

Grade 5 · Classifying Two-Dimensional Figures

· Lesson

Common Core 5.G.B.3, 5.G.B.4 · mathovore.fr

Two-dimensional figures are classified by their attributes: sides, parallel lines, and angles. Attributes of a category belong to every shape in its subcategories, so every square is a rectangle, every rectangle is a parallelogram, and every equilateral triangle is isosceles. Name a shape by its most specific category.

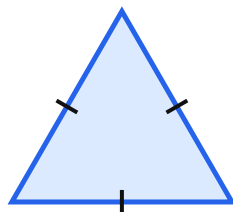
Grade 5 Common Core: 5.G.B.3 · 5.G.B.4

Key facts:

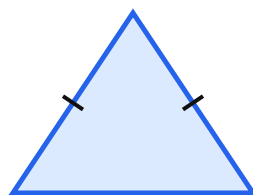
- Triangles are classified by sides (equilateral, isosceles, scalene) and by angles (acute, right, obtuse).
- A parallelogram has both pairs of opposite sides parallel; a trapezoid has at least one pair.
- A rectangle is a parallelogram with four right angles, and a rhombus is a parallelogram with four equal sides.
- A square is both a rectangle and a rhombus, so it has every attribute of both.
- Attributes of a category belong to all shapes in its subcategories.

How do you classify triangles?

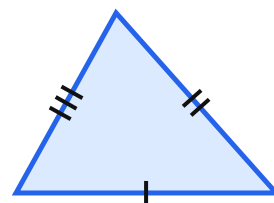
Triangles are sorted in two ways. By **sides**: an equilateral triangle has 3 equal sides, an isosceles triangle has at least 2 equal sides, and a scalene triangle has no equal sides. By **angles**: an acute triangle has three angles less than 90° , a right triangle has one angle of exactly 90° , and an obtuse triangle has one angle greater than 90° .



Equilateral

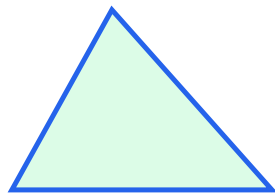


Isosceles

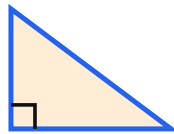


Scalene

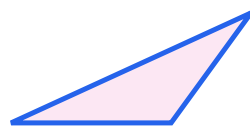
Matching tick marks show equal sides.



Acute



Right



Obtuse

Acute: all angles less than 90 degrees. Right: one 90 degree angle. Obtuse: one angle greater than 90 degrees.

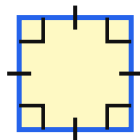
Category and subcategory

A **category** is a group of shapes that share certain attributes. A **subcategory** has all of those attributes plus more. Every equilateral triangle is also isosceles, because 3 equal sides include 2 equal sides.

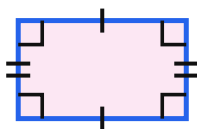
How do you classify quadrilaterals?

A **quadrilateral** is a closed shape with 4 straight sides. Look at three attributes: pairs of parallel sides, equal sides, and right angles.

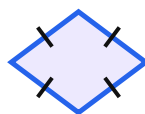
Shape	Defining attributes
Trapezoid	At least one pair of parallel sides
Parallelogram	Both pairs of opposite sides parallel
Rectangle	A parallelogram with 4 right angles
Rhombus	A parallelogram with 4 equal sides
Square	4 equal sides and 4 right angles



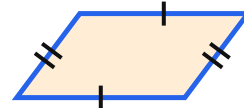
Square



Rectangle

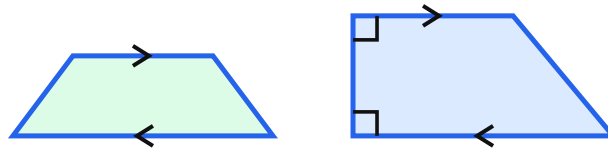


Rhombus



Parallelogram

Tick marks show equal sides. Small squares show right angles.



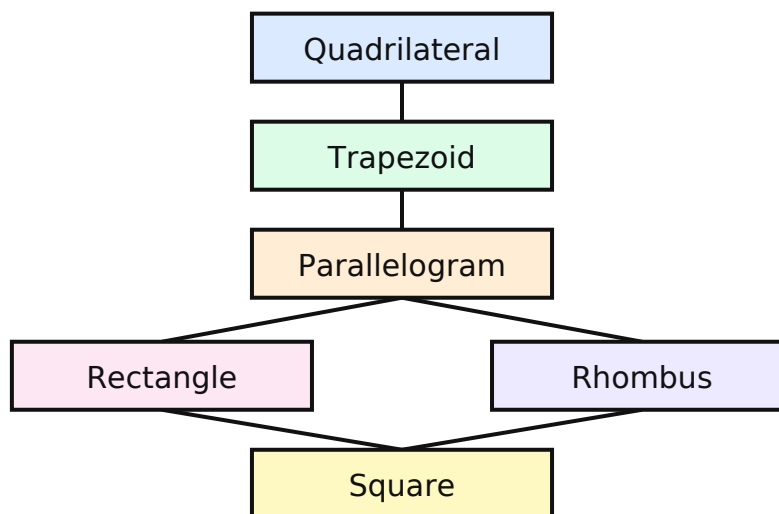
Trapezoid

Right trapezoid

Arrows mark parallel sides. A trapezoid has at least one pair.

How does the hierarchy of two-dimensional figures work?

Read the diagram from top to bottom. Every shape inherits all the attributes of the boxes above it. Opposite sides of a parallelogram are parallel, so rectangles, rhombuses, and squares all have parallel opposite sides. A square sits at the bottom because it is both a rectangle and a rhombus. Because a trapezoid needs only one pair of parallel sides, every parallelogram is also a trapezoid.



Each shape is a special kind of the shape above it.

How do you name a quadrilateral?

1. Count the sides to confirm it is a quadrilateral.
2. Count the pairs of parallel sides.
3. Check for four equal sides.
4. Check for right angles.
5. Give the most specific name that fits.

Example. A shape has 4 sides, both pairs of opposite sides parallel, all sides 5 inches long, and no right angles. It is a parallelogram with 4 equal sides, so it is a **rhombus**. It is not a square, because it has no right angles.

Classifying Two-Dimensional Figures: frequently asked questions

Is a square a rectangle?

Yes. A rectangle is a parallelogram with four right angles, and a square has four right angles. A square is also a rhombus because its four sides are equal.

Is every rectangle a square?

No. A square needs four equal sides. A rectangle that is 6 inches by 2 inches has four right angles but unequal sides, so it is not a square.

What is the difference between a trapezoid and a parallelogram?

A trapezoid has at least one pair of parallel sides. A parallelogram has two pairs of parallel sides, so every parallelogram is also a trapezoid in the Common Core definition.

Can a triangle be both isosceles and right?

Yes. A triangle with a 90° angle and two equal sides is both right and isosceles. Sides and angles are two separate ways to classify.

What does most specific name mean?

It is the name lowest on the hierarchy diagram that still fits the shape. A figure with four equal sides and four right angles can be called a rectangle, but square is the most specific name.