

Operations and Algebraic Thinking

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application																		
5.OA.1 Interpret Parenthesis, Brackets & Braces.	Evaluate $(26 + 18) - 4$ Evaluate $[3 + (2 \times 6)] - 5$ Evaluate $\{[2 \times (3 + 5)] - 9\} + 8$	Compare $3 \times 2 + 5 + 13$ and $[3 \times (2 + 5)] + 13$ Use parentheses, brackets, or braces to make the value of the two expressions different $14 + 8 - 3 \times 2$ and $14 + 8 - 3 \times 2$	Billy claims that $\{[(12 + 8) \times 3] - 15\} + 10$ is the same as $\{12 + (8 \times 3) - 15\} + 10$ because they have the same digits and symbols. Is Billy correct? Explain your thinking.																		
5.OA.2 Write and interpret numerical expressions	Write "add 8 and 5, then multiply by 3" as an expression	Which two expressions are equivalent? <ul style="list-style-type: none"> $3 \times (1891 + 302)$ two times as large as 302 three times as large as $1891 + 302$ How does the expression $3(4 \times 5)$ relate to (4×5) ?	Write an expression for the steps "double seven". Now, create an expression that is six times larger than your first expression.																		
5.OA.3 Analyze patterns and relationships	Calculate the missing values in the input/output tables by using the rule given. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>input</th> <th>output</th> </tr> </thead> <tbody> <tr> <td>0</td> <td></td> </tr> <tr> <td>2</td> <td></td> </tr> </tbody> </table> Rule: Add 2	input	output	0		2		Kiya and Anderson are each thinking of a different rule. If you start with the number 8, Kiya applies her rule and her answer is 11. Starting with the same number of 8, when Anderson applies his rule, his answer is 14. The data has been recorded in the chart below. Find the missing values (where there is a ? for each). Then identify the relationship between the two rules.	Maurice and Terrance went ice fishing for multiple days this winter. The table below shows the number of fish each boy had at the end of each day. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>End of Day</th> <th>Maurice's fish total</th> <th>Terrence's fish total</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>2</td> <td>4</td> <td>8</td> </tr> </tbody> </table>	End of Day	Maurice's fish total	Terrence's fish total	0	0	0	1	2	4	2	4	8
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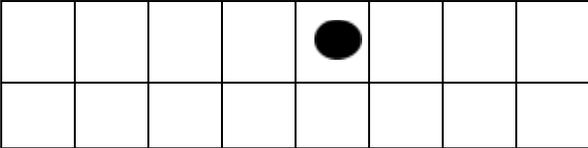
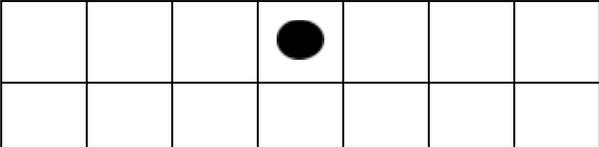
Grade 5 Math Question Stem Bank: Common Core State Standards
Standards for Mathematical Practice

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Rule: Add 3			<p>Construct a line graph showing the number of fish Maurice and Terrance had at the end of each day.</p> <p>What conclusion can you draw about the relationship between the number of fish Maurice caught compared to the number of fish Terrance caught.</p>																								

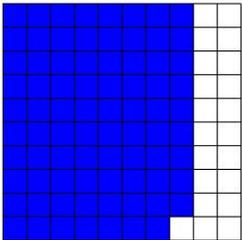
Numbers and Operations in Base Ten

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
5.NBT.1 Understand relationships between places in the place value system	What is the value of the 2 in each number? 542 324 18.2	In the number 33.33 each digit is a three. Compare the value of the two threes to the left and right of the decimal point. Do these three's have the same value? <div align="center"> </div>	Aneesa said that she has found a relationship between the digits in 444.44 and drew a diagram that is shown below. She said that while all the digits are fours, they do not have the same value. Aneesa said that if you move one place to the left, each digit gets divided by 10. So each digit is 1/10 of the value to its right. As you move to the right, the value of each digit gets multiplied by 10. She has drawn this illustration. <div align="center"> </div> Do you agree with Aneesa? Why or why not?

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<p>5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and the placement of the decimal point when dividing a decimal by a power of 10</p>	<p>Find the solution.</p> <p>$4.342 \times 10 =$ _____ $8.674 \times 100 =$ _____ $9.124 \times 1000 =$ _____</p> <p>$2.86 \div 10 =$ _____ $378 \div 100 =$ _____ $67 \div 1000 =$ _____</p>	<p>Josiah used his place value chart to show a number. After he multiplied his number by 10, the chart showed 1,200.4 Draw a picture of what Josiah's place value chart looked like before he multiplied.</p>  <p>Lyla used her chart to show a different number. After she divided by 10^2, her chart showed 35.623 What did her chart look like before she divided?</p> 	<p>Create a pattern multiplying 2.5 by 10, 10^2, and 10^3.</p> <p>Create a pattern dividing 350 by 10, 10^2, and 10^3.</p> <p>Develop a theory about how the decimal point moves when multiplying and dividing by power of 10.</p>										
<p>5.NBT.3.a-b Read, write and compare decimals to thousandths</p>	<p>Select the correct term from the box to correctly fill in each blank.</p> <p>$347.291 = 3 \times$ _____ $+ 4 \times$ _____ $+ 7 \times$ _____ $+ 2 \times$ _____ $+ 9 \times$ _____ $+ 1 \times$ _____</p> <table border="1"> <tbody> <tr> <td>1/10</td> <td>1/100</td> <td>1/1000</td> </tr> <tr> <td>100</td> <td>10</td> <td>1</td> </tr> </tbody> </table>	1/10	1/100	1/1000	100	10	1	<p>Compare the value of the 5 in the numbers below using a $>$, $<$, or $=$ sign</p> <p>34.562 and 42.035</p>	<p>Jackson and Jillian are competing for the highest score on Math team. Their scores are as follows:</p> <table border="1"> <tbody> <tr> <td>Jackson</td> <td>10.259</td> </tr> <tr> <td>Jillian</td> <td>10.4</td> </tr> </tbody> </table> <p>Jackson claims he is in the lead because he has more digits. Do you agree with Jackson? Explain.</p>	Jackson	10.259	Jillian	10.4
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<p>5.NBT.4 Use place value understanding to round decimals to any place</p>	<p>Round 42.237 to the nearest tenth.</p> <p>Round 509.28 to the nearest ten.</p> <p>Round 357,189 to the nearest ten thousand.</p>	<p>Which of the following numbers would not round to 287.23 when rounding to the nearest hundredth?</p> <p>a. 287.228 b. 287.231 c. 287.239</p>	<p>Which benchmark number is the best estimate of the shaded amount in the model below? Explain your thinking.</p> 
<p>5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm</p>	<p>245 ✖ 12</p> <p>179 ✖ 13</p> <p>314 ✖ 17</p>	<p>Draw a model to show how you could find the answer to 179 ✖ 13.</p>	<p>Three students were given the problem 225 ✖ 12. Which student do you believe has the correct answer?</p> <div style="border: 2px solid red; padding: 10px; margin: 10px 0;"> <p>Student 1 225 x 12 I broke 12 up into 10 and 2. 225 x 10 = 2,250 225 x 2 = 450 2,250 + 450 = 2,700</p> </div>

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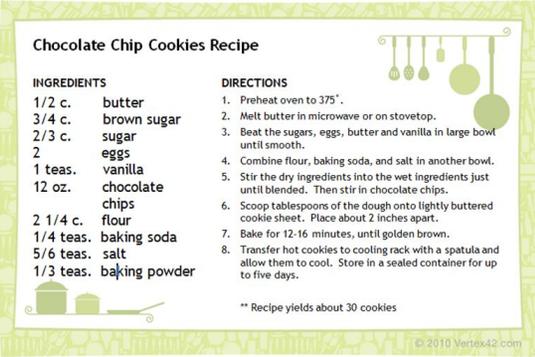
			<div style="border: 1px solid blue; padding: 5px;"> <p>Student 2 225×12 I broke up 225 into 200 and 25. $200 \times 12 = 2,400$ I broke 25 up into 5×5, so I had $5 \times 5 \times 12$ or $5 \times 12 \times 5$. $5 \times 12 = 60$. $60 \times 5 = 600$ I then added 2,400 and 600 $2,400 + 600 = 3,000$</p> </div> <div style="border: 1px solid green; padding: 5px; margin-top: 10px;"> <p>Student 3 225×12 I doubled 225 and cut 12 in half to get 450×6. I then doubled 450 again and cut 6 in half to get 900×12. $900 \times 12 = 10,800$</p> </div> <p>Now, find one student who got an incorrect answer and identify a mistake that student made.</p> <p>change student examples up a bit! NC Frameworks</p>
<p>5.NBT.6 Find, illustrate, and explain whole number</p>	<p>$9984 \div 64$ $2568 \div 24$</p>	<p>Create a model to illustrate $2568 \div 24$.</p>	<p>There are 1,514 students participating in Science Challenge Night. They are put into teams of 12 for the experiment challenges. How many teams get created? If you have left over students, what do you do with them?</p>

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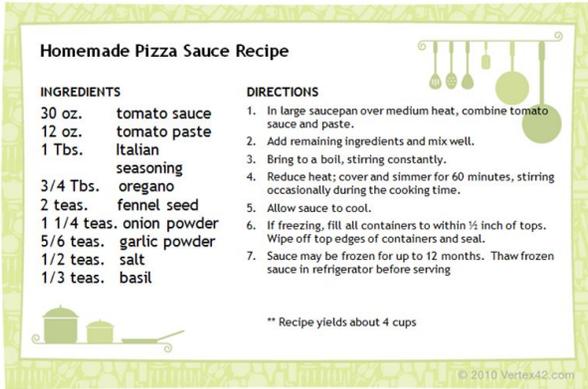
<p>quotients of whole numbers (up to 4-digit dividends and 2-digit divisors).</p>			
<p>5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths using models, drawings, order of operations, or relationships between properties. Relate the strategy to a written method and explain the reasoning used.</p>	<p>5.75 + 0.62</p> <p>8.72 - 1.9</p> <p>1.75 × 0.25</p> <p>8.5 ÷ 0.25</p>	<p>On Monday it rained 4.3 inches. On Tuesday, it rained 0.9 inches. How much rain did you receive altogether in both days?</p> <p>There was a post that was 8.75 feet tall. You buried the post 1.23 feet in the ground. How much of the post is showing now?</p> <p>Each bracelet you make takes 1.12 meters of blue yarn. If you want to make 7 bracelets, how many meters of blue yarn do you need?</p> <p>For a science experiment, your group needs to watch the turtle for 2.25 hours straight. If your group has a total of 3 people who all want to watch the turtle for the same amount of time, how long will each person observe the turtle?</p>	<p>Draw a model to show the sum of 1.75, 0.3, and 1.15</p> <p>Draw a model to show the difference of 8.3 and 0.90</p> <p>add one for multiplication and division?</p>

**Grade 5 Math Question Stem Bank: Common Core State Standards
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Number & Operations: Fractions

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
<p>5.NF.1-2 Add and subtract fractions with unlike denominators (including mixed numbers). Solve word problems to find the sum or difference by using visual fraction models or equations.</p>	<p>$\frac{1}{4} + \frac{1}{3}$</p> <p>$\frac{2}{3} - \frac{1}{2}$</p> <p>$1\frac{1}{4} + \frac{5}{6}$</p> <p>$1\frac{1}{2} - \frac{3}{4}$</p>	<p>You decide to make a batch of cookies using the recipe below.</p>  <p>How much flour and baking powder will you use altogether?</p> <p>If you have $1\frac{1}{2}$ c. brown sugar and you make one batch, how much brown sugar will you have left in your cabinet?</p>	<p>Mark needs to measure out $3\frac{1}{2}$ c. of M&M's for his trail mix recipe. When he got his measuring cups out, he noticed he was missing the $\frac{1}{2}$ cup scoop. The only scoops he has are for $\frac{1}{8}$c, $\frac{1}{4}$c, $\frac{1}{3}$ c and 1 cup. How would you instruct Mark to measure the correct amount of M&M's?</p>
<p>5.NF.3 Interpret a fraction as division of the numerator by the denominator.</p>	<p>Complete the equation by filling in each blank with a number.</p> <p>$\frac{4}{5} = \underline{\quad} \div \underline{\quad}$</p>	<p>If 9 people want to share a 50-pound sack of gummy bears evenly by weight, how many pounds of gummy bears should each person get?</p>	<p>Create a story context about sharing for the fraction $\frac{8}{7}$.</p>
<p>5.NF.4.a-b</p>	<p>$\frac{2}{3} \times 5$</p>	<p>Use the recipe to answer the following</p>	<p>Jane has $\frac{1}{3}$ of a pan of birthday treats.</p>

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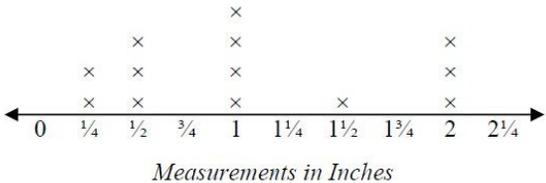
<p>Apply and extend previous understandings to multiply a fraction or whole number by a fraction.</p>	<p>$\frac{5}{6} \times \frac{1}{3}$</p>	<p>questions.</p>  <p>Homemade Pizza Sauce Recipe</p> <p>INGREDIENTS 30 oz. tomato sauce 12 oz. tomato paste 1 Tbs. Italian seasoning 3/4 Tbs. oregano 2 teas. fennel seed 1 1/4 teas. onion powder 5/6 teas. garlic powder 1/2 teas. salt 1/3 teas. basil</p> <p>DIRECTIONS 1. In large saucepan over medium heat, combine tomato sauce and paste. 2. Add remaining ingredients and mix well. 3. Bring to a boil, stirring constantly. 4. Reduce heat; cover and simmer for 60 minutes, stirring occasionally during the cooking time. 5. Allow sauce to cool. 6. If freezing, fill all containers to within 1/2 inch of tops. Wipe off top edges of containers and seal. 7. Sauce may be frozen for up to 12 months. Thaw frozen sauce in refrigerator before serving</p> <p>** Recipe yields about 4 cups</p> <p>© 2010 Veriex42.com</p> <p>How much garlic powder would you need to make 3 batches of homemade pizza sauce?</p> <p>What is the product of the amount of garlic powder and salt?</p>	<p>She sends $\frac{1}{2}$ of the pan to school with her daughter. What fraction of the pan did Jane send with her daughter? Draw a model to show your conclusion.</p> <p>Find the area of a rectangle with side lengths of $\frac{3}{4}$ and 5. Draw a model to show your conclusion.</p>
<p>5.NF.5.a-b 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; explain why multiplying a given number by a fraction greater than 1 results in a</p>	<p>Fill in the _____ with a <, >, or = sign.</p> <p>$3 \times \frac{2}{3}$ _____ $3 \times 1\frac{1}{3}$</p>	<p>Jared says “there is no way that $18 \times \frac{1}{2}$ is only 9! I know that when you multiply, the number increases...and 9 is smaller than the 18 we started with.”</p> <p>Do you think Jared is correct or incorrect? Explain what you would tell him.</p>	<p>Two teams are competing in a cake contest. Team Chocolate is icing the top a cake that is 3 feet long and $\frac{3}{2}$ feet wide. Team Vanilla is icing a cake that is 3 feet long and $\frac{2}{3}$ feet wide. The winning team is the one that puts icing on the largest area. Which team will win the contest? Is the value of the area of the top of each cake greater than or less than 3 feet? Draw pictures to prove your answer.</p>

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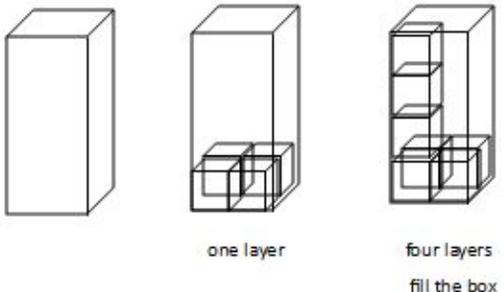
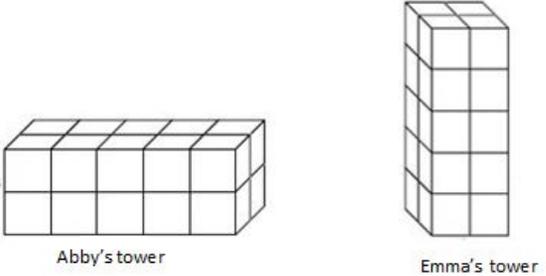
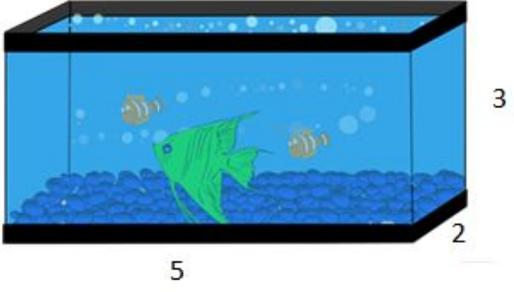
<p>product greater than the given number and multiplying a given number by a fraction less than one results in a product smaller than the given number.</p>			
<p>5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers.</p>	<p>$7 \frac{1}{4} \times \frac{3}{5}$ $1 \frac{1}{3} \times \frac{1}{4}$</p>	<p>There are $4 \frac{1}{2}$ wagon loads of people waiting for hay rack rides. If $\frac{2}{3}$ of the people waiting are children, how many wagons would it take to load just the children?</p>	<p>Eli bought $2 \frac{1}{2}$ watermelons. If $\frac{2}{5}$ of the watermelon was seedless, how many seedless watermelons did he buy? Draw a model to support your answer.</p>
<p>5.NF.7.a-c Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.</p>	<p>$2 \div \frac{2}{3}$ $\frac{3}{4} \div 3$</p>	<p>A recipe calls for 4 cups of flour. If you have a $\frac{2}{3}$ c. scoop, how many scoops of flour will it take to add in the entire 4 cups?</p> <p>How many $\frac{1}{8}$c servings are in a $\frac{3}{4}$c bag of sunflower seeds?</p>	<p>Create a story context and draw a diagram for the expression</p> <p>$\frac{3}{5} \div 5$</p> <p>Create a story context and draw a diagram for the expression</p> <p>$4 \div \frac{1}{3}$</p>

Measurement & Data

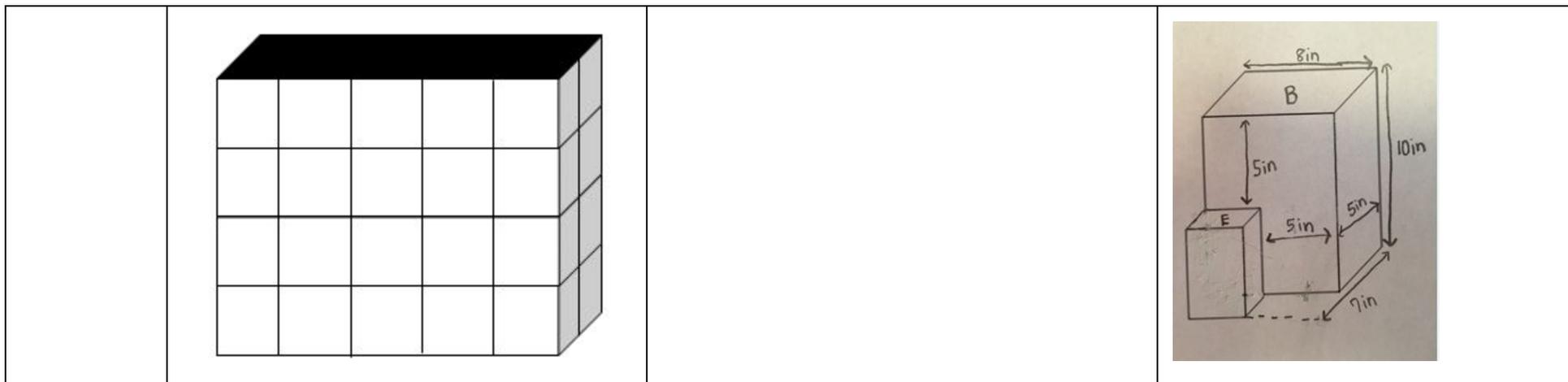
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Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
<p>5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.</p>	<p>Compare the measurements using $<$, $>$, $=$.</p> <p>35 feet ○ 12 yards</p> <p>4 hours ○ 240 minutes</p> <p>3 quarts ○ 8 cups</p> <p>36 ounces ○ 3 pounds</p>	<p>How many 300 ml cups can be filled from a 3 liter jug of water?</p> <p>The height of the cardinal bird is 23 cm. The wingspan is 260mm. Which is more the height of the cardinal bird or the wingspan?</p>	<p>Jill has 6 yd 2 ft of rope. Maggie has 252 inches of rope. Who has more rope? Explain how you found your answer.</p>
<p>5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.</p>	<p align="center">Objects on My Desk</p>  <p align="center"><i>Measurements in Inches</i></p> <p>(May consider using larger numbers for fifth grade)</p> <p>What is the difference between the longest and shortest objects?</p> <p>If you put together all the objects that were $\frac{1}{2}$ inches then how long would they be together?</p>	<p>Molly used the following amounts of sugar while baking cookies.</p> <p>$4\frac{1}{2}$ kg, $3\frac{1}{4}$ kg, $2\frac{1}{2}$ kg, 4 kg, $3\frac{1}{4}$ kg, $2\frac{1}{4}$ kg, $4\frac{1}{4}$ kg, 2 kg</p> <p>If Molly decides to divide the sugar into four equal containers, how many kg would be in each bag?</p>	<p>Create a line plot and plot the following measurements.</p> <p>3 cm, $2\frac{1}{4}$ cm, 1 cm, 5 cm, 3 cm, $1\frac{1}{2}$ cm, 4 cm, 5cm, 1 cm, 4 cm, $3\frac{1}{4}$ cm, $4\frac{1}{4}$ cm, $1\frac{1}{4}$ cm, 4 cm, 5cm, 1 cm, 4 cm, $3\frac{1}{4}$ cm, $4\frac{1}{4}$ cm, 2 cm</p> <p>Write 2 comparative statements about the data.</p>

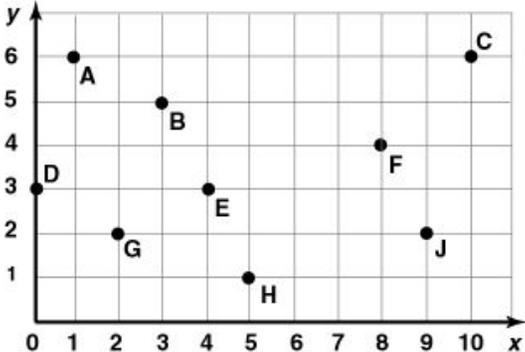
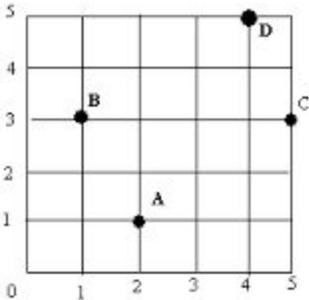
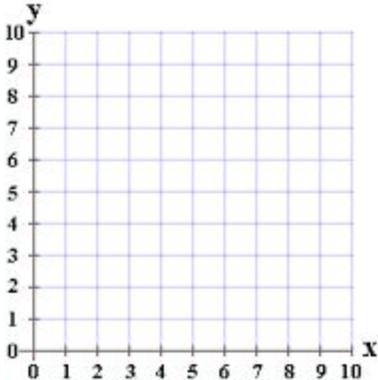
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	<p>What is the total length is you combine all the objects?</p>		
<p>5.MD.3.a-b & 5.MD.4 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. Measure volumes by counting unit cubes</p>	<p>Find the volume of the box.</p> 	<p>Abby and Emma are competing in a tower building contest. The contestant with the greatest volume is the winner. Abby claims her tower has a bigger volume because it has a wider base. Emma claims her tower's volume is greater because her tower is taller. What is your take on the situation?</p> 	<p>Using the tub of unit cubes, construct a box with a volume of 20 cubes.</p>
<p>5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.</p>	<p>Find the volume of the rectangular prism shown below.</p>	<p>What is the volume of the fish tank?</p> 	<p>Find the total volume of the barn Danny constructed. Notice that the barn has two parts--the main structure "B" and the small entry way, "E".</p>

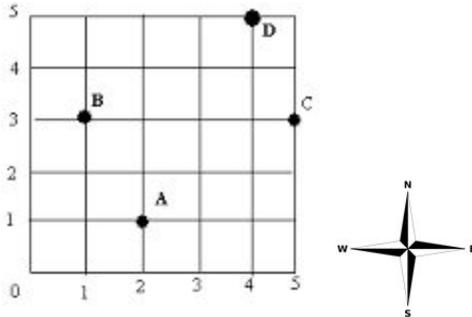
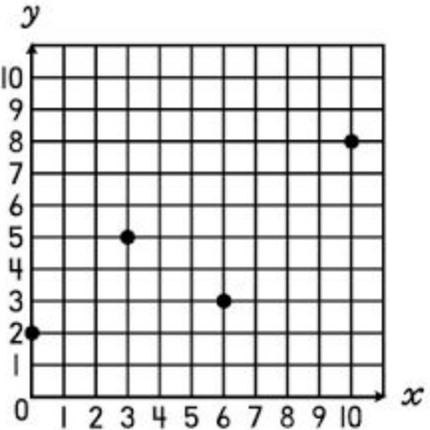
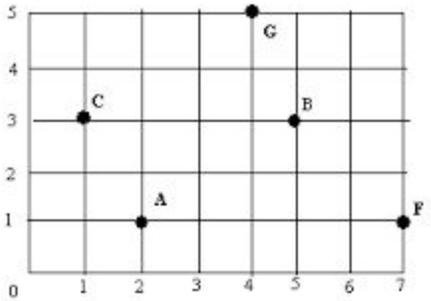
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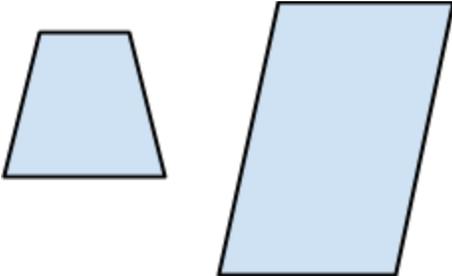
Geometry

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
<p>5. G.A.1 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</p>	 <p>Identify the ordered pairs for the given points. Point B (____, ____) Point J (____, ____) Point E (____, ____)</p>	 <p>Name the point labeled at (1, 3). _____</p> <p>If that point is moved two spaces to the right, what would the new coordinate be? (____, ____)</p>	 <p>Plot the following ordered pairs. Point A (3,2) Point B (7,2) Plot two more ordered pairs for Point C and D that would create a rectangle. Point C (____, ____)</p>

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<p>ordered pair of numbers, called its coordinates</p>			<p>Point D (____, ____)</p>
<p>5.G.A.2 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.</p>	<p>Each point on the grid represents locations in a small town.</p>  <p>Below are the coordinates for each place in the town use to answer the questions. School (2,1) Grocery (1,3) Post Office (5,3) Park (4,5)</p> <p>1. The grocery store is (north, south, east, west) of the school. 2. The Post office is (east, west) of the grocery.</p>	 <p>Farmer Jon has the following starting points for building a rectangular fence for his horses. What two coordinates could he use as a start to his fence? (____,____) and (____,____)</p> <p>What are two other coordinates he would need to enclose a rectangular fence?</p>	 <p>Lee has a limited amount of time at the museum. He has plotted the points of the museum that are his priority places to visit. If he enters the museum at Point F (7,1) what would be a path he could take to visit all his points. Draw out and label his walk around the museum.</p> <p>For example: Lee enters at (7,1) and walks north 2 units and west 2 units to point B (5,3).</p>
<p>5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategory</p>	<p>Read the clues and name the shape.</p> <p>Two sets of parallel sides and my opposite sides are equal. _____</p> <p>Four congruent sides. My opposite sides are parallel. _____</p>	<p>How are the shapes below similar? Different?</p>	<p>Draw two different quadrilaterals and identify them. Explain how you know the shapes are quadrilaterals.</p>

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<p>s of that category.</p> <p>5.G.4 Classify two-dimensional figures in a hierarchy based on properties</p>	<ol style="list-style-type: none">1. Draw a parallelogram with at least 2 right angles.2. Draw a parallelogram with equal sides with no right angles.		
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Operations & Algebraic Thinking

Write and interpret numerical expressions.

CCSS.MATH.CONTENT.5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

CCSS.MATH.CONTENT.5.OA.A.2 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 $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.*

Analyze patterns and relationships.

CCSS.MATH.CONTENT.5.OA.B.3 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.*

Number & Operations in Base Ten

Understand the place value system.

CCSS.MATH.CONTENT.5.NBT.A.1 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.

CCSS.MATH.CONTENT.5.NBT.A.2 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.

CCSS.MATH.CONTENT.5.NBT.A.3 Read, write, and compare decimals to thousandths.

CCSS.MATH.CONTENT.5.NBT.A.3.A Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.

CCSS.MATH.CONTENT.5.NBT.A.3.B Compare two decimals to thousandths based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

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CCSS.MATH.CONTENT.5.NBT.A.4 Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

CCSS.MATH.CONTENT.5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

CCSS.MATH.CONTENT.5.NBT.B.6 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 multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCSS.MATH.CONTENT.5.NBT.B.7 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.

Number & Operations: Fractions

Use equivalent fractions as a strategy to add and subtract fractions.

CCSS.MATH.CONTENT.5.NF.A.1 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, $a/b + c/d = (ad + bc)/bd$.)*

CCSS.MATH.CONTENT.5.NF.A.2 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 $3/7 < 1/2$.*

Apply and extend previous understandings of multiplication and division.

CCSS.MATH.CONTENT.5.NF.B.3 Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). 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 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?*

CCSS.Math.CONTENT.5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

CCSS.MATH.CONTENT.5.NF.B.4.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, $(a/b) \times (c/d) = ac/bd$.)*

CCSS.MATH.CONTENT.5.NF.B.4.B Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the

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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.

CCSS.MATH.CONTENT.5.NF.B.5 Interpret multiplication as scaling (resizing), by

CCSS.MATH.CONTENT.5.NF.B.5.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.

CCSS.MATH.CONTENT.5.NF.B.5.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.

CCSS.MATH.CONTENT.5.NF.B.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.

CCSS.MATH.CONTENT.5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.1

CCSS.MATH.CONTENT.5.NF.B.7.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 $(1/12) \times 4 = 1/3$.*

CCSS.MATH.CONTENT.5.NF.B.7.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 $20 \times (1/5) = 4$.*

CCSS.MATH.CONTENT.5.NF.B.7.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?*

Measurement & Data

Convert like measurement units within a given measurement system.

CCSS.MATH.CONTENT.5.MD.A.1 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.

Represent and interpret data.

CCSS.MATH.CONTENT.5.MD.B.2 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.*

Geometric measurement: understand concepts of volume.

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CCSS.MATH.CONTENT.5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

CCSS.MATH.CONTENT.5.MD.C.3.A 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.

CCSS.MATH.CONTENT.5.MD.C.3.B 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.

CCSS.MATH.CONTENT.5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

CCSS.MATH.CONTENT.5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

CCSS.MATH.CONTENT.5.MD.C.5.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.

CCSS.MATH.CONTENT.5.MD.C.5.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.

CCSS.MATH.CONTENT.5.MD.C.5.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.

Geometry

Graph points on the coordinate plane to solve real-world and mathematical problems.

CCSS.MATH.CONTENT.5.G.A.1 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).

CCSS.MATH.CONTENT.5.G.A.2 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.

Classify two-dimensional figures into categories based on their properties.

CCSS.MATH.CONTENT.5.G.B.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.

CCSS.MATH.CONTENT.5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.