Operations & Algebraic Thinking

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
3.OA.A.1-3.OA.C.4 Represent and solve problems involving multiplication and division.	$36= 6x$___ $3x$___$=12$ $5x8=$___ $24 \div 6=$ $81 \div$ ___ $=9$	Sandy worked at the pool 5 days a week for 6 hours each day. How many hours did she work that week? Jim worked 9 hours as a lifeguard and earned $7.00 each hour. How much did he earn? Sally needs to make $56.00 to buy a gift for her dad. If she makes $7.00 an hour at the ice cream shop then how many hours will she need to work to purchase the gift?	Molly bought a box of dog treats for her 2 dogs. The box has 48 dog treats. She feeds each dog 1 treat every day. How many days will her box last? How many treats would each dog get from the box? Solve and represent the equation 4x7 in three ways.
3.OA.5-3.OA.6 Understand properties of multiplication and the relationship between multiplication and division.	Show the commutative property for the following equation. $7x5=35$ _____ Solve using the associative property. $6x4x2=$ Solve using the distributive property. $9x6=$	Anna needed to buy beads to make bracelets for 2 of her friends. Each of her friends wanted 4 bracelets. If each bracelet has 8 beads on it, how many beads does she need to buy? Could you use the associative property to solve? Explain.	It's time for cake at Avery's party. Avery invited 12 friends. How many slices would each child get if the cake was cut into 24 pieces? Represent an equation and solve.
3.OA.7 Multiply and divide within 100.	Circle all the equations that are true. $24 \div 6 = 16 \div 4$ $72 \div 9 = 81 \div 9$ $12 \div 3 = 32 \div 8$ $20 \div 4 = 25 \div 5$ $4 \times 3 = 2 \times 6$ $6 \times 3 = 2 \times 9$ $7 \times 5 = 6 \times 4$ $4 \times 6 = 8 \times 3$	Write a division sentence that models the figure. $6 \times 3 = 18$ <table><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Our family has to travel 35 miles to get to our cabin. It takes us 2 minutes to travel one mile. How many minutes will it take us to get to the cabin? There are 5 bedrooms in our cabin. 3 people can sleep in each room. How many people could stay at the cabin?

* It may be appropriate to read some of the longer problems out loud especially with lower readers

Kids at the **Core**

| 3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. | Kim has 47 beads. She needs to make 9 necklaces. How many beads can she put on each one so they have the same amount? Will she have any left over? | Sam needs to buy snacks for his classroom. He has 24 students in his class. How many snacks will each student get if he bought a pack of 50 snacks? How many would he have left? | Third graders collected 378 cans for the food drive. The second graders collected 56 cans less than the third graders. How many cans did they collect altogether? |

Color boxes indicate question complexity focus range for CCSS

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Kids at the Core

Numbers and Operations in Base Ten

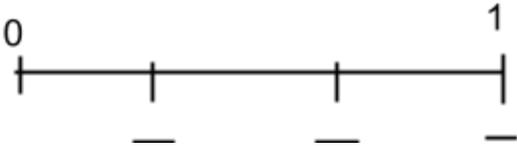| Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100	**Round the numbers to the nearest 10.** 524_____ 36_____ 739_____ **Round the numbers to the nearest 100.** 284_____ 591_____ 437_____ **Circle the numbers that round to 400.** 342 427 469 371 355	A 3 digit number with the digits 1, 7 and 5 rounded to 200 would be the number _____ or _____. Avery drew the numbers 3, 7 and 4 out of a bag. He had to arrange the numbers to make a number that would round to 400. Avery said 374 rounded to 400. Cameron used the same digits and said 437 rounds to 400. Are they both correct? Explain.	Three third grade classes were working together to read 100 books. Each class had 26 students. If each student read 1 book, would the classes together meet their goal? How could rounding help you to estimate whether students would reach 100 books? How many more books would they need to reach their goal of 100 books? Place the number 96 on the number line. What two numbers would 96 be between. Round 96 to the nearest 10.
3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship	Solve the problems. 648+152= 243+____=399 576-357=____ ____-181=211	There were 123 kids swimming in the pool. 18 more kids arrived and joined them. How many kids were now swimming at the pool. The library had 347 nonfiction books and 743 fiction books. How many more fiction books did the library have then nonfiction?	648-____=391 Explain using numbers and words how you solved the problem. ____+621=942 Explain using numbers and words how you solved the problem.

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between addition and subtraction.			
3.NBT.A.3 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.	Solve the equations. 40x3=_____ ___x5=300 70x___=280	Mrs. Smith's students went to the football game to help sell raffle tickets. During the first hour they they sold 60 tickets. If they continue to sell 60 tickets each hour, how many tickets will they sell in 4 hours?	Explain in numbers and words how you would solve the equations. 40x3=_____ ___x60=180

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Number & Operations: Fractions

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
3.NF.A.1 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.	Divide the pizzas into fractional parts. halves fourths eighths Shade the rectangle to show the fraction. ⅖	Dalton bought a funnel cake for him and his 3 cousins. Show how Dalton and his 3 cousins could each get a fair share of the funnel cake. Represent ¾ in two different ways. What does the denominator represent?	Dierks needs to divide his paper into 6 equal sections. Draw three ways he could do this.
3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.	Label the points on the number line with the corresponding fraction. 0 — — — 1 Place the fraction ⅓ on the number line. 0 1 Give number lines and have students	Mrs. Hahn has $10.00 to share equally with 5 students. What fraction of the dollar will each student get? How much will each student receive?	Complete the number line. $\frac{0}{2}$ $\frac{1}{2}$ ▯ ▯ ▯ 0 1 2 Determine if the following fractions are close to 0, ½ or 1. Circle and explain why you chose your answer.

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	place fractions on the number line. Mark off the number line by thirds. 0 _____ 1 (number line marked in thirds)		¾ Close to 0 ½ 1 2/6 close to 0 ½ 1
3.NF.A.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.	Use the symbols <, > or = to compare the fractions below. ¾ ¼ ⅘ ⅓	Is ⅜ equivalent to ½? Explain. Tristan says ⅔ and 4/6 are equivalent. Use rectangles below to show the fractions. Is Tristan correct? Explain.	Illustrate the fractions ⅚ and 2/6. Then write a statement that comparing the fractions. Draw 4 ladders using the information below. The first one has been done for you. - ladder B is ½ the length of ladder A. - ladder C is ⅓ the length of ladder B -Ladder D is ⅓ shorter than ladder A Ladder A

Measurement & Data

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Kids at the Core

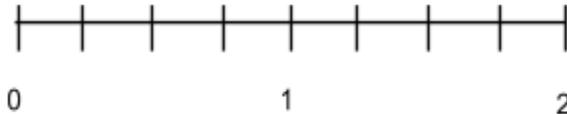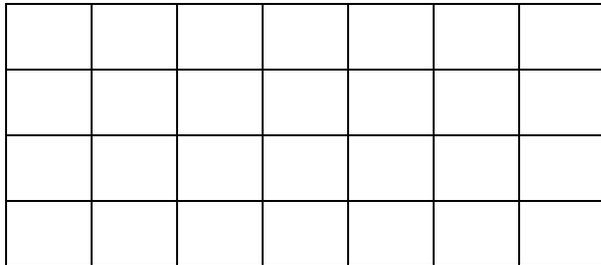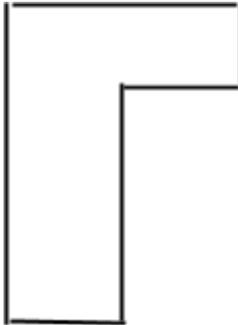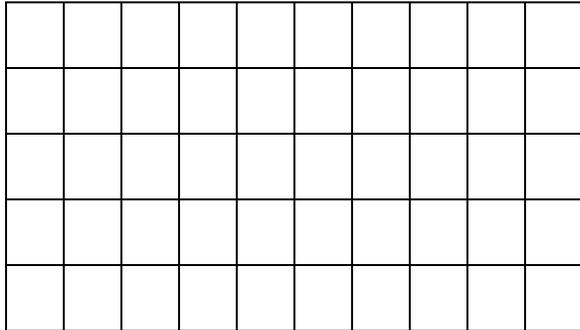| Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	Have students tell and write the time on clocks. Also give students two clocks and have them write the elapsed time. (some problems they could solve using a number line)	Solve using a number line. Gus went to the movie at 6:15 and left at 8:50. How long was the movie? Kali was reading a book about turtles for her report. She began reading at 9:05 and read until 10:00. She took a break and began reading again at 10:30 and completed the book at 11:20. How long did it take Kali to finish her book?	Chad wanted to make a fruit pizza for a family dinner. His family was going to arrive at 6:00 p.m. It is 4:00 p.m. It is going to take him 15 minutes to prepare the crust. Then the crust has to cook for 10 minutes. The crust has to cool for 30 minutes. Once the crust is cool he can put on the toppings and it will be ready to eat after it chills in the refrigerator for 20 minutes. How much time will it take him to make his pizza? How much time will he have until his family arrives?

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Grade 3 Math Question Stem Bank: Common Core State Standards
Standards for Mathematical Practice

3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems.	Circle the best unit of measure. swimming pool **gallons** **cups** length of classroom **miles** **feet** a friend **ounces** **pounds** glass of milk **liters** **milliliters**	Mom was making dinner for 12 friends. She needs to buy a turkey to bake. If each person eats ½ lb of turkey, how big of a turkey will she need?	Mrs. Walker's class was painting posters for their hallway. She needs 24 ounces of paint for the project. She only found 4 oz bottles. She bought 5 of them. Did she have enough? Explain.
3.MD.A.3 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	Represent the data using a pictograph. (or bar graph) Favorite Summer Activity: Swimming 12 Vacation 9 Boating 3 Water Park 9 Fair 6	Using the *Favorite Summer Activity* pictograph solve the following problems. How many more students enjoyed swimming as their summer activity than boating?	Create a bar graph using the data. Then answer the questions. Summer Reading (books read) Jake 25 Ally 15 Landree 30 Megan 20 Toby 10 How many more books did Jake read than Ally? If the goal was to read 30 books how many more does Toby need to read? Which two kids read the most books? How many books did they read

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Kids at the **Core**

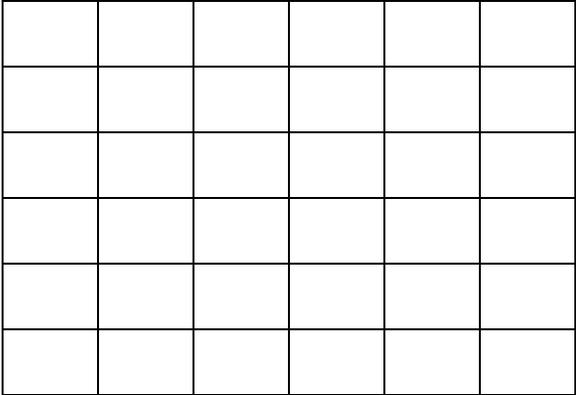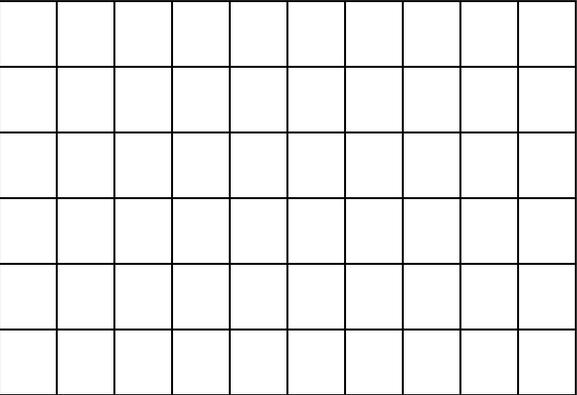| scaled bar graphs.			altogether? If Ally wanted to read as many books as Landree, how many more books does she need to read?
3.MD.A.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters	Measure the pencils below. 	Complete the number line. Fill in the measurements to show fourths and halves of an inch. 	Measure the worms. (provide students with a variety of lengths) Create a line plot to represent the measurements.
3.MD.B.5 A plane figure	How many square tiles will it take to cover	Shade in 8 sq. units.	Sally bought 24 square inch tiles for

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which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	the shape?	You could also shade an area and have students count the squares and complete. _____ sq units are shaded	her kitchen. Will she have enough tiles? Students may use sq. tiles to cover the shape to solve the problem.
3.MD.B.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	Find the area of the figure. Provide students with square units.	In the grid below, each square represents 1 square centimeter. Draw a figure that has an area of 16 square centimeters that is **not** a square.	The school wants to build a new playground. They need an area of 50 square feet. Use the grid to represent two ways the playground could be built.

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3.MD.C.7 Relate area to the operations of multiplication and addition	Shade to represent an area of 4x5.	Below is a picture of a bulletin board. We know the area is 30 sq. feet. We know the width is 6 feet. What is the length? 6ft	Students created a new pattern for the classroom floor using tiles. They used 15 tiles. Draw an array to represent the new floor. Write a multiplication equation to represent your array.
3.MD.C.8 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	What is the area and perimeter for the shape. Area=_____ Perimeter=_____ 8 in. 5 in.	Draw a figure with an area of 30 square units. What is the perimeter of your figure?_____	Our deck has a perimeter of 42 feet. One side of the deck is 12 feet. What are the lengths of the other three sides? 12 ft

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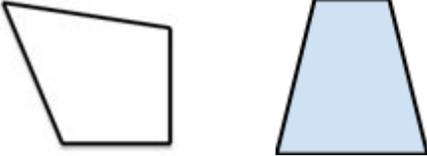
Kids at the **Core**

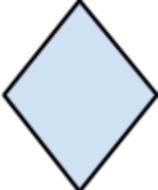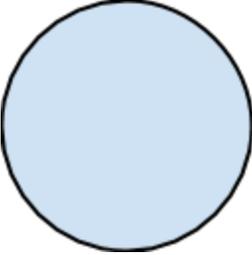| area and different perimeters.			

Geometry

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Grade 3 Math Question Stem Bank: Common Core State Standards
Standards for Mathematical Practice

Standard	Basic: Conceptual "Understand"	Standard: Procedural "Doing"	Expanded: Application
3.G.A.1 3.G.1 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	Provide students with various polygons. Have them circle the ones that are quadrilaterals or parallelograms.	What makes a shape a quadrilateral? Circle all that are correct. four straight sides 3 dimensional flat- 2 dimensional shape has four angles Blake said both of these shapes are parallelograms. Is he correct? Explain?	Draw 3 polygons that are quadrilaterals. Explain what makes them a quadrilateral. List the attributes of the polygon below. Draw a quadrilateral with 2 parallel sides. Darken the parallel sides.

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Kids at the **Core**

that do not belong to any of these subcategories			
3.G.A.2 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.	Partition the shape above into 5 equal parts.	Partition the shape into 4 equal parts and label each part as a fraction.	Partition the circle into 4 equal parts. How do you know you are correct?

Grade 3 Math Common Core State Standards

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Kids at the Core

Operations & Algebraic Thinking

Represent and solve problems involving multiplication and division.

CCSS.MATH.CONTENT.3.OA.A.1 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.

CCSS.MATH.CONTENT.3.OA.A.2 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.

CCSS.MATH.CONTENT.3.OA.A.3 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.1

CCSS.MATH.CONTENT.3.OA.A.4 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 = ?

Understand properties of multiplication and the relationship between multiplication and division.

CCSS.MATH.CONTENT.3.OA.B.5 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 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)

CCSS.MATH.CONTENT.3.OA.B.6 Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.

Multiply and divide within 100.

CCSS.MATH.CONTENT.3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

CCSS.MATH.CONTENT.3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations

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with a letter standing for the unknown quantity.

Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCSS.MATH.CONTENT.3.OA.D.9 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.

Number & Operations in Base Ten

Use place value understanding and properties of operation to perform multi-digit arithmetic

CCSS.MATH.CONTENT.3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100
CCSS.MATH.CONTENT.3.NBT.A.2 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.
CCSS.MATH.CONTENT.3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.

Number & Operations: Fractions

Develop understanding of fractions as numbers.

CCSS.MATH.CONTENT.3.NF.A.1 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*.
CCSS.MATH.CONTENT.3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.
CCSS.MATH.CONTENT.3.NF.A.2.A 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.
CCSS.MATH.CONTENT.3.NF.A.2.B Represent a fraction *a*/*b* on a number line diagram by marking off a lengths 1/*b*f rom

Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.

CCSS.MATH.CONTENT.3.NF.A.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

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Standards for Mathematical Practice

CCSS.MATH.CONTENT.3.NF.A.3.A Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

CCSS.MATH.CONTENT.3.NF.A.3.B 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.

CCSS.MATH.CONTENT.3.NF.A.3.C Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *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*.

CCSS.MATH.CONTENT.3.NF.A.3.D 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.

Measurement & Data

Solve problems involving measurement and estimation.

CCSS.MATH.CONTENT.3.MD.A.1Tell 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.

CCSS.MATH.CONTENT.3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 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.

Represent and interpret data.

CCSS.MATH.CONTENT.3.MD.B.3 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*.

CCSS.MATH.CONTENT.3.MD.B.4 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.

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

CCSS.MATH.CONTENT.3.MD.C. Recognize area as an attribute of plane figures and understand concepts of area measurement.

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

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

CCSS.MATH.CONTENT.3.MD.C.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised

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units).
CCSS.MATH.CONTENT.3.MD.C.7 Relate area to the operations of multiplication and addition.

CCSS.MATH.CONTENT.3.MD.C.7.A 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.

CCSS.MATH.CONTENT.3.MD.C.7.B 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.

CCSS.MATH.CONTENT.3.MD.C.7.C 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 $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.

CCSS.MATH.CONTENT.3.MD.C.7.D 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.

Geometric measurement: recognize perimeter.

CCSS.MATH.CONTENT.3.MD.D.8 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.

Geometry

Reason with shapes and their attributes.

CCSS.MATH.CONTENT.3.G.A.1 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.

CCSS.MATH.CONTENT.3.G.A.2 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.*

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