CREATING A VALID AND RELIABLE UNIT ASSESSMENT

Grade 4 – Mathematics

2016 – 2017   Pacing Guide - DRAFT

Module 1 Aug 8 - Sept 14	Module 2 Sept 15 – Sept 23	Module 7 Sept 26 – Sept 30	- Oct 3- Oct 7	Module 3 Oct 17- Dec 16	Module 5 Jan 2- Feb 3	Module 6 Feb 6 –Mar 3	Module 4 Mar 6- Apr 7	Module 5 Apr 10 – May 10	Module 7 May 11 - May 26
Place Value, Rounding, & Algorithms for Add. & Sub.	Unit Conversion & Problem Solving with Metric Measurements	Exploring Measurement with Multi. (Standard Measurement)	Combinations and Probability (Not part of Engage but AZCCRS)	Multi-Digit Mult. & Division	Fraction Equivalence, Ordering & Operations	Decimal Fractions Angle Measure & Plane Figures	Angle Measure & Plane Figures	Fraction Equivalence, Ordering & Operations	Exploring Measurement with Multi. (Standard Measurement)
27 days	**7 days**	**5 days**	**5 days**	**39 days**	**24 days**	**19 days**	**20 days**	**22 days**	**12 days**
4.OA.A.3	4.MD.A.1	4.OA.A.1	AZ.4.OA.A.3	4.OA.A.1	4.NF.A.1	4.NF.C.5	4.MD.C.5	4.NF.A.1	4.OA.A.1
4.NBT.A.1	4.MD.A.2	4.OA.A.2		4.OA.A.2	4.NF.A.2	4.NF.C.6	4.MD.C.6	4.NF.A.2	4.OA.A.2
4.NBT.A.2		4.OA.A.3		4.OA.A.3	4.NF.A.3	4.NF.C.7	4.MD.C.7	4.NF.A.3	4.OA.A.3
4.NBT.A.3		4.MD.A.1		4.OA.B.4	4.NF.A.4	4.MD.A.2	4.G.1	4.NF.A.4	4.MD.A.1
4.NBT.B.4		4.MD.A.2		4.NBT.B.5	4.OA.C.5		4.G.2	4.MD.A.2	4.MD.A.2
				4.NBT.B.6	4.MD.B.4		4.G.3	4.MD.B.4	
				4.MD.A.3				4.OA.A.2	
								4.OA.C.5	
6 Topics	**2 Topics**	**1 Topic**		**8 Topics**	**4 Topics**	**5 Topics**	**4 Topics**	**4 Topics**	**4 Topics**
19 Lessons	5 Lessons	1-4 Lessons		38 Lessons	1-21 Lessons	16 Lessons	16 Lessons	22-41 Lessons	5-18 Lessons
2 Assess. Day	1 Assess. Day	2 Assess. Day		1 Assess. Day	2 Assess. Day	2 Assess. Day	2 Assess. Day	2 Assess. Day	2 Assess. Day

Major Clusters			Supporting Clusters			Additional Clusters		
OA – Operations and Algebraic Thinking (1, 2, 3)			OA – Operations and Algebraic Thinking (4)			OA – Operations and Algebraic Thinking (5)		
NBT – Number and Operations in Base Ten (1, 2, 3, 4, 5, 6)			MD – Measurement and Data (1, 2, 3, 4)			MD – Measurement and Data (5, 6, 7)		
NF – Number and Operations – Fractions (1, 2, 3, 4, 5, 6, 7)						G –Geometry (1, 2, 3)		

AZMERIT Math Performance Level Indicators:

		a	b	c	d
Detailed	4.OA.A [1 to 3.1]	Recognizes that any two factors and their product can be read as a comparison. Solves word problems involving multiplicative comparison (where the unknown is the product or quotient), given visual representations. Solves multi-step word problems using the four operations with simple context and scaffolding, where the final answer is the unknown. Solves a counting problem with two attributes using a visual representation.	Represents comparisons of two factors and their product as equations using supports. Solve word problems involving multiplicative comparison (where the unknown is in a variety of positions), given visual representations. Solves multi-step word problems (which may include interpreting remainders) using the four operations with simple context and scaffolding, where the final answer is the unknown. Creates and uses any visual representation of a counting problem with two attributes.	Represents comparisons of two factors and their product as equations without support. Solves word problems involving multiplicative comparison, where the unknown is in a variety of positions. Solves multi-step word problems (including interpreting remainders) using the four operations. The unknown is in a variety of positions and can be represented by a symbol or letter. Recognizes the reasonableness of answers using mental computation and estimation strategies. Creates and uses any representation of counting problems; analyzes simple	Recognizes that any two factors and their product can be read as a comparison; uses multiple strategies and creates his or her own to represent and describe those comparisons. Creates own context for multiplicative comparison. Solves complex multi-step word problems with multiple possible solutions and determines which would be the most reasonable based upon given criteria. Analyzes relationships between any two representations of a counting problem and makes connections to the multiplication principle.

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Detailed	4.NBT.A [1 to 3]	With numbers within 10,000, recognizes that a digit in one place represents 10 times as much as it represents in the place to its right, reads and writes multi-digit whole numbers in a variety of forms, and uses place value understanding to round multi-digit whole numbers.	With numbers within 100,000, recognizes that a digit in one place represents 10 times as much as it represents in the place to its right, reads and writes multi-digit whole numbers in a variety of forms, and uses place value understanding to round multi-digit whole numbers.	With numbers within 1,000,000, recognizes that a digit in one place represents 10 times as much as it represents in the place to its right, reads and writes multi-digit whole numbers in a variety of forms, and uses place value understanding to round multi-digit whole numbers.	Uses place value strategies, comparisons of two numbers, and rounding in a real-world context.
Detailed	4.NBT.B [4 to 6]	Fluently adds and subtracts multi-digit whole numbers using the standard algorithm without regrouping. Finds products of a whole number (of up to three digits) by a single-digit whole number and whole number quotients and remainders (with up to double-digit dividends and single-digit divisors).	Fluently adds and subtracts multi-digit whole numbers using the standard algorithm with supports. Finds products of a whole number (of up to four digits) by a single-digit whole number and whole number quotients and remainders (with up to three-digit dividends and single-digit divisors).	Fluently adds and subtracts multi-digit whole numbers using the standard algorithm. Finds products of a whole number (of up to four digits) by a single-digit whole number or two double-digit numbers and whole number quotients and remainders (with up to four-digit dividends and single-digit divisors) in context. Illustrates and explains calculations by using equations, rectangular arrays, and/or area models.	Recognizes and identifies an error in an addition or subtraction and shows the correct answer. Interprets a multiplication or division context and explains strategies used to solve. Fluently adds and subtracts multidigit whole numbers using the standard algorithm.

THINGS TO CONSIDER WHEN CREATING UNIT ASSESSMENTS:

- **Percent of Items at each DOK Level**

Percentage of Points by Depth of Knowledge (DOK) Level			
Grade 4	DOK Level 1	DOK Level 2	DOK Level 3
	10% - 20%	60% - 70%	12% - 30%

For more information on DOK go to www.azed.gov/AzMERIT.

- **Math Item Specification**

Operations and Algebraic Thinking & Numbers in Base Ten

Content Standards	AzCCRS.Math.Content.4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.		
Explanations	Students should be familiar with and use place value as they work with numbers.		
Content Limits	Whole numbers within 1,000,000		
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.	Math Practices	2, 6, 7
Sample Task Demands		**Common Item Formats**	**Recommended Math Practices**
Students will be required to when presented with a multiplication problem, identify the power of 10 by which one number is greater than another.		• Equation Response	2, 6, 7
Students will be required to compare the value of a digit in different place values of two given numbers and identify the power of 10 by which one number is greater.			2, 6, 7

- **Calculators**

  No calculators are permitted for either the paper-based or computer-based assessment for Math Grade 4.

- **Item Formats for Grade 4 Math**
  - Editing Tasks (ET)
  - Editing Task Choice (ETC)
  - Equation Editor (EQ)
  - Graphic Response Item Display (GRID)
  - Hot Text (HT)
    - Selectable Hot Text
    - Drag-and-Drop Hot Text
  - Matching Item (MI)
  - Multi-Select (MS)
  - Open Response
  - Table Item (TI)

- **Arizona College and Career ready Standards**

4.G.A – Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

4.MD.A – Solve problems involving measurement and conversion of measurements.

4.MD.B – Represent and interpret data.

4.MD.C – Geometric measurement: understand concepts of angle and measure angles.

4.NBT.A – Generalize place value understanding for multi-digit whole numbers.

4.NBT.B – Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NF.A – Extend understanding of fraction equivalence and ordering.

4.NF.B – Build fractions from unit fractions.

4.NF.C – Understand decimal notation for fractions, and compare decimal fractions.

4.OA.A – Use the four operations with whole to solve problems.

4.OA.B – Gain familiarity with factors and multiples.

4.OA.C – Generate and analyze patterns.

Content Limits: Greater than 1000 and within 1,000,000

Standard: 4.NBT.A.3

Task: Tag each item to a specific standard and performance level (e.g., 4.RI.2**a** vs. 4.RI.2**c**)

Delete any item that does match the knowledge, skill, vocabulary, or process of any indicator

Create your own item BUT connect the new item to an indicator

Item Descriptor	Item	Performance Indicator Code
Students will be required to identify the value of a given number rounded to the nearest place value.		
Students will be required to identify the numbers that round to a given value.		
Students will be required to identify what place value a number was rounded to		
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.		

Today's Goal: To create a valid and reliable first unit assessment to be reviewed and implemented this year.

Today's Process:
- Review an existing assessment for the first unit.
- Tag existing items to a specific AZMERIT Performance Indicator where applicable (*include justification*).
- Ensure a mix of Minimally Proficient, Partially Proficient, Proficient, and Highly Proficient.
    - **Minimally & Partial** items _should be less represented_ but are essential to allow teachers to find the 'floor' of student achievement that will be used to plan intervention.
    - **Proficient & Highly Proficient** _should be more heavily emphasized_ as these skills are the goal for each student.

NOTE: Each team member will need a copy of the proposed edits and justifications as they will be used to begin a peer 'item review'.