problems and persevere in solving them

6. Attend to precision

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics

5. Use appropriate tools strategically

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

Reasoning and explaining

Modeling and using tools

Seeing structure and generalizing

November 2016

Writing in Math Class Grades K-5	11/1	\$60.00
Math Content Coaching: Leading the way for Teaching and Learning	11/7	\$70.00
Webinar: Understanding the Math Teaching Practices Part 1 (3:30-4:30pm)	11/14	Free
Webinar: Understanding the Math Teaching Practices Part 2 (3:30-4:30pm)	11/15	Free
Webinar: Understanding the Math Teaching Practices Part 3 (3:30-4:30pm)	11/16	Free
Webinar: Promoting Productive Struggle in the Math Classroom (3:30-4:30pm)	11/17	Free
Webinar: Math Journals in K-2	11/17	Free
Standards Based Math Stations Grades 3-5	11/30	Free

December 2016

Promoting Productive Struggle in the Math Classroom Grades 3-8	12/6	\$60.00
Webinar: Ratio, Proportion, and Proportional Relationships in Middle School	12/19	Free
Webinar: Geometry in Middle School	12/20	Free
Webinar: Statistics in Middle School	12/21	Free

<https://ems.azed.gov/Home/Calendar>



Next Level

Video Self Modeling

What is Video Self Modeling?

Video Self Modeling



THE NATIONAL PROFESSIONAL DEVELOPMENT CENTER ON
AUTISM SPECTRUM DISORDERS



Let's try!

Solve and show work

A. $3x + 1 = 13$

B. $4x - 6 = 2x + 8$

C. $3(x - 2) = -(x - 14)$



"So it turns out that what is
ESSENTIAL for some students
turns out to be good for ALL
students."

David Rose
CAST



Show and Tell



Accommodations And Modifications

Grades 3-6: No calculators permitted on AzMERIT.

**Grades 7-8: Scientific calculator permitted on AzMERIT Math Part 1 only.
No calculators permitted on AzMERIT Math Part 2.**

Scientific calculator should include these functions: standard four functions (addition, subtraction, multiplication, division), decimal, change sign (+/-), parentheses, square root, and π .

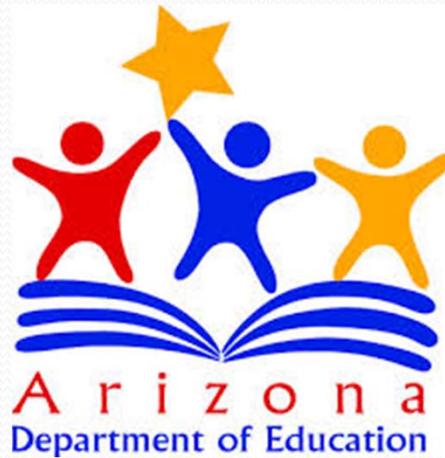
They may NOT include: any problem solving or programming capabilities, place values, and inequalities. *Sample acceptable calculator: TI-30X IIS or similar.*

High School End-of-Course Tests: Graphing calculators permitted on AzMERIT Math Part 1 and Part 2.

No calculators with Computer Algebra System (CAS) features are allowed. Calculators may NOT be capable of communication with other calculators through infrared sensors. NO instruction or formula cards, or other information regarding the operation of calculators such as operating manuals are permitted. The memory of any calculator with programming capability must be cleared, reset, or disabled when students enter the testing room. Many calculators have a testing mode that will allow these features to be disabled and will meet the requirements of AzMERIT. Check the calculator documentation for instructions on enabling this mode. If the memory of any calculator is password protected, and cannot be cleared or reset, the calculator may NOT be used. Items for the EOC tests are written with these types of calculators in mind; however students may use a scientific calculator if they choose to do so.

Sample acceptable calculators: TI-84 Plus, Casio FX-9750GII, or similar.

Resources



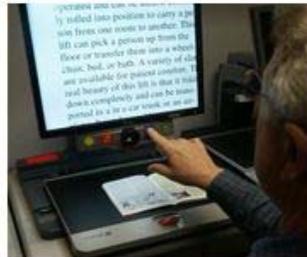


<http://bit.ly/aztechsymbaloos>

www.adeatloan.org

AzTAP ARIZONA
Technology
Access Program

A Statewide, Phoenix-based program of the
Institute for Human Development at
NORTHERN ARIZONA UNIVERSITY



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Arizona Department of Education AT Short Term Loan Library

Please note: The equipment inventory via this program is only available for loan to personnel from public education agencies (i.e., districts, charters, and other public schools), as defined in Arizona state statute and recognized by the Arizona Department of Education. If you are not affiliated with a public education agency, please visit the Arizona Technology Access Program's loan program, which is available to all residents of Arizona.



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Welcome

Use the tabs above to find out more Assistive Technology Short Term Loan Library, Exceptional Student Services at the Arizona Department of Education, search our inventory of equipment, review our frequently asked questions, download forms, or contact us.



Other State Initiatives

- UDL
- MTSS



Ah Ha's



Questions?