

Shapes and Equal Shares: math lesson, Grade 1 – download the PDF

Look around you. A ball, a soup can, a box, a slice of pizza: everything has a shape! In this chapter you will learn the names of flat shapes and solid shapes, find out what makes each one special, build new shapes, and share things into equal parts called halves and fourths.

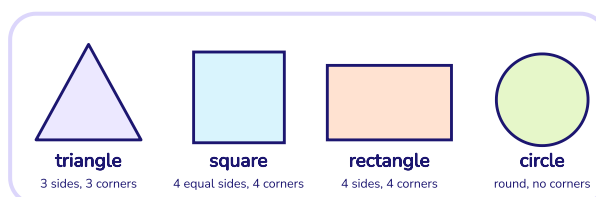
1. Flat shapes and solid shapes

Some shapes are **flat**. You can draw them on paper. They are called **two-dimensional shapes**, or **2-D shapes**. Other shapes are **solid**. You can hold them in your hand. They are called **three-dimensional shapes**, or **3-D shapes**.

A drawing of a circle on a page is flat. A ball is a solid shape. They look alike, but they have different names: a **circle** and a **sphere**.

2. Defining attributes of flat shapes

An **attribute** is something you can notice about a shape. To tell flat shapes apart, we look at two attributes: the number of **sides** and the number of **corners**. A side is a straight edge. A corner is a point where two sides meet.



D Definition: the four flat shapes

A **triangle** has 3 sides and 3 corners. A **square** has 4 sides that are all the same length and 4 square corners. A **rectangle** has 4 sides and 4 square corners, and its sides across from each other are the same length. A **circle** is perfectly round: it has no straight sides and no corners.

Shape	Sides	Corners
triangle	3	3
square	4	4
rectangle	4	4
circle	0	0

Careful!

A square is a special kind of rectangle, but when you name a shape with four equal sides, say **square**. A shape does not change its name when you turn it. A triangle that points down is still a triangle.

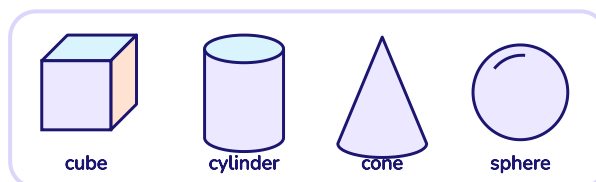
E**Example 1: mystery shape**

I have 4 straight sides. Two sides are long and two sides are short. All my corners are square. What am I?

Four sides and four corners means a square or a rectangle. My sides are not all equal, so I am a **rectangle**.

3. Naming solid shapes

Solid shapes have **faces**. A flat face is a flat surface you can lay on a table. A curved surface is rounded.



- A **cube** has 6 flat faces. Every face is a square. A number die is a cube.
- A **cylinder** has 2 flat faces that are circles, and 1 curved surface. A soup can is a cylinder.
- A **cone** has 1 flat face that is a circle, 1 curved surface, and a point on top. A party hat is a cone.
- A **sphere** has no flat face. It is round all over. A basketball is a sphere.

!**Zyro's tip**

On my home planet, we test a solid by pushing it. If it rolls in every direction, it is a sphere. If it only slides, it has flat faces everywhere, like a cube!

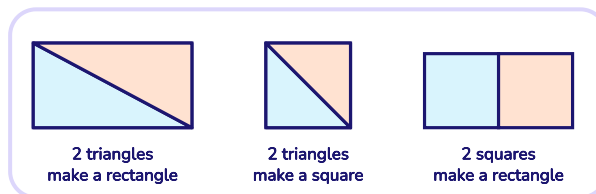
E**Example 2: which solid?**

A can of beans has two flat circles, one on the top and one on the bottom, and a curved side. Which solid is it?

Two circle faces and one curved surface describe a **cylinder**.

4. Composing flat shapes

To **compose** shapes means to put shapes together to make a new shape. When you slide two shapes together with no gaps and no overlaps, you can get a brand new shape.

**M****Method: make a new shape**

1. Pick the shapes you want to use.
2. Slide them together so that sides touch, with no gaps and no overlaps.
3. Look at the new shape. Count its sides and its corners.
4. Name it.

E**Example 3: composing**

You put 2 squares of the same size side by side. How many sides does the new shape have, and what is its name?

The new shape is long and has 4 sides and 4 square corners. It is a **rectangle**.

You can also put small shapes together to make a bigger shape of the same kind. Four small squares can make one big square!

5. Building with solid shapes

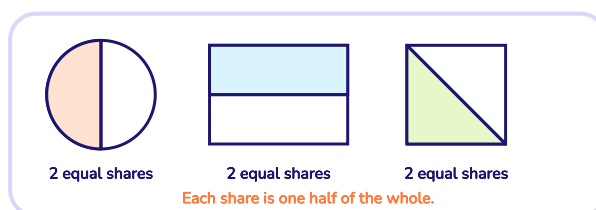
You can build towers, houses, and bridges with solid shapes. Some solids are good for building:

- Cubes stack neatly because their faces are flat and square.
- Cylinders stack when they stand on a flat circle face.
- A cone makes a good roof on top of a cylinder.
- A sphere rolls away, so it is hard to stack. It is best on top of a cup shape.

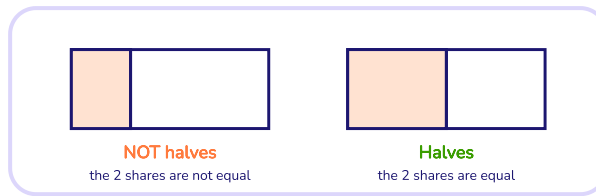
You can also build a new solid by putting solids together. A cone on top of a cylinder looks like a rocket!

6. Equal shares: halves

To **partition** a shape means to cut it into parts called **shares**. Shares are **equal** when every share has exactly the same size. When you cut a whole into **2 equal shares**, each share is called a **half**. Two halves make the whole.



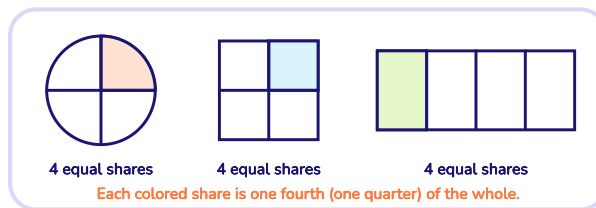
You can cut a shape into halves in different ways, but the two shares must always match. If one share is bigger than the other, they are not halves.



When you split a group, the same rule works. If you share 10 crackers equally between 2 friends, each friend gets 5 crackers.

7. Equal shares: fourths and quarters

When you cut a whole into **4 equal shares**, each share is called a **fourth**, or a **quarter**. These two words mean the same thing. Four fourths make the whole.



Later you will see these numbers written as fractions: one half is written $\frac{1}{2}$ and one fourth is written $\frac{1}{4}$. For now, just say the words.

P More shares means smaller shares

If you cut the same whole into more equal shares, each share is smaller. A fourth of a sandwich is smaller than a half of the same sandwich.



Example 4: sharing

12 grapes are shared equally by 4 children. How many grapes does each child get?

Each child gets one fourth of the grapes. Make 4 equal groups of 3:

$3 + 3 + 3 + 3 = 12$. Each child gets **3 grapes**.



Careful!

Shares must be equal. Four pieces of different sizes are not fourths. Always check that the pieces match before you say half or fourth.

8. Talking about shares

Here are good sentences to use:

- “The pizza is cut into 4 equal shares.”
- “This share is one fourth of the pizza.”
- “Two of the four shares are colored. That is two fourths, so it is the same as one half.”
- “Four fourths make one whole pizza.”

Key takeaways

- Flat shapes: a triangle has 3 sides and 3 corners, a square has 4 equal sides and 4 corners, a rectangle has 4 sides and 4 square corners, a circle is round with no corners.
- Solid shapes: a cube has 6 square faces, a cylinder has 2 circle faces, a cone has 1 circle face and a point, a sphere has no flat face.
- Composing means putting shapes together to make a new shape, with no gaps and no overlaps.
- Equal shares have exactly the same size. 2 equal shares are halves. 4 equal shares are fourths, or quarters.
- 2 halves make a whole and 4 fourths make a whole. More equal shares means smaller shares.



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