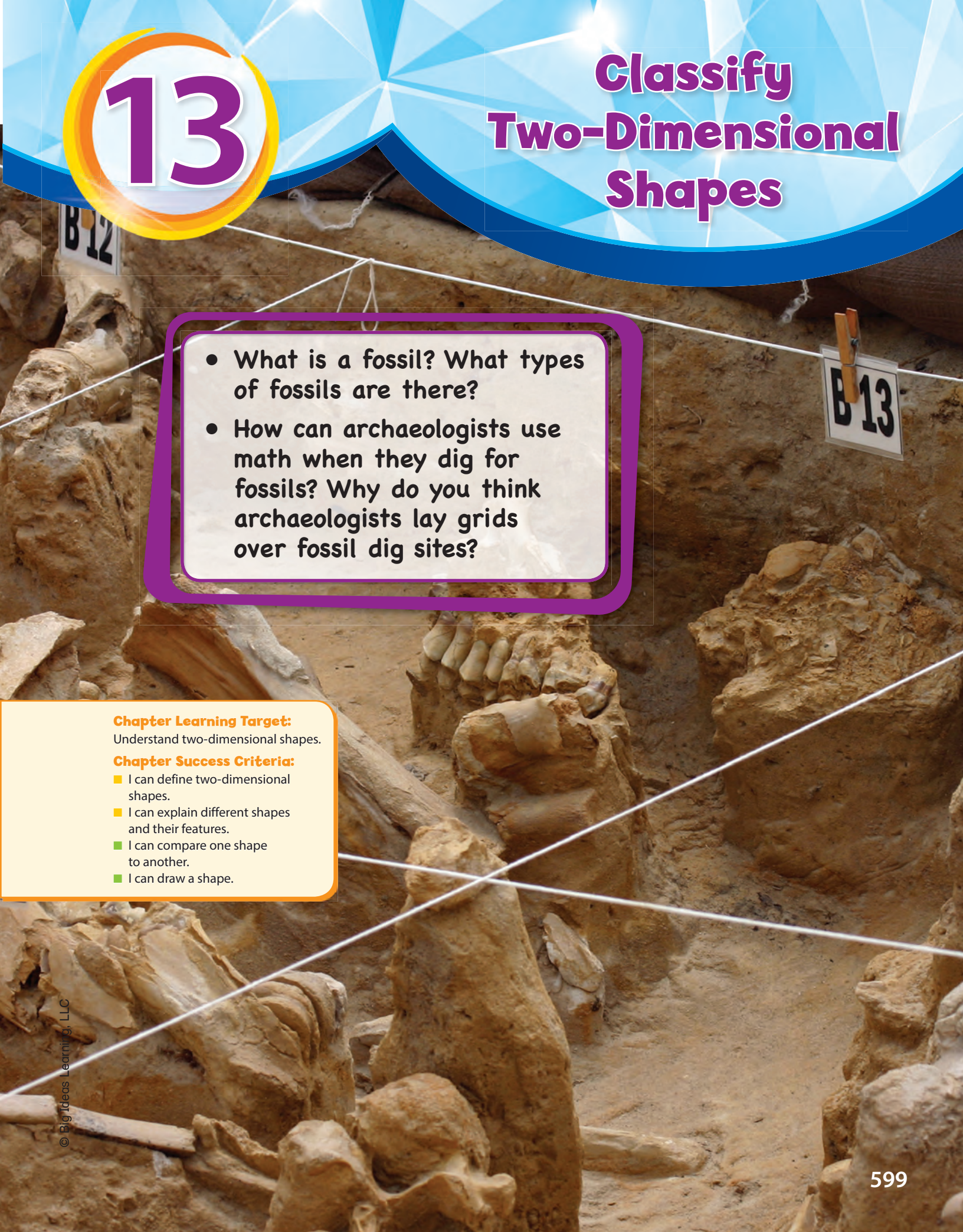
13 Classify Two-Dimensional Shapes



- What is a fossil? What types of fossils are there?
- How can archaeologists use math when they dig for fossils? Why do you think archaeologists lay grids over fossil dig sites?

Chapter Learning Target:
Understand two-dimensional shapes.

Chapter Success Criteria:
- I can define two-dimensional shapes.
- I can explain different shapes and their features.
- I can compare one shape to another.
- I can draw a shape.

Name _____

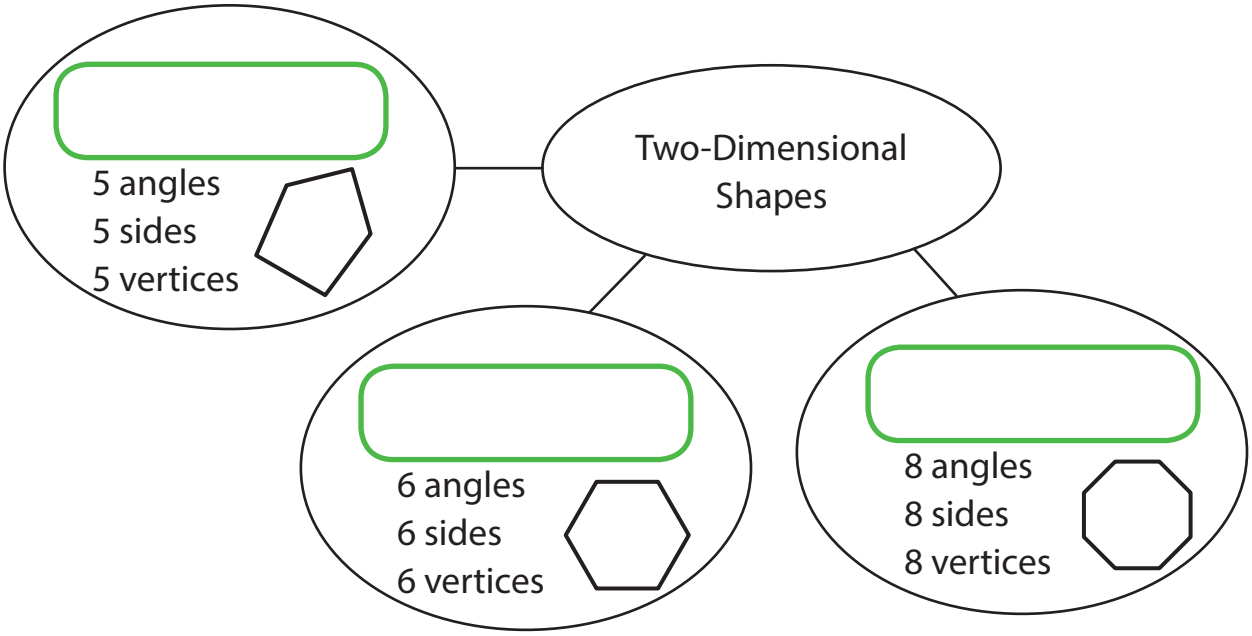
13 Vocabulary

Review Words

hexagon
octagon
pentagon

Organize It

Use the review words to complete the graphic organizer.



Define It

Use your vocabulary cards to complete the puzzle.

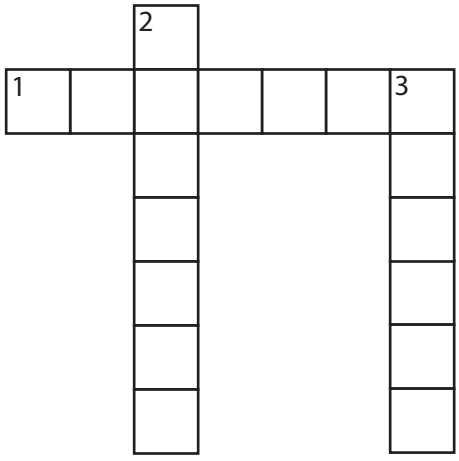
Across

1. A parallelogram with four equal sides

Down

2. A closed, two-dimensional shape with three or more sides

3. A parallelogram with four right angles and four equal sides



Chapter 13 Vocabulary Cards

angle

parallel sides

parallelogram

polygon

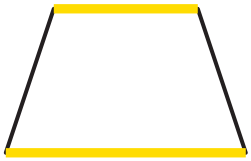
quadrilateral

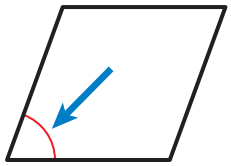
rectangle

rhombus

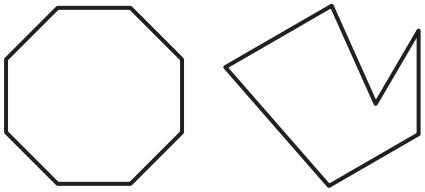
right angle

Two sides that are always the same distance apart

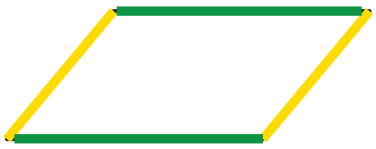




A closed, two-dimensional shape with three or more sides

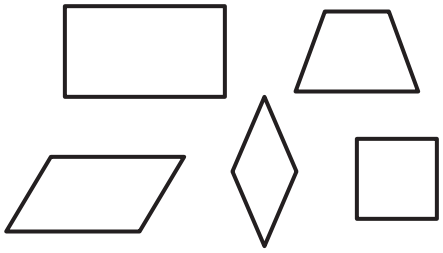


A quadrilateral with two pairs of parallel sides

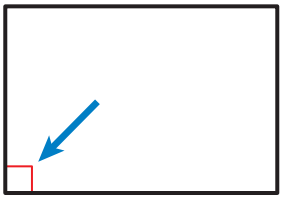


A parallelogram with four right angles

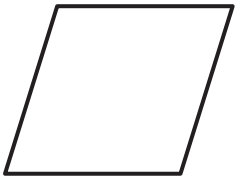
A polygon with four sides



An L-shaped angle



A parallelogram with four equal sides



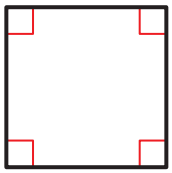
side

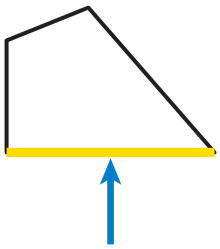
square

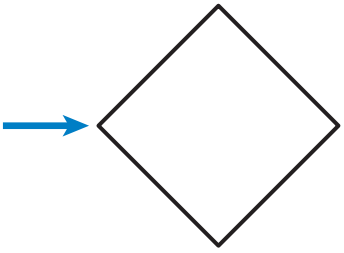
trapezoid

vertex

A parallelogram with four right angles and four equal sides







A quadrilateral with exactly one pair of parallel sides

Name _____

Identify Sides and Angles of Quadrilaterals

13.1

Learning Target: Identify parallel sides and right angles of quadrilaterals.

Success Criteria:

- I can identify when two sides of a quadrilateral are parallel.
- I can identify right angles of a quadrilateral.

Explore and Grow

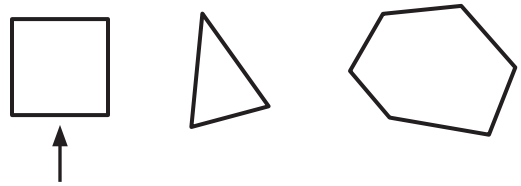
Sort the Polygon Cards.

Fewer Than 4 Sides	4 Sides	More Than 4 Sides

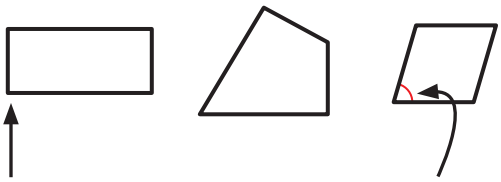
MP **Structure** Does the sort change if you sort by the number of vertices? Explain.

Think and Grow: Sides and Angles of Quadrilaterals

A **polygon** is a closed, two-dimensional shape with three or more sides.

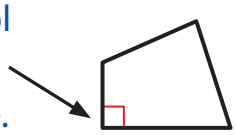


A **quadrilateral** is a polygon with four sides. Quadrilaterals have four vertices and four angles.



Quadrilaterals can have parallel sides and right angles. **Parallel sides** are two sides that are always the same distance apart. A **right angle** is an L-shaped angle.

The symbol ∟ shows a right angle.

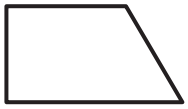


1 right angle

1 pair of parallel sides

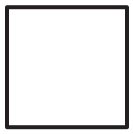
4 right angles
2 pairs of parallel sides

Example Identify the number of right angles and pairs of parallel sides.



Right angles: _____

Pairs of parallel sides: _____



Right angles: _____

Pairs of parallel sides: _____

Show and Grow

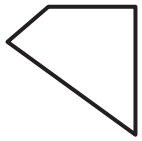
Identify the number of right angles and pairs of parallel sides.

1.

Right angles: _____

Pairs of parallel sides: _____

2.



Right angles: _____

Pairs of parallel sides: _____

Name _____

Apply and Grow: Practice

Identify the number of right angles and pairs of parallel sides.

3.

Right angles: _____

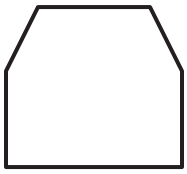
Pairs of parallel sides: _____

4.

Right angles: _____

Pairs of parallel sides: _____

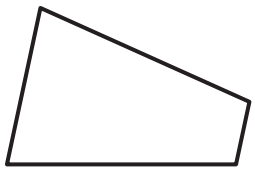
5.



Right angles: _____

Pairs of parallel sides: _____

6.



Right angles: _____

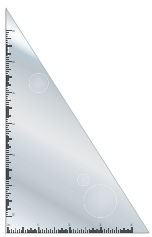
Pairs of parallel sides: _____

7.

Right angles: _____

Pairs of parallel sides: _____

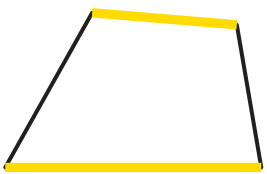
8.



Right angles: _____

Pairs of parallel sides: _____

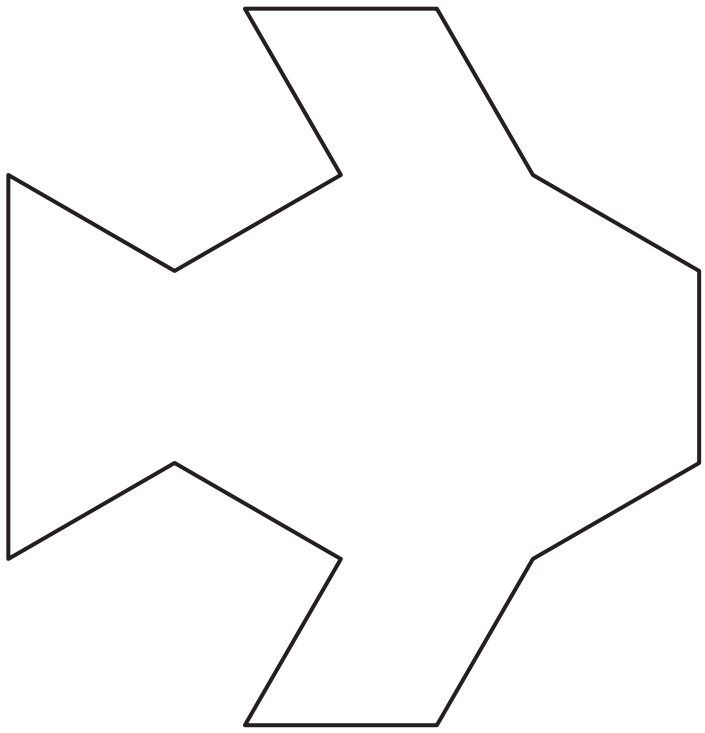
9. **YOU BE THE TEACHER** Your friend says the yellow sides are parallel. Is your friend correct? Explain.



Think and Grow: Modeling Real Life

Use quadrilateral pattern blocks to complete the puzzle.

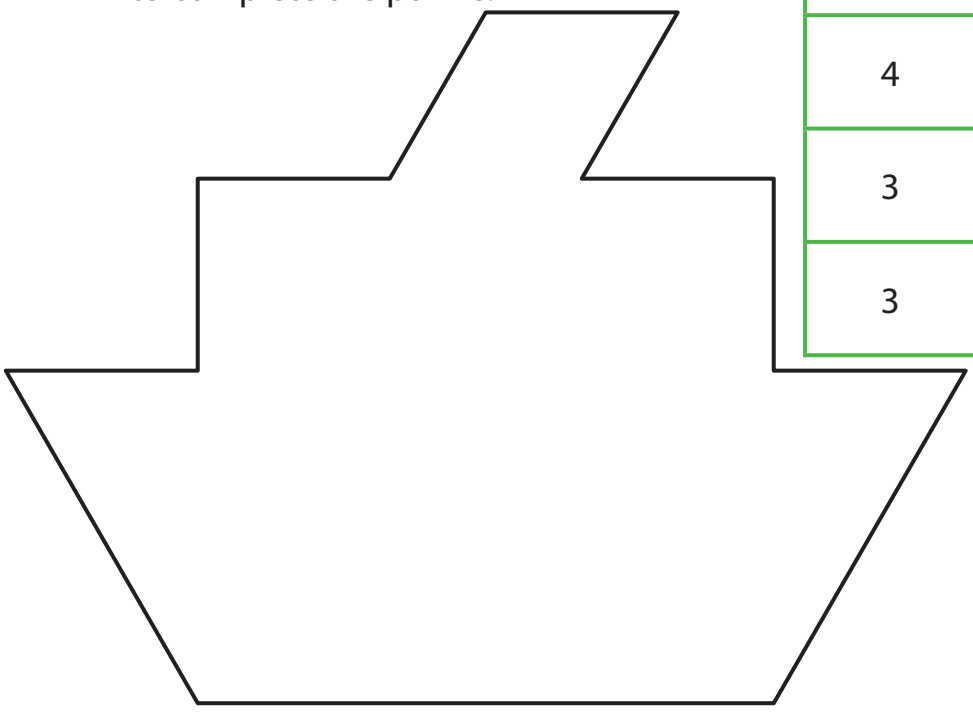
Number of Blocks	Description of Block
3	• 0 right angles • 1 pair of parallel sides
2	• 0 right angles • 2 pairs of parallel sides
2	• 4 right angles • 2 pairs of parallel sides



Show and Grow

10. Use quadrilateral pattern blocks to complete the puzzle.

Number of Blocks	Description of Block
4	• 0 right angles • 1 pair of parallel sides
3	• 0 right angles • 2 pairs of parallel sides
3	• 4 right angles • 2 pairs of parallel sides

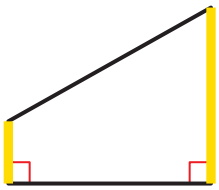


Name _____

Homework & Practice 13.1

Learning Target: Identify parallel sides and right angles of quadrilaterals.

Example Identify the number of right angles and pairs of parallel sides.

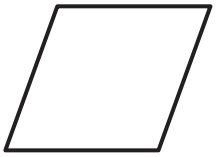


Right angles: 2

Pairs of parallel sides: 1

Identify the number of right angles and pairs of parallel sides.

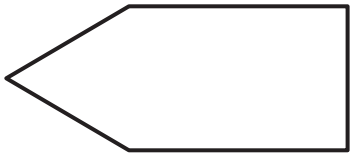
1.



Right angles: _____

Pairs of parallel sides: _____

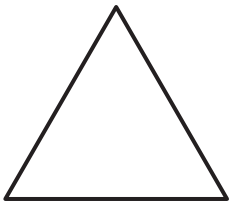
2.



Right angles: _____

Pairs of parallel sides: _____

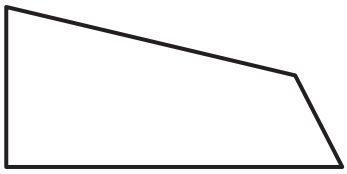
3.



Right angles: _____

Pairs of parallel sides: _____

4.



Right angles: _____

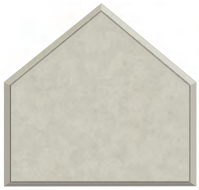
Pairs of parallel sides: _____

5.

Right angles: _____

Pairs of parallel sides: _____

6.



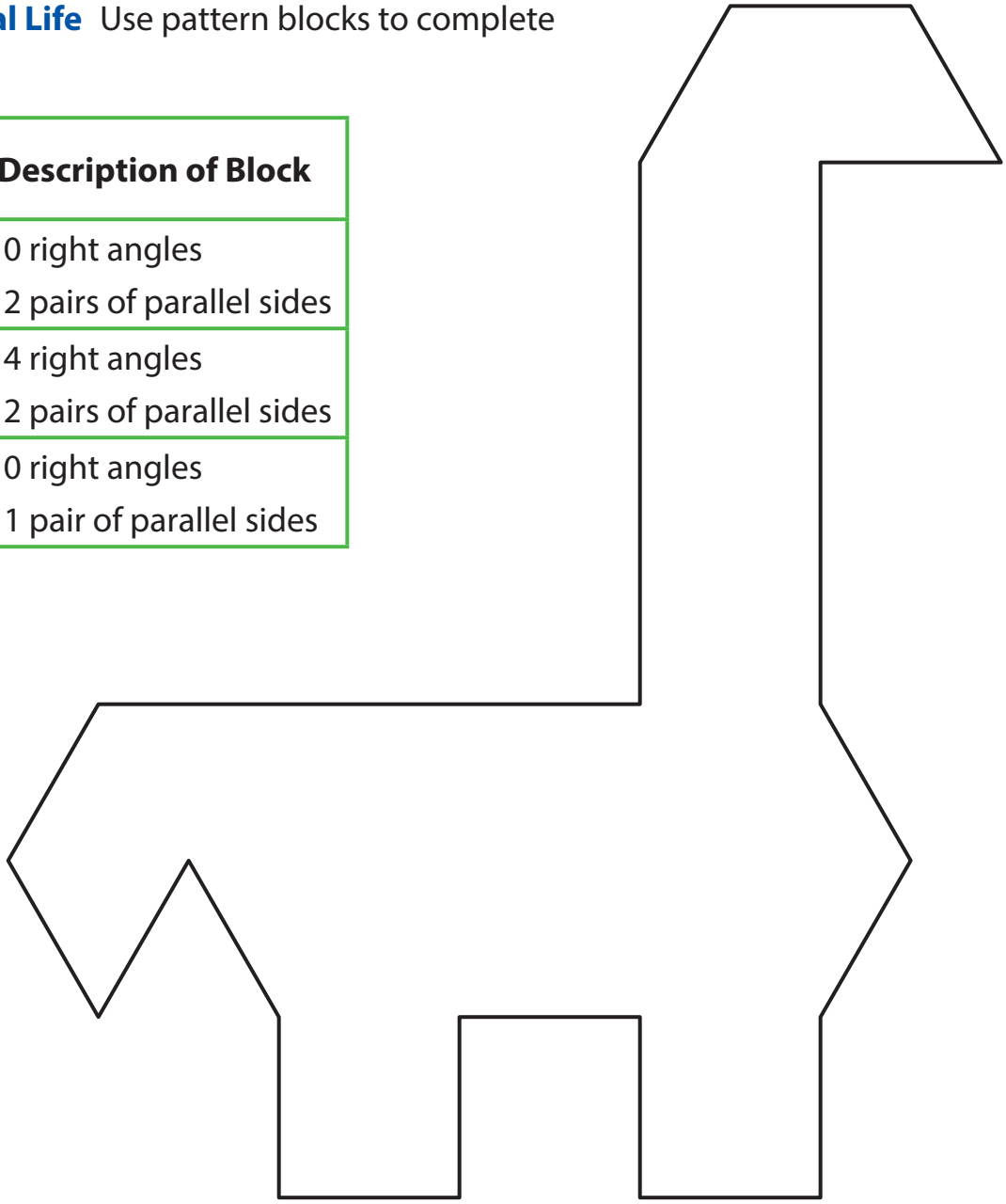
Right angles: _____

Pairs of parallel sides: _____

7. **Reasoning** Can a quadrilateral have exactly three right angles? Explain.

8. **Modeling Real Life** Use pattern blocks to complete the puzzle.

Number of Blocks	Description of Block
4	• 0 right angles • 2 pairs of parallel sides
5	• 4 right angles • 2 pairs of parallel sides
4	• 0 right angles • 1 pair of parallel sides



Review & Refresh

9. Newton has 28 cards. Descartes has 24 cards. Newton divides his cards into 4 equal stacks and gives Descartes one stack. How many cards does Descartes have now?

Name _____

Describe Quadrilaterals 13.2

Learning Target: Describe quadrilaterals using sides and angles.

Success Criteria:

- I can use sides and angles to identify a quadrilateral.
- I can explain why a quadrilateral can have more than one name.

Explore and Grow

Sort the Quadrilateral Cards.

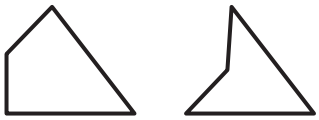
No Parallel Sides	Parallel Sides

MP **Structure** What is another way you can sort the quadrilaterals?

Think and Grow: Identify Quadrilaterals

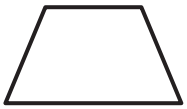
You can identify a quadrilateral using its sides and angles. A quadrilateral can have more than one name.

Quadrilateral



4 sides
4 angles

Trapezoid



exactly 1 pair of parallel sides

Parallelogram

2 pairs of parallel sides

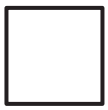
Rectangle

2 pairs of parallel sides
4 right angles

Rhombus

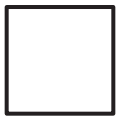
2 pairs of parallel sides
4 equal sides

Square



2 pairs of parallel sides
4 equal sides
4 right angles

Example Circle all of the names for the quadrilateral.



Pairs of parallel sides: _____

Equal sides: _____

Right angles: _____

Rhombus Square

Rectangle Parallelogram

Show and Grow

Circle all of the names for the quadrilateral.

1.

Trapezoid Rectangle

Rhombus Parallelogram

2.

Square Parallelogram

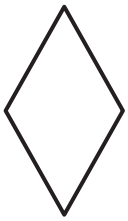
Rectangle Trapezoid

Name _____

Apply and Grow: Practice

Write all of the names for the quadrilateral.

3.



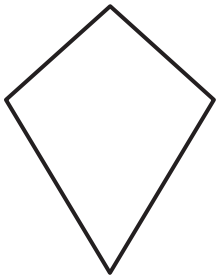
4.

Name all of the quadrilaterals that can have the given attribute.

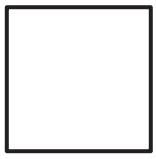
5. 2 pairs of parallel sides

6. 4 right angles

7. **Precision** Is the shape a rhombus? Explain.

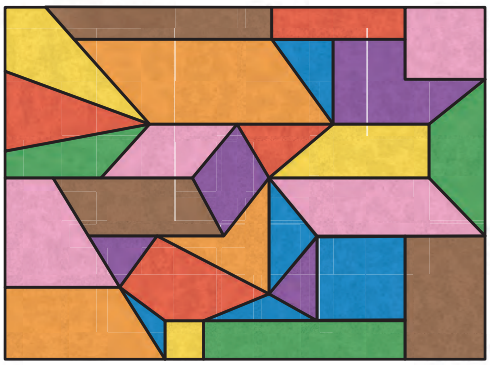


8. **YOU BE THE TEACHER** Your friend says the shape is *not* a rhombus. Is your friend correct? Explain.



Think and Grow: Modeling Real Life

Write all of the names for the red quadrilateral in the painting.



Show and Grow

Use the painting above.

9. Write all of the names for the blue quadrilateral.

10. What color is the rhombus that is *not* a square?

11. How many trapezoids are in the painting? Circle them.

12. DIG DEEPER! There are 4 squares and 8 rectangles in a floor tile pattern. Find the total number of right angles in the pattern. Explain.

Name _____

Homework & Practice 13.2

Learning Target: Describe quadrilaterals using sides and angles.

Example Circle all of the names for the quadrilateral.

Pairs of parallel sides: 2

Equal sides: 4

Right angles: 0

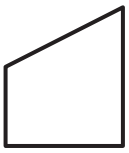
Square Trapezoid (Rhombus) Rectangle

Circle all of the names for the quadrilateral.

1. 

Rhombus Rectangle

Square Parallelogram

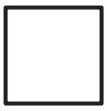
2. 

Rectangle Parallelogram

Trapezoid Rhombus

Write all of the names for the quadrilateral.

3. 

4. 

Name all of the quadrilaterals that can have the given attributes.

5. 4 sides and 4 angles

6. exactly 1 pair of parallel sides

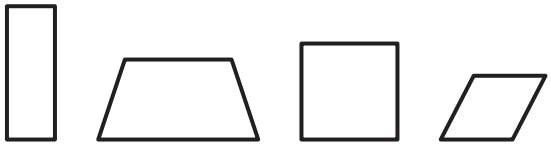
7. **Writing** Explain how a trapezoid is different from a parallelogram.

8. MP **Reasoning** Explain why the rectangle shown is *not* a square.

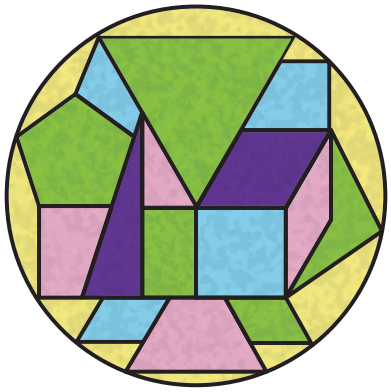
9. DIG DEEPER! What is Descartes's shape?

My quadrilateral has four right angles and two pairs of parallel sides. One pair of sides is greater in length than the other pair.

10. **Which One Doesn't Belong?** Which does *not* belong with the other three? Explain.



Modeling Real Life Use the mosaic.



11. Write all of the names for the purple quadrilateral.

_____

12. How many parallelograms are in the mosaic? Circle them.

Review & Refresh

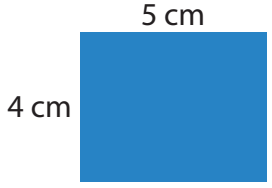
Find the area of the rectangle.

13.

_____ × _____ = _____

Area = _____

14.



_____ × _____ = _____

Area = _____

Name _____

Classify Quadrilaterals 13.3

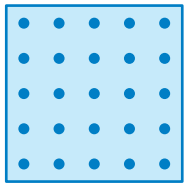
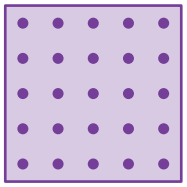
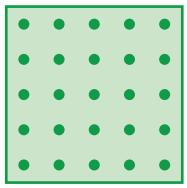
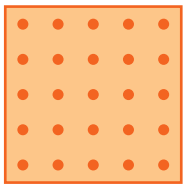
Learning Target: Classify quadrilaterals based on their attributes.

Success Criteria:

- I can tell what is alike between two groups of quadrilaterals.
- I can tell what is different between two groups of quadrilaterals.
- I can classify two types of quadrilaterals in one or more ways.

Explore and Grow

Use each description to model a quadrilateral on your geoboard. Draw each quadrilateral.

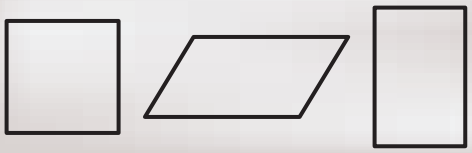
Two pairs of parallel sides 	Exactly one pair of parallel sides 
Four right angles that do *not* form a square 	Two pairs of parallel sides and no right angles 

MP **Structure** Compare your quadrilaterals to your partner's. Are your quadrilaterals the same? Are you both correct? Explain.

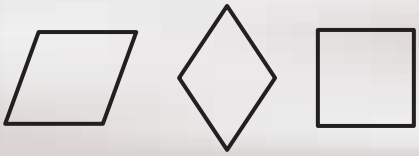
Think and Grow: Classify Quadrilaterals

Example How are the parallelograms and rhombuses alike? How are they different?

Parallelograms



Rhombuses



Ways they are alike:

Each has _____ sides.

Each has _____ angles.

Each has _____ pairs of parallel sides.

Ways they are different:

Rhombuses always have

_____ equal sides.

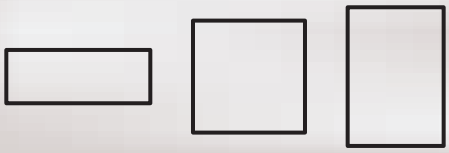
What names can you use to classify all parallelograms and rhombuses?

_____ and _____

Show and Grow

Squares

Rectangles



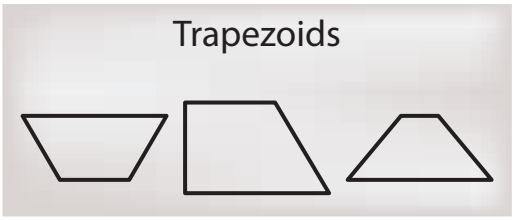
1. How are squares and rectangles alike? How are they different?

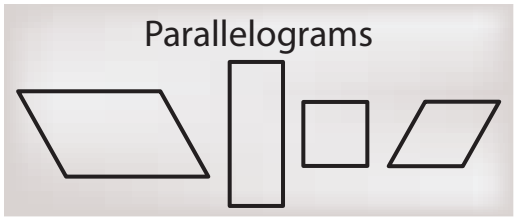
2. What names can you use to classify all squares and rectangles?

3. Draw a quadrilateral that is *not* a square or a rectangle. Explain.

Name _____

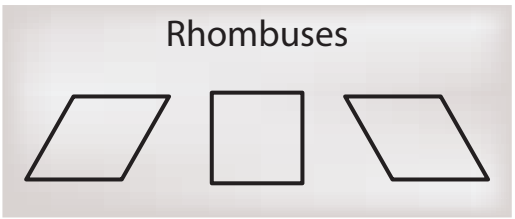
Apply and Grow: Practice

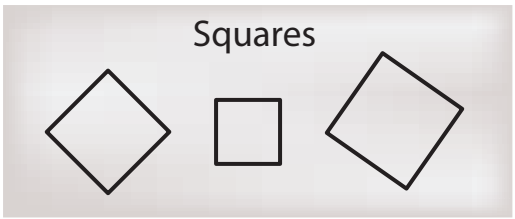




4. How are trapezoids and parallelograms alike? How are they different?

5. What name can you use to classify all trapezoids and parallelograms?





6. How are rhombuses and squares alike? How are they different?

7. What names can you use to classify all rhombuses and squares?

8. Draw a quadrilateral that is a rhombus but *not* a square.

9. Draw a quadrilateral that is *not* a rhombus or a square. Explain.

Think and Grow: Modeling Real Life

Sort the road signs into two groups by shape. What is alike and what is different between the two groups? What name can you use to classify all of the road sign shapes?

Show and Grow

10. Sort the road signs into two groups by shape. What is alike and what is different between the two groups? What names can you use to classify all of the road sign shapes?

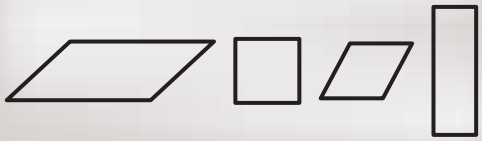
Name _____

Homework & Practice 13.3

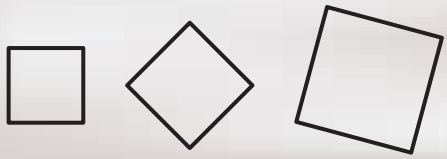
Learning Target: Classify quadrilaterals based on their attributes.

Example How are parallelograms and squares alike? How are they different?

Parallelograms



Squares



Ways they are alike:

Each has 4 sides.

Each has 4 angles.

Each has 2 pairs of parallel sides.

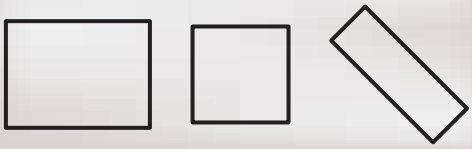
Ways they are different:

Squares always have 4 equal sides and 4 right angles.

What names can you use to classify all parallelograms and squares?

parallelograms and quadrilaterals

Rectangles



Rhombuses

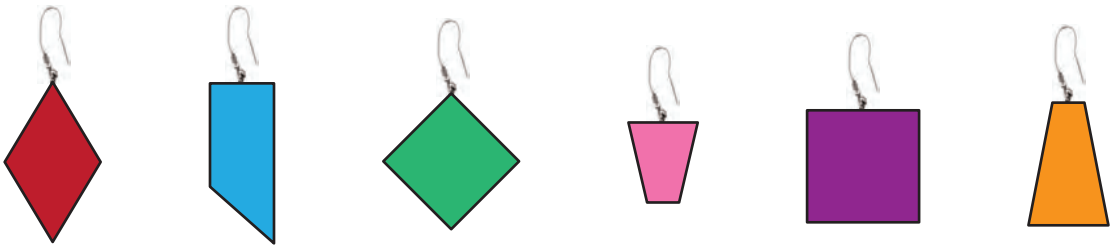
1. How are rectangles and rhombuses alike? How are they different?

2. What names can you use to classify all rectangles and rhombuses?

3. **DIG DEEPER!** Your friend says a shape is a rectangle. Newton says the same shape is a rhombus, and Descartes says it is a square. Can they all be correct? Explain.

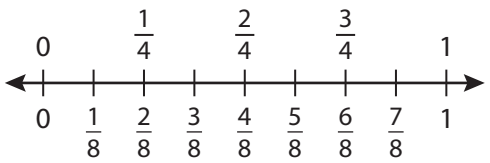
4. **YOU BE THE TEACHER** Is Newton correct? Explain.

5. **Modeling Real Life** Sort the earrings into two groups by shape. What is alike and what is different between the two groups? What name can you use to classify all of the earring shapes?



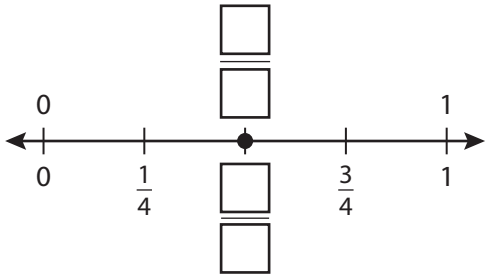
Review & Refresh

6. Use the number line to find an equivalent fraction.



$\frac{6}{8} = \frac{\square}{\square}$

7. Write two fractions that name the point shown.



$\frac{\square}{\square} = \frac{\square}{\square}$

Name _____

Draw Quadrilaterals 13.4

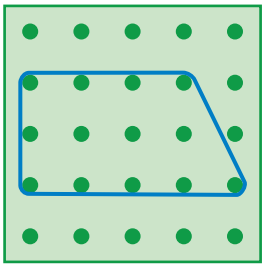
Learning Target: Draw quadrilaterals.

Success Criteria:

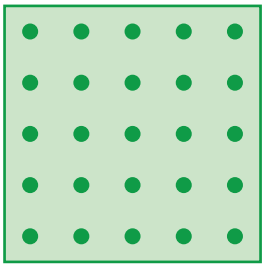
- I can draw and name a quadrilateral given a description.
- I can draw a quadrilateral that does not belong to a given group.

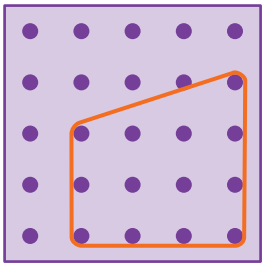
Explore and Grow

Model each quadrilateral on your geoboard. Move one vertex of each quadrilateral to create a new quadrilateral. Draw each new quadrilateral.

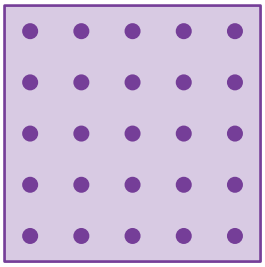


Trapezoid to Parallelogram

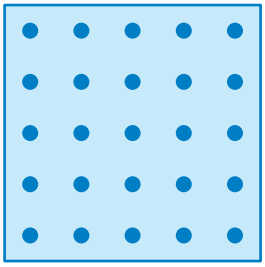


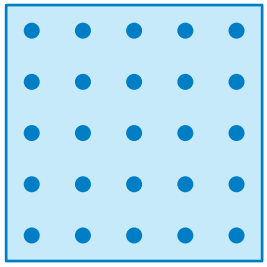


Trapezoid to Rectangle



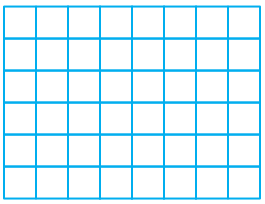
MP **Structure** Create your own quadrilateral. Move one vertex to create a new quadrilateral. Draw your quadrilaterals. Name each quadrilateral.



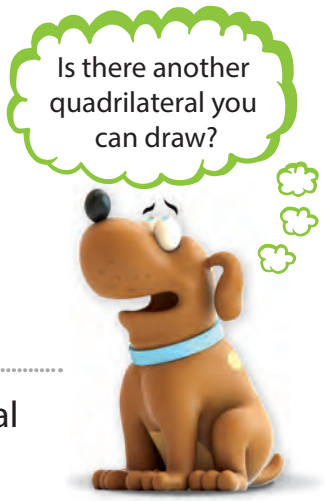


Think and Grow: Draw Quadrilaterals

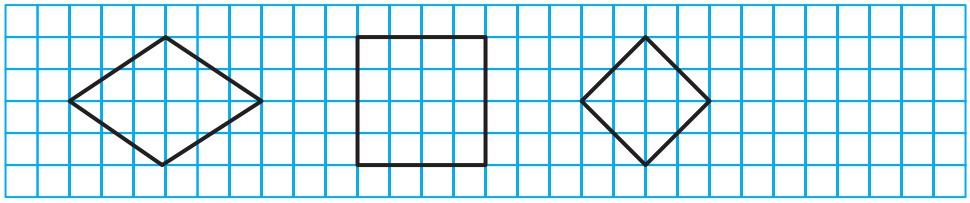
Example Draw a quadrilateral that has four right angles. Name the quadrilateral.



_____



Example Below are three rhombuses. Draw a quadrilateral that is *not* a rhombus. Explain why it is not a rhombus.

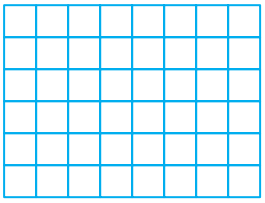


The quadrilateral is not a rhombus because _____

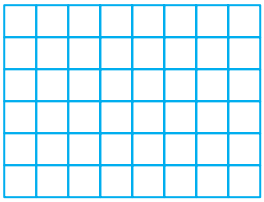
_____.

Show and Grow

1. Draw a quadrilateral that has exactly one pair of parallel sides. Name the quadrilateral.



2. Draw a quadrilateral that is *not* a square. Explain why it is not a square.

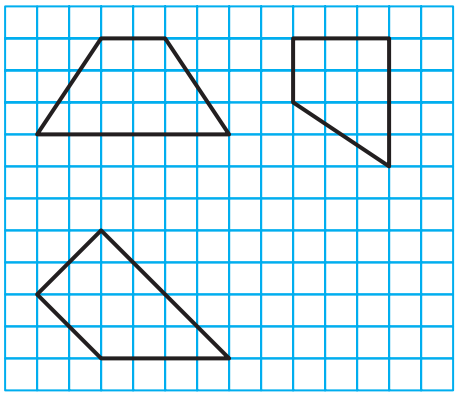


Name _____

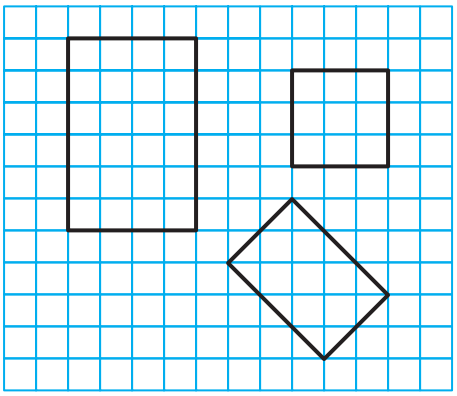
Apply and Grow: Practice

Name the group of quadrilaterals. Then draw a quadrilateral that does *not* belong in the group. Explain why it does not belong.

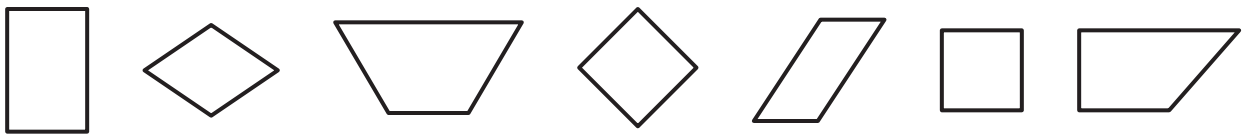
3.



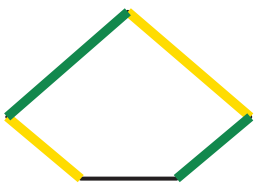
4.



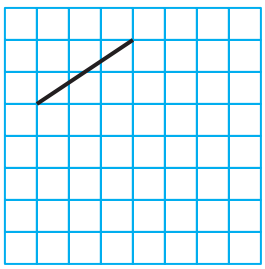
5. MP **Precision** Circle the quadrilaterals that are *not* rhombuses.



6. YOU BE THE TEACHER Your friend draws the shape and says it is a parallelogram because it has two pairs of parallel sides. Is your friend correct? Explain.

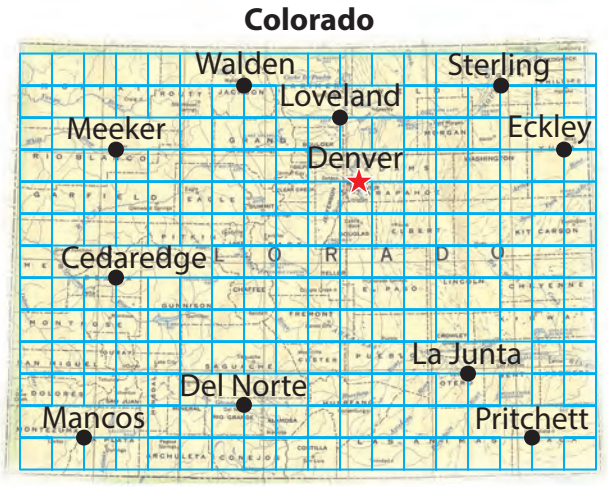


7. DIG DEEPER! Draw a quadrilateral with two pairs of parallel sides. One side is given.



Think and Grow: Modeling Real Life

A helicopter travels to various Colorado cities. Draw to show a route that forms a parallelogram. Write the names of the cities you use.



Show and Grow

8. Use the map above. Draw to show a route that forms a trapezoid. Write the names of the cities you use.

9. You have four markers of equal length. Name all of the quadrilaterals you can make using the markers as sides.

10. DIG DEEPER! Use a ruler to draw a trapezoid for each description.

- one side length of 1 inch
- one side length of 2 inches
- two right angles

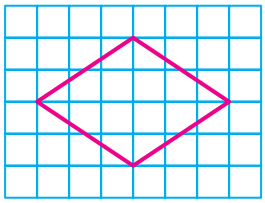
- one side length of 1 inch
- one side length of 2 inches
- no right angles

Name _____

Homework & Practice 13.4

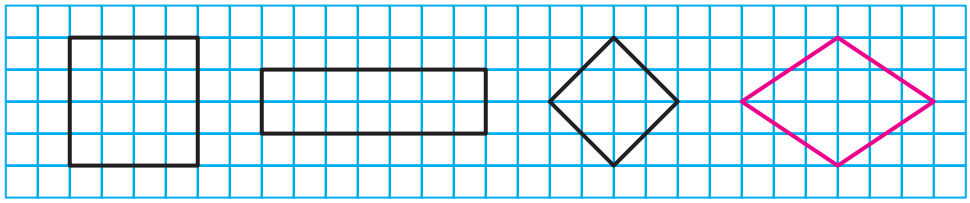
Learning Target: Draw quadrilaterals.

Example Draw a quadrilateral that has four equal sides. Name the quadrilateral.



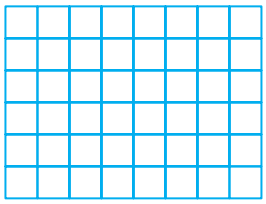
rhombus

Example Below are three rectangles. Draw a quadrilateral that is *not* a rectangle. Explain why it is not a rectangle.

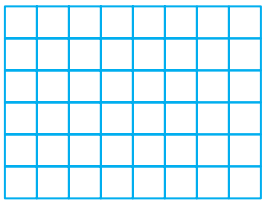


The quadrilateral is *not* a rectangle because it does not have four right angles.

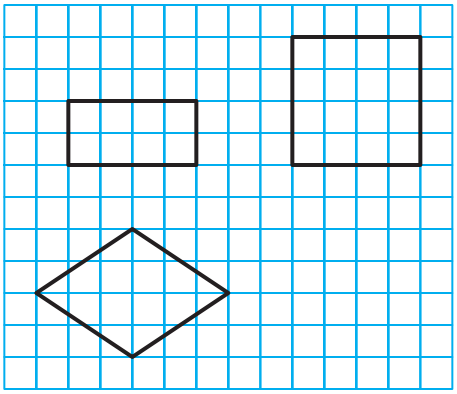
1. Draw a quadrilateral that has two pairs of parallel sides. Name the quadrilateral.



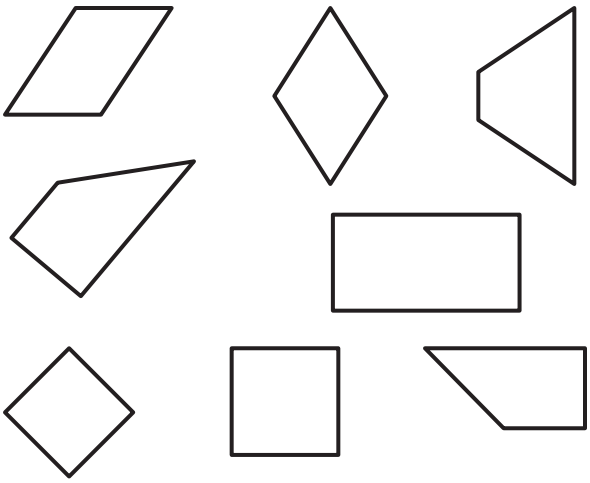
2. Draw a quadrilateral that is *not* a rhombus. Explain why it is not a rhombus.



3. Name the group of quadrilaterals. Then draw a quadrilateral that does *not* belong in the group. Explain why it does not belong.



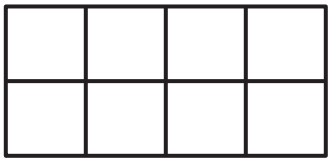
4. **Precision** Circle the quadrilaterals that are *not* trapezoids.



5. **Modeling Real Life** A bus tour wants to travel to various locations. Draw to show a route that forms a rectangle. Write the names of the location drop-off points you use.

Review & Refresh

6. Tell whether the shape shows equal parts or unequal parts. If the shape shows equal parts, then name them.



_____ parts _____

Name _____

Performance Task 13

Your class is learning about fossils.

1. Your teacher wants to create cards using the fossils below. Use each polygon description to write the fossil name on the correct card.

A polygon with $4 + 1$ sides

Dragonfly

A rhombus with 4×1 right angles

Starfish

A quadrilateral with only 1 right angle

Leaf

A quadrilateral with $8 \div 2$ right angles and $8 \div 4$ pairs of parallel sides

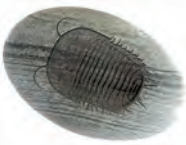
Fish

A rhombus with 4×0 right angles

Shell

A polygon with 2×1 pairs of parallel sides and *not* a rhombus

Trilobite

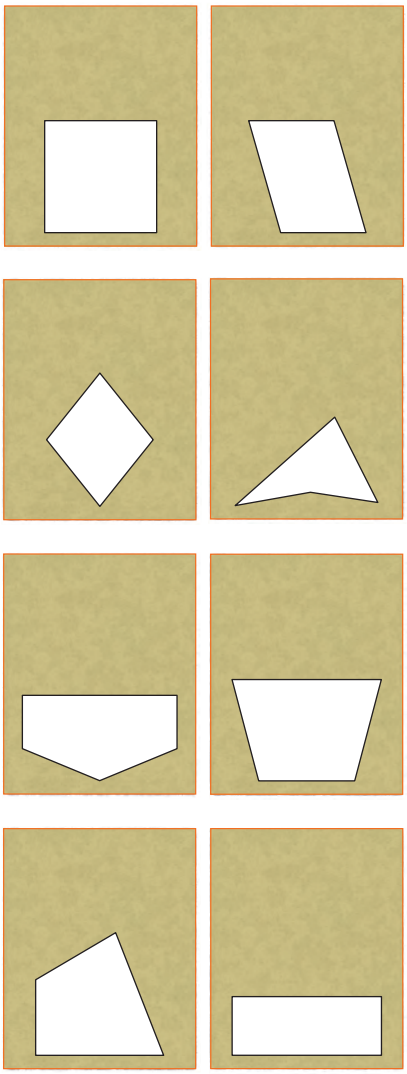


A quadrilateral with exactly 1 pair of parallel sides

Skull

A quadrilateral with $4 - 4$ right angles and 4×0 pairs of parallel sides

Bone

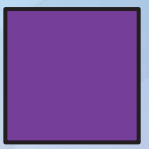
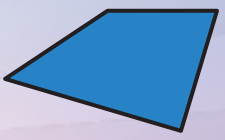
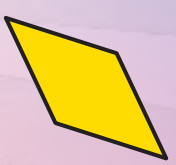
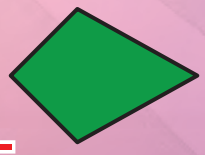


2. Your teacher uses the cards and a sandbox to create an archaeological dig site. Your teacher lays a grid with eight grid squares over the top of the sandbox. Each square has 10-inch side lengths. What is the area of the bottom of the sandbox?

Identify That Quadrilateral!

Directions:

1. Players take turns rolling a die.
2. On your turn, move your piece the number of spaces shown on the die.
3. Cover a space on the board that describes the shape where you landed.
4. If there are no spaces that match your shape, then you lose your turn.
5. The first player to cover six spaces wins!

START 				
	• 2 pairs of parallel sides • 4 equal sides • 4 right angles	rectangle	• 2 pairs of parallel sides	
	trapezoid	• 4 sides • 4 angles	square	
	parallelogram	rhombus	• exactly 1 pair of parallel sides	
	• 2 pairs of parallel sides • 4 equal sides	quadrilateral	• 2 pairs of parallel sides • 4 right angles	
				

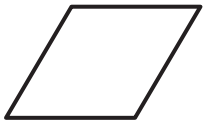
Name _____

Chapter Practice 13

13.1 Identify Sides and Angles of Quadrilaterals

Identify the number of right angles and pairs of parallel sides.

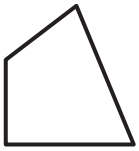
1.



Right angles: _____

Pairs of parallel sides: _____

2.



Right angles: _____

Pairs of parallel sides: _____

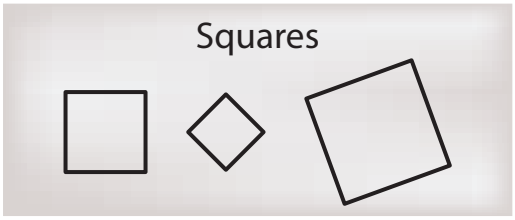
3. **YOU BE THE TEACHER** Your friend says the yellow sides are parallel. Is your friend correct? Explain.

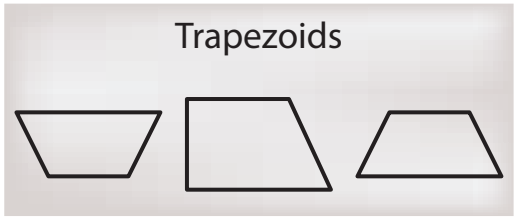
13.2 Describe Quadrilaterals

4. Write all of the names for the quadrilateral.

5. Name all of the quadrilaterals that can have no right angles.

13.3 Classify Quadrilaterals



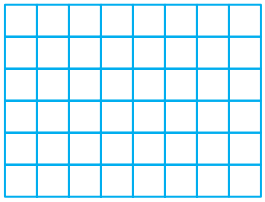


6. How are squares and trapezoids alike? How are they different?

7. What name can you use to classify all squares and trapezoids?

13.4 Draw Quadrilaterals

8. Draw a quadrilateral that has four right angles. Name the quadrilateral.



9. **Modeling Real Life** A helicopter travels to various locations in Wyoming. Draw to show a route that forms a square. Write the names of the locations you use.