



**THIRD SPACE  
LEARNING**

# Math Intervention Pack

Reasoning with shapes and  
their attributes

**Grade 3**

## How To Use This Resource

### 1. Title Slide

Use this slide to activate prior knowledge needed for lesson. Students should be encouraged to initially attempt the question presented independently.

### 2. Let's Learn

Use this slide to introduce the concept. Tutors should work with the student to explore the concept together, usually using diagrams to support understanding.

### 3. Follow Me + Your Turn

The tutor should work through the follow me slide, modeling the process and explaining their thinking out loud.

Students should use the your turn slide as an opportunity to work through a question similar to the follow me questions. They should apply the method modeled by the tutor in the follow me slide. Students should be encouraged to explain their thinking out loud.

### 4. You Do

Students should work through a range of questions that build in complexity.

Tutors can offer support but students should initially be encouraged to attempt these questions independently.

### 5. Go Further

Use this slide to allow students to apply their understanding to a more challenging question in an unfamiliar context.

### 6. Support for Slides

The support slide is used to support students during the lesson. In the tutor notes, there will be guidance as to when to use the support slide.

### 7. Check Your Understanding

Tutors should use this slide to assess the student's knowledge and whether or not they have mastered the concept within the lesson.

## Standard

**3.G.1** - Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

## Key Mathematical Ideas

1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category
2. Recognize rhombuses, rectangles, and squares as examples of quadrilaterals
3. Draw examples of quadrilaterals that do not belong to any of these subcategories

## Overview

### Terminology

- **Attributes:** The characteristics or properties of a shape or an object
- **Classify:** Put things into groups (classes) based on a property
- **Compare:** To identify similarities or differences among numbers or objects
- **Congruent:** Equal in size and shape
- **Geometry:** A branch of mathematics that deals with shapes, sizes, angles, and dimensions of objects
- **Kite:** A quadrilateral that has two adjacent pairs of sides that are equal in length, and at least one pair of opposite angles are equal.
- **Parallel lines:** Lines with no common points and always the same distance apart.
- **Parallelogram:** A quadrilateral with 2 pairs of parallel sides. Its opposite sides and angle are equal in size
- **Polygon:** A many-sided shape
- **Quadrilateral:** A closed shape with 4 sides
- **Rhombus:** A parallelogram with congruent sides. Opposite sides are equal in size.
- **Right angle:** An angle that measures exactly ninety degrees
- **Trapezoid:** A quadrilateral with one set of parallel sides
- **Two-dimensional shape:** A flat shape with two dimensions; circle, square, triangle, rectangle, hexagon, trapezoid, quadrilateral, rhombus, parallelogram

### Sentence Stems:

- This shape classifies as a \_\_\_\_\_.
- The attributes of this shape are \_\_\_\_\_.



## Overview

### Common Misconceptions

Common Misconceptions	Tutoring Strategies	Checks for Understanding
Students may not understand the hierarchical relationship between different quadrilaterals.	Ask students what the shape classifies as based on its properties.	Example: This shape has 4 sides... that means it classifies as what shape?
Students might overlook or misunderstand the properties of different quadrilaterals, such as the opposite sides being parallel in parallelograms or the presence of a pair of parallel sides in trapezoids.	Point out the other properties within each shape throughout the lesson - highlight, circle, mark, etc.	What other properties does this shape have?

## Title Slide

### If students...

- get the question correct:
  - start at You do
- get the question incorrect::
  - start at Let's Learn

## Let's Learn

### If stuck

- Point out and count each side and angle with the student.

### Questions

- What do all 6 shapes shown have in common? [They all have 4 sides.]
- Any shape with 4 sides is called a what? [Quadrilateral]
- Any shape with 2 pairs of parallel sides is called a what? [Parallelogram]
- Can a shape have more than 1 name? Why or why not? [Yes, some shapes can have enough attributes to classify as more than one shape. For example, a rectangle is a quadrilateral because it has four sides and it is also a parallelogram because it has two pairs of parallel sides.]

### Watch out for

- Students thinking a shape can only be referred to by 1 name.

## Follow Me

### Modeling prompts

- First, discuss how to determine if a shape is a quadrilateral (it must have 4 sides.)
- Go through each shape and say aloud if it does or does not have 4 sides.
- Think aloud as you draw a shape that is a quadrilateral and a parallelogram (example: I know the shape must have 4 sides and it also must have two pairs of parallel sides.)

## Your Turn

### If stuck

- Review properties of quadrilaterals and parallelograms with student.

### Questions

- A: How do you know which shapes are/are not parallelograms? [Any shapes that have 2 pairs of parallel sides are parallelograms/any shapes that do not have 2 pairs of parallel sides are not parallelograms.]

*Note: for part B, encourage students to draw a shape that is NOT shown in part A. (If they do, ask them to draw another shape.)*

- B: How do you know that the shape you drew is NOT a quadrilateral? [It does not have 4 sides.]
- How do you know it is NOT a parallelogram? [It does not have 2 pairs of parallel sides.]
- What other shapes could you draw? [Students can name any shape that does not have 4 sides and 2 pairs of parallel sides.]

### Watch out for

- Students missing some of the properties for each shape.

## You Do

### If stuck

- Go through the shapes one by one. Ask students - can this be classified as a quadrilateral? Discuss why it can or can not. If it can, students will add that to the list. If not, move onto the next shape name and repeat. Review properties of each shape as needed.
- Use the Support slide to view the quadrilateral hierarchy.

### Questions

- What do all four shapes have in common? [They are all quadrilaterals because they all have 4 sides.]
- Which shape did you write the most names for? Why? [The 3rd shape, the rectangle, because it classifies as a quadrilateral, a parallelogram, and a rectangle.]

### Watch out for

- Students missing some of the classifications.

## Go Further

### If stuck

- Have students list the properties of each shape and compare them.

### Questions

- Why can a square be called a rectangle? [Because the shape of a square includes all of the necessary attributes required to classify as a rectangle - 4 sides, 2 pairs of parallel sides, 4 right angles, and its opposite sides are equal.]
- Why can't a rectangle be called a square? [A rectangle has most of the same attributes as a square, but a rectangle does NOT have 4 equal sides, so it can not classify as a square.]

### Watch out for

- Students misunderstanding the question
- Students misunderstanding how the shared properties make a square a rectangle but a rectangle not a square.

## Support for Slide(s): Any (especially helpful for You Do)

### If stuck

- Use this to help students see which shapes can classify as other shapes.

### Questions

- How does this help us understand how to classify certain quadrilaterals? [If you find a specific shape on the hierarchy, you can see that it classifies as all of the shapes above it.]

## Assessment Question

### Correct answer:

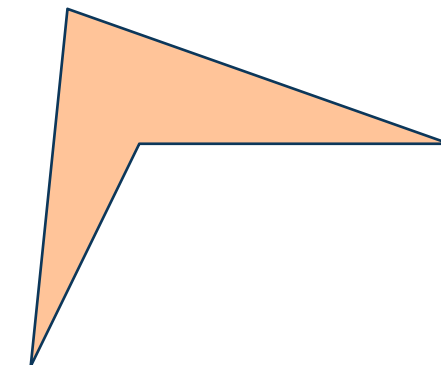
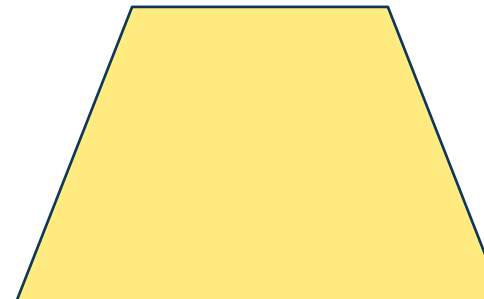
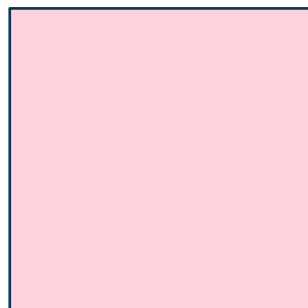
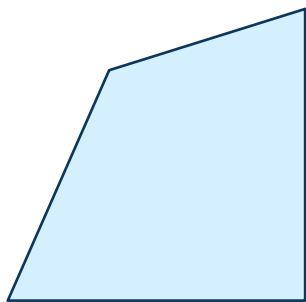
They are both correct.

Today you will learn about

# Reasoning with shapes and their attributes

Warm up question

What do all of these shapes have in common?



Let's learn

A **quadrilateral** is a two-dimensional shape with four sides. Let's look at examples of quadrilaterals and their **attributes**.

Parallelogram



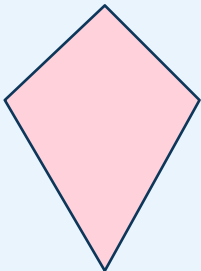
- 4 sides
- 2 pairs of parallel sides

Trapezoid



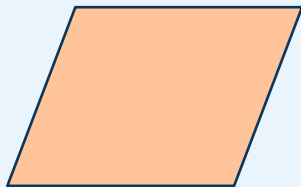
- 4 sides
- 1 pair of parallel sides

Kite



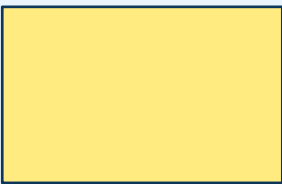
- 4 sides
- 1 pair of parallel sides
- 2 pairs of adjacent equal sides

Rhombus



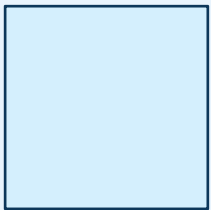
- 4 sides
- 2 pairs of parallel sides
- 4 equal sides

Rectangle



- 4 sides
- 2 pairs of parallel sides
- opposite sides are equal
- 4 right angles

Square



- 4 sides
- 2 pairs of parallel sides
- 4 equal sides
- 4 right angles

Shapes can be classified as another shape if they share all of its attributes.

a Since all of the shapes have 4 sides, they can all be classified as a

.....

b Which shapes have 4 sides and 2 pairs of parallel sides?

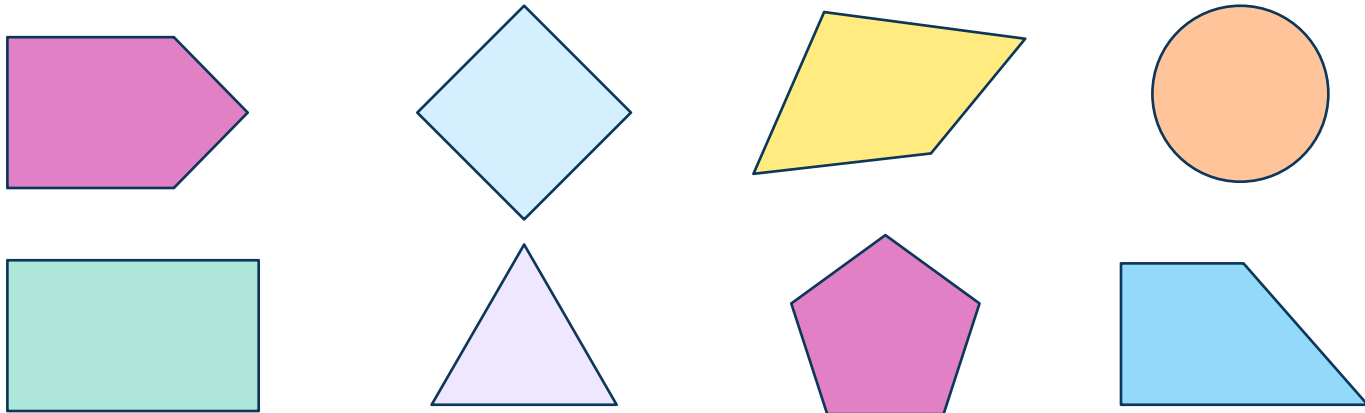
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These shapes can all be classified as a **parallelogram**.

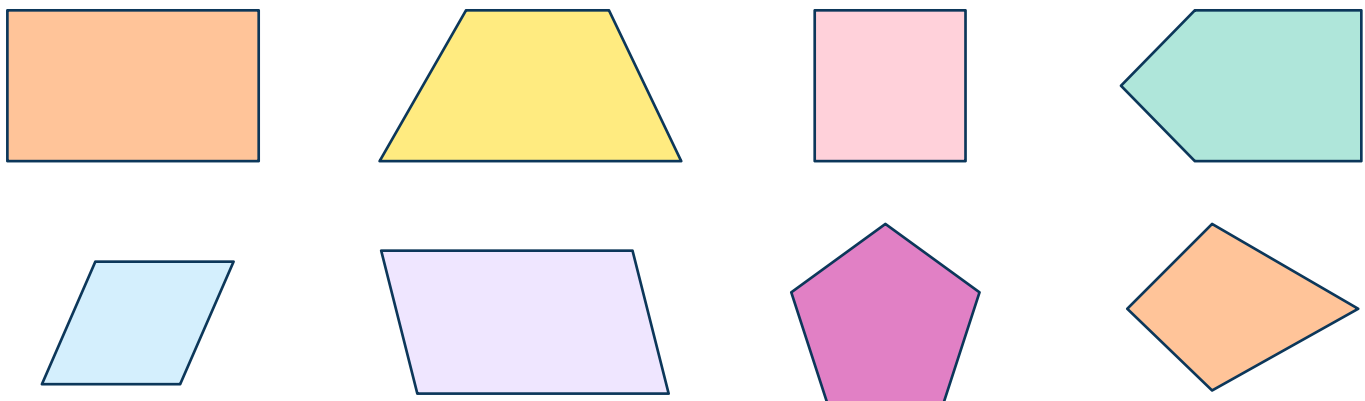
## Follow me

Let's look at properties of shapes to determine if they belong to each category.

a Circle the quadrilaterals.



b Circle the parallelograms.



## Your turn

a Draw a shape that is a quadrilateral and a parallelogram.

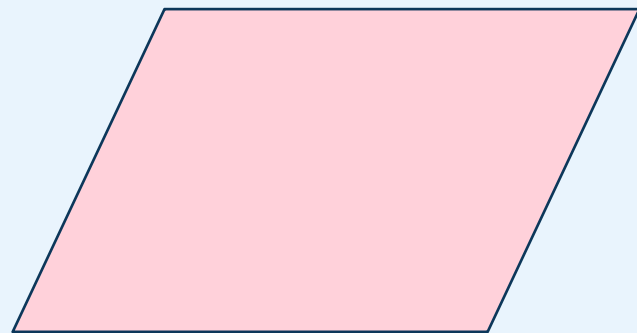
b Draw a shape that is neither a quadrilateral nor a parallelogram.



# You do

Label each shape using the following shape names: quadrilateral, parallelogram, rectangle, trapezoid, rhombus, kite, square

Note: Each shape may be labeled with more than one name.

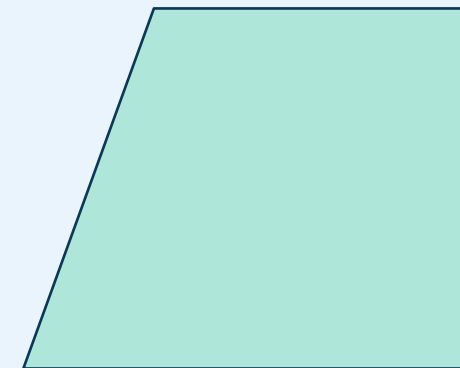


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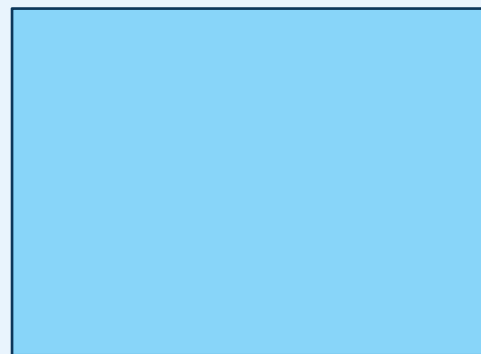


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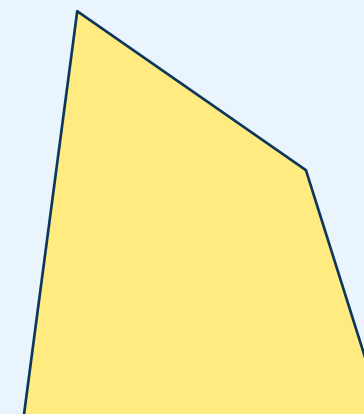


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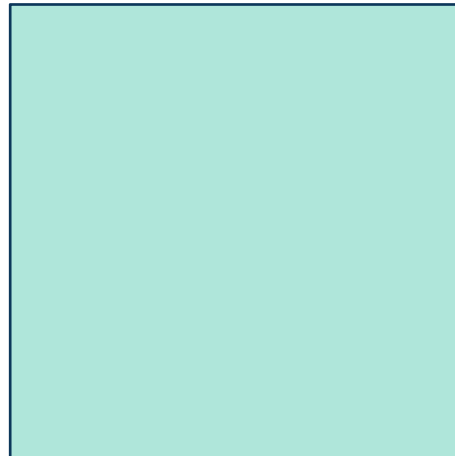
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## Go further

True or false:

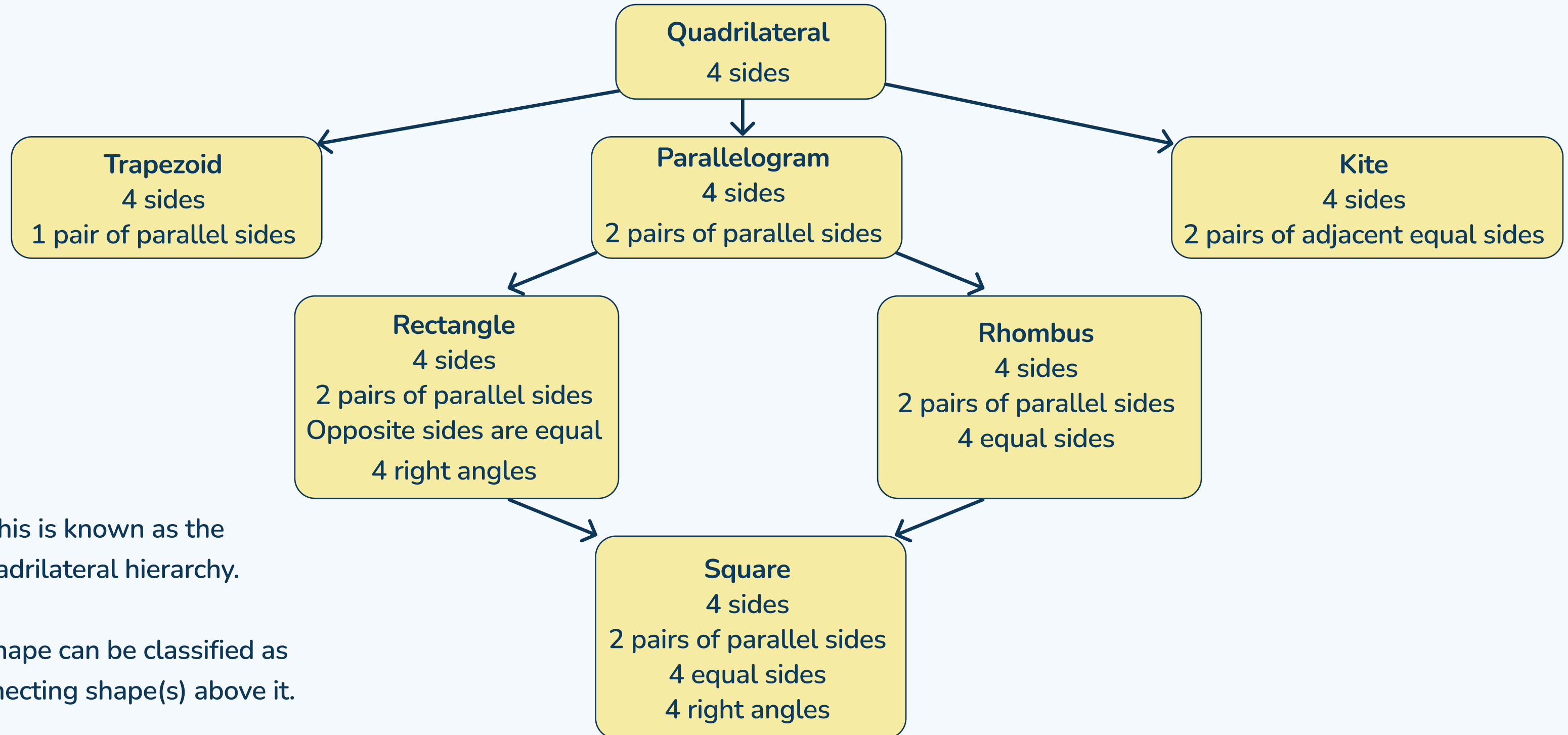
A square is a rectangle, but a rectangle is not a square.

Explain.



# Support

Let's look at these problems with visuals.



This is known as the quadrilateral hierarchy.

Each shape can be classified as the connecting shape(s) above it.

## Check your understanding



Ariel says this shape is a quadrilateral because it has 4 sides.  
Brady says its a parallelogram because it has two pairs of parallel sides.  
Who is correct?



Why do I need to try this question  
on my own first?

- To show your tutor what you understand
- To give you more practice
- To show your teacher how you are doing



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Michelle Craig, Instructional Coach,  
Sherwood Forest Elementary, Washington

## Speak to us

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-  (929) 298-4593
-  [hello@thirdspacelearning.com](mailto:hello@thirdspacelearning.com)



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