1st Grade Mathematics

UNIT 1: Building with and Talking about Shapes

ESSENTIAL QUESTION	BIG IDEAS
How do shapes help us understand our world?	Students build, draw, and describe shapes using defining attributes. Students create new shapes by composing and decomposing two-dimensional and three-dimensional shapes.

GUIDING QUESTIONS

Content and Process

- How are attributes used to define shapes? **1.G.1**
- How can shapes be identified and compared using attributes? **1.G.1**
- How are two-dimensional and three-dimensional shapes different? **1.G.2**
- How can shapes be put together and taken apart to form new shapes? **1.G.2**
- How do defining attributes change when you compose and decompose a shape? **1.G.2**

Reflective

- What strategies helped me to create new shapes using other shapes?
- What shapes are used to construct buildings in my community?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.7 Look for and make use of structure

Content Standards - Assessed

1.G.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 that possess defining attributes.

1.G.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.”

1st Grade Mathematics

UNIT 2: Tens and Ones Are Useful Ways to Organize

ESSENTIAL QUESTION	BIG IDEAS
How do place value patterns help us understand our number system?	Students understand place value patterns in numbers. Students use grouping to represent and count numbers.

GUIDING QUESTIONS

Content and Process

- How do you read and write numerals, and use them to represent a number of objects? **1.NBT.1**
- How are numbers in a counting sequence related? **1.NBT.1**
- What do the digits of a two-digit number represent? **1.NBT.2a, 1.NBT.2b**
- How does grouping numbers in sets of ten make them easier to use? **1.NBT.2a**
- For any number between 11-19, can a ten be made? Would any amount be left over? If so, how many leftovers? **1.NBT.2b**

Reflective

- How can I organize and group objects to help me count the total number in a set?
- How do I compose a number in different ways?
- How do I decompose a number using tens and ones?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.8 Look for and express regularity in repeated reasoning

Content Standards - Assessed
1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

- **1.NBT.2a** 10 can be thought of as a grouping of ten ones—called a “ten.”
- **1.NBT.2b** The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

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Supporting Standards - Not Assessed

1.NBT.1 Count to 120 (recognizing growth and repeating patterns), 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.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

- **1.NBT.2c** 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).

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UNIT 3: Representing and Modeling Joining and Separating Situations

ESSENTIAL QUESTION	BIG IDEAS
How does modeling help us make sense of math?	Students use a variety of strategies to make sense of and solve math stories. Students understand that addition and subtraction are related.

GUIDING QUESTIONS

Content and Process

- How can mathematical situations be represented using objects or drawings? **1.OA.1**
- What strategies can be used to solve an addition or subtraction word problem with an unknown result? An unknown change? An unknown part? **1.OA.1**
- How can addition help to solve a subtraction problem? **1.OA.4**
- What strategies can be used to solve unknown-addend subtraction problems? **1.OA.4**

Reflective

- How do I create a model to help me understand a math story?
- How can I use a model to share and describe my reasoning?
- How can I use addition and subtraction to solve the same math story?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.1 Make sense of problems and persevere in solving them.

Content Standards- Assessed

1.OA.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 situation equations and/or solution equations with a symbol for the unknown number to represent the problem.)* (Assess only 0-10; 0-20 will be assessed in a later unit)

1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract* 10 - 8 *by finding the number that makes 10 when added to 8.*

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Result Unknown	Change Unknown	Start Unknown
There are 9 students on the playground. Then 8 more students showed up. How many students are there now? $9 + 8 = ?$	There are 9 students on the playground. Some more students showed up. There are now 17 students. How many students came? $9 + ? = 17$	Here are some students on the playground. Then 8 more students came. There are now 17 students. How many students were on the playground at the beginning? $? + 8 = 17$

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UNIT 4: Using Data to Describe and Wonder about Our World

ESSENTIAL QUESTION	BIG IDEAS
How do students use data to understand and explain our world?	Students use data to understand and interpret information.

GUIDING QUESTIONS

Content and Process

- How can data be counted, organized and displayed? **1.NBT.1, 1.MD.4**
- How is a data display used to compare categories? **1.MD.4**
- How does organizing data make it easier to interpret? **1. MD.4**
- How do data displays communicate data? **1.MD.4**

Reflective

- How can understanding data help me explain the world around me?
- What questions can you ask and answer about a set of data?
- How do data displays help me understand collections?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.4 Model with mathematics.

Content Standards- Assessed

1.MD.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.

Supporting Standards - Not Assessed
1.NBT.1 Count to 120 (recognizing growth and repeating patterns), starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

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UNIT 5: Equal Means the Same

ESSENTIAL QUESTION	BIG IDEAS
How are equations used to communicate relationships?	Students explore the relationship between values on either side of the equal sign. Students use a variety of strategies to add and subtract whole numbers.

GUIDING QUESTIONS

Content and Process

- How can properties of operations be used as strategies to add and subtract? **1.OA.3**
- What does the equal sign tell us about the relationship between both sides of an equation? **1.OA.7**
- How can models be used to show two sides of an equation are equal? **1.OA.7**

Reflective

- How can I convince a friend that an equation is true or false?
- What strategies help me add and subtract whole numbers?
- How can I use what I know about the equal sign to solve a missing-number equation?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.3 Construct viable arguments and critique the reasoning of others.

Content Standards- Assessed
1.OA.3 Apply (not necessary to name) properties of operations as strategies to add and subtract. *Examples: 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.) To add 0 to any number, the answer is that number 7 + 0 = 7 (Additive identity property of 0).* Students need not use formal terms for these properties.
1.OA.7 Understand the meaning of the equal sign (the value is the same on both sides 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 = 3 + 2; 7 - 1 = 4 + 2; 5 + 4 = 7 - 2.

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Supporting Standards - Not Assessed

1.OA.8 Using related equations, determine the unknown whole number in an addition or subtraction equation. *For example, determine the unknown number that makes the equation true in each of the equations* $\Delta - 3 = 7;\ 7 + 3 = \Delta$.

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UNIT 6: Building with Numbers within 20

ESSENTIAL QUESTION	BIG IDEAS
How are addition and subtraction related?	Students use a variety of strategies to add and subtract fluently within 20.

GUIDING QUESTIONS

Content and Process

- What strategies can be used to add three numbers whose sum is less than or equal to 20? **1.OA.2**
- How are models used to solve word problems involving three addends? **1.OA.2**
- How can various counting strategies (count all, count on, count back, etc.) be used when adding and subtracting numbers within 20? **1.OA.5**
- How does the relationship between addition and subtraction help solve problems? **1.OA.5**, **1.OA.6**
- How can various strategies be used to fluently (efficiently, accurately, and flexibly) add and subtract numbers within 20? **1.OA.6**
- How can modeling demonstrate fluency when adding and subtracting numbers within 20? **1.OA.6**
- How does composing and decomposing numbers help with finding sums and differences within 20? **1.OA.6**

Reflective

- What strategies do I use most when adding or subtracting numbers?
- How do I determine the best strategy for adding or subtracting numbers?
- What patterns do I notice when adding or subtracting numbers?
- How can I write an equation to represent the way I see dots in a number visual?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.6 Attend to precision.

Content Standards- Assessed
1.OA.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.5 Relate counting to addition and subtraction (*e.g. by counting on 2 to add 2, counting back 1 to subtract 1*).

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1.OA.6 Add and subtract within 20, demonstrating fluency (efficiently, accurately, and flexibly) for addition and subtraction within 10. Use mental 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)*.

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UNIT 7: Finding Patterns in Numbers

ESSENTIAL QUESTION	BIG IDEAS
How do patterns better help us understand numbers?	Students explore, generate, and make connections between visual and numerical patterns. Students use patterns to understand place value in numbers.

GUIDING QUESTIONS

Content and Process

- What patterns can be found when counting (horizontally, vertically & diagonally) using a hundreds chart? **1.NBT.1**
- How does understanding place value help compare numbers? **1.NBT.3**
- How are mathematical symbols used to compare numbers? **1.NBT.3**
- What mental math strategies help to find 10 more or 10 less than a number? **1.NBT.5**
- How can strategies be used to subtract multiples of 10 from decade numbers? **1.NBT.5, 1.NBT.6**
- How can models be used to justify solutions to subtraction problems? **1.NBT.5, 1.NBT.6**

Reflective

- How do visual and numerical patterns help me count?
- What patterns on the hundreds chart are most interesting to me? Why?
- How can I explain my reasoning when adding and subtracting with multiples of 10?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.8 Look for and express regularity in repeated reasoning

Content Standards- Assessed

1.NBT.1 Count to 120 (recognizing growth and repeating patterns), 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.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the relational symbols >, <, =, and ≠.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

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1.NBT.6 Subtract multiples of 10 in the range 10 to 90 from multiples of 10 in the range 10 to 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.

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UNIT 8: Using Place Value to Add and Subtract

ESSENTIAL QUESTION	BIG IDEAS
How can place value help us use numbers flexibly?	Students compose and decompose numbers to add and subtract. Students use models to understand addition and subtraction.

GUIDING QUESTIONS

Content and Process

- How can tens and ones be used to flexibly compose and decompose numbers? **1.NBT.2c, 1.NBT.2d**
- What are decade numbers (e.g. 10, 20, 30, 40...) and how does place value help us define these numbers? **1.NBT.2c**
- How can decomposing numbers be used as a strategy for addition? **1.NBT.2d, 1.NBT.4c**
- How can addition and subtraction sentences within 100 be represented using models? **1.NBT.4**
- What strategies can be used to solve addition and subtraction word problems? **1.NBT.4**
- When adding, how can concrete models or drawings be represented in written form? **1.NBT.4**
- How can strategies be used to add within 100? **1.NBT.4a, 1.NBT.4b, 1.NBT.4c**
- What strategies can be used to solve addition and subtraction word problems? **1.OA.1**
- How can the relationship between addition and subtraction be used to find the unknown number in an equation? **1.OA.8**
- When counting, how much larger is a number that is said right after another number? **K.CC.4c**
- **How much larger is a number that is said right after another number?**
- **When counting, how many more does each successive number represent?**
- What if we have ____ cubes and added one more? How many cubes would there be then? **K.CC.4c**

Reflective

- What strategy helps me solve for an unknown number?
- How does my knowledge of place value help me add and subtract whole numbers?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.7 Look for and make use of structure.

Content Standards- Assessed

1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand

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the following as special cases:

- **1.NBT.2c** 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.2d** Show flexibility in composing and decomposing tens and ones *(e.g. 20 can be composed from 2 tens or 1 ten and 10 ones, or 20 ones.)*

1.NBT.4 Add within 100 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 including:

- **1.NBT.4a.** Adding a two-digit number and a one-digit number
- **1.NBT.4b.** Adding a two-digit number and a multiple of 10
- **1.NBT.4c** Understanding that when adding two-digit numbers, combine like base-ten units such as tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.OA.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 situation equations and/or solution equations with a symbol for the unknown number to represent the problem.)*

1.OA.8 Using related equations, Determine the unknown whole number in an addition or subtraction equation. *For example, determine the unknown number that makes the equation true in each of the equations* $\Delta - 3 = 7;\ 7 + 3 = \Delta.$

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UNIT 9: Using Units to Measure Our World

ESSENTIAL QUESTION	BIG IDEAS
How can we measure objects in our world?	Students use appropriate tools as units to measure and compare the length of objects.

GUIDING QUESTIONS

Content and Process

- How can lengths of objects be compared indirectly? **1.MD.1**
- Why is measurement important when ordering objects by length? **1.MD.1**
- Why is it important to use the same tool to measure objects when comparing lengths? **1.MD.1, 1.MD.2**
- What strategies can be used when measuring objects that are longer or shorter than the measuring tool being used? **1.MD.1**
- How can nonstandard units be iterated to find an approximate measure of length? **1.MD.2**
- Why is it important to measure accurately? **1.MD.2**

Reflective

- What helps me estimate the length of an object?
- Why do you think measurement is important?
- How do you decide when a situation requires precise measurement versus when to use an estimate?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.5 Use appropriate tools strategically.

Content Standards- Assessed

1.MD.1. Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1.MD.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.

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UNIT 10: Partitioning Shapes into Equal Parts

ESSENTIAL QUESTION	BIG IDEAS
What is the relationship between parts and a whole?	Students compose and decompose shapes to represent equal shares. Students tell and write time.

GUIDING QUESTIONS

Content and Process

- How can a shape be decomposed into equal parts (halves and fourths)? **1.G.3**
- How can equal shares be described using words? **1.G.3**
- How does the size of equal parts change when equal parts are decomposed into more equal parts? **1.G.3**
- How do halves of two different wholes compare in size? **1.G.3**
- How does decomposing an object into more equal shares change the size of each share? **1.G.3**
- How can time be determined to the hour and half-hour on analog and digital clocks? **1.MD.3**
- How do halves of circles relate to half hours? **1.MD.3, 1.G.3**

Reflective

- How can I prove that I have found half or fourth of a shape?
- Is one half always the same size?
- Why is it helpful to be able to read the time on a clock?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.2 Reason abstractly and quantitatively.

Content Standards- Assessed

1.G.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*. Note: fraction notation ($\frac{1}{2}, \frac{1}{4}$) is not expected at this grade level. 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.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

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