1st Grade – Summary of Revisions and Planning Guidance - *Arizona Mathematics Standards - Adopted in 2016*

Additions

- **1.MD.B.3b –** Identify coins by name and value (pennies, nickels, dimes and quarters).

Deletions

No deletions

Parameter Changes/Clarifications

1.OA.A.1	The stated situations were removed since they are in the referenced *Table 1*. The e.g. was changed to state "and/or equations" indicating written equations are not required.
1.OA.B.3	The properties referenced are commutative and associative properties of addition limiting the use of properties to those two.
1.OA.B.4	Subtraction as an unknown-addend problem is limited to using numbers within 20.
1.OA.C.6	Only includes fluency expectation within 10. Adding/Subtracting within 20 using strategies is now in 1.OA.A.1.
1.NBT.A.1	Specifically states to count by 1's, 2's, & 10's starting less than 100 so students have to transition from 2-digit numbers to 3-digit numbers when counting.
1.NBT.C.4	Standard states that students need to demonstrate understanding of addition within 100, raising the cognitive demand of this standard. Specific method of adding two-digit numbers was removed. The standard also explicitly states the inclusion of multiples of 10.
1.NBT.C.5	The requirement of explaining the reasoning use was removed, lowering the cognitive demand of this standard.
1.NBT.C.6	The limit of both numbers being a multiple of 10 was removed, expanding the scope of this standard. The requirement to explain the reasoning was removed, lowering the cognitive demand of this standard.
1.MD.B.3b	**NEW STANDARD**
1.G.A.1	This standard is limited to 2-D shapes only.
1.G.A.2	The names of shapes were removed from this standard.

Fluency Expectations

K	**K.OA.A.5** Fluently add and subtract within 5.
1st	**1.OA.C.6 -** Fluently add and subtract within 10.
2nd	**2.OA.B.2 -** Fluently add and subtract within 20. By the end of 2nd grade, know from memory all sums of two one-digit numbers. **2.NBT.B.5 -** Fluently add and subtract within 100.

Fluency Definition

Fluency standard instruction should begin at the beginning of the year and continue throughout the school year.

Wherever the word *fluently* appears in a content standard, the word includes ***efficiently, accurately, flexibly,*** *and* ***appropriately***. Being fluent means that students are able to choose flexibly among methods and strategies to solve contextual and mathematical problems, they understand and are able to explain their approaches, and they are able to produce accurate answers efficiently.

- **Efficiency**—carries out easily, keeps track of sub-problems, and makes use of intermediate results to solve the problem.
- **Accuracy**—reliably produces the correct answer.
- **Flexibility**—knows more than one approach, chooses a viable strategy, and uses one method to solve and another method to double-check.
- **Appropriately**—knows when to apply a particular procedure.

Standards that reference Table 1 in 1st Grade

1.OA.A.1	**1.OA.A.2**	**1.NBT.C.4**

Defining Standards, Curriculum and Instruction

Standards – What a student needs to know, understand, and be able to do by the end of each grade. Standards build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels. Standards are adopted at the state level by the State Board of Education.

Curriculum – The resources used for teaching and learning the standards. Curricula are adopted at a local level by districts and schools.

Instruction – The methods used by teachers to teach their students. Instructional techniques are employed by individual teachers in response to the needs of the students in their classes to help them progress through the curriculum in order to master the standards.

1st Grade Content Emphasis	
Operations and Algebraic Thinking (OA)	
●	Represent and solve problems involving addition and subtraction.
●	Understand and apply properties of operations and the relationship between addition and subtraction.
●	Add and subtract within 20.
●	Work with addition and subtraction equations.
Number and Operations in Base Ten (NBT)	
●	Extend the counting sequence.
●	Understand place value.
●	Use place value understanding and properties to add and subtract.
Measurement and Data (MD)	
●	Measure lengths indirectly and by iterating length units.
▲	Work with time and money.
▲	Represent and interpret data.
Geometry (G)	
▲	Reason with shapes and their attributes.
● - Major Content	▲ - Supporting Content

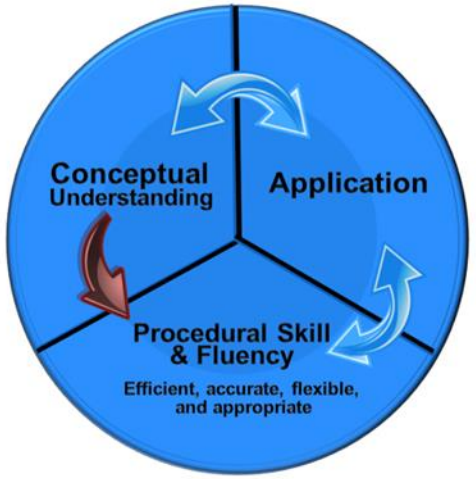
Major Content (●) from the content emphasis section should account for approximately 70% of instructional time. The majority of learning time in 1st grade should focus on number and place value.

The Standards for Mathematical Practice

The Standards for Mathematical Practice complement the content standards so that students increasingly engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle, and high school years.

The Arizona Mathematics Standards now include narratives for each of the 8 Mathematical Practices.

Balance of Rigor in the Math Classroom



"Tasks that ask students to perform a memorized procedure in a routine manner lead to one type of opportunity for student thinking; tasks that require students to think conceptually and that stimulate students to make connections lead to a different set of opportunities for student thinking."
(Stein & Smith, 1998)

Changes in Cognitive Demand

There are times in which the standards were changed, resulting in an increase or decrease in cognitive demand expectations within the standards. This is an important aspect of the standard to examine, keeping in mind that cognitive demand refers to the complexity of thinking involved in which students interact with the content; it does **not** refer to difficulty.

Changes in Cognitive Demand in the 1st Grade Standards
1.NBT.C.4
1.NBT.C.5

Comparison of Arizona Mathematics Standards – 2010 to 2016

Adopted 2010		Adopted 2016		
Operations and Algebraic Thinking (OA)		**Operations and Algebraic Thinking (OA)**		
1.OA.A	**Represent and solve problems involving addition and subtraction.**			
	1.OA.A.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Table 1.)	**1.OA.A** **Represent and solve problems involving addition and subtraction.**	**1.OA.A.1**	Use addition and subtraction within 20 to solve word problems with unknowns in all positions (e.g., by using objects, drawings, and/or equations with a symbol for the unknown number to represent the problem). *See Table 1.*
	1.OA.A.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.		**1.OA.A.2**	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 (e.g. by using objects, drawings, and/or equations with a symbol for the unknown number to represent the problem). *See Table 1.*
1.OA.B	**Understand and apply properties of operations and the relationship between addition and subtraction.**			
	1.OA.B.3. Apply properties of operations as strategies to add and subtract. *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) (*Students need not use formal terms for these properties.)	**1.OA.B** **Understand and apply properties of operations and the relationship between addition and subtraction.**	**1.OA.B.3**	Apply properties of operations (commutative and associative properties of addition) as strategies to add and subtract within 20. (Students need not use formal terms for these properties.)
	1.OA.B.4. Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*		**1.OA.B.4**	Understand subtraction as an unknown-addend problem within 20 (e.g., subtract 10 - 8 by finding the number that makes 10 when added to 8).

1.OA.C	**Add and subtract within 20.**			
	1.OA.C.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).	**1.OA.C Add and subtract within 10.**	**1.OA.C.5**	Relate counting to addition and subtraction (e.g., by using counting on 2 to add 2).
	1.OA.C.6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).		**1.OA.C.6**	Fluently add and subtract within 10.
1.OA.D	**Work with addition and subtraction equations.**			
	1.OA.D.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*	**1.OA.D Work with addition and subtraction equations.**	**1.OA.D.7**	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false (e.g., Which of the following equations are true and which are false? 6 + 1 = 6 - 1, 7 = 8 - 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2).
	1.OA.D.8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations: 8 + ? = 11, 5 =*o *– 3, 6 + 6 =* o*.*		**1.OA.D.8**	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers (e.g., determine the unknown number that makes the equation true in each of the equations 8 + o= 11, 5 = o- 3, 6 + 6 = o).
Number and Operations in Base Ten (NBT)		**Number and Operations in Base Ten (NBT)**		
1.NBT.A	**Extend the counting sequence.**			
	1.NBT.A.1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.	**1.NBT.A Extend the counting sequence.**	**1.NBT.A.1**	Count to 120 by 1's, 2's, and 10's starting at any number less than 100. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.B	**Understand place value.**			
	1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones — called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).	**1.NBT.B** **Understand place value.**	**1.NBT.B.2**	Understand that the two digits of a two-digit number represent groups of tens and ones. Understand the following as special cases: a. 10 can be thought of as a group of ten ones — called a "ten". b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
	1.NBT.B.3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.		**1.NBT.B.3**	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
1.NBT.C	**Use place value understanding and properties of operations to add and subtract.**			
	1.NBT.C.4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.	**1.NBT.C** **Use place value understanding and properties of operations to add and subtract.**	**1.NBT.C.4**	Demonstrate understanding of addition within 100, connecting objects or drawings to strategies based on place value (including multiples of 10), properties of operations, and/or the relationship between addition and subtraction. Relate the strategy to a written form. *See Table 1.*
	1.NBT.C.5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.		**1.NBT.C.5**	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count.

	1.NBT.C.6. Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	**1.NBT.C (cont.)**	**1.NBT.C.6**	Subtract multiples of 10 in the range of 10 to 90 (positive or zero differences), using objects or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. Relate the strategy to a written form.
Measurement and Data (MD)		**Measurement and Data (MD)**		
1.MD.A	**Measure lengths indirectly and by iterating length units.**			
	1.MD.A.1. Order three objects by length; compare the lengths of two objects indirectly by using a third object.	**1.MD.A Measure lengths indirectly and by iterating length units.**	**1.MD.A.1**	Order three objects by length. Compare the lengths of two objects indirectly by using a third object.
	1.MD.A.2. Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*		**1.MD.A.2**	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. (Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.)
1.MD.B	**Tell and write time.**			
	1.MD.B.3. Tell and write time in hours and half-hours using analog and digital clocks.	**1.MD.B Work with time and money.**	**1.MD.B.3a**	Tell and write time in hours and half-hours using analog and digital clocks.
			1.MD.B.3b	Identify coins by name and value (pennies, nickels, dimes and quarters).
1.MD.C	**Represent and interpret data.**			
	1.MD.C.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.	**1.MD.C Represent and interpret data.**	**1.MD.C.4**	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Geometry (G)		Geometry (G)		
1.G.A	**Reason with shapes and their attributes.**			
	1.G.A.1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.	**1.G.A** **Reason with shapes and their attributes.**	**1.G.A.1**	Distinguish between defining attributes (triangles are closed and 3 sided) versus non-defining attributes (color, orientation, overall size) for two-dimensional shapes; build and draw shapes that possess defining attributes.
	1.G.A.2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Students do not need to learn formal names such as "right rectangular prism.")		**1.G.A.2**	Compose two-dimensional shapes or three-dimensional shapes to create a composite shape.
	1.G.A.3. Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.		**1.G.A.3**	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters. Describe the whole as two of, or four of the shares. Understand that decomposing into more equal shares creates smaller shares.

Standards for Mathematical Practice

1.MP.1 Make sense of problems and persevere in solving them.
Mathematically proficient students explain to themselves the meaning of a problem, look for entry points to begin work on the problem, and plan and choose a solution pathway. While engaging in productive struggle to solve a problem, they continually ask themselves, "Does this make sense?" to monitor and evaluate their progress and change course if necessary. Once they have a solution, they look back at the problem to determine if the solution is reasonable and accurate. Mathematically proficient students check their solutions to problems using different methods, approaches, or representations. They also compare and understand different representations of problems and different solution pathways, both their own and those of others.

1.MP.2 Reason abstractly and quantitatively.
Mathematically proficient students make sense of quantities and their relationships in problem situations. Students can contextualize and decontextualize problems involving quantitative relationships. They contextualize quantities, operations, and expressions by describing a corresponding situation. They decontextualize a situation by representing it symbolically. As they manipulate the symbols, they can pause as needed to access the meaning of the numbers, the units, and the operations that the symbols represent. Mathematically proficient students know and flexibly use different properties of operations, numbers, and geometric objects and when appropriate they interpret their solution in terms of the context.

1.MP.3 Construct viable arguments, and critique the reasoning of others.
Mathematically proficient students construct mathematical arguments (explain the reasoning underlying a strategy, solution, or conjecture) using concrete, pictorial, or symbolic referents. Arguments may also rely on definitions, assumptions, previously established results, properties, or structures. Mathematically proficient students make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. Mathematically proficient students present their arguments in the form of representations, actions on those representations, and explanations in words (oral or written). Students critique others by affirming or questioning the reasoning of others. They can listen to or read the reasoning of others, decide whether it makes sense, ask questions to clarify or improve the reasoning, and validate or build on it. Mathematically proficient students can communicate their arguments, compare them to others, and reconsider their own arguments in response to the critiques of others.

1.MP.4 Model with mathematics.
Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. When given a problem in a contextual situation, they identify the mathematical elements of a situation and create a mathematical model that represents those mathematical elements and the relationships among them. Mathematically proficient students use their model to analyze the relationships and draw conclusions. They interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

1.MP.5 Use appropriate tools strategically.
Mathematically proficient students consider available tools when solving a mathematical problem. They choose tools that are relevant and useful to the problem at hand. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful; recognizing both the insight to be gained and their limitations. Students deepen their understanding of mathematical concepts when using tools to visualize, explore, compare, communicate, make and test predictions, and understand the thinking of others.

1.MP.6 Attend to precision.
Mathematically proficient students clearly communicate to others using appropriate mathematical terminology, and craft explanations that convey their reasoning. When making mathematical arguments about a solution, strategy, or conjecture, they describe mathematical relationships and connect their words clearly to their representations. Mathematically proficient students understand meanings of symbols used in mathematics, calculate accurately and efficiently, label quantities appropriately, and record their work clearly and concisely.

1.MP.7 Look for and make use of structure.
Mathematically proficient students use structure and patterns to assist in making connections among mathematical ideas or concepts when making sense of mathematics. Students recognize and apply general mathematical rules to complex situations. They are able to compose and decompose mathematical ideas and notations into familiar relationships. Mathematically proficient students manage their own progress, stepping back for an overview and shifting perspective when needed.

1.MP.8 Look for and express regularity in repeated reasoning.
Mathematically proficient students look for and describe regularities as they solve multiple related problems. They formulate conjectures about what they notice and communicate observations with precision. While solving problems, students maintain oversight of the process and continually evaluate the reasonableness of their results. This informs and strengthens their understanding of the structure of mathematics which leads to fluency.