

Grade 5

Teacher Guide Sample

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Scope Introduction

SCOPE SUMMARY



Students classify two-dimensional figures and identify shapes based on their attributes and properties. Students use their knowledge of the geometric properties of sides and angles to identify figures within sets and subsets.

Student Expectations

5.5A

 Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.

VERTICAL ALIGNMENT



Background Knowledge

In third grade, students make generalizations about properties that are shared between categories of shapes, such as parallel line segments, perpendicular line segments, right angles, and lines of symmetry. Third-grade students mainly focus on identifying quadrilaterals and subcategories of quadrilaterals, but they also classify, compare, and contrast various polygons and three-dimensional figures. In fourth grade, students more precisely name two-dimensional shapes by classifying them based on line types, angle types, and side lengths.

Future Expectations

In sixth and seventh grades, students use the coordinate system to plot polygons and reason about their attributes. Students identify the bases and heights of triangles and parallelograms, and they apply shape composition and decomposition to derive and understand the formulas for area and volume. They also investigate three-dimensional figures, they find the volumes of rectangular prisms, they analyze nets of three-dimensional figures, and they use nets to solve problems involving surface area.

ENGAGE ACTIVITIES



Accessing Prior Knowledge

Students in groups compare and contrast two-dimensional figures based on the presence or absence of parallel and perpendicular lines, as well as the size of angles. Using student handouts, they independently identify similarities and differences between figures, then share and discuss their findings within their groups and with the class. This activity highlights their understanding of geometric properties and encourages precise mathematical communication, helping assess their prior knowledge and clear up any misconceptions.

If your students are struggling with previously taught concepts, use the Foundation Builder activity in this scope to reinforce ideas presented in the APK.

To o k

In this activity, students explore geometric classification by using a graphic organizer to sort two-dimensional shapes based on their attributes. After viewing shapes in an art museum scenario, they work in pairs to identify properties such as sides and angles, and categorize each shape into the most specific group possible. Discussions and comparisons of their findings help deepen their understanding of geometric properties and the relationships between different shapes. This process enhances their analytical and collaborative skills.





EXPLORE ACTIVITIES

plore

Classify Polygons

In this educational activity, students collaborate in small groups to classify polygons using various geometric properties. They utilize Table Shapes to sort based on the number of sides, size of angles, and presence of parallel sides. This handson exploration enhances their understanding of geometric terminology and the attributes of different polygons, such as congruency and parallelism. Through this process, students apply critical thinking to identify and communicate the characteristics that differentiate each polygon type.

olore 2

Classify Quadrilaterals

In this engaging activity, students work in small groups to classify quadrilaterals into a hierarchy based on their attributes, such as the number of sides and angle types. They use various materials, including Quadrilateral Shapes and Category Headings, to explore and discuss each shape's properties. The classification process enhances their understanding of geometric relationships and vocabulary, fostering analytical thinking as they determine the most specific categories for each quadrilateral. This hands-on approach encourages collaboration and critical reasoning in applying mathematical concepts.

Explore 3

Classify Triangles

Students collaborate in small groups to classify triangles using their side lengths and angles, organizing them into categories like equilateral, isosceles, and scalene. This activity involves examining physical triangle shapes, discussing their properties, and placing them on chart paper under appropriate headings. Through this hands-on approach, students deepen their understanding of geometric principles and improve their ability to identify and classify triangles based on distinct mathematical attributes.

Notes



Accessing Prior Knowledge

ACTIVITY PREPARATION



Students compare and contrast two-dimensional figures based on presence or absence of parallel or perpendicular line segments, and presence or absence of angles of a specified size.

Materials

Printed

• 1 Student Handout (per group)

Reusable

 1 Projector or document camera (per class, optional)

Preparation

- Plan to have students work in groups of 2 to 3 to complete this activity.
- Print a Student Handout for each group.

PROCEDURE AND FACILITATION



FACILITATION TIP

Consider breaking the first task into two parts. First, have students find as many similarities as possible. Then, have students look for differences between the two figures.

FACILITATION TIP

ecord students' findings on the board or chart paper. Be sure to use and highlight the terms parallel, perpendicular, and angles.

- 1. Divide the class into groups of 2 to 3 students. Distribute a Student Handout to each group of students, and direct their attention to the first task box.
- 2. Challenge students to first find as many similarities and differences between the two figures as possible independently.
- 3. Allow time for students to share their similarities and differences with their groups.
- 4. Invite students to share their similarities and differences with the class. Encourage students to use the terms *parallel*, *perpendicular*, and *angles* in their explanations. Record their responses in a Venn diagram for the class.
- 5. Facilitate a class discussion about the similarities and differences between the figures. This provides an opportunity to gather an understanding of prior student knowledge before beginning the lessons. Encourage students to support their answers, and check for understanding and misconceptions. Sample student responses include the following:
 - Similarities: two sets of parallel sides, four sides, four angles, opposite sides are equal, and opposite angles are congruent
 - b. Differences: rectangle—four right angles, sides are perpendicular, and all four angles are congruent; parallelogram—two acute angles, two obtuse angles
- 6. Have students move on to the second task box and decide as a group what quadrilateral they will draw with the given angle attributes.
- Allow time for groups to compare and contrast the angle attributes of their drawn quadrilaterals with the rectangle and parallelogram from the first task box.

















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Acceleratio

- 8. Invite students to share their drawn quadrilaterals and the similarities and differences between the angles of the two figures in the first task box.
- 9. Facilitate a class discussion about the similarities and differences between the angles of the quadrilaterals. This provides an opportunity to gather an understanding of prior student knowledge before beginning the lessons. Encourage students to support their answers, and check for understanding and misconceptions. Sample student responses include the following:
 - **a.** The drawn quadrilateral is similar to the other quadrilaterals because it has four sides and four angles.
 - b. The drawn quadrilateral is similar to the parallelogram because it has two obtuse and two acute angles.
 - **c.** The drawn quadrilateral is different from the rectangle because it does not have any right angles.
 - **d.** We drew a rhombus, and it is similar to the other quadrilaterals because its opposite angles are congruent.
 - **e.** We drew a trapezoid, and it is different from the other quadrilaterals because its opposite angles are not congruent.
- 10. If students are struggling to complete this task, do the Foundation Builder to fill the gap in prior knowledge before moving on to other parts of the scope.

FACILITATION TIP

Consider having students conduct a gallery walk to view each groups' quadrilateral and identify the similarities and differences between the angles of the two figures from the first task box.

Notes



Hook: Shape Sort

ACTIVITY PREPARATION



Students use a graphic organizer to classify two-dimensional figures in categories and subcategories based on their attributes and properties.

Materials

Printed

• 1 Student Handout (per student)

Reusable

- 1 Phenomena (per class)
- 1 Projector (per class)

Preparation

- · Plan to show the Phenomena.
- Plan to project the Student Handout for the class.
- Part I
 - o Plan to have students work in pairs to complete this activity.
 - o Print the Student Handout for each student.

PROCEDURE AND FACILITATION



FACILITATION TIP

Allow students to make all reasonable observations of math in this situation, even if it does not relate to the topic of classifying two-dimensional figures.

FACILITATION TIP

Consider having a vocabulary word bank or word wall accessible to students to refer to when discussing the properties of the shapes. This vocabulary word bank can be added to throughout the scope.

Part I: Pre-Explore

- 1. Introduce this activity toward the beginning of the scope. The class will revisit the activity and solve the original problem after students have completed the corresponding Explore activities.
- Show the Phenomena. Ask students the following questions: What do you notice? Where can you see math in this situation? Allow students to share all ideas.
- 3. Explain the scenario to the class: Your aunt is a math teacher who loves art. One day she takes you to a modern art museum. As she walks through the museum, she asks you to sketch two-dimensional shapes that you see. Then she asks you to look at the different shapes and think about how they might have similar and different properties. When you get home, she asks you to classify the shapes into categories and subcategories by using a graphic organizer. Can you do it?
- 4. Allow the students to ask questions and clarify the context as needed. Encourage them to share their thoughts and experiences with the class using the following questions:
 - a. Have you ever been to an art museum?
 - b. What are some properties that shapes may have in common?
- 5. Project the Shapes page from the Student Handout for the class.
- 6. Discuss the following questions with the class:
 - a. DOK-1 What do you notice about the shapes of the art? I see a lot of quadrilaterals and triangles.
 - **b. DOK-1** How are the shapes similar? How are they different? They all have straight edges. Some have 4 sides and some have 3 sides. Some have right angles, and others have acute or obtuse angles.
- 7. Move on to complete the Explore activities.



















Part II: Post-Explore

- 1. After students have completed the Explore activities for this topic, show the Phenomena again, and repeat the scenario.
- 2. Distribute a Student Handout to each student and instruct them to turn to the Shapes page.
- 3. Discuss the following questions with the class:
 - **a. DOK-1** What do you notice about the shapes of the art? I see a lot of quadrilaterals and triangles.
 - **b. DOK-1** How are the shapes similar? How are they different? They all have straight edges. Some have 4 sides and some have 3 sides. Some have right angles, and others have acute or obtuse angles.
- 4. Place students into pairs to complete this activity.
- 5. Explain to students they should look at each figure and its properties, think about how these properties relate to various categories of two-dimensional shapes, and discuss the following questions with their partners:
 - a. Is it a quadrilateral?
 - b. Is it a parallelogram, a trapezoid, or an irregular quadrilateral?
 - c. Is it a rectangle and/or a rhombus?
- 6. Instruct students to evaluate each shape, and record the number of each shape in the most specific category where it fits on the graphic organizer.
- 7. Allow students to identify the properties of each shape and classify where it belongs on the graphic organizer with their partner.
- 8. When students are finished, instruct each pair to meet with another pair to compare and discuss their results.
- 9. Discuss the following questions with the class:
 - a. DOK-2 Can a shape be classified in more than one category? Yes
 - **b. DOK-2** What categories does a square belong to? Quadrilateral, parallelogram, rectangle, and rhombus
 - **c. DOK-2** What are some examples of shapes that are not quadrilaterals? Triangles, pentagons, and hexagons
 - d. DOK-1 What is the most general category on the graphic organizer? Quadrilateral
 - e. DOK-3 What are the similarities and differences between a rectangle and a rhombus? Both are quadrilaterals and parallelograms and both have straight sides. Both have opposite angles that are equal. Rectangles have four right angles. Rhombi have four equal sides.
- 10. As an extension, have students go on a scavenger hunt to find twodimensional shapes in the classroom and classify them in various hierarchies of categories and subcategories based on different properties.

FACILITATION TIP

Provide students with sentence stems to use when discussing how they classified each of the shapes into a specific category. Some examples include: "Shape __ is a __ because..." or "We classified shape _ as a __ because..."

Notes



Explore 1: Classify Polygons

ACTIVITY PREPARATION



Students classify polygons based on their number of sides, size of angles, and whether their sides are parallel.

Mathematical Process Standards

- (A) Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(B)** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- **(D)** Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- (E) Create and use representations to organize, record, and communicate mathematical ideas.
- (F) Analyze mathematical relationships to connect and communicate mathematical ideas.
- (G) Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Set of Table Shapes (per group)
- 1 Exit Ticket (per student)

Consumable

• 1 Resealable bag (per group)

Preparation

- Plan to have students work in groups of 3–4 to complete this activity.
- Print a Student Journal and an Exit Ticket for each student.
- Print a set of Table Shapes on card stock for durability for each group of students. Cut apart each set of cards, and place them in a resealable bag.
- For students who need more support in recalling information, please see our Angles and Geoboard Supplemental Aids elements in the Intervention section.
- **Go Digital!** Have students explore or present their solutions using virtual manipulatives! The manipulatives used in this lesson can be found in the Explore drop-down menu and can be digitally assigned to students. (Geoboard)

Notes























PROCEDURE AND FACILITATION

- 1. Help students access the task by using the following guiding questions:
 - a. What is a warehouse?
 - b. What does the word *organize* mean to you?
 - c. What do you remember about classifying two-dimensional figures based on their attributes?
- 2. Read the following scenario to the class: *The employees at a party-supply* rental company are reorganizing their warehouse. They need some help organizing all their different tables. Can you help them classify the tables?
- 3. Distribute a bag of Table Shapes to each group, and tell them you are handing out models of the tables stored in the warehouse. Allow students time to explore the bag of shapes. Discuss the following questions:
 - a. DOK-1 What do the shapes have in common? They are all twodimensional. They all have straight edges, 3 or more sides, and vertices.
 - i. Explain that all of these shapes are polygons. A polygon is a two-dimensional closed shape with 3 or more straight sides. Ask students to name nonexamples of polygons, such as circles or cubes.
 - **b. DOK-1** How are the shapes different? They have different numbers of sides and different angle sizes. Some have perpendicular lines or parallel lines.
 - c. DOK-1 What types of shapes do you see? Answers will vary. I see triangles, squares, rectangles, pentagons, and octagons.
 - **d. DOK-2** What do the markings on the Table Shapes mean? There are tick marks on the sides to tell you which are the same length. The curves inside some of the angles tell you if any angles are the same size. The squares in some corners tell you they are right angles.
 - i. Explain that polygons with all equal sides are called *regular* polygons. Ensure students understand this is a different use of the word regular than they may be familiar with.
 - e. DOK-1 What other words mean equal, when describing the sides and angles of shapes? The words congruent and equivalent both mean equal in size.
 - **f. DOK-2** How could we organize the shapes? We can organize them based on the attributes that are different about them, such as the number of sides or the size of the angles.

FACILITATION TIP

Consider projecting an image of a warehouse for students to refer to and providing several examples that students can connect the definition to.

FACILITATION TIP

Be sure to use attribute language when explaining the nonexamples of polygons. For example, you may explain that circles are NOT polygons because they have curved lines and have no straight edges or sides and vertices.

FACILITATION TIP

Add the term regular polygons to a word bank or word wall for students to refer back to throughout the scope.

Notes



Explore 1: Classify Polygons

FACILITATION TIP

Set a timer and project it for students to see while they are working to classify the shapes how they choose. Keep this session brief, but allow all students to communicate their ideas at this time.

FACILITATION TIP

Model filling out the Student Journal page with students before allowing them to work independently. Show students how to classify one table shape by all 3 categories (number of sides, size of angles, and number of pairs of parallel sides). Be sure to model your expectations for labeling each table with the correct mathematical terms.

- 4. Inform students that the employees cannot figure out the best way to organize the tables, so they have come up with three ways to try. Instruct students to remove the shapes from their bags and to observe them.
- 5. Give them a few minutes to classify the shapes however they choose. Ask the following guiding questions, and allow time for students to share their thinking:
 - a. What are some of the ways you have learned to classify shapes in the past?
 - b. How can we classify these shapes?
 - c. Is there more than one way to classify these shapes? Explain.
 - d. What are some of the attributes that make these shapes similar or different?
 - e. Make a list on the board of the following ways these shapes can be classified as students mention them during the discussion:
 - i. Number of sides
 - ii. Size of angles
 - iii. Type of lines
- 6. Distribute a Student Journal to each student, and explain how they will be classifying the Table Shapes.
 - a. Part I: By number of sides
 - b. Part II: By the size of the angles (acute, obtuse, or right)
 - c. Part III: By the number of pairs of parallel sides
- 7. Explain that students are also responsible for labeling each set of tables once they are classified, using the correct mathematical terms. Sample labels include the following:
 - a. Tables with four sides would be labeled Quadrilaterals.
 - b. Tables with vertices larger than 90 degrees would be labeled Obtuse Angles.
 - c. Tables with one pair of sides that are the same distance apart and never meet would be labeled One Pair of Parallel Sides.

Part I: Number of Sides

- 1. Explain that the employees want to try sorting the tables by the number of sides because some customers want tables with more or less sides.
- 2. Challenge students to discuss and determine how to use the number of sides to classify the tables.
- 3. Have students complete the four tasks for Part I on their Student Journals.
 - They should help the employees correctly label each group. They should be sure to use the correct term for shapes with that number of sides, such as *hexagons*.
 - b. Students will sort the polygon tables into groups based on the number of sides they have. Ask students to write the number from the top-right corner of each card in the correct group. Every table belongs in one of the groups.
 - c. Encourage students to discuss and answer the reflection questions using their observations.

















Intervention





- 4. Monitor and talk with students as needed to check for understanding by using the following guiding questions: (Answers will vary.)
 - a. **DOK-1** How many sides does this polygon have? This polygon has sides.
 - i. Help students count the sides by touching each one with their finger or marking each side with their pencil to keep track.
 - **b. DOK-1** What do we call a polygon with ___ sides? A polygon with ___ sides is called a .
 - c. DOK-3 How do the prefixes of the polygon names relate to the number of sides? The prefix tri- means "three," so I know a triangle has 3 angles and 3 sides.
- 5. After Part I, invite the class to a Math Chat to share their observations and learning.

Math Chat

- o **DOK-1** What patterns do you notice in the names of the polygons? The name of each polygon begins with a prefix that tells how many sides the shape has. TRIangles have 3 sides, QUADrilaterals have 4 sides, PENTagons have 5 sides, HEXagons have 6 sides, HEPTagons have 7 sides, OCTagons have 8 sides, NONagons have 9 sides, and DECagons have 10 sides.
- o **DOK-2** Could these groups be classified any further? Yes, they could be classified by types of quadrilaterals: squares, rhombuses, rectangles, parallelograms, or trapezoids. They also can be classified by other polygons: regular or irregular; angles: acute, obtuse, or right.
- o **DOK-1** What do the markings on the shapes tell you about each polygon? The tick marks on the sides can tell you which sides are the same length. The squares in the corners of some shapes mean those are right angles. The curves in some of the angles tell you which angles are the same measure.

FACILITATION TIP

Create an anchor chart with the names of all the polygons for students to refer back to. Be sure to include examples of each of the polygons and to highlight or underline the prefix of each of the polygons to help students identify the number of sides for each polygon.

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Explore 1: Classify Polygons

FACILITATION TIP

This Explore could potentially be split into 3 separate sessions. Students could complete each part on a separate day.

FACILITATION TIP

A helpful tool to help student identify types of angles is an index card highlighted at the right angle of one of the corners of the card. Allow students to use this index card to compare each of the Table Cards to when classifying each of the cards.

Part II: Types of Angles

- 1. Now the employees want to try sorting the tables by the size of the angles.
 - a. Students will need to look at the angles of each shape and decide if they are acute, obtuse, or right. They will also determine if two or more angles on a shape are congruent.
 - b. Ask the following guiding questions to review the types of angles, and allow time for students to share their thinking:
 - i. Which table shapes have an acute angle? How do you know?
 - ii. Which table shapes have an obtuse angle? How do you know?
 - iii. Which table shapes have a right angle? How do you know?
 - iv. Can you show me a way to determine if an angle is a right angle?Note: Students might suggest using the corner of a piece of paper. If they do not, show them this method. In addition, show students how a shape has a right angle if you see a little square drawn in the angles.
 - v. Do any of these table shapes have more than one type of angle? Which ones?
 - vi. How can you tell the difference between an acute and obtuse angle?
 - vii. How is a right angle different from acute and obtuse angles?
 - viii. What are congruent angles? Which shapes have at least two congruent angles?
 - Note: Discuss the term *congruent* if students do not already know what this means.
- 2. Once students have had an opportunity to review types of angles, they should sort the table shapes into piles by the size of the angles of each table.
- 3. Invite students to brainstorm the different ways to classify the shapes by their angle types and then share in a whole group discussion. As students share their thinking, make a list of the suggested ways to classify angles on the board. These could include the following examples:
 - a. Tables with all acute angles
 - b. Tables with all right angles
 - c. Tables with all obtuse angles
 - d. Tables with some right angles
 - e. Tables with some acute and some obtuse angles

Notes

















Intervention





4. Have students complete the tasks for Part II on their Student Journals.

- a. They should help the employees correctly label each group. They should use the correct terms for the sizes of angles, such as acute.
- b. They should write the number from the top-right corner of each card in the correct group. Every table belongs in at least one of the groups.
- c. Encourage students to discuss and answer the reflection questions using their observations.
- 5. Monitor and talk with students as needed to check for understanding by using the following guiding questions: (Answers will vary.)
 - a. DOK-1 How many angles does this polygon have? This polygon has
 - i. Help students count the angles by touching each one with their finger or marking each angle with their pencil to keep
 - **b. DOK-1** What types of angles are seen in the Table Shapes? An angle less than 90 degrees is called an acute angle. An angle greater than 90 degrees is called an obtuse angle. An angle exactly 90 degrees is called a right angle.
 - c. DOK-2 How can we tell the size of each angle? If it has a square in the corner, then it is exactly 90 degrees. I can use a corner of a piece of paper to check if the angle is more or less than 90 degrees.
 - **d. DOK-3** What do you notice about the angles of the regular polygons? When a polygon has all congruent sides, it also has all congruent
- 6. After Part II, invite the class to a Math Chat to share their observations and learning.

Math Chat

- o **DOK-1** What are the attributes of all regular polygons? All polygons are two-dimensional closed shapes with no curves. Regular polygons have all of those attributes, and they have all equal sides and equal angles.
- o **DOK-2** What do you notice about the shapes with all right angles? Why do you think this is? They are all quadrilaterals. I think this is because right angles occur at perpendicular lines, so they would make rectangles and squares.
- o **DOK-3** What types of polygons could never have only obtuse angles? Triangles and quadrilaterals could never be in the category for only obtuse angles. A triangle can not have more than one obtuse angle. A quadrilateral can not have more than 2 obtuse angles.

FACILITATION TIP

Be sure to remind students that every table belongs in at least one of the groups.

FACILITATION TIP

Print and project these math chat auestions for students to refer to during the discussion. Record student responses to the guestions on the board or an anchor chart for students to refer to later.

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Explore 1: Classify Polygons

FACILITATION TIP

Have students use total physical response to review the term parallel lines. Have students hold up their arms horizontally and/or vertically to model making parallel lines with their body.

Part III: Parallel Sides

- 1. Finally, the employees want to sort the tables based on how many pairs of parallel sides they have.
- 2. Give students time to talk within their groups as you ask the following quiding questions to review the types of lines:
 - a. What are parallel lines?
 - b. Which shapes have at least one pair of parallel lines?
 - c. Which shapes have more than one pair of parallel lines?
 - d. Which shapes do not have any parallel lines?
- 3. Once students have had an opportunity to review parallel lines, they should sort the table shapes into piles by how many pairs of parallel sides they have. Students should brainstorm the different ways to classify the shapes by their parallel lines and then share in a whole group discussion. As students share their thinking, make a list of the suggested ways to classify on the board. These could include the following examples:
 - a. Tables with no parallel sides
 - b. Tables with one pair of parallel sides
 - c. Tables with two pairs of parallel sides
 - d. Tables with more than two pairs of parallel sides
- 4. Have students complete the tasks for Part III on their Student Journals.
 - a. They should write the number from the top-right corner of each card in the correct group. Every table belongs in at least one of the groups.
 - b. Encourage students to discuss and answer the reflection questions using their observations.
- 5. Monitor and talk with students as needed to check for understanding by using the following guiding questions:
 - a. DOK-1 What does it mean if two sides are parallel? Parallel sides are always equal distance apart, even if the lines were to continue on forever.
 - i. Help students extend lines to determine if they are parallel.
 - **b. DOK-2** What other types of sides do you see on these polygons? Some of the sides are perpendicular, meaning they form a right angle when they meet.
 - ii. Point out examples of perpendicular lines as needed.
 - **c. DOK-2** Do regular polygons always have a set of parallel sides? Not always; the regular polygons with an even number of sides, such as a quadrilateral, do have parallel sides. But, the regular polygons with an odd number of sides, do not have parallel sides.
- 6. After the Explore, invite the class to a Math Chat to share their observations and learning.

Notes



















Elaborate

Evaluata

Intervention

Math Chat

 Choose a Structured Conversation routine to facilitate the following question:

DOK-3 What connections can you make between the number of total sides and the number of parallel sides on a polygon? If you have 2 sides that are parallel, you need at least 2 more sides to close the shape. This would make it a quadrilateral. Therefore, you cannot make a triangle with parallel sides. If a regular polygon has an even number of sides (quadrilateral, hexagon, octagon, etc.), then it will have sets of parallel sides. If a regular polygon has an odd number of sides (triangle, pentagon, etc.), then it will not have parallel sides.

- o **DOK-2** How can your understanding of parallel and perpendicular lines help when classifying different shapes? You can use this information to classify the shapes more specifically. For example, you can classify a quadrilateral as a parallelogram or trapezoid. You can also use this information to analyze the angles inside the polygon.
- DOK-2 What are other attributes that could be used to classify these table shapes? We could sort based on the number of perpendicular lines, number of lines of symmetry, number of vertices, etc.

Post-Explore

- 1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.
- 2. Complete the Anchor Chart as a class.
- 3. Have each student complete their Interactive Notebook.

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Explore 2: Classify Quadrilaterals

ACTIVITY PREPARATION



Students classify quadrilaterals in a hierarchy based on their attributes.

Mathematical Process Standards

- (A) Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(B)** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- (E) Create and use representations to organize, record, and communicate mathematical ideas.
- (F) Analyze mathematical relationships to connect and communicate mathematical ideas.
- (G) Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Set of Quadrilateral Shapes (per group)
- 1 Set of Category Headings (per group)
- 1 Quadrilateral Classification (per teacher)
- 1 Exit Ticket (per student)

Reusable

- 1 Pair of scissors (per group)
- 1 Marker (per group)

Consumable

- 1 Glue stick (per group)
- 1 Resealable bag (per group)
- 1 Large sheet of adhesive chart paper or butcher paper (per group)
- 1 Roll of tape (per class)

Preparation

- Plan to have students work in groups of 3–4 to complete this activity.
- Print a Student Journal and an Exit Ticket for each student.
- Print one set of Quadrilateral Shapes on card stock for durability for each group of students. Cut out each set, remove shape 6 (square) from each set, and place each set into a resealable bag. Shape 6 will be given to the students after the other shapes have been organized.
- Print one set of Category Headings on card stock for durability for each group of students.
- For students who need more support in recalling information, please see our Angles and Geoboard Supplemental Aids elements in the Intervention
 continue.
- **Go Digital!** Have students explore or present their solutions using virtual manipulatives! The manipulatives used in this lesson can be found in the Explore drop-down menu and can be digitally assigned to students. (Geoboard)

	Notes
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PROCEDURE AND FACILITATION

- Read the following scenario to the class: You are a team of video game designers. A brand new game called Quadrilateral Quest is in the beginning stages of development. Your team has been tasked with forming the parameters of the game. You will work through the shapes and sort them based on their attributes so the correct attributes can be assigned to each shape in the game.
- 2. Help students access the task by using the following guiding questions:
 - a. What are the rules of your favorite video game?
 - b. What type of math might be involved in video game design?
 - c. What do you already know about classifying two-dimensional figures based on their attributes?
- 3. Distribute to each group a bag of Quadrilateral Shapes, a set of Category Headings, a large sheet of chart paper, a marker, a glue stick, and a pair of scissors. Give each student a Student Journal.
- 4. As a whole group, discuss students' prior knowledge about attributes as potential classification groups.
 - a. DOK-1 What attributes can help us classify shapes? Number of sides, type of angles, and type of lines
 - **b. DOK-2** Give an example of a shape that shares an attribute with another shape. Answers will vary. Rectangles and squares have 2 sets of parallel lines and 4 right angles.
 - c. DOK-2 How can shapes look different but share similar attributes? Answers will vary. Shapes may have the same number of sides but different types of angles. For example, squares and rhombuses each have 4 sides, but squares have 4 right angles and rhombuses do not.
- 5. Explain that students will work with their groups to create and investigate quadrilateral categories and subcategories to classify figures based on their attributes.
- 6. Explain that they will not glue any of the shapes on their chart paper until they are instructed.
- 7. Have students cut out their Category Headings and glue the heading for "Four-sided polygon" at the top of the chart paper.
- 8. Refer to the Quadrilateral Classification to help you guide the students through the different classifications. Note that this classification is not meant for students.
- 9. Invite student groups to look at their shapes and collaborate to determine which shapes fit the four-sided polygon attribute.
- 10. DOK-1 Challenge the students to classify the shapes by naming the group they have made. Students should notice that all the shapes they received are quadrilaterals.
- 11. Have the students write quadrilateral on top of the "Four-sided polygon" heading at the top of their chart paper and then write down the numbers of all shapes that can fit in that classification category on their Student
- 12. Invite students to analyze the quadrilaterals.

FACILITATION TIP

Shape 6 will be given to the students AFTER the other shapes have been organized.

FACILITATION TIP

Students may not realize that shapes can be classified into more than one group and share more than one name. Challenge students to think of a shape that has more than one name. For example, rectangles and squares are also polygons, quadrilaterals, and parallelograms.



Explore 2: Classify Quadrilaterals

FACILITATION TIP

Students might need clarification about "set." Explain that this means a pair of opposite sides. Project shapes 1, 2, and 3 and for each one, identify the existence of parallel sides and count the sets of parallel sides. Show students that if they are not sure if 2 sides are parallel, they can extend the sides to see if they intersect.

FACILITATION TIP

If students are not able to decipher if the sides are congruent, provide them with a ruler so they may check.

- 13. Challenge them to discuss and create groups according to the number of pairs of parallel sides. Students should classify by the following attributes:
 - a. No sets of parallel sides (2, 8)
 - b. Exactly one pair of parallel sides (3, 7, 10)
 - c. Exactly two pairs of parallel sides (1, 4, 5, 9, 11, 12)
- 14. Ask students to find the category headings that match these attributes, and challenge them to name the shapes.
- **15. DOK-1** Invite groups to write the classification names on the blanks of the category headings.
 - a. Trapezoid exactly one pair of parallel sides (3, 7, 10)
 - b. Parallelogram two pairs of parallel sides and two opposite sets of congruent sides (1, 4, 5, 9, 11, 12)
- 16. Have students write down the numbers of all the shapes that fit in that classification category.
- 17. Have the students draw arrows from Quadrilateral to each of the three new category headings.
- 18. Encourage the groups to discuss how a quadrilateral can fit into more than one category based on attributes.
 - a. As a quadrilateral moves from one category to another, encourage them to list the number of the quadrilateral under the classification heading so they are able to see which quadrilaterals can be classified in more than one way based on their attributes.
- 19. Challenge them to analyze and discuss the parallelograms.
- 20. Ask the students how they could put these into a group based on congruent sides.
 - **a. DOK-1** Exactly four congruent sides (5, 12)
- 21. Have students find this category heading and write the name on the blank.
 - a. Rhombus Exactly four congruent sides (5, 12)
- 22. Have students write down the numbers of all the shapes that fit in that classification category.
- 23. Remind the students to draw the arrow and mark where the shapes came from.
- 24. Challenge them to analyze and discuss the remaining parallelograms. Ask them how they could put these into a group according to their sides.
 - a. **DOK-1** Exactly 2 pairs of perpendicular sides (1, 11)
- 25. Have students find this category heading and write the name on the blank
 - a. Rectangle Exactly 2 pairs of perpendicular sides (1, 11)
- 26. Have students write down the numbers of all the shapes that fit in that classification category.
- 27. Have students glue the category headings to the chart paper.
- 28. Give each group quadrilateral shape 6 (square). Challenge them to discuss the following topics in their groups:
 - a. Attributes of the shape
 - b. Name of the quadrilateral
 - c. Category or categories in which it can be sorted and why



















Intervention

- 29. Monitor and talk with students as needed to check for understanding by using the following guiding questions:
 - a. DOK-1 What attribute(s) does this shape have? It has 2 pairs of parallel sides, 4 right angles, and 4 congruent sides.
 - **b. DOK-1** What shapes have these attributes? Parallelograms, rectangles, and rhombuses
 - **c. DOK-1** Why shouldn't we place shape 6 under the trapezoid heading? Trapezoids have 1 pair of parallel sides, but this shape has 2 pairs.
- 30. Add the name Square as a category heading under the Rectangle and Rhombus headings, and draw arrows from both to the Square heading.
- 31. Glue the shape under the last category heading it falls under, Square, and have students write 6 under each category heading that it falls under.
- 32. Explain that students may now glue each shape down under the most specific category heading to which the shape belongs. For example, shape 6 fit the requirements of a quadrilateral, parallelogram, rectangle, rhombus, and square, but we glued it down under square because that was the most specific name.

Notes



Explore 2: Classify Quadrilaterals

- 33. While students glue their shapes down, monitor and talk with students as needed to check for understanding by using the following guiding questions: (Answers will vary.)
 - **a. DOK-1** What names apply to this shape? Shape 1 is a quadrilateral, parallelogram, and rectangle.
 - **b. DOK-2** Which category is the most specific? The most specific name is rectangle, so we will glue shape 1 in the rectangle category.
 - c. DOK-2 What is another attribute that could be listed for all parallelograms? They all have opposite sides congruent and opposite angles congruent.
 - **d. DOK-2** What is another attribute that could be listed for all rectangles? They all have 4 right angles.
 - **e. DOK-2** How many total degrees are inside all four angles of the square? The angles are all right angles, which are 90 degrees, so the square has a total of 360 degrees inside the angles.
 - Explain that all quadrilaterals have a total of 360 degrees in their four angles. The square and rectangle demonstrate this most easily.
 - f. DOK-3 What is the relationship between the different categories in the hierarchy? The categories that are lower on the hierarchy share all of the attributes of the categories above them that are connected by arrows.
 - i. Shapes always have the characteristics of the categories connected above them. For example, a square always has 2 sets of parallel sides because it is under the parallelogram category.
 - ii. Shapes sometimes have the attributes of the categories connected below them. For example, a parallelogram sometimes has 4 congruent sides.
 - iii. Shapes never have the attributes of the shapes in categories not connected. For example, a rectangle never has exactly 1 pair of parallel sides.
 - **g. DOK-3** What is something that is always true about this shape? The rectangle always has 2 sets of parallel sides, 4 right angles, 2 sets of perpendicular sides, and opposite sides congruent.
 - h. DOK-3 Remember, these shapes are being classified to use in the video game. Within the game, different shapes will be worth different points based on how unique they are. Which shapes do you think should be the most valuable in the game? Which should be least valuable in the game? Why? I think the square should be the most valuable in the game because it is the most special. It fits into many categories and has very specific requirements. I think the parallelograms should be the least valuable because there are so many different types of parallelograms, therefore they aren't as rare.
- 34. Instruct groups to work together to draw how they categorized their quadrilaterals on their created hierarchy on the second page of their Student Journals.
- 35. Students may tape their chart paper around the classroom to display how they classified their quadrilaterals.
- 36. Allow each group time to answer the reflection questions on their Student Journal.
- 37. After the Explore, invite the class to a Math Chat to share their observations and learning.

FACILITATION TIP

Instead of simply explaining this geometric rule, challenge students to prove it wrong using manipulatives.



















Intervention

Math Chat

o Choose a Structured Conversation routine to facilitate the following question:

> **DOK-1** What is always true about quadrilaterals? They are polygons, so they have straight sides, they are closed, and they are two-dimensional. Quadrilaterals all have 4 sides and 4 angles, and their angles total 360 degrees.

- o **DOK-1** What categories does the square belong to? It can also be considered a rhombus, rectangle, parallelogram, and quadrilateral.
- o **DOK-1** What shapes are also classified as special parallelograms? Rectangles, rhombuses, and squares are also classified as special parallelograms because they are types of parallelograms.
- o **DOK-2** If a square is always a rectangle, is a rectangle always a square? Why or why not? No. Not all rectangles have four equal sides. A square is a special type of rectangle that must have four equal sides.
- o **DOK-2** What is always true about parallelograms? They are quadrilaterals, so they are 4-sided polygons. They always have 2 sets of parallel sides, opposite sides are congruent, and opposite angles are congruent.
- o **DOK-1** Is a trapezoid a type of parallelogram? It is a quadrilateral because it has 4 sides but has only 1 pair of parallel sides. A parallelogram must have 2 pairs of parallel sides.
- o **DOK-3** How is the relationship between each category modeled in your created hierarchy? Each shape belongs to all of the categories above it on the hierarchy. It is similar to a family tree, and the shapes are related to all of the shapes above them. The shapes sometimes have the characteristics of the categories below them on a branch. The shapes never have the attributes of the shapes on different branches.

Post-Explore

- 1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.

2.	Complete the Anchor Chart as a class.	
3.	Have each student complete their Interactive Notebook.	
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Ask students to explain if square is always a rhombus (yes - it has 4 congruent sides) and if a rhombus is always a square (no - a square has 2 sets of perpendicular sides, but a rhombus does not).



Explore 3: Classify Triangles

ACTIVITY PREPARATION



Students classify triangles in a hierarchy based on their angle sizes and side lengths.

Mathematical Process Standards

- (A) Apply mathematics to problems arising in everyday life, society, and the workplace.
- **(B)** Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- **(C)** Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- (E) Create and use representations to organize, record, and communicate mathematical ideas.
- **(G)** Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Materials

Printed

- 1 Student Journal (per student)
- 1 Set of Triangle Shapes (per group)
- 1 Set of Category Headings (per group)
- 1 Triangle Classification (per teacher)
- 1 Exit Ticket (per student)

Reusable

- 1 Pair of scissors (per group)
- 1 Marker (per group)

Consumable

- 1 Glue stick (per group)
- 1 Resealable bag (per group)
- 1 Large sheet of adhesive chart paper or butcher paper (per group)
- · 1 Roll of tape (per class)

Preparation

- Plan to have students work in groups of 3–4 to complete this activity.
- · Print a Student Journal and an Exit Ticket for each student.
- Print one set of Triangle Shapes on card stock for durability for each group
 of students. Cut apart each set of cards, and place each set into a resealable
 bag.
- Print one set of Category Headings on card stock for durability for each group of students.
- For students who need more support in recalling information, please see our Angles and Geoboard Supplemental Aids elements in the Intervention section.
- **Go Digital!** Have students explore or present their solutions using virtual manipulatives! The manipulatives used in this lesson can be found in the Explore drop-down menu and can be digitally assigned to students. (Geoboard)

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PROCEDURE AND FACILITATION

Part I: Classify Types of Triangles Based on Side Lengths and Angles

- 1. Read the following scenario to the class: A local outdoor store just got a shipment of boxes containing sails for various types of sailboats. These sails are in the shape of a triangle; however, the side lengths and angles of these sails vary in size. Depending on the kind of sailboat someone owns, they may need a certain type of triangle for that sailboat. The store needs your help classifying the different types of triangles so they can organize the shelves correctly to make it easier for a sailboat owner to purchase the correct type of sail for their sailboat.
- 2. Help students access the task by using the following guiding guestions:
 - a. What do sailboats look like?
 - b. Why would the shape of the sail be important?
 - c. What do you already know about classifying two-dimensional figures based on their attributes?
- 3. Distribute to each group a bag of Triangle Shapes, a set of Category Headings, a large sheet of chart paper, a marker, a glue stick, and scissors. Give each student a Student Journal.
- 4. Instruct each group to cut out their Category Headings. Have students write the heading "Three-sided polygon" at the top of the chart paper.
- 5. Have students remove the shapes from the resealable bag and examine their attributes. Explain to the class that these shapes represent the different sails the local outdoor store received and will be selling to customers.
- 6. As a whole group, discuss students' prior knowledge about shapes and their attributes as potential classification groups. Ask the following guiding questions while students observe and think about the triangles with their groups:
 - a. DOK-1 What attributes can help us classify shapes? Number of sides, type of angles, and differing side lengths
 - **b. DOK-2** Give an example of a shape that shares an attribute with another shape. Answers will vary. A rectangle and a rhombus both have two sets of parallel sides.
 - **c. DOK-2** How can shapes look different but share similar attributes? Answers will vary. Shapes may have the same number of sides but different types of angles.
- 7. Invite student groups to look at their shapes and collaborate to determine which shapes fit the three-sided polygon attribute.
- **8. DOK-1** Challenge the students to classify the shapes by naming the group they have made. Students should notice that all the shapes they received are triangles.
- 9. Have the students write Triangles on top of "Three-sided polygon" at the top of their chart paper and then write down the numbers of all shapes that can fit in that classification category on their Student Journals.
- 10. Refer to the Triangle Classification to help you guide the students through the different classifications. Note that the classification is not meant for students.

FACILITATION TIP

Project images of sailboats to assist students in visualizing the secnario and for those who may not have personal experience with them.

FACILITATION TIP

Help students identify attributes that aren't helpful in a mathematical context for organizing shapes, such as color and texture.



Explore 3: Classify Triangles

11. Explain to the students that the local outdoor store has printed off the following labels to be placed on the shelves to help with organizing the sails: Equilateral, Isosceles, and Scalene.

- 12. Ask students to find the category headings that match these attributes and place them in a row under the Triangle on their chart paper.
- 13. Have students draw arrows from Triangle to each of the three category headings.
- 14. Challenge student groups to discuss and create groups according to the side lengths of each triangle. Students should classify the triangles by the following attributes:
 - a. Equilateral all three sides are the same length (1, 8)
 - b. Isosceles two or more sides are the same length (1, 3, 4, 6, 8)
 - c. Scalene each side is a different length (2, 5, 7)
- 15. Encourage students to analyze and discuss the descriptions given for an equilateral, isosceles, and scalene triangle to classify each triangle correctly. Ask the following guiding questions after students have shared their observations with their groups:
 - a. DOK-1 What are some of the attributes of a triangle? 3 sides, 3 angles
 - **b. DOK-1** What do you notice about the sides of the triangles you were given? Some triangles have side lengths that are all congruent or equal in length, while other triangles have two side lengths that are congruent or no side lengths that are congruent.
 - c. DOK-3 Why is it important to notice the differences between the given triangles? Answers will vary. It is important to notice differences between triangles because it shows us that even though all triangles have 3 sides and 3 angles, those 3 sides and 3 angles can have various side lengths and angles.
 - **d. DOK-2** How did you determine which triangles are equilateral, isosceles, or scalene? I analyzed each image of the triangle and examined their side lengths and the symbols on each side length to determine how many of the triangle side lengths were congruent.
 - e. DOK-2 Do any of the sails belong to multiple categories when sorting by side length? Explain. Yes, triangles 1 and 8 are classified as both isosceles and equilateral. They have three sides the same length, which makes them equilateral. They also have 2 or more equal sides, so they meet the requirements of an isosceles triangle.
 - i. Ensure students understand that an equilateral triangle is a special type of isosceles triangle where all 3 sides are equal. This can be compared to the way a square is a special type of rectangle. All equilateral triangles can also be classified as isosceles triangles. Some isosceles triangles can also be classified as equilateral triangles.
 - **f. DOK-2** Can we sort these triangles further to be more specific? Yes, we could sort by angle size next.
- 16. Have students write down the number of all the shapes that fit in that related classification subcategory on their chart paper. Students will also represent and label how they classified the triangles from their chart paper into the correct categories on their Student Journals.

FACILITATION TIP

Help students understand the difference between these words by dissecting their structures. For example, an isoceles triangle refers to one side being "isolated" by the other two who share the same length.

FACILITATION TIP

For some students, the idea of nonexclusive classfication might be frustrating and confusing. Relate this idea to the world around them. For example, a plant can be tall and produce fruit, versus some are just tall or just produce fruit.







Explore











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Intervention

17. Explain the following to the class: The local outdoor store would like you to organize the sails even further by classifying the angles of the sails. The store manager has printed off three more labels that say Acute, Right, and Obtuse.

- 18. Ask students to find the category headings that match these attributes and place each heading under the headings Equilateral, Isosceles, and Scalene on their chart paper.
- 19. Encourage the groups to discuss how a triangle can fit into more than one category based on attributes.
 - a. As a triangle moves from one category to another, encourage them to list the number of the triangle under the classification heading so they are able to see which triangles can be classified in more than one way based on their side lengths or their angles.
- 20. Challenge them to analyze and discuss the equilateral triangles.
 - a. **DOK-1** What types of angles are represented in triangle 1? Acute
 - b. DOK-1 What types of angles are represented in triangle 8? Acute
 - c. DOK-2 Is it possible to have an equilateral triangle with a right or obtuse angle? Explain. No, it is not possible because in order for a triangle to have a right or obtuse angle it would lengthen or shorten a side, which would make the sides no longer congruent.
 - **d. DOK-3** If a quadrilateral has 360 total degrees in the interior angles, what can we determine about the interior angles of a triangle? Two triangles fit in one square, so I can assume the triangle has half the amount of degrees inside. Therefore, a triangle must have 180 total degrees inside.
 - e. **DOK-2** Since a triangle has 180 degrees total in all three angles, what can we determine about each angle on an equilateral triangle? All angles will be equal; $180 \div 3 = 60$. Each angle is 60 degrees, and is acute.
- 21. Challenge students to analyze and discuss the isosceles triangles.
 - **a. DOK-1** What types of angles are represented in triangle 3? It has 1 obtuse angle and 2 acute angles. The obtuse angle makes this an obtuse isosceles triangle.
 - **b. DOK-1** What types of angles are represented in triangle 4? It has 1 right angle and 2 acute angles. The right angle makes this a right isosceles triangle.
 - **c. DOK-1** What types of angles are represented in triangle 6? All the angles are acute, which makes this an acute isosceles triangle.
 - **d. DOK-2** What observations can you make about the angles inside isosceles triangles? All of the isosceles triangles with 2 congruent sides appear to have 2 congruent angles as well.

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Use straws to mimic an attempt to create such a triangle in front of students.

Notes



Explore 3: Classify Triangles

- 22. Challenge students to analyze and discuss the scalene triangles.
 - **a. DOK-1** What types of angles are represented in triangle 2? It has 1 right angle and 2 acute angles. The right angle makes this a right scalene triangle.
 - **b. DOK-1** What types of angles are represented in triangle 5? It has 1 obtuse angle and 2 acute angles. The obtuse angle makes this an obtuse scalene triangle.
 - **c. DOK-1** What types of angles are represented in triangle 7? All the angles are acute, which makes this an acute scalene triangle.
 - **d. DOK-2** What observations can you make about the angles inside isosceles triangles? All of the scalene triangles have 3 angles that are all different sizes.
- 23. Students should discuss with their groups and help each other as they are working. Students' work should be recorded on their Student Journals.
- 24. Have the students glue each triangle in its most specific classification and draw arrows to mark where each triangle came from so students can notice that each triangle can be named by its side lengths as well as its angles.
- 25. Students may tape their chart paper around the classroom to display how they classified their triangles.
- 26. Allow each group time to answer the reflection questions on their Student Journal.

Part II: Choosing the Best Triangle

- 1. Read the following scenario to the class: Now that you have organized all the boxes of sails, it is time to complete customer orders. Three sailboat owners have requested particular requirements for the sails they need to get their sailboat up and running.
- 2. Have students read the three requests on their Student Journals and use their findings from Part I to draw a triangular sail for each sailboat. They will identify each sail type by right, acute, or obtuse and equilateral, isosceles, or scalene.
- 3. After the Explore, invite the class to a Math Chat to share their observations and learning.

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Motoc

Remind students that a triangle might fit in more than one classification.



















Intervention

Acceleratio

Math Chat

- DOK-1 What is always true about all triangles? All triangles are polygons, so they are two-dimensional with straight sides. Triangles all have 3 sides and 3 angles. They all have a total of 180 degrees in the interior angles.
- DOK-2 How can you determine whether a triangle is equilateral, isosceles, or scalene? You can determine whether a triangle is equilateral, isosceles, or scalene by identifying how many congruent sides the triangle contains.
- DOK-2 How can you determine whether a triangle is right, acute, or obtuse? You can determine whether a triangle is right, acute, or obtuse by examining all three of the angle types within a triangle. If the triangle contains only acute angles, it is an acute triangle. However, if the triangle contains one right angle but two acute angles, it is considered a right triangle. If the triangle contains one obtuse angle and two acute angles, it is considered an obtuse triangle.
- DOK-3 How can a triangle be named after two different classifications?
 A triangle can be classified by its side lengths and by its angles. When we name a triangle, its name could be equilateral, isosceles, or scalene based on the side lengths. It can also be named right, acute, or obtuse based on the angles.
- Choose a Structured Conversation routine to facilitate the following question:

DOK-3 What combinations of triangle classifications would be impossible? Why? It would be impossible for a triangle to be classified as equilateral and obtuse, or equilateral and right. Equilateral triangles will always have all acute angles.

Post-Explore

- 1. Have students complete the Exit Ticket to formatively assess their understanding of the concept.
- 2. Complete the Anchor Chart as a class.
- 3. Have each student complete their Interactive Notebook.
- 4. Return to the Hook and instruct students to use their newly acquired skills to successfully complete the activity.

FACILITATION TIP

Utilize anchor charts are a running record of classroom knowledge, which students can return to and be reminded of concepts and vocabulary throughout the unit and during future reviews.

Notes	



Additional Scope Resources



ELEMENT USE KEY • Can be assigned digitally	■ Contains printable handouts ★ Can be done independently
Picture Vocabulary A slide presentation of important vocabulary terms along with a picture and definition	Show What You Know, Part 1 Classify Polygons Independent practice assignment that gives students an opportunity to demonstrate their learning
Anchor Chart A guide to facilitating the creation of a chart with students for each scope.	Show What You Know, Part 2 Classify Quadrilaterals Independent practice assignment that gives students an opportunity to demonstrate their learning
My Math Thoughts A collection of journal prompts designed to allow students to explain their thinking and reflect on their learning	Show What You Know, Part 3 Classify Triangles Independent practice assignment that gives students an opportunity to demonstrate their learning
Interactive Notebook A cut-and-glue activity to process learning that can be added to a notebook for future reference	Language Connections Language Connections An opportunity to use linguistic and cultural background knowledge to support connections to new skills, vocabulary, and concepts at different proficiency levels and linguistic domains.
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ELABORATE ELEMENTS

ELEMENT USE KEY



Contains printable handouts

★ Can be done independently



Spiraled Review

Scout's Motto

A quick story to engage student interest along with four problems over previously learned skills.



Fluency Builder

Match Attributes to Triangles and Quadrilaterals

Independent and partner games and other activities that provide students with an engaging way to practice the new concept $\,$



Math Story

Do You Have a Pencil?

Reading passage that supports literacy and expands the students' ability to identify the information they need to solve problems



Career Connections

Fashion Designer

STEM careers come to life with these career exploration videos and student guides designed to take the learning further.



Problem-Based Task

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Independent or collaborative task that allows students to solve a challenging, meaningful problem in a real-world context



Interactive Practice

Profile Builder

A game to practice the skills established by the standards in the scope. $% \label{eq:scope} % A = \left(\frac{1}{2} \right) \left(\frac{1}{2} \left(\frac{1}{2} \right) \left($



Intervention and Assessment

STUDENT INTERVENTION



Depending on available time and your teaching style, use the resources provided in our Explain, Elaborate, Intervention, and Acceleration sections of this scope to move forward. Use the space below to organize next steps while keeping the needs of your students in mind. Some suggested resources have been listed. (Look online to see the full menu.)

	Resources	Students	Notes & Comments
Students who are still acquiring the concept and need remediation	☐ Fluency Builder ☐ Small-Group Intervention		
Students who are approaching mastery and need review	☐ Career Connections☐ Interactive Practice		
Students who have mastered the concept and need extension	□ Problem-Based Task □ Math Today □ Create Your Own		





















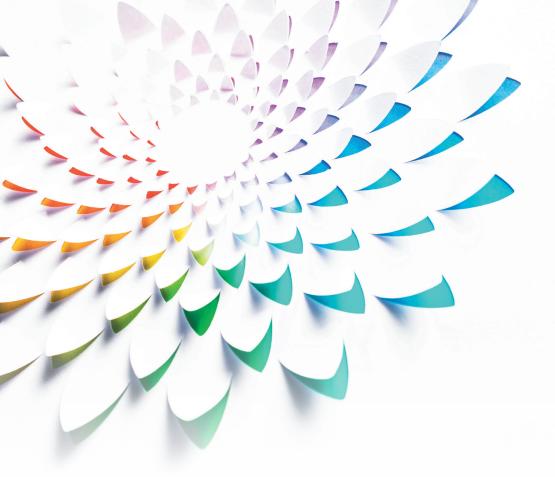
ASSESSMENT PLANNER

Evaluate Resources

- ☐ Standards-Based Assessment
- ☐ Decide and Defend
- ☐ Skills Quiz
- ☐ Technology-Enhanced Questions
- ☐ Heat Map

Use this template to decide how to assess your students for concept mastery. Depending on the format of the assessment, you can identify prompts and intended responses that would measure student mastery of the expectation. See the beginning of this scope to identify standards and grade-level expectations.

Fundamental Questions	What prompts will be used?	What does mastery look like?
I can classify two-dimensional figures in a hierarchy.		









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Our lessons and resources:

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