PSD MATH CURRICULUM OVERVIEW K-5		
Note:There is significant math vocabulary used throughout these documents. If you have questions about math content, the best person to speak with is your child's teacher. An additional math vocabulary resource can be found here.		
Kindergarten	**Grade 1**	**Grade 2**
• Counting and Cardinality • Operations and Algebraic Thinking • Numbers and Operations-Base Ten • Measurement and Data • Geometry	• Operations and Algebraic Thinking • Numbers and Operations-Base Ten • Measurement and Data • Geometry	• Operations and Algebraic Thinking • Numbers and Operations-Base Ten • Measurement and Data • Geometry
Grade 3	**Grade 4**	**Grade 5**
• Operations and Algebraic Thinking • Numbers and Operations-Base Ten • Numbers and Operations-Fractions • Measurement and Data • Geometry	• Operations and Algebraic Thinking • Numbers and Operations-Base Ten • Numbers and Operations-Fractions • Measurement and Data • Geometry	• Operations and Algebraic Thinking • Numbers and Operations-Base Ten • Numbers and Operations-Fractions • Measurement and Data • Geometry

<table>
<tr><th colspan="2">Unit: Counting and Cardinality</th></tr>
<tr><td colspan="2">The purpose of this unit is to represent, relate, and operate on whole numbers, initially with sets of objects.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Count to 100 by ones and by tens.
Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
Understand the relationship between numbers and quantities; connect counting to cardinality.

When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
Understand that each successive number name refers to a quantity that is one larger.

Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

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Students Will Know:

Zero, One, Two, Three, Four, Five, Six, Seven, Eight, Nine, Ten, Eleven, Twelve, Thirteen, Fourteen, Fifteen, Sixteen, Seventeen, Eighteen, Nineteen, Twenty, Equal, Fewer, Greater than, Less than, One more

Students Will Be Able To:

Use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set (up to 20); counting out a given number of objects (up to 20); comparing sets or numerals (within 10); and modeling simple joining and separating situations with sets of objects (within 10), or eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5.
Choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.
Count to 100 from any given whole number by ones and tens.

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• Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. • Compare two numbers between 1 and 10 presented as written numerals.	

Essential Questions/Understandings

Essential Questions:
- How do I count, show, and compare numbers?
- How do I count to 100 by 1s and 10s?

Enduring Understandings:
- Know number names and the count sequence.
- Count to tell the number of objects.
- Compare numbers.

<table>
<tr><th colspan="2">Unit: Operations and Algebraic Thinking</th></tr>
<tr><td colspan="2">The purpose of this unit is to represent, relate, and operate on whole numbers, initially with sets of objects.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
Fluently add and subtract within 5.

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Students Will Know:

Add, Equal sign, Equation, In all, Join, Plus sign, Sum (total), Difference, Minus, Subtract, Count back, Count on, Decompose (break apart), Make (compose), Number path

Students Will Be Able To:

Use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set (up to 20); counting out a given number of objects (up to 20); comparing sets or numerals (within 10); and modeling simple joining and separating situations with sets of objects (within 10), or eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5.
Choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.
Fluently add and subtract within 5.

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Essential Questions/Understandings
Essential Questions: ● How can I solve addition word problems? ● How can I solve subtraction word problems? ● How can I make and decompose numbers in more than 1 way? **Enduring Understandings:** ● Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

Unit: Numbers and Operations - Base Ten	
The purpose of this unit is to represent, relate, and operate on whole numbers, initially with sets of objects.	
Standards	**Knowledge/Skills**
• Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.	**Students Will Know:** • Add, Equal sign, Equation, In all, Join, Plus sign, Sum (total), Difference, Minus, Subtract, Count back, Count on, Decompose (break apart), Make (compose), Number path **Students Will Be Able To:** • Use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set (up to 20); counting out a given number of objects (up to 20); comparing sets or numerals (within 10); and modeling simple joining and separating situations with sets of objects (within 10), or eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5. • Choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

Essential Questions/Understandings
Essential Questions: ● How can I represent, make, and decompose numbers 11 to 15? ● How can I represent, make, and decompose numbers 16 to 19? **Enduring Understandings:** ● Work with numbers 11 through 19 to gain foundations for place value.

Unit: Measurement and Data	
The purpose of this unit is to describe shapes and space.	
Standards	**Knowledge/Skills**
• Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. • Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. ○ For example, directly compare the heights of two children and describe one child as taller/shorter. • Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.	**Students Will Know:** • Capacity, Height, Length, Weight, Alike, Different, Fewer, More, Shape, Size, Sort **Students Will Be Able To:** • Explore and describe measurable attributes of objects. Describe the difference between objects with a common attribute, using terms such as “more of”/”less of” or “taller than”/”shorter than.” • Identify attributes of objects (such as size, shape, color) and use those attributes to sort objects into categories and count the objects in each category.
Essential Questions/Understandings	
Essential Questions: • How can I use attributes to sort a collection of objects? • How can I describe and compare the length, heights, weight, and capacity of objects? **Enduring Understandings:** • Describe and compare measurable attributes. • Classify objects and count the number of objects in each category.	

Unit: Geometry	
The purpose of this unit is to describe shapes and space.	
Standards	**Knowledge/Skills**
● Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to. ● Correctly name shapes regardless of their orientations or overall size. ● Identify shapes as two-dimensional (lying in a plane, “flat”) or three dimensional (“solid”).	**Students Will Know:** ● Circle, Hexagon, Rectangle, Side, Square, Triangle, Vertex, 2-dimensional shape, 3-dimensional shape, Apex, Base, Cone, Cube, Cylinder, Face, Sphere, Build **Students Will Be Able To:** ● Describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. ● Identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. ● Use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.
Essential Questions/Understandings	
Essential Questions: ● How can I identify 2-dimensional shapes? ● How can I identify 3-dimensional shapes? ● How can I tell how shapes are alike and different? **Enduring Understandings:** ● Identify and describe shapes. ● Analyze, compare, create, and compose shapes.	

<table>
<tr><th colspan="2">Unit: Operations and Algebraic Thinking</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of addition, subtraction, and strategies for addition and subtraction within 20.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

- Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
- 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.
- Apply properties of operations as strategies to add and subtract.
  - Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)
- Understand subtraction as an unknown-addend problem.
  - For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.
- Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
- Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the

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Students Will Know:

- Add, Addend, Doubles, Sum, Difference, Fact family, Fact triangle, Related facts, Subtract, Total, Part, Whole, Word problem

Students Will Be Able To:

- Develop strategies for adding and subtracting whole numbers based on their prior work with small numbers.
- Use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations.
- Understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two).
- Use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20.
- Compare a variety of solution strategies to build their understanding of the relationship between addition and subtraction.

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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).	

Essential Questions/Understandings

Essential Questions:

- What strategies can I use to add?
- What strategies can I use to subtract?
- How can I solve addition problems?
- How can I compare using addition and subtraction?

Enduring Understandings:

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.

<table>
<tr><th colspan="2">Unit: Numbers and Operations - Base Ten</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of whole number relationships and place value, including grouping tens and ones.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

10 can be thought of as a bundle of ten ones — called a “ten.”
The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
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).

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.
Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers,

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Students Will Know:

Column, Count, How many, Number chart, Number line, Ones, Pattern, Row, Tens, Group of ten, Ten frame, Compare, Equal to, Greater than, Less than, 2-digit number, Open number line, Regroup

Students Will Be Able To:

Develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10.
Compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes.
Think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones).
Understand the order of the counting numbers and their relative magnitudes, through activities that build number sense.

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one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. ● Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. ● Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	

Essential Questions/Understandings

Essential Questions:

- How can I use patterns to count, read, and write numbers?
- How can I use place value to represent and compare numbers?
- How do I use strategies to add 2-digit numbers?
- What strategies help me to subtract 2-digit numbers?

Enduring Understandings:

- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

<table>
<tr><th colspan="2">Unit: Measurement and Data</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of linear measurement and measuring lengths as iterating length units.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Order three objects by length; compare the lengths of two objects indirectly by using a third object.
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.
Tell and write time in hours and half-hours using analog and digital clocks.
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.

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Students Will Know:

Analog clock/digital clock, Data, Longer/longest, Hour hand/minute hand, Measure, Tally chart/tally marks, Shorter/shortest, Unit

Students Will Be Able To:

Develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement.
Read time to the hour and to the half-hour on analog and digital clocks.
Collect and organize data (up to three categories) into a table or tally chart, and interpret the data to make comparisons between categories.
Identify, know the value of, and count groups of like coins.

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Essential Questions/Understandings
Essential Questions: ● How can I use tools to measure and interpret data? **Enduring Understandings:** ● Measure lengths indirectly and by iterating length units. ● Tell and write time. ● Represent and interpret data.

<table>
<tr><th colspan="2">Unit: Geometry</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop reasoning about attributes of, and composing and decomposing geometric shapes.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
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.
Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares

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Students Will Know:

2- and 3-dimensional shapes, Apex, Base, Closed, Cube and rectangular prism, Defining attribute, Faces, vertices, and edges, Sides and vertices, Equal shares, Fourth/quarter, Half/halves, Whole

Students Will Be Able To:

Compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes.
Combine shapes to recognize them from different perspectives and orientations and describe their geometric attributes, determining how they are alike and different, develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

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Essential Questions/Understandings
Essential Questions: ● What are shapes and solids? ● What are equal shares? **Enduring Understandings:** ● Reason with shapes and their attributes.

Unit: Operations and Algebraic Thinking	
The purpose of this unit is to build fluency with addition and subtraction.	
Standards	**Knowledge/Skills**
• 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. • Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers. • 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. • 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.	**Students Will Know:** • Even, Odd, Array, Repeated addition, Part-part-whole mat, Bar diagram, Count on, Count back, Related facts **Students Will Be Able To:** • Extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. • Understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones). • Represent and solve one and two-step word problems, using drawings and equations for the unknown number.

Essential Questions/Understandings
Essential Questions: ● How can I use patterns to count and add numbers? ● How can I represent and solve addition and subtraction word problems? ● What strategies can I use to add 2-digit numbers? ● What strategies can I use to subtract 2-digit numbers? **Enduring Understandings:** ● Represent and solve problems involving addition and subtraction. ● Add and subtract within 20. ● Work with equal groups of objects to gain foundations for multiplication.

<table>
<tr><th colspan="2">Unit: Numbers and Operations - Base Ten</th></tr>
<tr><td colspan="2">The purpose of this unit is to extend an understanding of base-ten notation.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

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:

100 can be thought of as a bundle of ten tens — called a “hundred.”
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).

Count within 1000; skip-count by 5s, 10s, and 100s.
Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

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Students Will Know:

Digit, Decompose, Expanded form, Greater than, Hundreds, Less than, Standard form, Word form, Column, Pattern, Row, Skip count, Regroup, Friendly numbers, Partial sums, Number line, Adjust

Students Will Be Able To:

Use their understanding of addition to develop fluency with addition and subtraction within 100.
Solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations.
Select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.

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Essential Questions/Understandings
Essential Questions: ● How can I use place value to understand and compare numbers to 1000? ● How can I use patterns to count and add numbers? ● What strategies can I use to add 2-digit numbers? ● What strategies can I use to subtract 2-digit numbers? ● What strategies can I use to add 3-digit numbers? ● What strategies can I use to subtract 3-digit numbers? **Enduring Understandings:** ● Understand place value. ● Use place value understanding and properties of operations to add and subtract

<table>
<tr><th colspan="2">Unit: Measurement and Data</th></tr>
<tr><td colspan="2">The purpose of this unit is to use standard units of measure.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
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.
Estimate lengths using units of inches, feet, centimeters, and meters.
Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
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.
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.
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
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?

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Students Will Know:

Inch, Unit, Foot/feet, Yard, Estimate, Centimeter, Meter, Cent, Dime, Nickel, Penny, Quarter, Dollar bill, Dollar sign, Analog clock, Digital clock, Half past, Hour hand, Minute hand, Quarter past, Quarter to, A.M., P.M., Category, Data, Key, Picture graph, Tally chart, Tally marks, Time, Bar graph, Line plot

Students Will Be Able To:

Recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units.
Recognize that the smaller the unit, the more iterations they need to cover a given length.
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately, as sets of mixed coins and bills.
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.

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

Essential Questions:
- How can I estimate and measure length in standard units?
- How can I measure with money and time?
- How can picture graphs, bar graphs, and line plots help me interpret data?

Enduring Understandings:
- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

<table>
<tr><th colspan="2">Unit: Geometry</th></tr>
<tr><td colspan="2">The purpose of this unit is to describe and analyze shapes.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>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.
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 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.</td><td>Students Will Know:
Angle, Attribute, Pentagon, Polygon, Quadrilateral, Rectangular prism, Equal shares, Fourths, Halves, Partition, Thirds
Students Will Be Able To:
Describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes.
Develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades, through building, drawing, and analyzing two- and three-dimensional shapes.
Develop a foundation for understanding equal shares by dividing circles multiple ways into halves, thirds, and fourths, and recognize that one equal share is a unit-fraction of the whole.</td></tr>
<tr><th colspan="2">Essential Questions/Understandings</th></tr>
<tr><td colspan="2">Essential Questions:
How can I name, draw, and partition geometric shapes?
Enduring Understandings:
Reason with shapes and their attributes.</td></tr>
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<table>
<tr><th colspan="2">Unit: Operations and Algebraic Thinking</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of multiplication and division and strategies for multiplication and division within 100.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.
For example, describe a context in which a total number of objects can be expressed as 5 × 7.
Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.
For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = � ÷ 3, 6 × 6 = ?
Apply properties of operations as strategies to multiply and divide.2
Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 =

</td><td>
Students Will Know:
Even number, Odd number, Decompose, Partial sum, Bar diagram, Equal groups, Multiplication, Array, Factor, Product, Division, Dividend, Divisor, Quotient, Multiple, Multiplication fact table, Skip count
Students Will Be Able To:

Develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size.
Use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.

</td></tr>
</table>

10, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.) ● Understand division as an unknown-factor problem. ○ For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8. ● Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. ● Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. ● Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. ○ For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	

Essential Questions/Understandings
Essential Questions: ● How can I use strategies to add and subtract fluently? ● What does it mean to multiply and divide? ● How can I recall facts that multiply by 0, 1, 2, 5, and 10? ● How can I recall facts that multiply by 3, 4, 6, 7, 8, and 9? ● How can I use multiplication to recall division facts? **Enduring Understandings:** ● Represent and solve problems involving multiplication and division. ● Understand properties of multiplication and the relationship between multiplication and division. ● Multiply and divide within 100. ● Solve problems involving the four operations, and identify and explain patterns in arithmetic.

<table>
<tr><th colspan="2">Unit: Numbers and Operations - Base Ten</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of multiplication and division and strategies for multiplication and division within 100.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>Use place value understanding to round whole numbers to the nearest 10 or 100.
Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations</td><td>Students Will Know:
Expanded form, Word form, Standard form, Round, Estimate, Compatible numbers
Students Will Be Able To:
Develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size.
Use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division.</td></tr>
</table>

Essential Questions/Understandings
Essential Questions: ● How can I use strategies to add and subtract fluently? ● How can I use properties and strategies to multiply and divide? **Enduring Understandings:** ● Use place value understanding and properties of operations to perform multi-digit arithmetic.

<table>
<tr><th colspan="2">Unit: Numbers and Operations - Fractions</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of fractions, especially unit fractions (fractions with numerator 1).</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.
Understand a fraction as a number on the number line; represent fractions on a number line diagram.

Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.
Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.

</td><td>
Students Will Know:

Partition, Denominator, Fraction, Numerator, Unit fraction, Fraction tiles, Equivalent

Students Will Be Able To:

Develop an understanding of fractions, beginning with unit fractions.
View fractions in general as being built out of unit fractions, and they use fractions along with visual fraction models to represent parts of a whole.
Understand that the size of a fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts are longer than when the ribbon is divided into 5 equal parts.
Use fractions to represent numbers equal to, less than, and greater than one.
Solve problems that involve comparing fractions by using visual fraction models and strategies based on noticing equal numerators or denominators.

</td></tr>
</table>

        - Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.
    - Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Essential Questions/Understandings

Essential Questions:

- What are fractions and how can I represent them?
- How can I compare fractions?

Enduring Understandings:

- Develop understanding of fractions as numbers.

<table>
<tr><th colspan="2">Unit: Measurement and Data</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of the structure of rectangular arrays and of area.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).6 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.
Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
Recognize area as an attribute of plane figures and understand concepts of area measurement.

</td><td>
Students Will Know:

Area, Square units, Unit square, Composite figure, Perimeter, Liquid volume, Liter, Milliliter, Balance scale, Gram, Kilogram, Mass, Key, Scale, Ruler, Line plot

Students Will Be Able To:

Recognize perimeter as the distance around the outside of a polygon, and distinguish it from area. Solve problems involving rectangles with the same area and different perimeters, or with the same perimeter and different areas.
Recognize area as an attribute of two-dimensional regions.
Measure the area of a shape by finding the total number of same size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for measuring area.
Understand that rectangular arrays can be decomposed into identical rows or into identical columns.
Connect area to multiplication, and justify using multiplication to determine the area of a rectangle by decomposing rectangles into rectangular arrays of squares.
Tell and write time to the nearest minute on digital and analog clocks, and solve problems involving elapsed time (time intervals).
Reason about capacity and mass using a variety of strategies, including estimation.

</td></tr>
</table>

○ A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. ○ A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units. ● Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units). ● Relate area to the operations of multiplication and addition. ○ Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. ○ Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. ○ Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning. ○ Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. ● Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	● Represent and interpret data in pictographs scaled bar graphs, and line plots (with fractional parts). Solve one- and two-step word problems using the data from the displays.

Essential Questions/Understandings
Essential Questions: ● How can I find the area? ● How can I solve perimeter problems? ● How can I measure and record data? **Enduring Understandings:** ● Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. ● Represent and interpret data. ● Understand concepts of area and relate area to multiplication and to addition. ● Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

<table>
<tr><th colspan="2">Unit: Geometry</th></tr>
<tr><td colspan="2">The purpose of this unit is to describe and analyze two-dimensional shapes.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

- Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.
  - For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

</td><td>

Students Will Know:

- Denominator, Fraction, Numerator, Unit fraction, Octagon, Pentagon, Polygon, Quadrilateral, Right angle, Rhombus

Students Will Be Able To:

- Describe, analyze, and compare properties of two dimensional shapes.
- Compare and classify shapes by their sides and angles, and connect these with definitions of shapes.
- Relate their fraction work to geometry by expressing the area of part of a shape as a unit fraction of the whole.

</td></tr>
<tr><th colspan="2">Essential Questions/Understandings</th></tr>
<tr><td colspan="2">

Essential Questions:

- How can I identify, classify, and draw 2-dimensional shapes?

Enduring Understandings:

- Reason with shapes and their attributes.

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</table>

<table>
<tr><th colspan="2">Unit: Operations and Algebraic Thinking</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding and fluency with multi-digit multiplication and to develop an understanding of dividing to find quotients involving multi-digit dividends.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>
Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
</td><td>Students Will Know:

Front-end estimation, Partial sums, Algorithm, Variable, Multi-step strategies, Multiplicative comparison, Additive comparison, Factor pairs, Composite number, Prime number, Pattern rule, Sequence, Term

Students Will Be Able To:

Generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place.
Apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers.
Select and accurately apply appropriate methods to estimate or mentally calculate products, depending on the numbers and the context.
Develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems.
Apply their understanding of models for division, place value, properties of operations, and the relationship of division to
</td></tr>
</table>

○ For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.	multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. ● Select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

Essential Questions/Understandings

Essential Questions:
- How can I compare using multiplication and division?
- How can I use patterns to describe the relationship between numbers?
- How can I solve multi-step word problems using the four operations?

Enduring Understandings:
- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

Unit: Number and Operations - Base Ten

The purpose of this unit is to develop an understanding and fluency with multi-digit multiplication and to develop an understanding of dividing to find quotients involving multi-digit dividends.

Standards	Knowledge/Skills
• Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. ○ For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division. • Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. • Use place value understanding to round multi-digit whole numbers to any place. • Fluently add and subtract multi-digit whole numbers using the standard algorithm. • Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. • Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**Students Will Know:** • Period, Associative property of multiplication, Distributive property, Area model, Partial products, Dividend, Divisor, Quotient, Range, Partial quotients, Remainder **Students Will Be Able To:** • Generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. • Apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. • Select and accurately apply appropriate methods to estimate or mentally calculate products, depending on the numbers and the context. • Develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. • Apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate,

	and generalizable procedures to find quotients involving multi-digit dividends. ● Select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

Essential Questions/Understandings

Essential Questions:
- How can I use place value to work with multi-digit numbers?
- How can I add and subtract with strategies?
- How can I multiply multi-digit numbers using strategies?
- How can I divide with multi-digit numbers using strategies?

Enduring Understandings:
- Generalize place value understanding for multi digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Unit: Numbers and Operations - Fractions	
The purpose of this unit is to develop an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.	
Standards	**Knowledge/Skills**

• Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
• Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
• Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
  ○ Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
  ○ Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
    ■ Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
	Students Will Know:
	• Equivalent fractions, Denominator, Numerator, Benchmark fraction, Like denominators, Like numerators, Mixed number, Hundredths, One-hundredth, Tenths, Decimal, Decimal point
	
	Students Will Be Able To:
	• Develop understanding of fraction equivalence and operations with fractions.
	• Recognize that two different fractions can be equivalent (e.g., 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions.
	• Extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.
	• Fluidly work with fractions with denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 100. (according to standards, these are the only denominators students should be working with)

○ Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. ○ Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. ● Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. ○ Understand a fraction a/b as a multiple of 1/b. ■ For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4). ○ Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. ■ For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.) ○ Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. ■ For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie? ● Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.	

- For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.
- Use decimal notation for fractions with denominators 10 or 100.
  - For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
- Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

Essential Questions/Understandings

Essential Questions:
- How can I use equivalent fractions to help me compare fractions?
- How can I add and subtract fractions with common denominators?
- How can I add and subtract mixed numbers with common denominators?
- How can I multiply a fraction by a whole number?
- How can I represent and compare decimals and fractions?

Enduring Understandings:
- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions, and compare decimal fractions.

<table>
<tr><th colspan="2">Unit: Measurement and Data</th></tr>
<tr><td colspan="2">The purpose of the unit is to understand measurement systems, estimate appropriate units for objects, to convert units of length, weight, capacity, and time, and to represent and interpret data in line plots, as well as measuring angles.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.
For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), …
Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
Apply the area and perimeter formulas for rectangles in real world and mathematical problems.
For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor

</td><td>
Students Will Know:
Convert, Length, Weight, Capacity, Time, Angle, Ray, Degrees, Area, Perimeter, Protractor, Line Plot
Students Will Be Able To:

Apply formulas for area and perimeter to solve real-world and numerical problems.
Relate and compare units of measure within the same system of measurement. Convert units of measure by decomposing larger units into smaller units, and composing larger units by combining smaller units. Solve problems involving measurement and measurement conversion.
Recognize angles as geometric shapes formed whenever two rays share a common endpoint. Measure angles to the nearest whole degree, and understand that when an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts.

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</table>

• Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
  ○ For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.
• Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
  ○ An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a “one-degree angle,” and can be used to measure angles.
  ○ An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
• Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
• Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	

Essential Questions/Understandings
Essential Questions: ● How can I use and compare units of measurement? **Enduring Understandings:** ● Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. ● Represent and interpret data. ● Understand concepts of angle and measure angles.

<table>
<tr><th colspan="2">Unit: Geometry</th></tr>
<tr><td colspan="2">The purpose of this unit is to understand that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.</td><td>Students Will Know:
End point, Line, Line segment, Point, Ray, Acute angle, Obtuse angle, Right angle, Degrees, Protractor, Parallel lines, Perpendicular lines, Parallelogram, Trapezoid, Acute triangle, Equilateral triangle, Isosceles triangle, Obtuse triangle, Right triangle, Scalene triangle, Lines of symmetry, Symmetrical
Students Will Be Able To:
Describe, analyze, compare, and classify two-dimensional shapes.
Deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry through building, drawing, and analyzing two-dimensional shapes.</td></tr>
<tr><th colspan="2">Essential Questions/Understandings</th></tr>
<tr><td colspan="2">Essential Questions:
How can I solve problems involving geometric figures?
Enduring Understandings:
Draw and identify lines and angles
Classify shapes by properties of their lines and angles.</td></tr>
</table>

Unit: Operations and Algebraic Thinking	
The purpose of this unit is to extend division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations	
Standards	**Knowledge/Skills**
● Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. ● Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. ○ For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product. ● Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. ○ For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.	**Students Will Know:** ● Corresponding terms, Evaluate, Grouping symbols, Numerical expressions, Numerical patterns, Order of operations, Parentheses, Rule **Students Will Be Able To:** ● Interpret and evaluate numerical statements, including those with grouping symbols, by using and describing the order of operations rule. ● Identify and describe patterns between corresponding terms, and generate sequences based on a given rule.

Essential Questions/Understandings
Essential Questions: ● How can I begin to think about algebra? **Enduring Understandings:** ● Write and interpret numerical expressions. ● Analyze patterns and relationships.

<table>
<tr><th colspan="2">Unit: Number and Operations - Base Ten</th></tr>
<tr><td colspan="2">The purpose of this unit is to extend division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations</td></tr>
<tr><th>Standards</th><th>Knowledge/Skills</th></tr>
<tr><td>

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
Read, write, and compare decimals to thousandths.

Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).
Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Use place value understanding to round decimals to any place.
Fluently multiply multi-digit whole numbers using the standard algorithm.
Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between

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Students Will Know:

Thousandths, Base, Exponent, Exponential form, Power of 10, Range

Students Will Be Able To:

Recognize and describe the relationship between digits of a number in a base-10 number system. Describe place value patterns and shifts when multiplying and dividing by powers of 10.
Develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations.
Finalize fluency with multi-digit addition, subtraction, multiplication, and division.
Apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths.
Develop fluency in these computations, and make reasonable estimates of their results.
Use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense.

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multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. ● Add, subtract, multiply, and divide decimals to hundredths, 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.	● Compute products and quotients of decimals to hundredths efficiently and accurately.

Essential Questions/Understandings

Essential Questions:

- How can I extend my knowledge of place value to decimals?
- How do I add and subtract decimals?
- How can I multiply multi-digit numbers?
- What strategies can I use to multiply decimals?
- How can I divide multi-digit numbers?
- What strategies can I use to divide decimals?

Enduring Understandings:

- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

<table>
<tr><th colspan="2">Unit: Numbers and Operations - Fractions</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop fluency with addition and subtraction of fractions, and develop an understanding of the multiplication of fractions and division of fractions in limited cases (unit fractions divided by whale numbers and whole numbers divided by unit fractions).</td></tr>
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Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)
Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.
Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person

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Students Will Know:
Benchmark number, Like denominators, Multiple, Mixed number, Scaling
Students Will Be Able To:

Apply their understanding of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators.
Fluently calculate sums and differences of fractions, and make reasonable estimates of them.
Use the meaning of fractions, of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for multiplying and dividing fractions make sense.

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has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie? ● Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. ○ Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. ■ For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.) ○ Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. ● Interpret multiplication as scaling (resizing), by: ○ Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. ○ Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the effect of multiplying a/b by 1.	

- Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. - Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.1 - Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. - For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3. - Interpret division of a whole number by a unit fraction, and compute such quotients. - For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4. - Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. - For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?	
Essential Questions/Understandings	

Essential Questions:

- How do I add and subtract fractions?
- How can I multiply fractions?
- How can I divide fractions?

Enduring Understandings:

- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

<table>
<tr><th colspan="2">Unit: Measurement and Data</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of volume.</td></tr>
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Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.
For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally
Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
A cube with side length 1 unit, called a “unit cube,” is said to have “one cubic unit” of volume, and can be used to measure volume.
A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes,

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Students Will Know:
Rectangular prism, Unit cube, Volume, Cubic unit, Formula, Composite solid, Figure, Convert, Data, Outlier
Students Will Be Able To:

Students recognize volume as an attribute of three-dimensional space.
Understand that volume can be measured by finding the total number of same-size units of volume required to fill the space without gaps or overlaps.
Understand that a 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume.
Select appropriate units, strategies, and tools for solving problems that involve estimating and measuring volume.
Decompose three-dimensional shapes and find volumes of right rectangular prisms by viewing them as decomposed into layers of arrays of cubes.
Measure necessary attributes of shapes in order to determine volumes to solve real world and mathematical problems.
Complete and describe non-metric and metric conversions involving length, mass and volume, time conversions, and solve problems involving various units of measurement.
Represent and interpret data by graphing, explaining, and interpreting data sets using line plots.

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and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. ○ Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems. ○ Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	

Essential Questions/Understandings

Essential Questions:
- How can I find the volume of rectangular prisms?
- How can I convert measurement units and represent measurement data?

Enduring Understandings:
- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Understand concepts of volume and relate volume to multiplication and to addition.

<table>
<tr><th colspan="2">Unit: Geometry</th></tr>
<tr><td colspan="2">The purpose of this unit is to develop an understanding of volume.</td></tr>
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Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
Understand that attributes belonging to a category of two dimensional figures also belong to all subcategories of that category.
For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
Classify two-dimensional figures in a hierarchy based on properties.

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Students Will Know:

Coordinate plane, Ordered pair, Origin , X-axis, Y-axis, X-coordinate, Y-coordinate, Category, Equilateral triangle, Hierarchy, Isosceles triangle, Property, Scalene triangle, Subcategory, Venn diagram

Students Will Be Able To:

Explain the coordinate plane, locate and graph ordered pairs on coordinate grid (in the first quadrant), and interpret graphs of ordered pairs.
Use attributes of two-dimensional shapes to identify subcategories, and classify two-dimensional shapes in a hierarchy.

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Essential Questions/Understandings
Essential Questions: ● How can I use the coordinate plane to identify and classify 2-dimensional figures? **Enduring Understandings:** ● Graph points on the coordinate plane to solve real-world and mathematical problems. ● Classify two-dimensional figures into categories based on their properties.