FSAA—Datafolio Grade 3 Mathematics

Reporting Category	Domain	Cluster 4: Solve problems involving the four operations, and identify and explain patterns in arithmetic.				
Operations, Algebraic Thinking, and Number in Base Ten	Operations and Algebraic Thinking	STANDARD CODE	Standard: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.			
		MAFS.3.OA.4.8	ACCESS POINT CODE	Access Point Standard: Solve and check one-step word problems using the four operations within 100.		
				Essential Understandings	Activity Choices	Examples
			MAFS.3.OA.4.AP.8a	Concrete: ➢ Match the vocabulary in a word problem to an action. ➢ Use manipulatives to model the context of the word problem. ➢ Count to find the answer.	**Choice 1:** Combine (+) with concrete objects; use counting to get the answer.	1. The student is presented with 2 apples and 1 banana and three response options. How many pieces of fruit are there? **Response:** 3
					Choice 2: Decompose (-) with concrete objects; use counting to get the answer.	2. The student is presented with a problem and three response options. If there are 3 pieces of fruit and 1 piece of fruit is eaten, how many pieces of fruit are left? **Response:** 2
					Choice 3: Match the vocabulary in a word problem to an action.	3. The student is presented with a problem and three response options. There are 3 pencils in the box. I put in 1 more. Which action did I perform (add; subtract; multiply)? **Response:** add

Activity Choices MAFS.3.OA.4.AP.8a

Activity Choices	Examples
Choice 1: Combine (+) with concrete objects; use counting to get the answer.	The student is presented with 2 apples and 1 banana and three response options. How many pieces of fruit are there? **Response:** 3 The student is presented with 3 triangle pattern blocks and 4 square pattern blocks. The student is also presented with three response options: 3, 4, 7. "These are all shapes. There are 3 triangles and 4 squares. How many shapes are there?" **Response:** 7 The student is presented with 5 cards showing a printed picture of a cat and 6 cards showing a printed picture of a dog. The student is also presented with three response options: 5, 6, 11. "These are all animals. There are 5 cats and 6 dogs. How many animals are there?" **Response:** 11 Instructional Supports: The purpose of this activity choice is for students to solve *Put Together* addition problems with the total unknown (e.g., Set A + Set B = Combined Total). The *Put Together* problem type (e.g., boys + girls = kids) focuses on part-part-whole relationships by providing contexts that require combining sets of different types of objects (e.g., boys and girls) to find the total of a broader category (e.g., kids). After combining sets of concrete objects, students may count to find the answer. Students need consistent practice with modeling word problems using manipulatives such as: real world objects or pictures matching the context of the word problem, counters, linking cubes, pattern blocks, base ten blocks, etc. Guide students to be very explicit about the relationship between the components of a model and the features of the problem (e.g., "Where are the 2 apples?" "Where are the 3 bananas?" "If you put together the 2 apples and the 3 bananas, can you count to tell how many pieces of fruit there are in all?" "Where are the 5 pieces of fruit you counted?").

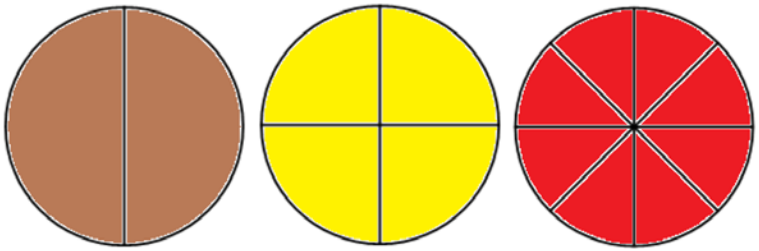
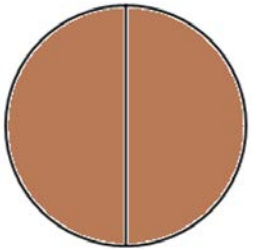
	Students should also develop the ability to check their work by taking apart the combined set to show that it can still be decomposed into the two original individual sets (e.g., "If you take apart the 5 pieces of fruit, do you still have 2 apples and 3 bananas?"). For this Access Point Standard, students may be presented with 2 addends whose sum is within 100, however the focus is more so on problem solving and conceptually understanding the context of word problems than on performing computations. If a student struggles with the numbers given, the teacher may change the problem to reflect lesser sets of objects to determine if the source of misconception is the structure of the problem or the magnitude of the numbers.
Choice 2: Decompose (-) with concrete objects; use counting to get the answer.	The student is presented with a problem and three response options. If there are 3 pieces of fruit and 1 piece of fruit is eaten, how many pieces of fruit are left? **Response:** 2 The student is presented with 7 teddy bear counters and three response options: 3, 4, 7. "There are 7 bears in a cave. If 3 bears go to sleep, how many bears will still be awake?" **Response:** 4 The student is presented with 5 cards showing a printed picture of a frog and three response options: 2, 3, 5. "There are 5 frogs on a log. If 2 frogs hop away, how many frogs will be left?" **Response:** 3 Instructional Supports: The purpose of this activity choice is for students to solve subtraction problems using concrete objects. After decomposing the set of concrete objects, students may count to find the answer. Students need consistent practice with modeling word problems using manipulatives such as: real world objects or pictures matching the context of the word problem, counters, linking cubes, pattern blocks, base ten blocks, etc. Guide students to be very explicit about the relationship between the components of a model and the features of the problem (e.g., "Where are the 5 frogs that started on the log?" "If you take away the frogs that hopped away, where are the 2 frogs that hopped away?" "Where are the frogs that are left on the log?" "Can you count to tell how many frogs are left on the log?").

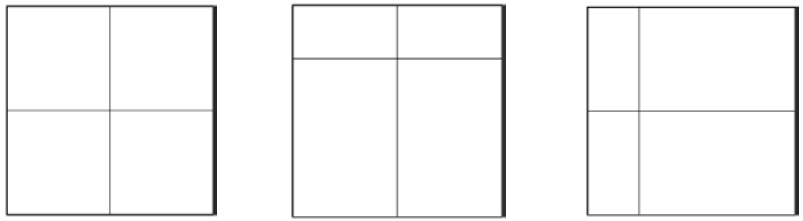
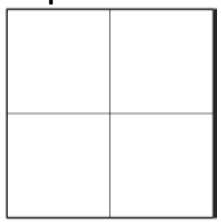
	Students should also develop the ability to check their work by combining the two individual sets to show that they can be put back together to form the original combined set (e.g., "If the 2 frogs hopped back to the log, will there be 5 frogs on the log again?") For this Access Point Standard, students may be presented with a minuend (total) within 100, however the focus is more so on problem solving and conceptually understanding the context of word problems than on performing computations. If a student struggles with the numbers given, the teacher may change the problem to reflect lesser sets of objects to determine if the source of misconception is the structure of the problem or the magnitude of the numbers.
Choice 3: Match the vocabulary in a word problem to an action.	The student is presented with a problem and three response options. There are 3 pencils in the box. I put in 1 more. Which action did I perform (add; subtract; multiply)? **Response:** add The student is presented with a problem and three response options: add, subtract, divide. "Five bunnies sat on the grass. Two bunnies hopped away. Which math operation does the bunnies' action represent?" **Response:** subtract The student is presented with a problem and three response options: subtract, multiply, divide. "Six students each brought two bottles of soda to the party. Which math operation does the students' action represent?" **Response:** multiply The student is presented with a problem and three response options: add, multiply, divide. "The girl had six seeds and two pots. She used all her seeds by planting the same number of seeds in each pot. Which operation does the girl's action represent?" **Response:** divide Instructional Supports: The purpose of this activity choice is for students to conceptually relate the action involved in various contexts to the four operations, not on performing computations and finding solutions to word problems.

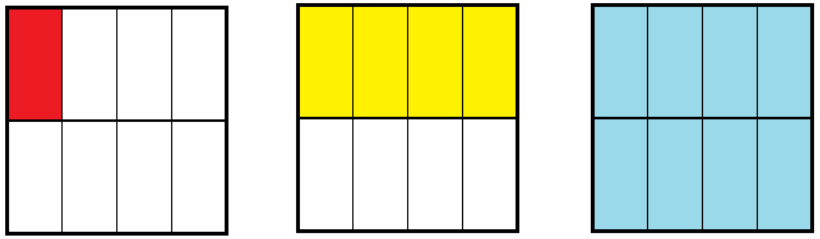
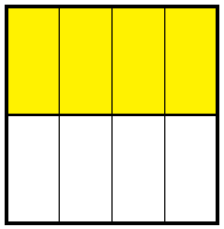
	Students need consistent practice with modeling the actions involved in word problems using manipulatives such as: real world objects or pictures matching the context of the word problem, counters, linking cubes, pattern blocks, base ten blocks, etc. Support students in associating each component of the model to the corresponding action in the situation. Guide students to be very explicit about the relationship between the action in a word problem and the mathematical operation involved (e.g., "What does it look like to put another pencil in the box? Will I have more or fewer pencils now?" "What does it look like for two bunnies to hop away? Will there be more or fewer bunnies now?" "What does it look like for six students to each bring two bottles of soda? Will there be more or fewer bottles total than the number of bottles that each student brought?" "What does it look like to put the same number of seeds in two pots? Will there be more or fewer seeds in each pot than the number of seeds the girl had to begin with?") Be aware that the action in multiplication contexts can also be described as repeated addition and the action in division contexts can also be described as repeated subtraction.

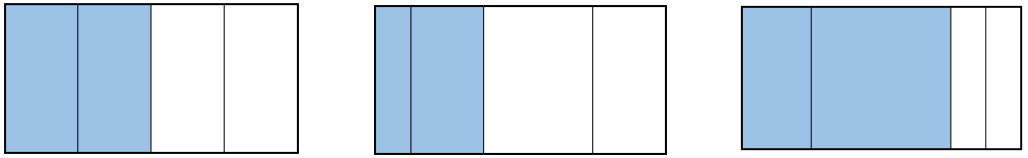
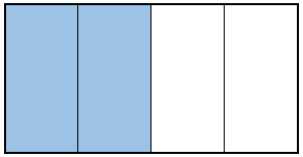
Reporting Category	Domain	Cluster 1: Develop understanding of fractions as numbers.				
Number and Operations – Fractions	Number and Operations – Fractions	STANDARD CODE	Standard: Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.			
		MAFS.3.NF.1.1	ACCESS POINT CODE	Access Point Standard: Identify the fraction that matches the representation of partitioned rectangles and circles into halves, fourths, thirds, and eighths.		
				Essential Understandings	Activity Choices	Examples
			MAFS.3.NF.1.AP.1c	Concrete: ➢ Given a model of a shape that has been divided into equal parts (2, 3, 4, or 8 parts), count the total number of equal parts (denominator). ➢ Identify the total number of equal parts as the denominator. ➢ Given the same model of a shape that has been divided into equal parts (above) with parts covered to represent a fraction, count the number of pieces covered (numerator). ➢ Identify the number of pieces covered as the numerator.	**Choice 1:** Identify the total number of equal parts.	1. The student is presented with a fraction strip divided into three equal parts and three response options. How many equal parts are there? **Response:** 3
					Choice 2: Count the number of parts selected.	2. The student is presented with and read a fraction strip with three of the four parts shaded. How many parts are shaded? **Response:** 3
					Choice 3: Given a model of a simple fraction, identify the numeric fraction.	3. The student is presented a model of a fraction and three response options. Which is the fraction shown? **Response:** the fraction

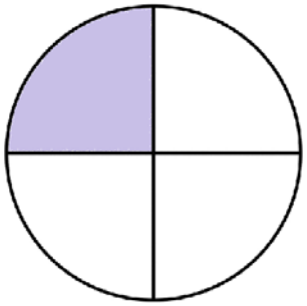
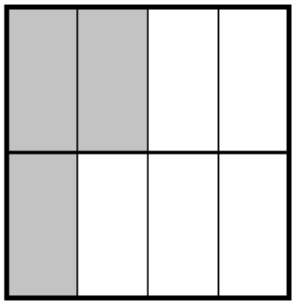
Activity Choices MAFS.3.NF.1.AP.1c

Activity Choices	Examples
Choice 1: Identify the total number of equal parts.	The student is presented with a fraction strip divided into three equal parts and three response options. How many equal parts are there? **Response:** 3 The student is presented with three response options: a circle fraction manipulative divided into two equal parts, a circle fraction manipulative divided into four equal parts, and a circle fraction manipulative divided into eight equal parts. "Which model shows two equal parts?" *Note: The circle fraction manipulatives should be turned upside down so that the numeric fractions are not visible at this time.*  **Response:** 

	The student is presented with three response options: a picture of a square divided into four equal parts and pictures of two separate squares, each divided into four unequal parts. "Which picture shows four equal parts?"  **Response:**  Instructional Supports: Students should be exposed to multiple examples and non-examples of squares, rectangles, and circles divided into 2, 3, 4, or 8 equal parts. The idea of equal parts can be modeled by folding whole squares, rectangles, and circles into equal pieces, counting the equal pieces, and identifying the equal pieces as halves, thirds, fourths, or eighths. Students should be provided with a variety of models to explore in order to understand the relationship between partitioning the whole into equal parts and naming the equal parts based on the total number of equal parts needed to compose the whole.
Choice 2: Count the number of parts selected.	The student is presented with and read a fraction strip with three of the four parts shaded. How many parts are shaded? **Response:** 3

	The student is presented with a picture of a circle with two of the three equal parts shaded and three response options: 1, 2, 3. “How many equal parts are shaded?”  **Response:** 2 The student is presented with three response options: a picture of a square with one of the eight equal parts shaded, a picture of a square with four of the eight equal parts shaded, and a picture of a square with eight of the eight equal parts shaded. “Which shows four equal parts shaded?”  **Response:** 

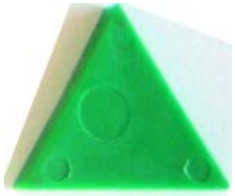
	The student is presented with three response options: a picture of a rectangle with two of the four equal parts shaded and pictures of two separate rectangles, each with two of the four unequal parts shaded. "Which shows two equal part shaded?"  **Response:**  Instructional Supports: Students should be exposed to multiple examples and non-examples of squares, rectangles, and circles representing the following unit fractions: 1 half, 1 third, 1 fourth, and 1 eighth. Students can then explore non-unit fractions by counting the number of selected unit fractions (e.g., 2 halves, 2 thirds, 3 fourths, 4 eighths, etc.). The idea of naming fractions based on selecting equal parts can be modeled by folding whole squares, rectangles, and circles into equal pieces, counting the equal pieces, identifying the equal pieces as halves, thirds, fourths, or eighths, then shading a select number of pieces and counting how many of those halves, thirds, fourths, or eighths have been selected (e.g., Fold a sentence strip into four equal pieces, count the equal pieces, and identify the pieces as fourths. Then, shade three of the fourths and count that there are 1, 2, 3 fourths). Students should be provided with a variety of models to explore in order to understand the relationship between selecting a number of equal parts and naming the fraction of the whole represented based on the total number of equal parts of that size that were selected.
Choice 3: Given a model of a simple fraction, identify the numeric fraction.	The student is presented a model of a fraction and three response options. Which is the fraction shown? **Response:** the fraction

	The student is presented with a circle model with one of four equal parts shaded and three response options: $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$. "Which fraction does the shaded part of the model represent?"  **Response:** $\frac{1}{4}$ The student is presented with a square model with three of the eight equal pieces shaded and three response options: $\frac{1}{8}, \frac{3}{8}, \frac{8}{8}$. "Which fraction does the shaded part of the model represent?"  **Response:** $\frac{3}{8}$ Instructional Supports: Students must be clearly shown what each fraction means and how that translates to a numeric representation. Students should be provided with a variety of models to explore in order to understand the relationship between partitioning the whole into equal parts and recording the total

	number of equal parts needed to compose the whole as the denominator of the fraction, and the relationship between selecting a number of those equal parts and recording the total number of equal parts of that size that were selected as the numerator of the fraction.

<table>
<tr><th>Reporting Category</th><th>Domain</th><th colspan="4">Cluster 1: Reason with shapes and their attributes.</th></tr>
<tr><td rowspan="5">Measurement, Data, and Geometry</td><td rowspan="5">Geometry</td><td>STANDARD CODE</td><td colspan="3">Standard: 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.</td></tr>
<tr><td rowspan="4">MAFS.3.G.1.1</td><td>ACCESS POINT CODE</td><td colspan="3">Access Point Standard: Identify different examples of quadrilaterals.</td></tr>
<tr><td>Essential Understandings</td><td>Activity Choices</td><td>Examples</td></tr>
<tr><td rowspan="3">MAFS.3.G.1.AP.1b</td><td rowspan="3">Concrete:
➢ Sort shapes into quadrilaterals and non-quadrilaterals.</td><td>Choice 1: Match same.</td><td>1. The student is presented with an assortment of shapes to sort and asked to match squares to squares, circles to circles, etc.
Response: squares to squares, circles to circles, etc.</td></tr>
<tr><td>Choice 2: Sort by same and different.</td><td>2. The student is presented with an assortment of squares and circles, and asked to sort squares into one group and circles into another group.
Response: squares sorted into one group and circles sorted into another group</td></tr>
<tr><td>Choice 3: Identify a quadrilateral.</td><td>3. The student is presented with three shapes. Which shape has four sides?
Response: square</td></tr>
</table>

Activity Choices MAFS.3.G.1.AP.1b

Activity Choices	Examples
Choice 1: Match same.	The student is presented with an assortment of shapes to sort and asked to match squares to squares, circles to circles, etc. **Response:** squares to squares, circles to circles, etc. The student is presented with a trapezoid pattern block and three response options: a triangle pattern block, a square pattern block, and a trapezoid pattern block. "This is a trapezoid. Which of these pattern blocks is also a trapezoid?"     **Response:** 

	The student is presented with an image of a rectangle and three response options: a rectangle, a circle, and a pentagon. "This is a rectangle. Which of these shapes is also a rectangle." **Response:** The rectangle. Instructional Supports: Students should be exposed to multiple examples and non-examples of quadrilaterals (i.e., square, rectangle, trapezoid, rhombus, and parallelogram) and given opportunities to use exemplars to find matching examples in the environment, in collections of various shape manipulatives, and in collections of various images of shapes.
Choice 2: Sort by same and different	The student is presented with an assortment of squares and circles, and asked to sort squares into one group and circles into another group. **Response:** squares sorted into one group and circles sorted into another group The student is presented with a group of three squares in various sizes and orientations and three response options: a triangle, a square, and an octagon. "Which shape belongs in this group?" **Response:** The square. The student is presented with a group of three parallelograms in various sizes and orientations and three response options: a pentagon and two parallelograms (different in size and orientation). "Which shape does **not** belong in this group?" **Response:** The pentagon. The student is presented with a group of three various quadrilaterals and three response options: a circle, a rectangle, and a hexagon. "These shapes all have four sides. Which shape has the same number of sides?" **Response:** The rectangle. The student is presented with a group of three various quadrilaterals and three response options: a triangle, a parallelogram, and a rhombus. "These shapes all have four vertices. Which shape has a different number of vertices?" **Response:** The triangle.

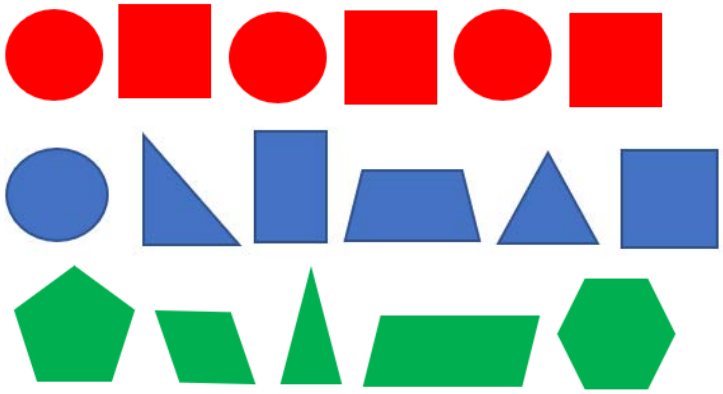
	Instructional Supports: Students should be exposed to multiple examples and non-examples of quadrilaterals (i.e., square, rectangle, trapezoid, rhombus, and parallelogram), with their attention being focused on what is the same about all the examples (four sides and four vertices) and what makes the non-examples different (greater than or less than four sides and four vertices). Students should be given opportunities to use exemplars to find examples of shapes that share the same attributes as quadrilaterals (four sides and four vertices) and shapes that have different attributes than quadrilaterals. Provide clear instruction on how to determine the number of a shape's sides and vertices and model sorting the shapes into groups of shapes with four sides (or shapes with four vertices) and groups of shapes without four sides (or shapes without four vertices). Graphic organizers should be used to organize the sort.
Choice 3: Identify a quadrilateral.	The student is presented with three shapes. Which shape has four sides? **Response:** square The student is presented with a square and three response options: a triangle, a trapezoid, and a hexagon. "This is a quadrilateral. Which shape is also a quadrilateral?" **Response:** The trapezoid. The student is presented with three response options: a circle, a rectangle, and an octagon. "Which shape is a quadrilateral?" **Response:** The rectangle. Instructional Supports: Students must be clearly shown how to model quadrilaterals (using a Geoboard and/or objects such as toothpicks and clay or craft sticks) by creating four sides and four vertices and explicitly taught to recognize the four sides and four vertices that make a shape a quadrilateral. Students must be exposed to a number of different quadrilaterals (i.e., squares, rectangles, trapezoids, rhombuses, and parallelograms) in various sizes and orientations. Explain to students that these shapes are examples of quadrilaterals because each one has four sides and four vertices. Show students examples of shapes that are not quadrilaterals and explain that these shapes are not

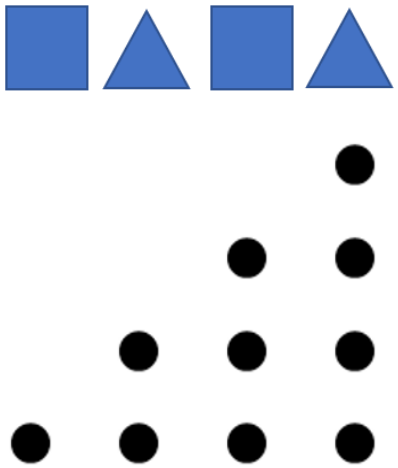
	quadrilaterals because they do not have four sides and four vertices. When a shape is displayed, students should be asked to determine if it is a quadrilateral or not a quadrilateral based on the number of sides or vertices.

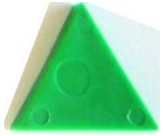
FSAA—Datafolio Grade 4 Mathematics

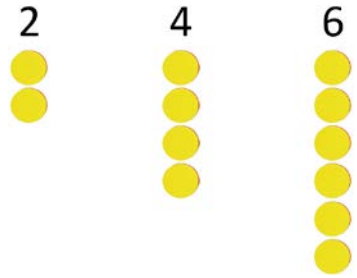
Reporting Category	Domain	Cluster 3: Generate and analyze patterns.			
Operations and Algebraic Thinking	Operations and Algebraic Thinking	STANDARD CODE	**Standard:** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.		
		MAFS.4.OA.3.5	ACCESS POINT CODE	**Access Point Standard:** Generate a pattern when given a rule.	
				Essential Understandings	Activity Choices	Examples
			MAFS.4.OA.3.AP.5a	Concrete: ➢ **Use manipulatives to create a pattern.**	**Choice 1:** Identify a pattern.	1. The student is presented with three object displays: shape pattern, random objects, and coins. Which set shows a pattern? **Response:** shape pattern
					Choice 2: Extend a pattern using manipulatives.	2. The student is presented with the first five elements of a simple pattern. What comes next in the pattern? **Response:** will vary
					Choice 3: Model a pattern using manipulatives.	3. The student is presented with four square (S) tiles and four circular (C) tiles, and asked to create a simple pattern. **Response:** will vary

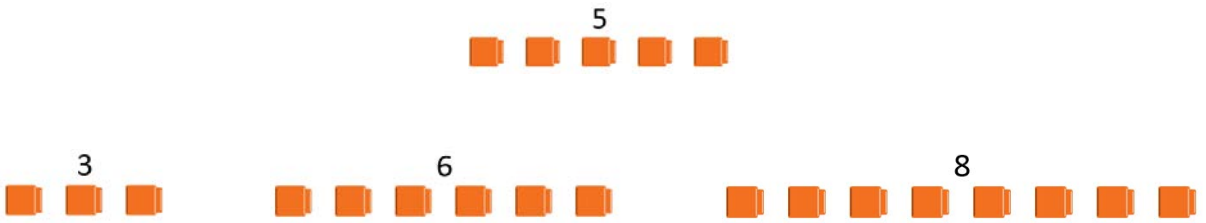
Activity Choices MAFS.4.OA.3.AP.5a

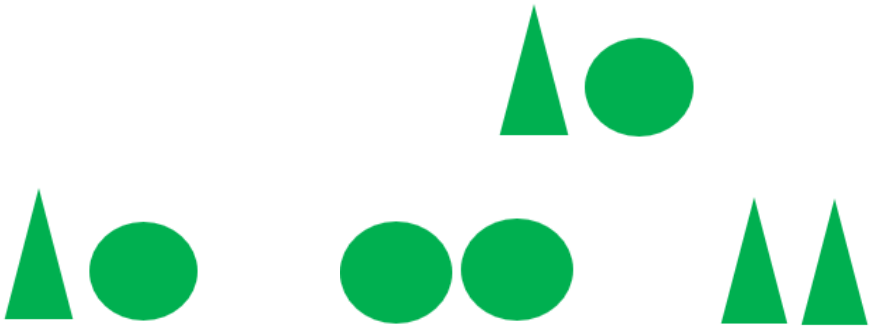
Activity Choices	Examples
Choice 1: Identify a pattern.	The student is presented with three object displays: shape pattern, random objects, and coins. Which set shows a pattern? **Response:** shape pattern The student is presented with three examples of simple shape patterns with 6 terms each. “Which shows the pattern: circle, square, circle, square, circle, square?”  **Response**: 

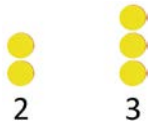
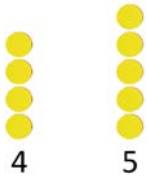
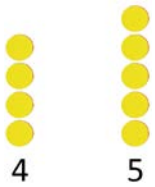
	The student is presented with three response options: a shape pattern, a dot pattern growing by one dot each step, and a numeric pattern with the rule: add 10. "Which shows the pattern with the rule: add 10?"  10, 20, 30, 40 **Response:** 10, 20, 30, 40 Instructional Supports: Students need to be exposed to multiple examples and non-examples of simple patterns. The repetitive nature of the pattern should be clear, with more than one repetition of the pattern's sequence (e.g., "Here is a pattern. See how the shapes alternate between circle, square, circle, square, circle, square?"). Use manipulatives to show students how rules are repeating as the pattern is extended.

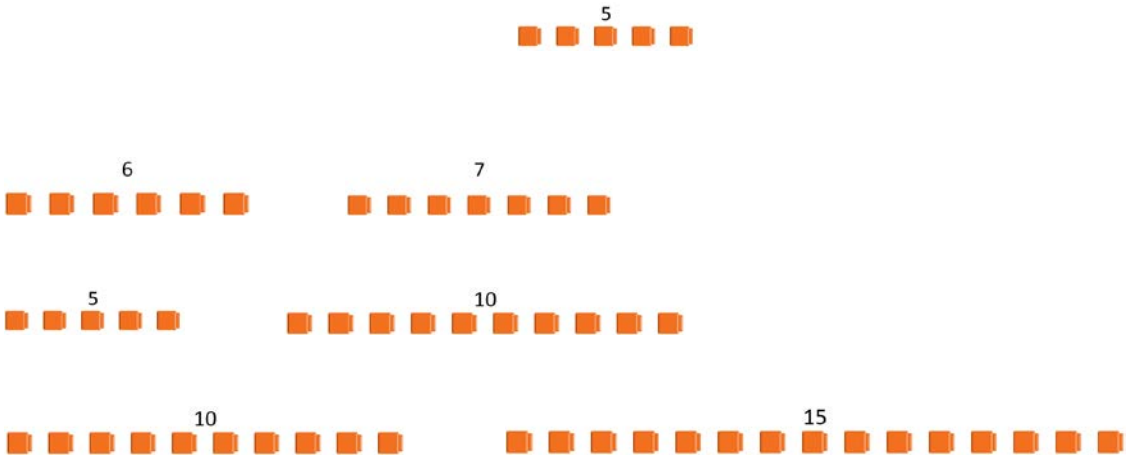
Choice 2: Extend a pattern using manipulatives.	The student is presented with the first five elements of a simple pattern. What comes next in the pattern? **Response:** will vary The student is presented pattern blocks that are arranged to show the pattern: triangle, hexagon, square. The student is given three response options: triangle, hexagon, square. “This is a pattern. The pattern is: triangle, hexagon, square. Which shape comes next in the pattern?”  **Response:** 

	The student is presented with a growing dot pattern that is modeled with counters: 2, 4, 6. The student is given three response options that are also modeled with counters: 2, 7, 8. “This is a pattern. For each step, two dots are added. Which shows the next step in the pattern?”   **Response:** 8

	The student is presented with the number 5, modeled with manipulatives, and three response options that are also modeled with manipulatives: 3, 6, 8. "The first number in a pattern is 5. The pattern follows the rule: add 3. Which is the next number in the pattern?"  **Response:** 8 Instructional Supports: Model for students how to continue a sequence with a simple repeating rule (e.g., a shape pattern alternating between two to three shapes, a growing dot pattern, or a numeric pattern with a one-step rule first involving basic skip counting by 2's, 5's, or 10's.) Lead the student to extend these sequences using manipulatives. Craft sticks can be utilized for shape patterns to help students identify the pattern rule by laying the craft stick beneath the rule (e.g., triangle, square, circle) and then placing a second craft stick after the first craft stick to build the pattern again, helping students understand the repeating nature of the pattern. Relate the rules in a numeric pattern to a context and help the students visualize the context (e.g., for the rule add 2: "Billy picked 2 apples on Monday. Billy picked 2 more apples on Monday than he picked on Tuesday. Billy picked 2 more apples on Wednesday than he picked on Tuesday.") Numeric patterns can be organized in T-charts and then modeled with manipulatives so show how the quantities are increasing or decreasing in each row.
Choice 3: Model a pattern using manipulatives.	The student is presented with four square (S) tiles and four circular (C) tiles and asked to create a simple pattern. **Response:** will vary

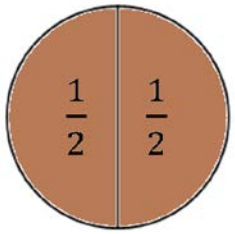
	The student is presented with the pattern: triangle, circle. The student is also presented with three response options: (triangle, circle); (circle, circle); (triangle, triangle). "This is a pattern. The pattern is: triangle, circle. Which shapes come next in the pattern?"  **Response:** 

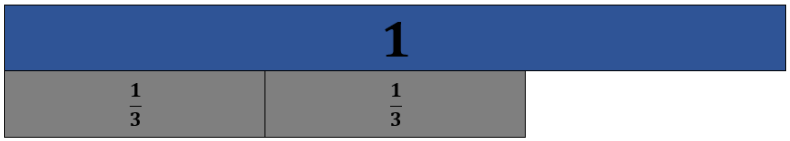
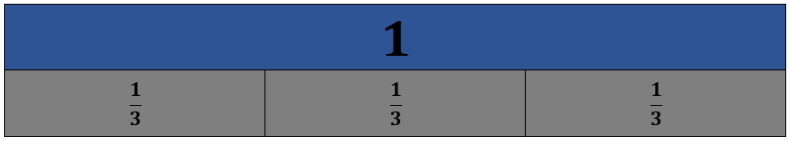
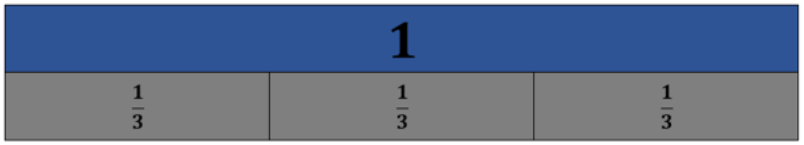
	The student is presented with a growing dot pattern that is modeled with counters: 1, 2, 3. The student is given three response options that are also modeled with counters: (1, 2); (2, 3); (4, 5). "This is a pattern. For each step, one dot is added. Which shows the next two steps in the pattern?"     **Response:** 

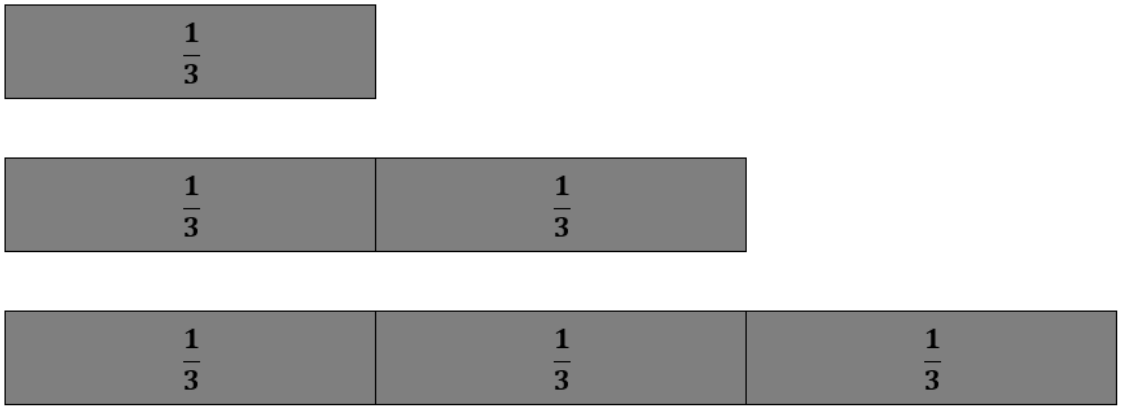
	The student is presented with the number 5, modeled with manipulatives, and three response options that are also modeled with manipulatives: (6, 7); (5, 10); (10, 15). "The first number in a pattern is 5. The pattern follows the rule: add 5. Which shows the next two numbers in the pattern?"  **Response:** 10, 15 Instructional Supports: After multiple experiences extending patterns by finding the next one to two terms when given the first few terms of the pattern, model for students how to generate a pattern when given just the starting term and rule. Lead students to use manipulatives to generate patterns with the same rule, but different starting terms.

Reporting Category	Domain	Cluster 2: Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.				
Number and Operations – Fractions	Number and Operations – Fractions	STANDARD CODE	**Standard:** Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.			
		MAFS.4.NF.2.3	ACCESS POINT CODE	**Access Point Standard:** Using a representation, decompose a fraction into multiple copies of a unit fraction (e.g., ¾ = ¼ + ¼ + ¼).		
				Essential Understandings	Activity Choices	Examples
			MAFS.4.NF.2.AP.3a	Concrete: ➢ **Using fraction manipulatives, model a whole and then decompose (i.e., divide) it into equal parts to create unit fractions (i.e., fractions where 1 is the numerator). For example: 1 = 1/3 + 1/3 + 1/3 or 1 = 1/4 + 1/4 + 1/4 + 1/4.** ➢ **Using fraction manipulatives, model a non-unit fraction (i.e., a fraction where 1 is not the numerator) and then decompose the fraction into unit fractions. For example: 2/3 = 1/3 + 1/3 or 3/4 = 1/4 + 1/4 + 1/4.**	**Choice 1:** Using fraction manipulatives, model a whole and then decompose (i.e., divide) it into equal parts to create a unit fraction.	1. The student is presented with a fraction manipulative representing a whole (e.g., four $\frac{1}{4}$ manipulatives placed together. How many equal parts make up the whole? **Response:** 4
					Choice 2: Using fraction manipulatives, model a non-unit fraction.	2. The student is presented with a partitioned fraction manipulative. How many parts are needed to make $\frac{3}{4}$? **Response:** 3
					Choice 3: Understand the following concepts, symbols, and vocabulary: numerator, denominator, fraction, /.	3. The student is presented with the fraction $\frac{3}{4}$ and three response options. What is the denominator of the fraction? **Response:** 4

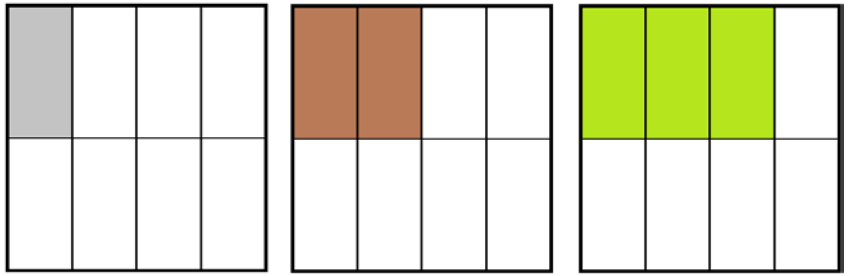
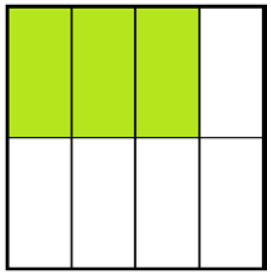
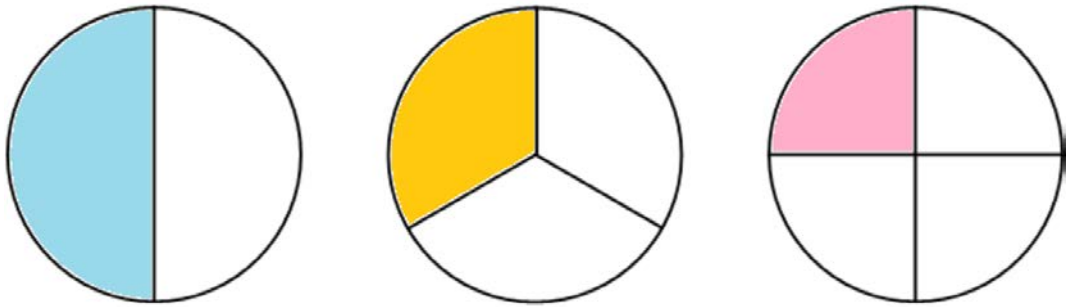
Activity Choices MAFS.4.NF.2.AP.3a

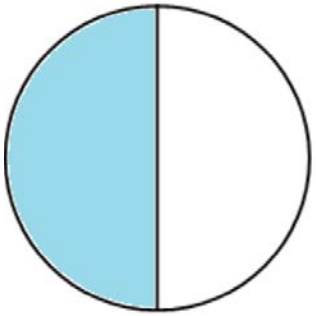
Activity Choices	Examples
Choice 1: Using fraction manipulatives, model a whole and then decompose (i.e., divide) it into equal parts to create a unit fraction.	The student is presented with a fraction manipulative representing a whole (e.g., four $\frac{1}{4}$ manipulatives placed together). How many equal parts make up the whole? **Response:** 4 The student is presented with a circle fraction manipulative representing a whole composed of two $\frac{1}{2}$ sized fraction manipulatives placed together and three response options: 0, 1, 2. "How many one-halves make up the whole?"  **Response:** 2

	The student is presented with three response options: a one whole sized fraction tile with one $\frac{1}{3}$ sized fraction tile directly beneath it, a one whole sized fraction tile with two $\frac{1}{3}$ sized fraction tiles side by side directly beneath it, and a one whole sized fraction tile with three $\frac{1}{3}$ sized fraction tiles side by side directly beneath it. "Which model shows how many one-thirds make up the whole?"    **Response**:  Instructional Supports: Students may use fraction manipulatives (e.g., fraction tiles and circle fraction manipulatives) to compose wholes by repeatedly laying the same sized unit fraction on top of a fraction manipulative representing a whole to cover the same area as the whole (e.g, covering the whole with two $\frac{1}{2}$ sized pieces, three $\frac{1}{3}$ sized pieces, etc.). Students count the equal sized parts to determine the appropriate number of each unit fraction required to equal the whole.

Choice 2: Using fraction manipulatives, model a non-unit fraction.	The student is presented with a partitioned fraction manipulative. How many parts are needed to make $\frac{3}{4}$? **Response:** 3 The student is presented with a model composed of four $\frac{1}{8}$ sized fraction manipulatives to represent $\frac{4}{8}$ and three response options: 1, 4, 8. "How many one-eighths are needed to make $\frac{4}{8}$?"  **Response:** 4 The student is presented with three response options: one $\frac{1}{3}$ sized fraction tile, two $\frac{1}{3}$ sized fraction tiles placed side by side, and three $\frac{1}{3}$ sized fraction tiles placed side by side. "Which model shows how many one-thirds you need to make $\frac{2}{3}$?"  **Response**:

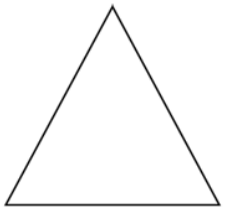
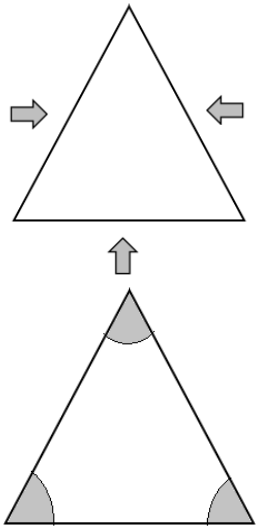
	 The student is presented with several $\frac{1}{4}$ sized fraction tiles and three response options: 1, 2, 4. "How many one-fourths do you need to make $\frac{2}{4}$?" **Response:** 2 Instructional Supports: Students may use fraction manipulatives (e.g., fraction tiles and circle fraction manipulatives) to compose non-unit fractions by placing together the appropriate number of the same sized unit fraction required to model the non-unit fraction. Students may benefit from having a template of the fraction being composed in order to cover each shaded part with a fraction tile and then count the equal sized parts placed on the template to determine the appropriate number of each unit fraction required to compose the non-unit fraction.
Choice 3: Understand the following concepts, symbols, and vocabulary: numerator, denominator, fraction, /.	The student is presented with the fraction $\frac{3}{4}$ and three response options. What is the denominator of the fraction? **Response:** 4 The student is presented with the numeric representation of the fraction $\frac{2}{3}$ and three response options: 2, -, and 3. "Which is the numerator of the fraction?" **Response:** 2 The student is presented with the numeric representation of the fraction $\frac{1}{4}$ and three response options: 1, -, 4. "Which is the denominator of the fraction?" **Response:** 4

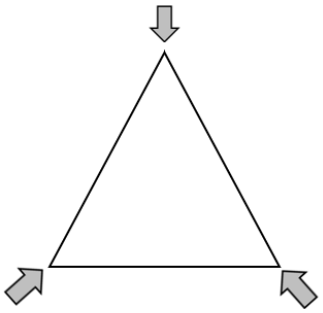
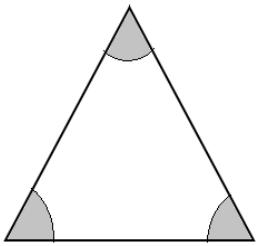
	The student is presented with three models representing: one-eighth, two-eighths, and three-eighths. “Which model represents a fraction with a numerator of 3?”  **Response:**  The student is presented with three models representing: one-half, one-third, and one-fourth. “Which model represents a fraction with a denominator of 2?” 

	Response:  Instructional Supports: When given a numeric representation of a fraction (e.g., $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{8}$) model decomposing squares, rectangles, and circles into halves, thirds, fourths, or eighths to represent the given denominator. Model selecting or shading the appropriate number of pieces to represent the given numerator. When given a model, determine the number that will be used to represent the numerator and the number that will be used to represents the denominator when recording the quantity as a fraction.

Reporting Category	Domain	Cluster 1: Draw and identify lines and angles, and classify shapes by properties of their lines and angles.				
Measurement, Data, and Geometry	Geometry	STANDARD CODE	Standard: Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.			
		MAFS.4.G.1.2	ACCESS POINT CODE	Access Point Standard: Identify and sort objects based on parallelism, perpendicularity, and angle type.		
				Essential Understandings	Activity Choices	Examples
			MAFS.4.G.1.AP.2a	Concrete: ➢ Identify attributes within a two-dimensional figure (i.e., sides and angles). ➢ Sort manipulatives into categories: ○ Parallel sides ○ Perpendicular sides ○ Types of angles	Choice 1: Identify attributes within a two-dimensional figure.	1. The student is presented with a rectangle and asked to identify a side of the rectangle. Response: a side of the rectangle
					Choice 2: Sort manipulatives into categories (parallel sides, perpendicular sides, types of angles).	2. The student is presented with three manipulatives. Which manipulative shows perpendicular sides? Response: perpendicular sides

Activity Choices MAFS.4.G.1.AP.2a

Activity Choices	Examples
Choice 1: Identify attributes within a two-dimensional figure.	The student is presented with a rectangle and asked to identify a side of the rectangle. **Response:** a side of the rectangle The student is presented with a triangle and three response options: an image of the triangle with arrows pointing to each side, an image of the triangle with the angles colored, and an image of the triangle with arrows pointed to each vertex. "Which image shows the angles of the triangle?"  

	 **Response:**  Instructional Supports: Provide students with clear definitions of the terms: “sides” and “angles.” Students must be clearly shown how to model two-dimensional shapes (using a Geoboard and/or objects such as toothpicks and clay or craft sticks) with specific attention to how various numbers of sides and angles come together to create each shape. Students should be explicitly taught to recognize the sides and angles within a variety of two-dimensional figures. Students can shade or mark sides or angles of two-dimensional shapes and then count the number of sides or angles.
Choice 2: Sort manipulatives into categories (parallel sides, perpendicular sides, types of angles).	The student is presented with three manipulatives. Which manipulative shows perpendicular sides? **Response:** perpendicular sides The student is presented with a group of three two-dimensional shapes with parallel sides and three response options: a square, an acute triangle, and a circle. “These shapes have parallel sides. Which shape belongs in this group?” **Response:** The square.

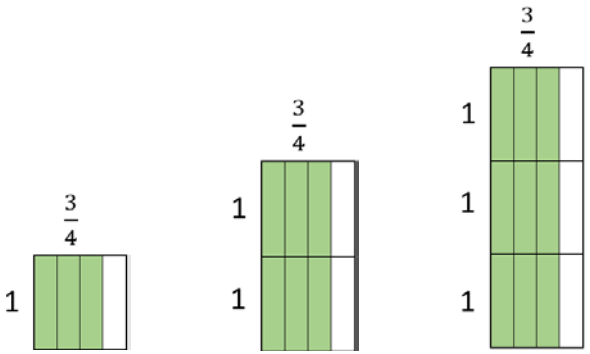
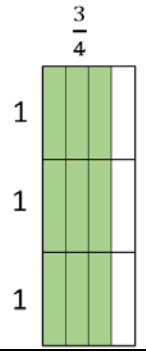
	The student is presented with a group of three two-dimensional shapes with perpendicular sides and three response options: an obtuse triangle, a rectangle, and a regular hexagon. "These shapes have perpendicular sides. Which shape belongs in this group?" **Response:** The rectangle. The student is presented with a group of three two-dimensional shapes with at least one right angle and three response options: a right triangle, an oval, and a regular pentagon. "These shapes all have a right angle. Which shape belongs in this group?" **Response:** The right triangle. The student is presented with a group of three two-dimensional shapes with at least one acute angle and three response options: a square, an acute triangle, and a circle. "These shapes all have an acute angle. Which shape belongs in this group?" **Response:** The acute triangle. The student is presented with a group of three two-dimensional shapes with at least one obtuse angle and three response options: a rectangle, an obtuse triangle, and a right triangle. "These shapes all have an obtuse angle. Which shape belongs in this group?" **Response:** The obtuse triangle. Instructional Supports: Provide students with clear definitions of the terms: "parallel", "perpendicular", "acute angle", "obtuse angle", and "right angle". Students must be clearly shown how to model these attributes (using a Geoboard and/or objects such as toothpicks and clay or craft sticks). Demonstrate how to use the corner of a piece of paper, or a right-angle cut-out, to determine if an angle is a right angle (if the angle is smaller than the corner of the paper, the angle is acute, and if the angle is larger than the corner of the paper, the angle is obtuse). Angles should be clearly acute or obtuse and right angles should be marked with a square. Students should be explicitly taught to recognize different types of sides (i.e., parallel and perpendicular) and different types of angles (i.e., acute, obtuse, and right) in a variety of two-dimensional figures. Students should be exposed to numerous examples and non-examples of shapes with a certain type of side or angle with their attention being focused on what is the same

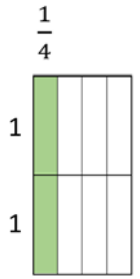
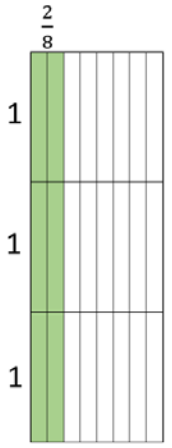
	about all the examples and what makes the non-examples different. Students can shade or mark representations of different types of sides or angles of two-dimensional shapes. After numerous opportunities to identify different types of sides and angles within two-dimensional shapes, model sorting the shapes into groups of shapes with or without a given attribute (e.g., shapes with parallel sides and shapes without parallel sides or shapes with right angles and shapes without right angles). Graphic organizers should be used to organize the sort.

FSAA—Datafolio Grade 5 Mathematics

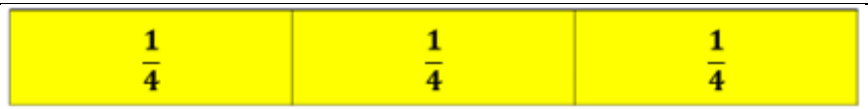
Reporting Category	Domain	Cluster 2: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.				
Operations, Algebraic Thinking, and Fractions	Number and Operations – Fractions	STANDARD CODE	Standard: Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.			
		MAFS.5.NF.2.6	ACCESS POINT CODE	Access Point Standard: Multiply a fraction by a whole or mixed number using visual fraction models.		
				Essential Understandings	Activity Choices	Examples
			MAFS.5.NF.2.AP.6a	Concrete: ➢ Place fraction manipulatives in groups as indicated by the whole number in a given multiplication expression (e.g., 2 x 1/3 = 2 groups of 1/3 or 3 x 1/4 = 3 groups of 1/4). ➢ Use repeated addition/skip counting to find the product (e.g., 1/3 + 1/3 = 2/3 or 1/4 + 1/4 + 1/4 = 3/4).	**Choice 1:** Use arrays to multiply a whole number by a fraction.	1. The student is presented with the expression $2\times\frac{1}{3}$ and presented with three response options. Which picture shows $2\times\frac{1}{3}$? **Response:** picture showing $2\times\frac{1}{3}$
					Choice 2: Using grouped fraction manipulatives, match the model to the multiplication expression.	2. The student is presented with the multiplication expression $3\times\frac{1}{4}$ and three response options. Which model shows $3\times\frac{1}{4}$? **Response:** the group of three $\frac{3}{4}$
					Choice 3: Use repeated addition/skip counting to find the product.	3. The student is presented with the expression $2\times\frac{1}{3}$ and three response options. Which equation uses addition to show $2\times\frac{1}{3}$? **Response:** $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$

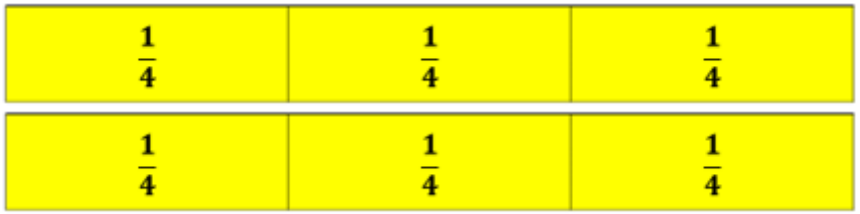
Activity Choices MAFS.5.NF.2.AP.6a

Activity Choices	Examples
Choice 1: Use arrays to multiply a whole number by a fraction.	The student is presented with the expression $2 \times \frac{1}{3}$ and presented with three response options. Which picture shows $2 \times \frac{1}{3}$? **Response:** the array representing $2 \times \frac{1}{3}$. The student is presented with the expression $3 \times \frac{3}{4}$ and presented with three response options: an array representing $1 \times \frac{3}{4}$, an array representing $2 \times \frac{3}{4}$, and an array representing $3 \times \frac{3}{4}$. "Which array shows $3 \times \frac{3}{4}$?"  **Response:** 

	The student is presented with an array representing $2 \times \frac{1}{4}$ and presented with three response options: $\frac{1}{4}$, $\frac{2}{4}$, 8. "This array shows $2 \times \frac{1}{4}$. What does $2 \times \frac{1}{4}$ equal?"  **Response:** $\frac{2}{4}$ The student is presented with an array representing $3 \times \frac{2}{8}$ and presented with three response options: $\frac{2}{8}$, $\frac{6}{8}$, 24. "This array shows $3 \times \frac{2}{8}$." What does $3 \times \frac{2}{8}$ equal?"  **Response:** $\frac{6}{8}$

	Instructional Supports: After students have had multiple exposures to using concrete faction manipulatives to represent equal groups, model using graph paper to create representations of arrays. This process should strategically build upon students' prior understanding of using arrays to multiply whole numbers. To begin, students should understand how to use an array to represent multiplication of unit fractions by 1 (e.g., 1 x $\frac{1}{2}$). These arrays can be iterated (repeated) vertically to model multiplying unit fractions by 2 groups (e.g., 2 x $\frac{1}{2}$), then 3 groups (e.g., 3 x $\frac{1}{2}$), etc. Encourage students to generalize this approach to creating arrays to represent multiplication of non-unit fractions (e.g, $\frac{2}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{8}$) by a whole number. Relating values in multiplication expressions to a context and action can help students make sense of these arrays. Understanding that the multiplication symbol can be read as "groups of" (e.g., 2 x $\frac{1}{4}$ can be read as "2 groups of $\frac{1}{4}$") can also help students interpret the meaning of the expression. Students can then count the individual unit fractions within the array or use repeated addition to find the product of the expression represented.
Choice 2: Using grouped fraction manipulatives, match the model to the multiplication expression.	The student is presented with the multiplication expression 3 × $\frac{1}{4}$ and three response options. Which model shows 3 × $\frac{1}{4}$? **Response:** the group of three $\frac{3}{4}$ The student is presented with the multiplication expression 2 × $\frac{3}{4}$ and three response options: grouped fraction manipulatives representing 1 x $\frac{3}{4}$, grouped fraction manipulatives representing 2 × $\frac{3}{4}$, grouped fraction manipulatives representing 3 x $\frac{3}{4}$. "Which model shows 2 × $\frac{3}{4}$?"


$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$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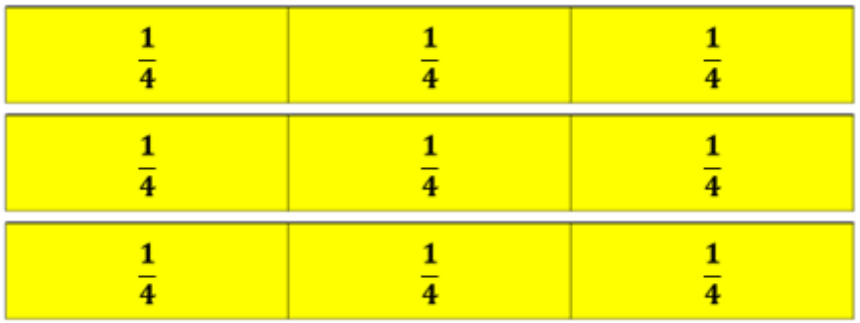
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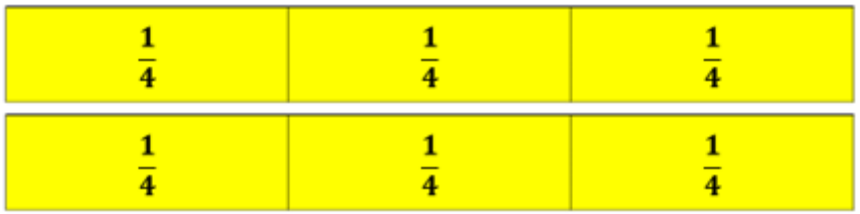
Response: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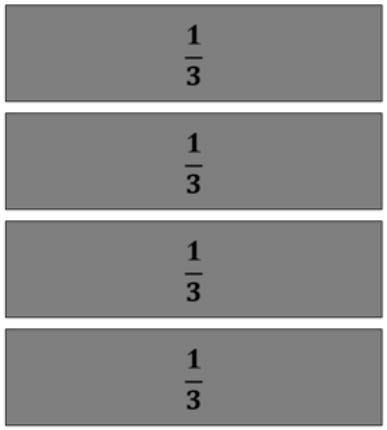
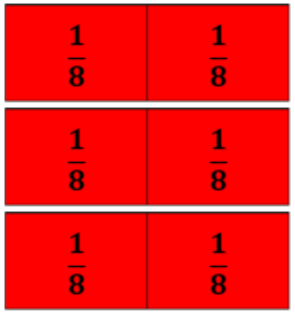
	The student is presented with a model of fraction manipulatives representing four groups of $\frac{1}{3}$ and presented with three response options: 4 x $\frac{1}{3}$, 4 x 1, 4 x 3. Which expression matches the model?  **Response:** 4 x $\frac{1}{3}$ The student is presented with a model of fraction manipulatives representing three groups of $\frac{2}{8}$ and presented with three response options: 3 x $\frac{1}{8}$, 3 x $\frac{2}{8}$, 3 x 2. Which expression matches the model?  **Response:** 3 x $\frac{2}{8}$

	Instructional Supports: Model using fraction manipulatives to represent equal groups situations. Demonstrate creating equal groups by laying manipulatives on a template to represent the quantity in each group. This process should strategically build upon students' prior understanding of using equal groups representations to multiply whole numbers. To begin, students should understand how to use equal groups to represent multiplication of unit fractions by 1 (e.g., 1 x $\frac{1}{2}$). Additional groups can be created to model multiplying unit fractions by 2 groups (e.g., 2 x $\frac{1}{2}$), then 3 groups (e.g., 3 x $\frac{1}{2}$), etc. Encourage students to generalize this approach to creating equal groups to represent multiplication of non-unit fractions (e.g, $\frac{2}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{8}$) by a whole number. Relating values in multiplication expressions to a context and action can help students make sense of these equal groups representations. Understanding that the multiplication symbol can be read as "groups of" (e.g., 2 x $\frac{1}{4}$ can be read as "2 groups of $\frac{1}{4}$") can also help students interpret the meaning of the expression. Students can then count the individual unit fractions within the model or use repeated addition to find the product of the expression represented.
Choice 3: Use repeated addition/skip counting to find the product.	The student is presented with the expression 2 × $\frac{1}{3}$ and three response options. Which equation uses addition to show 2 × $\frac{1}{3}$ **Response:** $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$ The student is presented with the expression 4 × $\frac{2}{8}$ and presented with three response options: $\frac{2}{8}+\frac{2}{8}+\frac{2}{8}+\frac{2}{8}=\frac{8}{8}$, 2 + 2 + 2 + 2 = 8, 8 + 8 + 8 + 8 = 32. "Which equation uses addition to show 4 × $\frac{2}{8}$?" **Response:** $\frac{2}{8}+\frac{2}{8}+\frac{2}{8}+\frac{2}{8}=\frac{8}{8}$

	The student is presented with the expression $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$ and presented with three response options: $\frac{3}{4}$, 3, 12. "This expression has the same value as 3 x $\frac{1}{4}$. What does 3 x $\frac{1}{4}$ equal?" **Response:** $\frac{3}{4}$ The student is presented with the expression $\frac{3}{8}+\frac{3}{8}$ and presented with three response options: $\frac{6}{8}$, 6, 16. "This expression has the same value as 2 x $\frac{3}{8}$. What does 2 x $\frac{3}{8}$ equal?" **Response:** $\frac{6}{8}$ Instructional Supports: Model representing multiplication expressions as repeated addition expressions (e.g., 3 x $\frac{1}{8}$ can be represented as $\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$). This process should strategically build upon students' prior understanding of relating multiplication of whole numbers to repeated addition (e.g., 3 x 8 can be represented as 8 + 8 + 8). Relating values in multiplication expressions to a context and action can help students make sense of the relationship between multiplication and repeated addition. Understanding that the multiplication symbol can be read as "groups of" (e.g., 2 x $\frac{1}{4}$ can be read as "2 groups of $\frac{1}{4}$") can also help students interpret the meaning of the expression.

Reporting Category	Domain	Cluster 1: Write and interpret numerical expressions.				
Number and Operations in Base 10	Operations and Algebraic Thinking	STANDARD CODE	Standard: Write simple expressions that record calculation with numbers and interpret numerical expressions without evaluating them.			
		MAFS.5.OA.1.2	ACCESS POINT CODE	Access Point Standard: Write a simple expression for a calculation.		
				Essential Understandings	Activity Choices	Examples
			MAFS.5.OA.1.AP.2a	Concrete: ➢ Use manipulatives and a frame, jig, or template to express the calculation (i.e., "add 8 and 7").	**Choice 1**: Use manipulatives and a frame, jig, or template to express an addition calculation.	1. The student is presented with the calculation 2 + 3 and an addition template (e.g., __ + __ = __) and asked to show the calculation using manipulatives. **Response:** 2 + 3
					Choice 2: Use manipulatives and a frame, jig, or template to express a subtraction calculation.	2. The student is presented with the calculation 4 – 3 and a subtraction template (e.g., __ - __ = __) and asked to show the calculation on the template using manipulatives. **Response:** 4 – 3
					Choice 3: Use manipulatives and a frame, jig, or template to express a multiplication calculation.	3. The student is presented with the calculation 2 x 3 and a multiplication template (e.g., graphic organizer of an array) and asked to show the calculation on the template using manipulatives. **Response:** two rows of three manipulatives

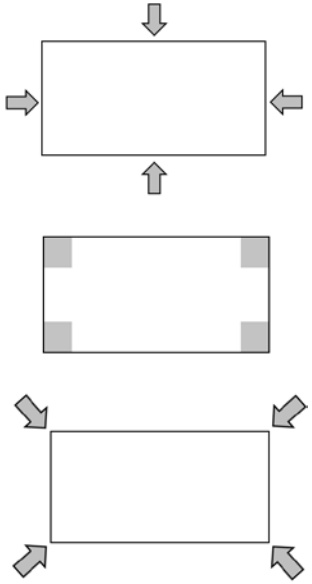
Activity Choices MAFS.5.OA.1.AP.2a

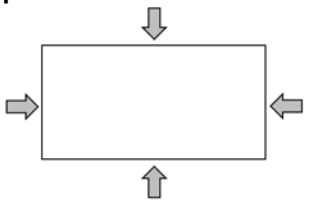
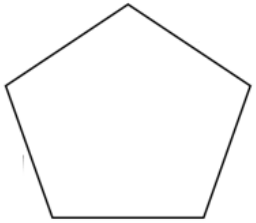
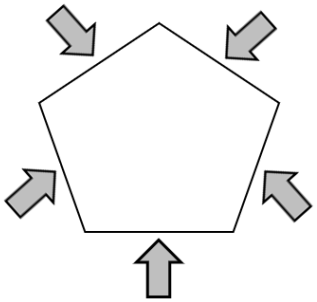
Activity Choices	Examples
Choice 1: Use manipulatives and a frame, jig, or template to express an addition calculation.	The student is presented with the calculation 2 + 3 and an addition template (e.g., __ + __ = __) and asked to show the calculation using manipulatives. **Response:** 2 + 3 The student is presented with five linked black cubes and four linked white cubes. The student is also presented with three response options: 5 + 4, 5 – 4, 5 x 4. "I have five black cubes and four white cubes. When I put these two groups together, it shows the calculation 'add five and four'." Model adding five and four by connecting the links. "Which expression matches the calculation?" **Response**: 5 + 4 Instructional Supports: Review key mathematical terms that indicate addition (e.g., *sum, add, plus*) and guide students to focus on these terms in verbal descriptions of simple addition calculations (e.g., "The sum of two and three.") in order to represent these descriptions using manipulatives (e.g., connecting two linked cubes of one color and three linked cubes of another color). Guide students to be very explicit about the relationship between the components of the model and the terms in the verbal description (e.g., "Where is the two in the model? Where is the three in the model? Where is the word 'sum' represented in the model? What is the symbol we use to indicate addition?"). Model how to translate these verbal descriptions and the representations created with manipulatives to mathematical symbols (e.g., 2 + 3) by organizing digits and operational signs on a template: __◯__ to create a simple expression.
Choice 2: Use manipulatives and a frame, jig, or template to express a subtraction calculation.	The student is presented with the calculation 4 – 3 and a subtraction template (e.g., __ - __ = __) and asked to show the calculation on the template using manipulatives. **Response:** 4 – 3 The student is presented with six counters on a mat and three response options: 6 + 2, 6 – 2, 6 ÷ 2. "I have six counters. I am going to take away two counters to show the calculation 'six subtract two.'" Remove two counters from the mat. "Which expression matches the calculation?" **Response**: 6 - 2

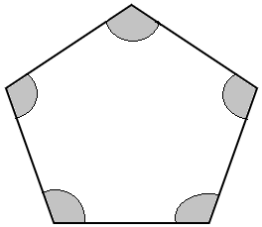
	Instructional Supports: Review key mathematical terms that indicate subtraction (e.g., *difference, subtract, minus*) and guide students to focus on these terms in verbal descriptions of simple subtraction calculations (e.g., "Subtract four from five.") in order to represent these descriptions using manipulatives (e.g., removing four counters from a set of five counters). Guide students to be very explicit about the relationship between the components of the model and the terms in the verbal description (e.g., "Where is the five in the model? Where is the four in the model? Where is the word 'subtract' represented in the model? What is the symbol we use to indicate subtraction?"). Model how to translate these verbal descriptions and the representations created with manipulatives to mathematical symbols (e.g., 5 - 4) by organizing digits and operational signs on a template: __◯__ to create a simple expression.
Choice 3: Use manipulatives and a frame, jig, or template to express a multiplication calculation.	The student is presented with the calculation 2 x 3 and a multiplication template (e.g., graphic organizer of an array) and asked to show the calculation on the template using manipulatives. **Response:** two rows of three manipulatives The student is presented with a template showing 4 groups with 2 counters in each group. The student is also presented with three response options: 4 + 2, 4 x 2, 4 ÷2. "This model shows the calculation 'four times two'. Which expression matches the model?" **Response**: 4 x 2 Instructional Supports: Review key mathematical terms that indicate multiplication (e.g., *product, multiply by, times as many*) and guide students to focus on these terms in verbal descriptions of simple multiplication calculations (e.g., "The product of three and five.") in order to represent these descriptions using manipulatives (e.g., three groups of five counters). Guide students to be very explicit about the relationship between the components of the model and the terms in the verbal description (e.g., "Where is the three in the model? Where is the five in the model? Where is the word 'product' represented in the model? What is the symbol we use to indicate multiplication?"). Model how to translate these verbal descriptions and the representations created with manipulatives to mathematical symbols (e.g., 3 x 5) by organizing digits and operational signs on a template: __◯__ to create a simple expression.

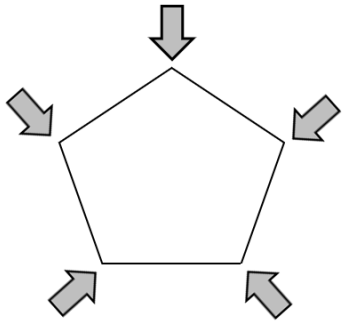
Reporting Category	Domain	Cluster 2: Classify two-dimensional figures into categories based on their properties.				
Measurement, Data, and Geometry	Geometry	STANDARD CODE	Standard: Classify two-dimensional figures in a hierarchy based on properties.			
		MAFS.5.G.2.4	ACCESS POINT CODE	Access Point Standard: Use polygon-shaped manipulatives to classify and organize two-dimensional figures into Venn diagrams based on the attributes of the figures.		
				Essential Understandings	Activity Choices	Examples
			MAFS.5.G.2.AP.4a	Concrete: ➢ Use models and manipulatives to show properties of plane figures. ➢ Sort two-dimensional figures based upon their properties. ➢ Place sorted two-dimensional figures onto Venn diagram template (e.g., create a Venn diagram from hula hoops).	**Choice 1:** Use models and manipulatives to show properties of plane figures.	1. The student is presented with a triangle with angles labeled A, B, and C. Which letter represents an angle of the triangle? **Response:** A
					Choice 2: Sort two-dimensional figures based upon their properties.	2. The student is presented with rectangles and triangles. Which of these are triangles? **Response:** the triangles
					Choice 3: Place sorted two-dimensional figures onto a Venn diagram.	3. The student is presented with a Venn diagram with one circle labeled "four sides" and the other circle labeled "equal sides" and the middle labeled "four sides and equal sides." The student is also presented with the sorted rectangles, rhombi, squares, and equilateral triangles. Where do the shapes belong in the diagram? **Response:** correctly places shapes in Venn diagram

Activity Choices MAFS.5.G.2.AP.4a

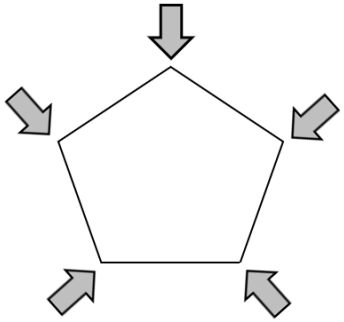
Activity Choices	Examples
Choice 1: Use models and manipulatives to show properties of plane figures.	The student is presented with a triangle with angles labeled A, B, and C. Which letter represents an angle of the triangle? **Response:** A The student is presented with a rectangle and three response options: an image of the rectangle with arrows pointing to each side, an image of the rectangle with the angles colored, and an image of the rectangle with arrows pointing to each vertex. "Which image shows the sides of the rectangle?"  

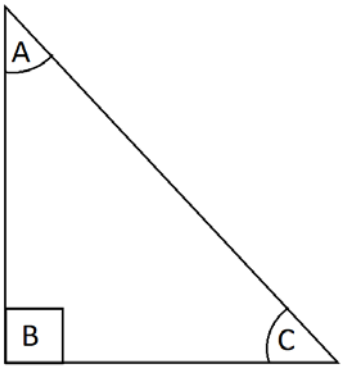
	Response:  The student is presented with a pentagon and three response options: an image of the pentagon with arrows pointing to each side, an image of the pentagon with the angles colored, and an image of the pentagon with arrows pointing to each vertex. "Which image shows the vertices of the pentagon?"  



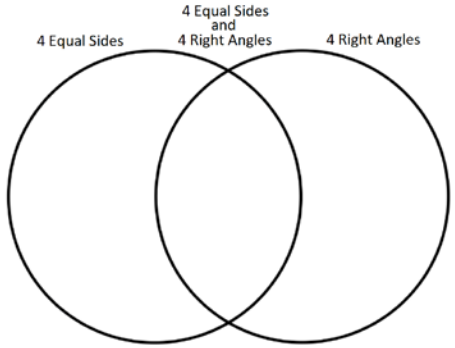
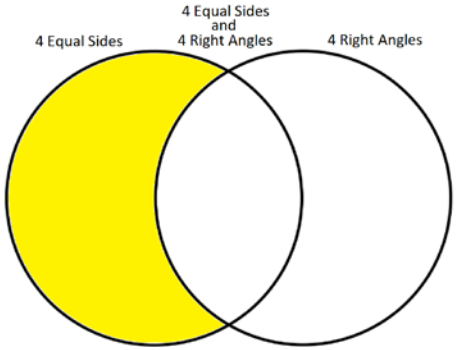


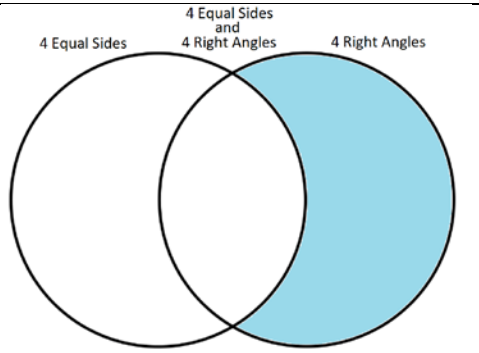
Response:

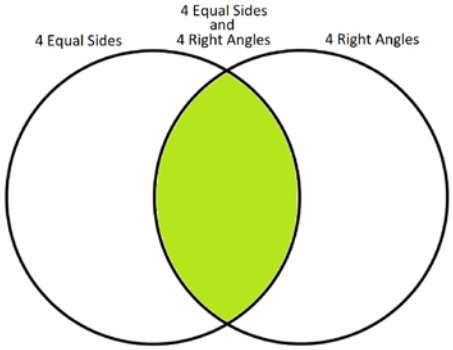


	The student is presented with a right triangle with angles labeled A, B, and C. Which letter represents a right angle?  **Response:** B Instructional Supports: Provide students with clear definitions of the terms: “sides”, “vertices”, “parallel”, “perpendicular”, and “angles”. Students must be clearly shown how to model two-dimensional shapes (using a Geoboard and/or objects such as toothpicks and clay or craft sticks) with specific attention to how various numbers and types of sides and angles come together to create each shape. Students should be explicitly taught to recognize the properties of two-dimensional figures. Students can shade or mark sides, vertices, and angles of two-dimensional shapes and then count the number of each. Review the following polygons and their attributes: triangle, rectangle, square, trapezoid, rhombus, parallelogram, pentagon, hexagon, and octagon. Provide students with extensive exposure to each of these shapes in various sizes and orientations. Guide students to focus on the defining attributes of each shape and model the use of mathematical terminology to describe these attributes. Help the student develop an understanding of different polygons and their attributes by showing a variety of examples and non-examples. Draw students’ attention to similarities and differences between each shape.
Choice 2: Sort two-dimensional figures based upon their properties.	The student is presented with rectangles and triangles. Which of these are triangles? **Response:** the triangles

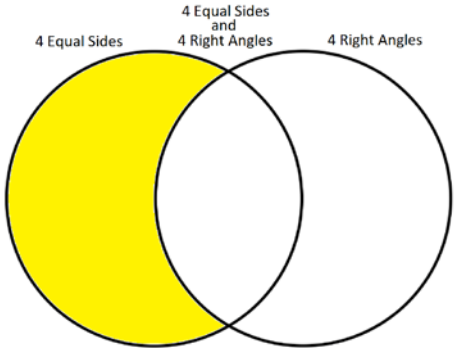
	The student is presented with a group of three hexagons in various sizes and orientations. The student is also presented three response options: a square, a pentagon, and a hexagon. "These shapes all have six straight sides. Which shape belongs in this group?" **Response:** The hexagon. The student is presented with a group of three quadrilaterals in various sizes and orientations. The student is also presented three response options: a circle, a triangle, and a parallelogram. "These shapes all have four vertices. Which shape belongs in this group?" **Response:** The parallelogram. The student is presented with a group of three two-dimensional shapes with parallel sides and three response options: a square, an acute triangle, and a circle. "These shapes have parallel sides. Which shape belongs in this group?" **Response:** The square. The student is presented with a group of three two-dimensional shapes with at least one right angle and three response options: a right triangle, a square, and an obtuse triangle. "These shapes all have a right angle. Which shape does **not** belong in this group?" **Response:** The obtuse triangle. Instructional Supports: Students should be exposed to multiple examples and non-examples of polygons, with their attention being focused on what is the same about all the examples and what makes the non-examples different. Students should be given opportunities to use exemplars to find examples of shapes that share the same attributes as the given shape and shapes that have different attributes. After numerous opportunities to identify different types of sides and angles within two-dimensional shapes, model sorting the shapes into groups of shapes with or without a given attribute (e.g., shapes with parallel sides and shapes without parallel sides or shapes with right angles and shapes without right angles). Graphic organizers should be used to organize the sort.

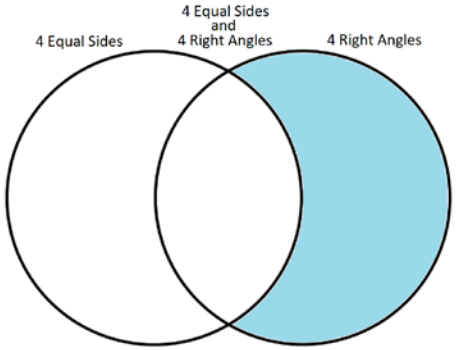
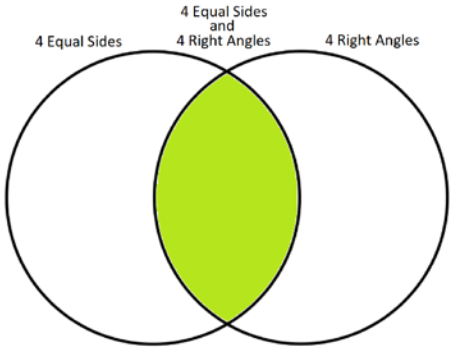
Choice 3: Place sorted two-dimensional figures onto a Venn diagram.	The student is presented with a Venn diagram with one circle labeled ”four sides” and the other circle labeled ”equal sides” and the middle labeled “four sides and equal sides.” The student is also presented with the sorted rectangles, rhombi, squares, and equilateral triangles. Where do the shapes belong in the diagram? **Response:** correctly places shapes in Venn diagram The student is presented with a Venn diagram with one circle labeled “4 equal sides” and the other circle labeled “4 right angles” and the middle labeled “4 equal sides and 4 right angles”. The student is also presented with a rhombus (that is not a square) and three response options: The circle labeled “4 equal sides”, the circle labeled “4 right angles”, and the middle labeled “4 equal sides and 4 right angles”. “This is a rhombus. Where does the rhombus belong in the diagram?”  


4 Equal Sides
4 Equal Sides and 4 Right Angles
4 Right Angles


4 Equal Sides
4 Equal Sides and 4 Right Angles
4 Right Angles

Response:


4 Equal Sides
4 Equal Sides and 4 Right Angles
4 Right Angles

	The student is presented with a Venn diagram with one circle labeled “4 equal sides” and the other circle labeled “4 right angles” and the middle labeled “4 equal sides and 4 right angles”. The student is also presented with a rectangle (that is not a square) and three response options: The circle labeled “4 equal sides”, the circle labeled “4 right angles”, and the middle labeled “4 equal sides and 4 right angles”. “This is a rectangle. Where does the rectangle belong in the diagram?” **Response:**  The student is presented with a Venn diagram with one circle labeled “4 equal sides” and the other circle labeled “4 right angles” and the middle labeled “4 equal sides and 4 right angles”. The student is also presented with a square and three response options: The circle labeled “4 equal sides”, the circle labeled “4 right angles”, and the middle labeled “4 equal sides and 4 right angles”. “This is a square. Where does the square belong in the diagram?” **Response:** 

	Instructional Supports: Be sure that students understand the structure of Venn Diagrams and how to use their prior experiences sorting to help classify shapes using this graphic organizer. Model how to identify whether a given polygon possesses the attribute that each circle is labeled with and how to use this analysis to determine the most precise placement for the shape. Focus students' attention on the attributes that shapes sorted into the middle section of the diagram share with the shapes on each of the outer regions and why certain shapes, like the square, can fit into more than one category.