2nd Grade Mathematics

UNIT 1: Partitioning Shapes into Equal Parts

ESSENTIAL QUESTION	BIG IDEAS
How can shapes be partitioned into equal parts?	Students identify and draw shapes based on a given set of attributes. Students explore equality by partitioning shapes into equal shares.

GUIDING QUESTIONS

Content and Process

- What attributes help students identify, describe, and draw cubes, quadrilaterals, triangles, pentagons, and hexagons (regular and irregular)? **2.G.1**
- How can a rectangle be partitioned into rows and columns of same-size squares? **2.G.2**
- What does it mean to have one half, one third or one fourth of a shape? **2.G.3**
- How can a whole be described in terms of halves, thirds and fourths? **2.G.3**
- Do equal parts of a whole need to have the same shape to be equal? Why or why not? **2.G.3**

Reflective

- How do you know when the parts of a shape are equal or not equal?
- When would partitioning a rectangle into rows and columns be useful to me?

FOCUS STANDARDS

Standards of Mathematical Practice

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

Content Standards- Assessed

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. *Note: fraction notation* $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ *is not expected at this grade level.* Recognize that equal shares of identical wholes need not have the same shape.

Supporting Standards- Not Assessed

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

2nd Grade Mathematics

UNIT 2: Making and Using Equal Groups

ESSENTIAL QUESTION	BIG IDEAS
How do equal groups help us solve problems strategically?	Students explore numbers through grouping and finding patterns. Students use equal groups to compose and decompose numbers to solve problems.

GUIDING QUESTIONS

Content and Process

- How can the total number of objects in a group be determined as even or odd? **2.OA.3**
- How can an equation be written to show that two equal addends always make an even sum? **2.OA.3**
- How can a repeated addition equation show the total number of objects in a rectangular array? **2.OA.4**
- How does partitioning a rectangle into rows and columns of same-size squares create an array? **2.OA.4**
- What patterns can be found when skip-counting by 2s, 5s, and 10s? **2.NBT.2**

Reflective

- Why do you think arrays are so common in our world?
- Why can I find equal groups within some numbers and not others?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.7 Look for and make use of structure.

Content Standards- Assessed

2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, *(e.g. by pairing objects or counting them by 2s)*; write an equation to express an even number as a sum of two equal addends.

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

2.NBT.2 ~~Count within 1000~~; skip-count by 2s, 5s, 10s, ~~and 100s~~; explain and generalize the patterns.

2nd Grade Mathematics

UNIT 3: What Is 100?

ESSENTIAL QUESTION	BIG IDEAS
How can 100 be represented in different ways?	Students compose and decompose numbers in a variety of ways. Students use visual models to explore the meaning of 100. Students identify bills and coins.

GUIDING QUESTIONS

Content and Process

- How can numbers be flexibly composed and decomposed to add and subtract within 20? **2.OA.2**
- What mental strategies are helpful when adding and subtracting within 20? **2.OA.2**
- How can coins be composed in different ways to make 100 cents? **2.NBT.2**
- What patterns do you see when skip-counting? **2.NBT.2**
- How can different strategies be used to count within 1000? **2.NBT.2**
- What is the value of each coin and bill? **2.MD.9**
- What relationships exist between the values of a penny, nickel, dime, quarter, and dollar bill? **2.MD.9**

Reflective

- How many ways can I find to make one dollar?
- What ways did you find to make it easy to see 100?
- How can skip counting help me count coins in groups?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.8 Look for and express regularity in repeated reasoning.

Content Standards - Assessed

2.OA.2 Fluently (efficiently, accurately, and flexibly) add and subtract within 20 using mental strategies (counting on, making a ten, decomposing a number, creating an equivalent but easier and known sum, and using the relationship between addition and subtraction) Work with equal groups of objects to gain foundations for multiplication.

2.NBT.2 Count within 1000; skip-count by 2s, 5s, 10s, and 100s; explain and generalize the patterns.

2.MD.9 Identify coins and bills and their values.

Supporting Standards - Not Assessed

2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; *(e.g. 706 equals 7 hundreds, 0 tens, and 6 ones.)* Understand the following as special cases:

- **2.NBT.1a** 100 can be thought of as a bundle of ten tens—called a "hundred."

2.NBT.5 Fluently (efficiently, accurately, and flexibly) add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction *(e.g. composing/decomposing by like base-10 units, using friendly or benchmark numbers, using related equations, compensation, number line, etc.).*

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

2nd Grade Mathematics

UNIT 4: Composing and Decomposing Numbers

ESSENTIAL QUESTION	BIG IDEAS
How can numbers be built and taken apart?	Students compose, decompose, and compare numbers. Students use various strategies to solve addition and subtraction problems.

GUIDING QUESTIONS

Content and Process

- What strategies can be used to solve problems that have unknowns in all positions (results unknown, change unknown, start unknown)? **2.OA.1**
- How can addition and subtraction situations be represented and solved with equations? **2.OA.1**
- How can three-digit numbers be compared using place value? **2.NBT.4**
- How can place value and properties of operations be used to justify addition and subtraction strategies? **2.NBT.9**

Reflective

- What strategies for adding or subtracting numbers are most useful to me?
- How can I use place value to add, subtract, and compare numbers?

FOCUS STANDARDS

Standards of Mathematical Practice
MP. 4 Model with Mathematics

Content Standards- Assessed

2.OA.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, *with unknowns in all positions*, *(e.g. by using drawings and situation equations and/or solution equations with a symbol for the unknown number to represent the problem.)*

Results Unknown:	**Change Unknown:**	**Start Unknown:**
There are 29 students on the playground. Then 18 more students showed up. How many students are there now? $29 + 18 = ?$	There are 29 students on the playground. Some more students show up. There are now 47 students. How many students came? $29 + ? = 47$	There are some students on the playground. Then 18 more students came. There are now 47 students. How many students were on the playground at the beginning? $? + 18 = 47$

2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, <, =, and ≠ relational symbols to record the results of comparisons.

2.NBT.9 Explain why addition and subtraction strategies work using place value and the properties of operations. The explanations given may be supported by drawings or objects.

Supporting Standards- Not Assessed

2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; *(e.g. 706 equals 7 hundreds, 0 tens, and 6 ones.)* Understand the following as special cases:

- **2.NBT.1a** 100 can be thought of as a bundle of ten tens—called a "hundred."
- **2.NBT.1b** The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds
- **2.NBT.1c** Show flexibility in composing and decomposing hundreds, tens and ones *(e.g. 207 can be composed from 2 hundreds 7 ones OR 20 tens 7 ones OR 207 ones OR 1 hundred 10 tens 7 ones OR 1 hundred 9 tens 17 ones, etc.)*

2.NBT.5 Fluently (efficiently, accurately, and flexibly) add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction *(e.g. composing/decomposing by like base-10 units, using friendly or benchmark numbers, using related equations, compensation, number line, etc.).*

2.NBT.7 Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, like base-ten units such as hundreds and hundreds, tens and tens, ones and ones are used; and sometimes it is necessary to compose or decompose tens or hundreds.

2nd Grade Mathematics

UNIT 5: Using Patterns in Place Value

ESSENTIAL QUESTION	BIG IDEAS
How can exploring place value help us understand numbers?	Students apply their understanding of place value to flexibly compose and decompose numbers. Students use place value strategies and properties of operations to add numbers flexibly.

GUIDING QUESTIONS

Content and Process

- How can the value of each digit in a 3-digit number be shown using models or drawings? **2.NBT.1a, 2.NBT.1b, 2.NBT.1c**
- How do the values of base ten blocks help build numbers? **2.NBT.1a, 2.NBT.1b, 2.NBT.1c**
- How can hundreds, tens, and ones be used to flexibly compose and decompose numbers? **2.NBT.1c**
- How can you read and write numbers within 1000? **2.NBT.3**
- How can the same number be represented in a variety of ways (e.g., base-ten numerals, number names, expanded form and unit form)? **2.NBT.3**
- How can place value strategies and properties of operations help to flexibly add up to four two-digit numbers? **2.NBT.6**
- What tools and strategies can be used to mentally add or subtract 10 or 100 from a given number? **2.NBT.8**

Reflective

- How does a hundreds chart help me when adding and subtracting from a given number?
- How can I represent a three-digit number in multiple ways?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.5 Use Appropriate Tools Strategically

Content Standards - Assessed

2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; *(e.g. 706 equals 7 hundreds, 0 tens, and 6 ones.)* Understand the following as special cases:

- **2.NBT.1a** 100 can be thought of as a bundle of ten tens—called a “hundred.”
- **2.NBT.1b** The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five,

six, seven, eight, or nine hundreds

- **2.NBT.1c** Show flexibility in composing and decomposing hundreds, tens and ones *(e.g. 207 can be composed from 2 hundreds 7 ones OR 20 tens 7 ones OR 207 ones OR 1 hundred 10 tens 7 ones OR 1 hundred 9 tens 17 ones, etc.)*

2.NBT.3 Read and write numbers within 1000 using base-ten numerals, number names, expanded form, and unit form.

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

2.NBT.8 Mentally add 10 or 100 to a given number 100 – 900, and mentally subtract 10 or 100 from a given number 100 – 900.

Supporting Standards - Not Assessed

2.NBT.5 Fluently (efficiently, accurately, and flexibly) add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction *(e.g. composing/decomposing by like base-10 units, using friendly or benchmark numbers, using related equations, compensation, number line, etc.).*

2.NBT.7 Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, like base-ten units such as hundreds and hundreds, tens and tens, ones and ones are used; and sometimes it is necessary to compose or decompose tens or hundreds.

2nd Grade Mathematics

UNIT 6: Thinking on the Number Line

ESSENTIAL QUESTION	BIG IDEAS
What strategies can be used to fluently add and subtract?	Students fluently add and subtract. Students explore the structure of a number line and how it is used to represent, add, and subtract numbers. Students use dollar bills and coins to solve problems.

GUIDING QUESTIONS

Content and Process

- How can strategies and tools be used to fluently (efficiently, accurately, and flexibly) add and subtract numbers within 100? **2.NBT.5**
- How can various concrete models and strategies be used to add and subtract numbers within 1000? **2.NBT.7**
- How can a number line be used as a tool for finding the sum and difference of numbers? **2.NBT.5, 2.NBT.7, 2.MD.6**
- How can number lines be created to solve addition and subtraction problems? **2.MD.6**
- How can addition and subtraction be used to solve problems with dollar bills, quarters, dimes, nickels, and pennies? **2.MD.8**

Reflective

- How can I use a number line to represent addition and subtraction?
- What strategies or tools are most useful to me when adding and subtracting?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.2 Reason abstractly and quantitatively.

Content Standards - Assessed
2.NBT.5 Fluently (efficiently, accurately, and flexibly) add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction *(e.g. composing/decomposing by like base-10 units, using friendly or benchmark numbers, using related equations, compensation, number line, etc.).*

2.NBT.7 Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, like base-ten units such as hundreds and hundreds, tens and tens, ones and ones are used; and sometimes it is necessary to compose or decompose tens or hundreds.
2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.
2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately (Do not use decimal point, if showing 25 cents, use the word cents or ¢). *For example: If you have 2 dimes and 3 pennies, how many cents do you have?*

2nd Grade Mathematics

UNIT 7: Rulers and Clocks Are Number Lines

ESSENTIAL QUESTION	BIG IDEAS
How can measurement help us better understand and communicate about our world?	Students measure using various units of length. Students tell and write time using analog and digital clocks.

GUIDING QUESTIONS

Content and Process

- How can length be measured using rulers, yardsticks, meter sticks and measuring tapes? **2.MD.1**
- How can appropriate tools be used to measure objects? **2.MD.1**
- How does the size of the unit affect the number of units needed to measure something? **2.MD.2**
- How can you determine appropriate units of length (e.g., inches, feet, centimeter, meter) to measure an object? **2.MD.2**
- How can digital and analog clocks be used to tell time to the nearest five minutes? **2.MD.7**
- What are different ways to say time before and after the hour? **2.MD.7**

Reflective

- How do I select the most appropriate tool to measure a given object?
- How can I communicate my understanding of time using both numbers and language?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.6 Attend to precision.

Content Standards- Assessed

2.MD.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes.

Supporting Standards- Not Assessed

2.MD.3 Estimate lengths using whole units of inches, feet, centimeters, and meters.

2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit (inches, feet, centimeters, and meters).

2.MD.5 Use addition and subtraction within 100 to solve one- and two-step word problems involving lengths that are given in the same units*, e.g. by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.*

2nd Grade Mathematics

UNIT 8: Using Units to Estimate

ESSENTIAL QUESTION	BIG IDEAS
Why is estimation useful when measuring?	Students estimate lengths of objects. Students measure objects to compare lengths. Students solve word problems involving length.

GUIDING QUESTIONS

Content and Process

- How can the length of a given object be estimated in inches, feet, centimeters and meters? **2.MD.3**
- How can measurement be used to find how much longer one object is than another? **2.MD.4**
- How can the length of different objects be compared? **2.MD.4**
- How can addition and subtraction be used to solve one- and two-step problems involving length? **2.MD.5**

Reflective

- What strategies or tools helped you estimate and solve problems with length?
- How can you use previous measurements to help you estimate the length of other objects?

FOCUS STANDARDS

Standards of Mathematical Practice
MP.5 Use appropriate tools strategically.

Content Standards- Assessed
2.MD.3 Estimate lengths using whole units of inches, feet, centimeters, and meters.
2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit (inches, feet, centimeters, and meters).
2.MD.5 Use addition and subtraction within 100 to solve one- and two-step word problems involving lengths that are given in the same units, *e.g. by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.*

2nd Grade Mathematics

UNIT 9: Using Data to Visualize and Wonder About Our World

ESSENTIAL QUESTION	BIG IDEAS
How can we use data to help us visualize and communicate about our world?	Students organize, represent and interpret data.

GUIDING QUESTIONS

Content and Process

- How can a line plot be created to represent measurement data? **2.MD.10**
- How is the horizontal scale of a line plot similar to a number line? **2.MD.10**
- How can a picture graph or bar graph be created to represent a data set with up to four categories? **2.MD.11**
- How can the information in a bar graph be used to solve problems? **2.MD.11**

Reflective

- Why would I create a data display?
- What type of graph do I prefer to use to display data? Why?
- How do data displays help me interpret data?

FOCUS STANDARDS

Standards of Mathematical Practice

MP.1 Make Sense and Persevere in Solving Problems

Content Standards- Assessed

2.MD.10 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object using different units. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

2.MD.11 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.