

# East Prairie Fifth Grade Math Pacing Guide

2016-2017

Nine Weeks:

1<sup>st</sup>

2<sup>nd</sup>

3<sup>rd</sup>

4<sup>th</sup>

<p style="text-align: center;"><b>Operations and Algebraic Thinking</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Write and interpret numerical expressions.</li> <li><input type="checkbox"/> Analyze patterns and relationships</li> </ul>	<p style="text-align: center;"><b>Numbers and Operations in Base Ten</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Understand the place value system</li> <li><input type="checkbox"/> Perform operations with multi-digit whole numbers and with decimals to hundredths</li> </ul> <p style="text-align: center;"><b>Numbers and Operations Fractions</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use equivalent fractions as a strategy to add and subtract fractions</li> <li><input type="checkbox"/> Apply and extend previous understandings of multiplication and division to multiply and divide fractions</li> </ul>	<p style="text-align: center;"><b>Measurement and Data</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Convert like measurement units within a given measurement system.</li> <li><input type="checkbox"/> Represent and interpret data</li> <li><input checked="" type="checkbox"/> Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</li> </ul>	<p style="text-align: center;"><b>Geometry</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Graph points on the coordinate plane to solve real-world and mathematical problems</li> <li><input type="checkbox"/> Classify two-dimensional figures into categories based on their properties.</li> </ul>
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**Common Core Standard: 5.MD.5** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

- a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, 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.
- b. Apply the formulas  $V = l \times w \times h$  and  $V = b \times h$  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.
- c. 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.

**Key Vocabulary:** measurement, attribute, volume, solid figure, right rectangular prism, unit, unit cube, gap, overlap, cubic units, cubic cm (cm<sup>3</sup>), cubic (in<sup>3</sup>), cubic foot (ft<sup>3</sup>), nonstandard cubic units, multiplication, addition, edge lengths, height, area of base, 3-dimensional figures, decompose, exponent, area,  $a=l \times w$ ,  $v=l \times w \times h$ ,  $v=b \times h$

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How can I explain the relationship between three different</b></p>	<ul style="list-style-type: none"> <li><b>x Make sense of problems and persevere in solving them.</b></li> <li><b>x Reason abstractly and quantitatively.</b></li> <li><b>x Construct viable arguments and critique the reasoning of others.</b></li> </ul>	<p><b>I can.....</b> -find the volume of a right rectangular prism by packing it with unit cubes</p>	<p>Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, 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</p>	<p style="text-align: center;"><a href="#"><u>Hands-on Volume</u></a></p>

<p><b>strategies for finding the volume of a right rectangular prism?</b></p> <p><b>How can I apply the formulas for finding the volume of a right rectangular prism to solve real world problems?</b></p>	<p>x <b>Model with mathematics.</b>  x <b>Use appropriate tools strategically.</b>  x <b>Attend to precision.</b>  x <b>Look for and make use of structure.</b>  x <b>Look for and express regularity in repeated reasoning.</b></p>	<p>-realize that I need the three measurements, length, width, and height to be able to determine the volume of a rectangular prism</p> <p>-apply formulas to find the volume of a right rectangular prism</p> <p>-add the volume of many smaller right rectangular prisms to find the volume of a large right rectangular prism</p> <p><b>I will.....</b></p> <p>-I will explore volume using multiplication and addition.</p> <p>-I will solve real world mathematical problems involving volume.</p>	<p>associative property of multiplication. Separate irregular solids into familiar parts to find the volume of the two separate solids. Then add the volumes to find the total volume.</p> <p>Students work in pairs to solve real world problems (e.g., Ariana bought an aquarium with a rectangular base that measures 12 inches wide by 18 inches long and a height of 14 inches. One fish needs 48 cubic inches of space in the aquarium. What is the volume of the aquarium? How many fish can live in the aquarium?).</p> <p>Students use interlocking centimeter cubes to construct two rectangular prisms joined to create L - shaped models. Students separate the two parts and calculate volumes of each prism. Students add the two volumes to find the total volume of the models.</p>	
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**Common Core Standard: 5.G.3** 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.*

**Key Vocabulary:** attribute, category, subcategory, hierarchy, properties (rules about how numbers work), 2-dimensional, regular polygon, irregular polygon, polygon, parallelogram, rhombus, rhombi, rectangle, square, triangle, quadrilateral, pentagon, hexagon, cube, trapezoid, half circle, quarter circle, circle, right angle, obtuse angle, acute angle, congruent, perpendicular, parallel, adjacent, interior angles, scalene triangle, right triangle, equilateral triangle, obtuse triangle, acute triangle, isosceles triangle

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How can I analyze the attributes of two dimensional figures to classify them into categories and subcategories?</b></p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><input checked="" type="checkbox"/> Reason abstractly and quantitatively.</li> <li><input checked="" type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> <li><input checked="" type="checkbox"/> Model with mathematics.</li> <li><input type="checkbox"/> Use appropriate tools strategically.</li> <li><input type="checkbox"/> Attend to precision.</li> </ul>	<p><b>I can.....</b> -classify two dimensional figures by their attributes.</p> <p><b>I will.....</b> - compare two-dimensional figures and categorize them by their attributes.</p>	<p>Classify two dimensional figures based on the number of sides and angles</p> <p>Classify two dimensional figures based on the types of angles</p> <p>When given sets of two-dimensional figures, small groups collaborate to categorize the figures by attributes. Students present the information in a creative manner (e.g., drama, riddles, visual displays, songs).</p>	<p><a href="#">Triangle Foldable</a></p>

	<ul style="list-style-type: none"><li><input type="checkbox"/> Look for and make use of structure.</li><li><input type="checkbox"/> Look for and express regularity in repeated reasoning.</li></ul>		<p>Students examine and record attributes of parallelogram pattern blocks (e.g., has 4 sides, opposite sides are parallel, opposite sides are congruent, the sum of the angles is <math>360^\circ</math>). Students discuss why parallelograms are quadrilaterals and name and draw other quadrilaterals (e.g., rectangles, squares, rhombuses, trapezoids). Students discuss similarities and differences between quadrilaterals and parallelograms.</p> <p>Details learned in earlier grades need to be used in the descriptions of the attributes of shapes. The more ways that students can classify and discriminate shapes, the better they can understand them. The shapes are <b>not</b> limited to quadrilaterals.</p> <p>Students can use graphic organizers such as flow charts or T-charts to compare and contrast the attributes of geometric figures. Have students create a T-chart with a shape on each side. Have them list attributes of the shapes, such as number of sides, number of angles, types of lines, etc. They need to determine what's alike or different about the two shapes to get a larger classification for the shapes and be able to explain these properties.</p>	
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**Common Core Standard: 5.G.4** Classify two-dimensional figures in a hierarchy based on properties.

**Key Vocabulary:** attribute, category, subcategory, hierarchy, properties (rules about how numbers work), 2-dimensional, regular polygon, irregular polygon, polygon, parallelogram, rhombus, rhombi, rectangle, square, triangle, quadrilateral, pentagon, hexagon, cube, trapezoid, half circle, quarter circle, circle, right angle, obtuse angle, acute angle, congruent, perpendicular, parallel, adjacent, interior angles, scalene triangle, right triangle, equilateral triangle, obtuse triangle, acute triangle, isosceles triangle

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How can I classify two dimensional figures in a hierarchy based on properties?</b></p>	<ul style="list-style-type: none"> <li><b>x Make sense of problems and persevere in solving them.</b></li> <li><b>x Reason abstractly and quantitatively.</b></li> <li><b>x Construct viable arguments and critique the reasoning of others.</b></li> <li><b>x Model with mathematics.</b></li> <li><b>x Use appropriate tools strategically.</b></li> <li><b>x Attend to precision.</b></li> <li><b>x Look for and make use of structure.</b></li> </ul>	<p><b>I can.....</b> - classify two-dimensional figures in a hierarchy based on their properties.</p> <p><b>I will.....</b> -analyze and group two-dimensional figures into categories based on their attributes.</p>	<p>Classify pairs of two dimensional figures as congruent or similar Classify two dimensional as symmetrical by using grid paper to match the halves.</p> <p>Students analyze shape cut outs of polygons (e.g., isosceles triangle, equilateral triangle, rectangle, parallelogram, trapezoid, square, pentagon, and hexagon). Students discuss attributes of polygons and create groups based on numbers of sides, naming the groups. Students share groups' names (triangles, quadrilaterals, pentagon, and hexagon) and add shapes for each category, justifying each addition.</p>	

**x Look for and express regularity in repeated reasoning.**

Students create Venn Diagrams categorizing quadrilaterals by attributes. Students should note the importance of parallel and perpendicular lines.

Pose questions such as, —Why is a square always a rectangle? and —Why is a rectangle not always a square? Expect students to use precision in justifying and explaining their reasoning.

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**Common Core Standard: 5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- a. Interpret the product  $(a/b) \times q$  as  $a$  parts of a partition of  $q$  into  $b$  equal parts; equivalently, as the result of a sequence of operations  $a \times q \div b$ . For example, use a visual fraction model to show  $(2/3) \times 4 = 8/3$ , and create a story context for this equation. Do the same with  $(2/3) \times (4/5) = 8/15$ . (In general,  $(a/b) \times (c/d) = ac/bd$ .)
- b. 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.

**Key Vocabulary:** fraction, numerator, denominator, operations, multiplication, multiply, division, divide, mixed numbers, product, quotient, partition, equal parts, equivalent, factor, improper fraction, proper fraction, whole numbers, unit fraction, area, side lengths, fractional side lengths, scaling (resizing), comparing,  $a/b = a \div b$ , equation, fraction models, inverse, reciprocal, binomial

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How can I multiply a fraction by a whole number and a fraction?</b></p>	<ul style="list-style-type: none"> <li><b>x Make sense of problems and persevere in solving them.</b></li> <li><b>x Reason abstractly and quantitatively.</b></li> <li><b>x Construct viable arguments and critique the reasoning of others.</b></li> <li><b>x Model with mathematics.</b></li> </ul>	<p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>- understand that the product of a fraction times a whole number or a fraction times a fraction will equal the total number of parts of the whole</li> </ul>	<p>Interpret the product <math>(a/b) \times q</math> as <math>a</math> parts of a partition of <math>q</math> into <math>b</math> equal parts; equivalently, as the result of a sequence of operations <math>a \times q \div b</math>. For example, use a visual fraction model to show <math>(2/3) \times 4 = 8/3</math>, and create a story context for this equation. Do the same with <math>(2/3) \times (4/5) = 8/15</math>. (In general, <math>(a/b) \times (c/d) = ac/bd</math>.)</p>	<p style="text-align: center;"><a href="#"><u>Multiplying Fractions Game</u></a></p>

<p><b>How can I find the area of a rectangle with fractional side lengths?</b></p>	<p>x Use appropriate tools strategically.  x Attend to precision.  x Look for and make use of structure.  x Look for and express regularity in repeated reasoning.</p>	<p>- model and compute the area of a rectangle with fractional side lengths</p> <p><b>I will.....</b>  - create and solve multiplication fraction problems using visual fraction models.</p> <p>- use tiles and grids to find the area of rectangles with fractional side lengths.</p>	<p>Show students that whole numbers can be expressed as a fraction (3 is <math>\frac{3}{1}</math>) which will assist students in understanding how fractions; when multiplied, we multiply the numerators, and then, the denominators.</p> <p>Students use 1/2-inch paper squares to calculate areas of rectangles (e.g., rectangle with width of <math>\frac{3}{2}</math>-inch and length of <math>\frac{5}{2}</math>-inch). Students tile rectangles with 1/2-inch squares to determine the total number needed to cover surfaces (e.g., <math>\frac{15}{2}</math>). Students multiply the fractional side lengths to calculate areas (e.g., <math>\frac{3}{2} \times \frac{5}{2} = \frac{15}{2}</math>). Students discover connections between areas determined by models and the equations.</p> <p>Use the formula <math>A=L \times W</math> to find the area of a rectangle.</p> <p>Draw a large irregular area on a piece of cardboard or construction paper. Draw a straight line through the middle of the area in any direction. Use square post-it notes as your tiles Place tiles, one by one, on one side of the straight line that you have drawn, taking care that the tiles are aligned and there is no gap between them Now, moving up and down from the row of tiles placed next to the line, finish tiling of the area, leaving spaces only where whole tiles would not fit; make sure the tile sides are perfectly aligned, with no gap between them.</p> <p>Use calculators or models to explain what happens to the result of multiplying a whole number by a fraction (<math>3 \times \frac{1}{2}</math>, <math>4 \times \frac{1}{2}</math>, <math>5 \times \frac{1}{2}</math> ...and <math>4 \times \frac{1}{2}</math>, <math>4 \times \frac{1}{3}</math>, <math>4 \times \frac{1}{4}</math>, ...) and when multiplying a fraction by a number greater than 1.</p>	
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- Common Core Standard: 5.NF.5** Interpret multiplication as scaling (resizing), by:
- a. 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.
  - b. 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  $a/b = (n \times a)/(n \times b)$  to the effect of multiplying  $a/b$  by 1.

**Key Vocabulary:** fraction, numerator, denominator, operations, multiplication, multiply, division, divide, mixed numbers, product, quotient, partition, equal parts, equivalent, factor, improper fraction, proper fraction, whole numbers, unit fraction, area, side lengths, fractional side lengths, scaling (resizing), comparing,  $a/b = a \div b$ , equation, fraction models, inverse, reciprocal, binomial

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How does multiplying a fraction by a whole number change the size of an area?</b></p>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Make sense of problems and persevere in solving them.</li> <li><input checked="" type="checkbox"/> Reason abstractly and quantitatively.</li> <li><input checked="" type="checkbox"/> Construct viable arguments and critique the reasoning of others.</li> <li><input checked="" type="checkbox"/> Model with mathematics.</li> </ul>	<p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-understand that scaling (resizing) involves multiplication.</li> </ul>	<p>Students use equations (e.g., <math>(1/2) \times 4 = 2</math>; <math>(1/2) \times 5 = 5/2</math>; <math>(1/2) \times 6 = 3</math>; <math>(1/2) \times 7 = 7/2</math>). Students answer questions to develop an understanding that multiplication can be interpreted as a comparison of the size of a product to the size of one factor based on the size of the other factor (e.g., Which equation has the greatest product?; How is that equation different from the others?; Does the size of the</p>	<p><a href="#">Multiplying with Models</a></p>

<p><b>How does multiplying a mixed number by a whole number or fraction change the size of an area?</b></p>	<p>x Use appropriate tools strategically.  x Attend to precision.  x Look for and make use of structure.  x Look for and express regularity in repeated reasoning.</p>	<p>-compare the size of a product to the size of one factor based on the other, without multiplying</p> <p>- conclude that when multiplying a fraction greater than one the product will be greater than the given number</p> <p>-conclude that when multiplying a fraction by any form of 1 the result will be an equivalent fraction</p> <p>-conclude that when multiplying a fraction by a fraction, the product will be smaller than the given number</p> <p><b>I will.....</b></p> <p>- examine the relationship of the two different factors.</p> <p>-recognize the product is greater than the given number when I multiply with numbers greater than 1.</p> <p>-recognize the product is less than the given number when I multiply with numbers less than 1.</p>	<p>factor affect the product?; If the factor in the equation were smaller than ---' would it have a product greater than or less than _____. If the other factor in the equation were larger than ---' would it have a product greater than or less than _ (?).</p> <p>Students solve equations (e.g., <math>2 \times 1 =</math>; <math>2 \times (4/3) =</math>; <math>2 \times (2/3) =</math>) and observe products based on sizes, comparing sizes of product to sizes of fractions in the equations. Students record conclusions in math journals.</p> <p>Use calculators or models to explain what happens to the result when dividing a unit fraction by a non-zero whole number (<math>1/8 \div 4</math>, <math>1/8 \div 8</math>, <math>1/8 \div 1/6</math>,...) and what happens to the result when dividing a whole number by a unit fraction (<math>4 \div 1/4</math>, <math>8 \div 1/4</math>, <math>12 \div 1/4</math>,...).</p> <p>Three-fourths of the class is boys. Two-thirds of the boys are wearing tennis shoes. What fraction of the class are boys with tennis shoes? Students may draw a rectangle, use a fraction circle, or number line to model the problem.</p> <p>Students will compare the size of the product to the size of one factor without multiplying as they begin to consider multiplication as scaling.</p>	
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**Common Core Standard: 5.NF.6** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

**Key Vocabulary:** fraction, numerator, denominator, operations, multiplication, multiply, division, divide, mixed numbers, product, quotient, partition, equal parts, equivalent, factor, improper fraction, proper fraction, whole numbers, unit fraction, area, side lengths, fractional side lengths, scaling (resizing), comparing,  $\frac{a}{b} = a \div b$ , equation, fraction models, inverse, reciprocal, binomial

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How can I use my knowledge of multiplication of fractions, mixed numbers, and whole numbers to solve real world problems?</b></p>	<ul style="list-style-type: none"> <li>x Make sense of problems and persevere in solving them.</li> <li>x Reason abstractly and quantitatively.</li> <li>x Construct viable arguments and critique the reasoning of others.</li> <li>x Model with mathematics.</li> <li>x Use appropriate tools strategically.</li> <li>x Attend to precision.</li> <li>x Look for and make use of structure.</li> </ul>	<p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-solve real world problems involving multiplication of fractions and mixed numbers.</li> </ul> <p><b>I will.....</b></p> <ul style="list-style-type: none"> <li>-use fraction models to represent real world problem.</li> </ul>	<p>Students create original word problems supporting their solutions with illustrations, text, and recorded narration.</p> <p>Students use real world situations to write word problems involving multiplication of fractions and mixed numbers. Students use the draw a picture strategy to solve problems and justify answers.</p> <p>When given equations involving fractions and mixed numbers, students write word problems with real world applications that match the given equations. Students use fraction tiles and</p>	

**x Look for and express regularity in repeated reasoning.**

-use equations to represent real world problems.

drawings to check for accuracy and make corrections when appropriate.

Present problem situations and have students use models and equations to solve the problem. It is important for students to develop understanding of multiplication and division of fractions through contextual situations.

# East Prairie Fifth Grade Math Pacing Guide

2016-2017

Nine Weeks:

1<sup>st</sup>

2<sup>nd</sup>

3<sup>rd</sup>

4<sup>th</sup>

<b>Operations and Algebraic Thinking</b>	<b>Numbers and Operations in Base Ten</b>	<b>Measurement and Data</b>	<b>Geometry</b>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Write and interpret numerical expressions.</li> <li><input type="checkbox"/> Analyze patterns and relationships</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Understand the place value system</li> <li><input type="checkbox"/> Perform operations with multi-digit whole numbers and with decimals to hundredths</li> </ul> <p style="text-align: center;"><b>Numbers and Operations Fractions</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use equivalent fractions as a strategy to add and subtract fractions</li> <li><input checked="" type="checkbox"/> Apply and extend previous understandings of multiplication and division to multiply and divide fractions.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Convert like measurement units within a given measurement system.</li> <li><input type="checkbox"/> Represent and interpret data</li> <li><input type="checkbox"/> Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Graph points on the coordinate plane to solve real-world and mathematical problems</li> <li><input type="checkbox"/> Classify two-dimensional figures into categories based on their properties.</li> </ul>

**Common Core Standard: 5.NF.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Note: Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.)

- a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for  $(1/3) \div 4$ , and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that  $(1/3) \div 4 = 1/12$  because  $(1/12) \times 4 = 1/3$ .
- b. Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for  $4 \div (1/5)$ , and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that  $4 \div (1/5) = 20$  because  $20 \times (1/5) = 4$ .
- c. 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?

**Key Vocabulary:** fraction, numerator, denominator, operations, multiplication, multiply, division, divide, mixed numbers, product, quotient, partition, equal parts, equivalent, factor, improper fraction, proper fraction, whole numbers, unit fraction, area, side lengths, fractional side lengths, scaling (resizing), comparing,  $a/b = a \div b$ , equation, fraction models, inverse, reciprocal, binomial

Essential Question	Suggested Mathematical Practices	Student Outcomes	Suggested Activities	Materials Needed Websites
<p><b>How can I divide unit fractions by whole numbers and whole numbers by unit fractions given a story context?</b></p> <p><b>How can I create a story that requires the division of a unit fraction?</b></p>	<ul style="list-style-type: none"> <li>x Make sense of problems and persevere in solving them.</li> <li>x Reason abstractly and quantitatively.</li> <li>x Construct viable arguments and critique the reasoning of others.</li> <li>x Model with mathematics.</li> <li>x Use appropriate tools strategically.</li> <li>x Attend to precision.</li> <li>x Look for and make use of structure.</li> <li>x Look for and express regularity in repeated reasoning.</li> </ul>	<p><b>I can.....</b></p> <ul style="list-style-type: none"> <li>-divide a unit fraction by whole numbers.</li> <li>-divide fractions using the reciprocal (inverse operation).</li> <li>-interpret division of a whole number by a unit fraction, and compute such quotients.</li> <li>-solve real world problems involving division of unit fractions.</li> </ul> <p><b>I will.....</b></p> <ul style="list-style-type: none"> <li>- identify unit fractions.</li> <li>-create a number sentence (equation) to represent the story problem.</li> <li>-solve the number sentence (equation) for the story problem.</li> <li>-solve real world problems using visual fraction models.</li> </ul>	<p>Students outline 10 x 10 squares on centimeter grid paper and solve division problems using unit fractions (e.g., <math>3/10 \div 3</math>). Students shade fractional parts of squares (e.g., <math>3/10</math>) and subdivide the shaded part into equal groups (e.g., 3) by circling groups. Students count the number of columns in groups and write groups as fractions of the whole (e.g., <math>1/10</math>). Students analyze expressions and discuss that dividing by the divisor: (e.g., 3) is the same as multiplying by the reciprocal of the divisor (e.g., <math>1/3</math>). Students reason that opposite operations and opposite fractions can be used to solve problems with fraction division.</p> <p>Students draw pictures representing the division of whole numbers by fractions. Students observe expressions (e.g., <math>5 \div 1/3</math>) and use pictures to demonstrate expressions (e.g., To illustrate how many thirds are in five wholes, students draw five circles and divide the circles into thirds. Students count the total number of thirds (15) to represent the solution to the equation. Students express the relationship between multiplication and division to explain the solution (e.g., <math>5 \div 1/3 = 15</math> because <math>15 \times 1/3 = 5</math>).</p> <p>Students write division problems and use visual fraction models to represent and solve. Students exchange problems with partners and discuss differences between representations and solutions. Explain to students that the reciprocal is nothing more than a “flip-flop” approach that changes a division problem to multiplication. Ex: <math>1/2</math> divided by 2 is the same as <math>1/2</math> multiplied by <math>1/2</math>. Meaning, the reciprocal of 2 is <math>1/2</math>.</p> <p>Have students practice reciprocals providing them with a list of numbers/fractions and have them determine the number/fraction reciprocal form.</p>	