

Mathematics

Grade 2

Grade(s):	Grade 2
Discipline/Course:	Mathematics
Course Title:	Grade 2 Mathematics
Prerequisite(s):	Grade 1 Mathematics
Course Description: <i>Program of Studies</i>	In Grade 2 students build fluency with whole number multi-digit computation in addition and subtraction. Students solve problems within 1000, by applying their understanding of models for addition and subtraction, using properties of operations. They use their understanding of the base ten structure students build a deep conceptual foundation for number relationships and represent their mathematical thinking. Students use standard units of measure (metric and U.S. customary). Students use measurement tools to understand length. Additionally, students examine the attributes of geometric shapes, reasoning about the composition and decomposition of forms to strengthen spatial awareness and foundational fraction concepts. By the conclusion of the course, students will be able to: • Solve complex addition and subtraction problems using place-value-based strategies. • Measure and estimate lengths using appropriate tools and standard units. • Analyze geometric figures based on their structural properties. • Communicate mathematical reasoning clearly through verbal and written expression.
Course Essential Questions:	• How does the position of a digit affect its value in a multi-digit number? • What is the relationship between addition and subtraction, and how can that relationship be used to solve problems? • Which strategy—mental math, a visual model, or a written algorithm—is most effective for a given mathematical situation? • Why is it necessary to use standard units (inches, centimeters) when measuring and comparing objects?

	• What stories do graphs and charts tell us about the information we have collected? • How can shapes be classified and decomposed based on their specific attributes (sides, angles, faces)?
Course Enduring Understandings:	• The value of a digit is determined by its position (place value), and this structure allows for the efficient composition and decomposition of numbers up to 1,000. • Mathematical efficiency is achieved by applying flexible strategies. • Concrete and visual models (number racks, open number lines, base-ten pieces) are essential for representing mathematical thinking and solving complex problems. • Mathematical ideas are clarified when students use precise vocabulary and explain their reasoning through oral and written discourse. • Shapes are defined and categorized by specific properties such as the number of sides, vertices, and angles. • Objects and shapes can be grouped in multiple ways based on shared or contrasting characteristics. • Standard units of measure and data organization (graphs/charts) are critical tools for describing, comparing, and analyzing the physical world.
Duration:	1 year
Course Materials/Resources:	Bridges 2nd ed., Bridges Number Corner
FPS Course Academic Expectation(s):	☒ Exploring and Understanding (EU) ☐ Synthesizing and Evaluating (SE) ☐ Creating and Constructing (CC) ☒ Conveying Ideas (CI) ☐ Collaborating Strategically (CS) ☐ Using Communication Tools (UCT)
At a Glance	Unit 1: Figure the Facts (Bridges Unit 1 and August/September Number Corner) Unit 2: Place Value and Measurement (Bridges Unit 2 and October Number Corner)

	Unit 3: Addition and Subtraction within 100 (Bridges Unit 3, and November/December Number Corner) Unit 4: Measurement (Bridges Unit 4 and January Number corner) Unit 5: Place Value to 1,000 (Bridges Unit 5 and February Number Corner) Unit 6: Geometry (Bridges Unit 6 and March Number Corner) Unit 7: Measurement, Fractions and Multi-digit Computation (Bridges Unit 7, Bridges Unit 8 Module 1 and April, May/June Number Corner)
--	--

Unit 1: Figure the Facts	As an entree into the study of mathematics in second grade, Unit 1 works toward the establishment of classroom norms around mathematical inquiry and discourse. The mathematical focus rests primarily on the development of number sense, operations, and fact fluency to 20. Important mathematical models including the number rack, bead strings, and the number line are introduced during the unit, and students are expected to become proficient at using strategies that emerge from these models.
Standard(s):	Represent and solve problems involving addition and subtraction. 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, for example, by using drawings and equations with a symbol for the unknown number to represent the problem. Add and subtract within 20. 2.OA.2. Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers. Work with equal groups of objects to gain foundations for multiplication. 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. Represent and interpret data. 2.MD.10. 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.
Essential Question(s):	• How are strategies like "doubles" and "make ten" used to solve addition and subtraction facts? • How can we use what we know about numbers to solve addition and subtraction facts quickly and accurately? • How do visual models represent the relationship between numbers?

	• What methods are most effective for organizing and interpreting data? • How can equations be used to represent mathematical situations and story problems?
Enduring Understanding(s):	• Efficiency in addition and subtraction is achieved through the use of strategies. There are different efficient strategies to compute mentally, depending on the numbers in the problem. • Numbers can be composed and decomposed to make estimation and mental computation easier • Addition and subtraction are inverse operations; Known facts can help to determine unknown facts through fact families. • Data can be organized and represented in multiple ways to help us visualize quantities and relationships to reveal patterns and answer questions.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) • addend: one of the numbers being added. • sum: the total result of an addition problem. • difference: the result of a subtraction problem (the "gap" between numbers). • equation: a mathematical sentence with an equal sign • strategy: a mental path used to find an answer (e.g., "Counting On"). • doubles: addition facts where both addends are the same • neighbors (or near-doubles): facts that are one away from a double • make ten: using the benchmark of 10 to solve a fact • fact family: a set of four related equations using the same three numbers • fluency: from memory, the sums of all two one-digit numbers. • storing and graphing: classifying objects by attributes and representing data • fact strategies: ○ fact families ○ odd and even numbers ○ add zero ○ add ten ○ add nine

- count on (+1, +2, +3)
- make ten
- doubles facts
- doubles plus or minus one
- leftover facts
- models:
 - number rack

Skills: (Students will be able to...)

- analyze and interpret mental strategies to fluently add and subtract within 20.
- develop and use models to represent 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.
- create number and shape patterns.
- demonstrate understanding of subtraction as an unknown addend problem.
- use strategies to add with sums to 20.
- compare pairs of 2-digit numbers.
- measure the length of an object by laying multiple copies of a shorter unit end to end.
- solve one-step addition story problems with sums to 100 involving situations of adding to and putting together, with unknowns in all positions; solve one-step subtraction story problems with minuends to 100 involving situations taking from, taking apart, and comparing, with unknowns in all positions.
- fluently add and subtract with sums to 20 using mental strategies.
- 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.
- skip-count by 5s up to 1,000.
- recognize and construct shapes having specified attributes.
- partition a rectangle into rows and columns of same-size squares, and count them to find the total.

Unit 2: Place Value and Measurement	Throughout Unit 2, students explore base ten concepts and models within 1,000. Algebraic properties are used to compose and decompose numbers to make computation easier. Numbers are partitioned in standard and non-standard forms, including expanded notation and regrouping, to deepen understanding of equivalence. The concept of multiple sets of 10s and 100s builds foundational understanding of the magnitude of numbers that will facilitate the work with addition and subtraction in later units.
Standard(s):	Operations and Algebraic Thinking Represent and solve problems involving addition and subtraction. 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, for example, by using drawings and equations with a symbol for the unknown number to represent the problem. Add and subtract within 20. 2.OA.2. Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers. Number and Operations in Base Ten Understand place value. 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: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). 2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s.

	2.NBT.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. 2.NBT.4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons. Use place value understanding and properties of operations to add and subtract. 2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations. Relate addition and subtraction to length. 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.
Essential Question(s):	• Why does place determine value? • What pattern do you see in our number system when you count by a given number? • How can the same quantity be represented in different ways and why is it important to understand different ways for representing a number? (equivalence)
Enduring Understanding(s):	• A collection of objects can simultaneously be thought of as one group and as a collection, e.g. 10 ones make one ten and 10 tens make one hundred. • Skip counting can be more efficient than counting by ones. Number patterns occur when skip counting, e.g. counting by tens off the decades; 24, 34, 44, 54. • The number system is organized into groups of ten, where ten units of one place are equal to one unit of the next place to the left (10 ones = 1 ten; 10 tens = 1 hundred). • The value of a digit is determined by its specific position within a number (hundreds, tens, or ones). Position of digits in numbers determines their value, e.g. 706 equals 7 hundreds, 0 tens,

	and 6 ones. - Numbers can be expressed in multiple forms; base-ten models, expanded form, number names, and standard numerals, without changing the underlying quantity. Numbers can be composed or decomposed in order to compute, e.g. $17+8$ can be thought of as $17 + (3+5)$ or $(17+3) + 5$. - Numbers can be compared using place value relationships.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) - place value concepts: digit: any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 used to write numbers. place value: the value of a digit depending on its position in a number. hundreds place: the third position in a three-digit number, representing how many groups of one hundred are present. standard form: the common way to write a number using only digits (e.g., 582). expanded form: a way to write a number showing the sum of the values of its digits word form: writing a number using only words (e.g., five hundred eighty-two). - counting to one thousand: organize and count by ones, tens, and hundreds. “friendly” benchmarks. - comparing quantities on simple graphs. - model 2 and 3-digit numbers. - identify numbers by their component parts. - write numbers in standard and expanded form. - strategies: - splitting - decomposition by place value - add by regrouping sets of tens and ones - jumping strategies - models: - open number line - two number lines

Skills: (Students will be able to...)

- Analyze and interpret patterns in our number system to determine that 100 can be thought of as a bundle of ten tens — called a “hundred” and that the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds.
- Develop and use models to 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.
- Construct explanations using patterns, structures and relationships to count within 1000 including skip-counting by 5s, 10s, and 100s.
- Reason abstractly and quantitatively to compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons
- solve one-step addition story problems with sums to 100 involving situations of adding to and putting together, with unknowns in all positions.
- fluently subtract with minuends to 12 using models and mental strategies.
- find the total number of objects in an array with up to 5 rows and 5 columns, using addition.
- demonstrate an understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones.
- demonstrate an understanding that 100 can be thought of a bundle or group of 10 tens, called a hundred.
- skip-count by 5s and 10s within 1,000.
- read and write numbers to 1000 represented with numerals, number names, and expanded form.
- use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums to 100.
- measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
- represent whole numbers as lengths, and whole-number sums, on a number line.

Unit 3: Addition and Subtraction to 100	Unit 3 focuses on strategies for multi-digit addition and subtraction within the range of 0 to 100. Students use “skip-jumps” based on multiples of 5 and 10 on the number line. They continue to use the number line as a computational tool through which students add and subtract 2-digit numbers. Students then focus on addition and subtraction, using the base ten structure (collecting ones and tens). Students develop skills to flexibly, accurately and efficiently add and subtract within 100. Students communicate their thinking and justify their strategies both verbally and in written form while using appropriate models.
Standard(s):	Represent and solve problems involving addition and subtraction. 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 equations with a symbol for the unknown number to represent the problem. Add and subtract within 20. 2.OA.2. Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers. Number and Operations in Base Ten 2.NBT Understand place value. 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: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). Understand place value. 2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s. Use place value understanding and properties of operations to add and subtract.

	2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations. 2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations. Relate addition and subtraction to length. 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.
Essential Question(s):	• How can we use our understanding of place value to help us mentally compute or think about number relationships and equivalence? • How can we think about what we know about numbers first to help us choose an efficient strategy to solve a problem? • How do benchmark numbers help us to think about number relationships and figure out problems? • How can duration be thought of in fractional parts and how does a clock divided into equal segments help us to tell time and duration? • How does breaking numbers into tens and ones make addition and subtraction more manageable? • How can an open number line be used to model the different steps in a mental math strategy? • What are the advantages of "adding up" to solve a subtraction problem? • How can one determine which strategy is the most efficient for a specific set of numbers? • How is the "difference" between two numbers represented on a number line?
Enduring Understanding(s):	• Place determines value. • Place value patterns occur when adding or subtracting groups of ten.

	• Flexible methods for computation require a good understanding of the operations and properties of the operations, the commutative and associative properties. • Contextual problems can be represented and solved using a variety of problem structures (e.g., $90 + _ = 170$ or $_ + 80 = 170$ or $90 + 80 = _$). • Numbers can be regrouped into 10s and 100s when adding and subtracting. • Understanding place value strategies supports estimation. • Repeated addition and subtraction with the same number creates a repeating pattern in the ones and tens digits. • Benchmark numbers help make mental computation easier. • Multi-digit addition and subtraction can be solved using various strategies, such as splitting by place value or jumping on a number line. • Two-digit numbers are composed of tens and ones, and these units can be manipulated independently to simplify calculation. Numbers can be grouped and regrouped into equivalent forms. • Subtraction can be modeled as the "difference" or distance between two numbers, which can be found by adding up from the smaller number.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) • counting to one thousand. • expanded form, word form, and standard form of numbers. • “friendly” benchmarks. • tens and ones: count, combine, and organize based on place value and multiples of 5 and 10. • adding and subtracting: addition and subtraction within 100, using a number line, jumping, skip jumping by 1, 5, 10, splitting, adding up. • two-digit numbers: solving story problems with two-digit numbers. • data: counting, comparing, making predictions, and graphing data. • models: ○ open number line ○ base ten models • strategies

- calculating by counting
- skip-jumping
- subtracting on the number line
- splitting
- keeping one addend whole— adding friendly numbers
- keeping one addend whole— get to a friendly number

Skills: (Students will be able to...)

- Reason abstractly and quantitatively to fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- Construct explanations using patterns, structures and relationships to explain why strategies work when solving addition and subtraction problems within 100.
- Use appropriate tools to represent whole numbers as lengths of a number line diagram with equally spaced points and represent whole-number sums and differences within 100 on a number line.
- use addition and subtraction within 100 to solve one- and two-step story 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 equations with a symbol for the unknown number to represent the problem.
- fluently add and subtract with sums to 20 using mental strategies.
- demonstrate and understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones.
- count within 1000; skip-count by 5s, 10s, and 100s.
- read and write numbers to 1,000 represented with base ten numerals and expanded form.
- fluently add and subtract within 100 using strategies based on place value, properties of operations, or the relationship between addition and subtraction.
- add up to four two-digit numbers using strategies based on place value and properties of operations.
- use addition and subtraction within 100 to solve word problems involving lengths that are given

in the same units.

- 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.

Unit 4: Measurement	The purpose of this unit is to shift student thinking from measuring length using non-standard units to using standard units of measure (metric and U.S. Customary). Students develop estimation strategies using units of inches, feet, centimeters, and meters. Students describe the relationship between the size of the measurement unit and the number of iterations of the units needed to measure objects. In Unit 4, students explore measurement from multiple entry points. While proportional reasoning is considered by many to be a skill reserved for work with older students, this unit introduces proportional reasoning in a manner that is intuitive to second-grade students. Students identify, describe, and extend counting-by-3s patterns to illustrate the relationship between repeated addition and multiplication, as well as patterns that appear when counting by 3s.
Standard(s):	Measure and estimate lengths in standard units. 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.3. Estimate lengths using 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. Relate addition and subtraction to length. 2.MD.5. Use addition and subtraction within 100 to solve 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. Relate addition and subtraction to length. 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. Operations and Algebraic Thinking Represent and solve problems involving addition and subtraction. 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, for example, by using drawings and equations with a symbol for the unknown number to represent the problem. Add and subtract within 20. 2.OA.2. Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two one-digit numbers Number and Operations in Base Ten Understand place value. 2.NBT.4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons. Use place value understanding and properties of operations to add and subtract. 2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
Essential Question(s):	• Why is it important to keep the unit of measure consistent when making measurements? • What is a benchmark measure and how does it help you estimate length? • When measuring a given object, how is the size of the unit related to the number of units needed? • Which is an appropriate tool and unit of measure to measure a given object and why? • How can data be presented in different ways help us think and give us a better understanding about relationships? • How does organizing data help us understand information?
Enduring	• The distance between demarcations rather than the demarcations themselves determines length.

Understanding(s):	• The ability to estimate helps develop familiarity with the specific units of measure. • Direct comparisons can be made by measuring the difference in length between two objects by laying them side by side and selecting an appropriate standard length unit of measure. • Standard units (inches, feet, yards) allow for consistent and accurate communication of length across different contexts. Inches, feet and yards are US Customary standard units used to measure length. Centimeters and meters are standard units used in the metric system to measure length. • The smaller the unit of measure, the more units are required to measure a given object; conversely, larger units result in a smaller count. • Different tools and units are appropriate for measuring specific objects in different contexts. Choosing the appropriate tool (ruler, yardstick, or measuring tape) and using it correctly (aligning at zero) are essential for accurate measurement.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) • inches and feet: standardized measurements and the size of the unit of measure (inch (in.), foot (ft.), yard (yd.), centimeter (cm), meter (m)). • measure and compare: students measure objects and calculate their differences in length. • proportions and fractions: ratios and proportional reasoning leading to fraction measurement • efficient measuring strategies. • an appropriate unit of measurement. • how to select an appropriate unit of measurement for a given attribute. • counting: counting by 3s, repeated addition. • measure objects both forward and backward with iterated units (linking cubes). • measuring objects by placing objects in the middle of the ruler. • the lengths of different units being used to measure object. • size of the unit used to measure an object's length relates to the measurement of the object's length. Skills: (Students will be able to...)

- solve one-step addition story problems with sums to 100 involving situations of adding to and putting together, with unknowns in all positions.
- solve one- and two-step subtraction story problems with minuends to 100 involving situations taking from, taking apart, and comparing, with unknowns in all positions.
- fluently add and subtract with sums and minuends to 20 using mental strategies.
- recall from memory all sums of two 1-digit numbers.
- compare pairs of 2- and 3-digit numbers.
- add three 2-digit numbers.
- select and use the appropriate tool for measuring the length of an object.
- measure the length of objects in inches using a ruler a yardstick or a measuring tape.
- describe how the size of the unit used to measure an object's length relates to the measurement of the object's length.
- estimate length in inches feet, or yards.
- determine exactly how much longer one object is than another and express the difference between two lengths in terms of a standard unit of length.
- solve addition and subtraction story problems with sums and minuends to 100 involving lengths given in the same units.
- represent whole-number differences from minuends up to 100 on a number line.
- When measuring objects, reason abstractly about how the size of the unit is related to the number of units needed.
- Develop and use models to estimate lengths in customary and metric units.
- Ask questions and investigate how comparisons can be made by measuring the difference in length between two objects by laying them side by side.
- Use tools and clear and precise language to defend or counter one's reasoning about what tools are most appropriate to measure a given object.

Unit 5: Place Value to 1000	The purpose of this unit is to build on student understanding of the structure of our base ten place value system. Students use algebraic properties of operations to deepen understanding of number relationships and equivalence. Multiple sets of 10s, 100s, and 1000s build foundational understanding for later work with multiplication concepts. Algebraic properties are used to develop efficient strategies for computing with whole numbers. Students practice adding and subtracting in multiples of 10 and 100, both on and off the decade. Lessons focus explicitly on money contexts provide opportunities for students to count by 5 and 10 and consider 25 cents or a quarter as a unit. Students solve word problems involving money, using \$ and ¢ symbols appropriately. Students develop an understanding of time as measurement and measure time to the nearest 5-minutes, using a.m. and p.m. Students to observe and describe sequences as they search for patterns and generalizations that will enable them to build and represent succeeding arrangements in those sequences.
Standard(s):	Number and Operations in Base Ten 2.NBT Understand place value. 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: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). 2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s. 2.NBT.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. 2.NBT.4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons. Use place value understanding and properties of operations to add and subtract. 2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of

	operations, and/or the relationship between addition and subtraction. Use place value understanding and properties of operations to add and subtract. 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, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. 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. 2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations. Relate addition and subtraction to length. 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. Work with time and money. 2.MD.7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. 2.MD.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have? Represent and interpret data. 2.MD.10. 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.
Essential	• What patterns are in our number system when you count by 10, 100, 1000?

Question(s):	• How do properties of operation help us solve addition and subtraction problems within 1000? • How does grouping numbers help solve problems? • How can thinking of equivalent representations of numbers help make computation easier? • How does understanding the base ten system help us to solve problems? • How does understanding place value concepts help to compute with money amounts?
Enduring Understanding(s):	• Unitizing numbers continues and applies to larger numbers in our number system, i.e. through 1000. • Place determines value. • Equivalent values and expressions can be represented differently. • Commutativity and associativity applies to larger numbers. • Place value patterns result when adding or subtracting tens and when making groups of tens. • Partial sums can help to mentally compute and estimate. • Contextual problems can be represented and solved using a variety of problem structures (e.g., $900 + _ = 1700$ or $_ + 800 = 1700$ or $900 + 800 = _$). • Coins and dollars unitize money amounts. • Durations of time can be measured and a standard unit of measurement is needed. • Grouping larger units encompasses smaller units. • Duration of time can be cut into equal (fractional) parts.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) • value of coins: quarter, nickel, dime, penny. • read and write numbers to 1000. • counting to one thousand: students use bundles of 10 and 100. They practice adding and subtracting by 10 within the range of 0 to 200. • place value with money: Students count by 5 and 10 forward and backward. They use combination of coins which total a dollar or several dollars. • multiples of ten, one hundred, and one thousand: Students use place value concepts and multiples to add and subtract. • sequences and patterns: using sequences of geometric arrangements to build succeeding

arrangements.

- sets of 10 (and, subsequently, sets of 100) can be thought of as single entities.
- place value notation is dependent on the idea that the position of any individual digit (in a 2 or 3-digit number, for example) determines the size of the group that the digit is counting.
- multi-digit numbers are formed by following the same counting pattern present in singledigit counting.
- any number may be decomposed based on place value groupings (e.g., ones, tens, hundreds and thousands) in multiple ways.

Skills: (Students will be able to...)

- develop and use models to tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. Analyze and solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
- reason abstractly and quantitatively to fluently add and subtract within 1000 using a variety of strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- construct explanations using patterns, structures, and relationships to explain why strategies work when solving addition and subtraction problems within 1000.
- use appropriate tools to represent whole numbers as lengths of a number line diagram with equally spaced points and represent whole-number sums and differences within 1000 on a number line.
- count within 1,000, starting and ending with any given pair of numbers.
- demonstrate an understanding that 100 can be thought of as a bundle or group of 10 tens, called a hundred.
- demonstrate an understanding that multiples of 100 from 100 to 900 refer to some number of hundreds and 0 tens and 0 ones.
- demonstrate an understanding that multiples of 100 from 100 to 900 refer to some number of hundreds and 0 tens and 0 ones.
- skip-count by 5s, 10s and 100s up to 1,000.
- read & write numbers to 1,000 using base-ten numerals, words, and expanded form.

- compare pairs of 3-digit numbers, based on an understanding of what the digits in their hundreds, tens, and ones places represent and use $>$, $=$, and $<$ symbols to record comparisons of two 3-digit numbers.
- fluently add and subtract with sums and minuends to 100.
- add and subtract with sums and minuends to 1,000.
- mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
- explain why strategies for adding and subtracting 2- and 3-digit numbers work, using place value and the properties of operations.
- represent whole numbers, sums, and differences as lengths on a number line.
- solve money story problems involving pennies, nickels, dimes, quarters, and dollar bills.
- use \$ and ¢ symbols when solving money story problems.
- make a bar graph to represent a data set with up to 4 categories.
- tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Unit 6: Geometry	The purpose of this unit is to develop spatial reasoning through the identification and visualization of spatial relationships. Students develop fractional concepts as they decompose shapes into equal parts. Students work with the part-whole relationships using equal groups and equal shares of a whole unit. Students identify, describe and draw triangles, quadrilaterals, pentagons and hexagons. Pentagons, triangles, and hexagons appear as both regular (equal sides and equal angles) and irregular. Grade 2 students begin to develop greater specificity of language to describe attributes of shapes. Over the course of this unit, students investigate two-dimensional shapes, fractions (halves and fourths), congruence, symmetry, and transformations (slides, flips, and turns) using a variety of tools and models. There is a strong emphasis on identifying, describing, constructing, drawing, comparing, contrasting, and sorting various types of triangles and quadrilaterals, as well as other shapes, throughout the unit. The first grade focus on composing and decomposing shapes resurfaces at a more sophisticated level in as students are introduced to concepts of tiling a plane (tessellating).
Standard(s):	Reason with shapes and their attributes. 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. Recognize that equal shares of identical wholes need not have the same shape. Work with equal groups of objects to gain foundations for multiplication. 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.
Essential Question(s):	• How can shapes be composed and decomposed to make other shapes? • What attributes can be used to sort and classify two-dimensional shapes?

	• When is a fractional part of a given shape the same or different? • Why does the size of the whole matter when comparing fractional parts?
Enduring Understanding(s):	• Shapes can be classified based on their attributes. • Shapes and solids can be composed and decomposed (part-whole relations). • Shapes can be decomposed into fractional parts of equal size. • The bottom number of a fraction tells the number of equal parts. The top number tells how many of the equal parts are being named. • Benchmark fractions (halves, thirds and fourths) facilitate estimation. • The more the whole is divided into equal parts, the smaller the parts, e.g. fourths are smaller than halves. • Fractions are relations: the size of a fractional part is relative to the size of the whole and the size of the whole (unit) is important.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) • quadrilateral: a polygon with exactly four sides (e.g., square, rectangle, rhombus, trapezoid). • polygon: a closed two-dimensional shape with straight side (pentagon, hexagon). • partition: to divide a shape into smaller parts or equal shares. • equal shares: parts of a whole that are the exact same size. • halves / thirds / fourths: the names for two, three, or four equal shares of a whole. • row: a horizontal line of objects or squares. • column: a vertical line of objects or squares. • area: the measure of the total surface inside a 2D shape, often measured in square units. • attributes of two-dimensional shapes: types of triangles and quadrilaterals. • exploring areas and arrays: area as a measure and rectangular array with equal groups. • composing and decomposing: compare areas of regions. • features of shapes: tessellation, symmetry, and fractions. Skills: (Students will be able to...)

- draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.
- identify the attributes of shapes and classify them in different ways.
- look for and make use of structure as they identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- develop and use models to represent benchmark fractions to facilitate estimation.
- Investigate how the more the whole is divided into equal parts, the smaller the parts, e.g. fourths are smaller than halves.
- ask questions and investigate how the size of a fractional part is relative to the size of the whole and explain why the size of the whole matters, especially when comparing fractional parts.
- find the total number of objects in an array with up to 5 rows and 5 columns, using addition.
- write an equation to represent the total number of objects in an array with up to 5 rows and 5 columns as the sum of equal addends.
- recognize and draw shapes having specified attributes.
- identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- partition circles and rectangles into 2 and 4 equal parts.
- use the terms halves and half, fourths, quarters, fourth of, and quarter of to talk about the 2 or 4 equal parts into which circles and rectangles have been partitioned.
- describe whole circles and rectangles as 2 of two equal parts or 4 of four equal parts.
- demonstrate an understanding that equal parts of identical wholes do not have to be the same shape.

Unit 7: Measurement, Fractions, and Multi-digit Computation	This unit addresses metric measurement, fractions, and multi-digit addition and subtraction. Students use rules in both inches and centimeters. They begin investigating division and fractions. Students will use base ten blocks to reinforce regrouping as they work on addition and subtraction of 2- and 3-digit numbers. At the end of the unit there is a review of place value through and beyond 1,000, as well as 3-digit addition and subtraction. Students have an opportunity to deepen their understandings, correct misconceptions, solidify strategies for working with 3-digit addition and subtraction problems, and develop new methods of approaching these situations.
Standard(s):	Number and Operations in Base Ten 2.NBT Understand place value. 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: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones). Understand place value. 2.NBT.2. Count within 1000; skip-count by 5s, 10s, and 100s. 2.NBT.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. 2.NBT.4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons. Use place value understanding and properties of operations to add and subtract. 2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.

	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, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. 2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations. Relate addition and subtraction to length. 2.MD.5. Use addition and subtraction within 100 to solve 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. Work with time and money. 2.MD.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have? Reason with shapes and their attributes. 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. Recognize that equal shares of identical wholes need not have the same shape. Represent and solve problems involving addition and subtraction. 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, for example, by using drawings and equations with a symbol for the unknown number to represent the problem.
Essential	• How does the choice of strategy change based on the numbers being added or subtracted?

Question(s):	• What is the relationship between the size of a unit and the number of units needed to measure an object? • How can a whole be divided into equal shares to represent different fractions? • How do different combinations of coins and bills represent the same total value?
Enduring Understanding(s):	• Multi-digit addition and subtraction can be solved more efficiently by choosing a strategy (splitting, jumping, or compensation) that fits the specific numbers in the problem. • A whole can be partitioned into equal-sized shares, and these shares (halves, thirds, fourths) are described by the relationship between the part and the whole. • Accurate measurement requires the iterative use of standard units (inches, feet, yards) and the understanding that smaller units result in a larger numerical count for the same object. • Coins and bills provide a concrete model for place value and decimal notation, where 100 cents is equivalent to one dollar.
Learning Goal(s): <i>Students will be able to use their learning to:</i>	Content: (Students will know...) • equal shares and partitioning of shapes. • estimate, measure, and compare lengths. • groupings of 100 and 120 in rows of 2,4,5, and 10. • fractions: denominators of 2,3, and 4 to represent dividing using halves, thirds, and quarters. • addition and subtraction strategies for 3-digit numbers. • models and strategies: ○ paper strip fractions ○ number line ○ base ten area pieces ○ labeled sketches of base ten area pieces ○ partial sums ○ open number line: add to subtract ○ open number line: hopping backwards

- partial difference

Skills: (Students will be able to...)

- demonstrate an understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones.
- solve one- and two-step addition and subtraction story problems with sums and minuends to 100 involving situations of adding to, putting together, taking from, taking apart, and comparing, with unknowns in all positions.
- model division situations in which sets are separated into equal parts.
- skip-count by 10s and 100s up to 1000.
- read and write numbers to 1000 represented with numerals, words, and expanded form.
- compare pairs of 3-digit numbers, based on an understanding of what the digits in their hundreds, tens, and ones places represent and use $>$, $=$, and $<$ symbols to record the comparisons.
- add and subtract with sums and minuends to 1000.
- use concrete models or drawings to add and subtract with sums and minuends to 1000.
- use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract with sums and minuends to 1000.
- relate strategies for subtracting with minuends to 1000 to written methods.
- use written numbers and symbols to represent strategies for adding and subtracting with sums and minuends to 1000.
- add with sums to 1000 using strategies that involve adding hundreds to hundreds, tens to tens, and ones to one.
- add with sums to 1000 using strategies that involve composing a hundred or a ten.
- subtract with minuends to 1000 using strategies that involve subtracting hundreds from hundreds, tens from tens, and ones from ones.
- subtract with minuends to 1000 using strategies that involve decomposing a hundred or a ten.
- explain why strategies for adding and subtracting 2- and 3-digit numbers work, using place value and the properties of operations.
- select and use the appropriate tool for measuring the length of an object.

- measure the length of an object in centimeters and meters using rulers, meter sticks, and measuring tapes.
- estimate length in centimeters and meters.
- measure length to the nearest whole unit in metric units.
- determine exactly how much longer one object is than another, and express the difference between the two lengths in terms of a standard unit of length.
- solve addition and subtraction story problems with sums and minuends to 100 involving lengths given in the same units.
- solve money story problems involving dollars, quarters, dimes, nickels, and pennies, and use \$ and ¢ symbols when doing so.
- partition a circle (rectangle) into 2, 3, or 4 equal parts.
- use the terms halves, half, thirds, third of, fourths, quarters, a fourth of to talk about the equal parts into which a circle (rectangle) has been partitioned.
- describe a whole circle [rectangle] as 2 [3, 4] of two [three, four] equal parts.