

2D and 3D Shapes: math lesson, Kindergarten – download the PDF

Look around you right now. A clock, a door, a ball, a box of crayons: everything has a shape! In this chapter you will learn the names of flat shapes and solid shapes, count their sides and corners, and use words like above and below to tell where things are.

1. Shapes are everywhere

A shape tells us what something looks like. Windows, pizza slices, cans and balls all have shapes. When you can name a shape, you can talk about the world in a new way.

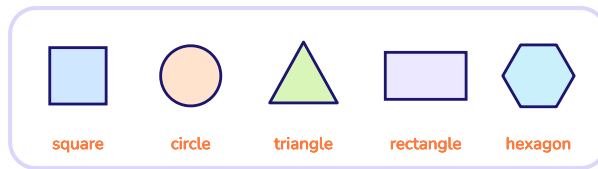
There are two big families of shapes. **Flat shapes** lie on paper, like a drawing. **Solid shapes** are things you can hold, like a ball or a block. Flat shapes are also called *2D shapes* and solid shapes are called *3D shapes*.

2. The flat shapes

D Flat shapes

A flat shape is drawn on a surface. You can trace it, but you cannot pick it up. We call it a 2D shape.

Here are five flat shapes. Say each name out loud.



A **square** has four sides that are all the same length. A **rectangle** also has four sides, but two sides are long and two sides are short. A **triangle** has three straight sides. A **hexagon** has six straight sides. A **circle** is perfectly round: it has no straight sides at all.

E Example 1: Name the shape

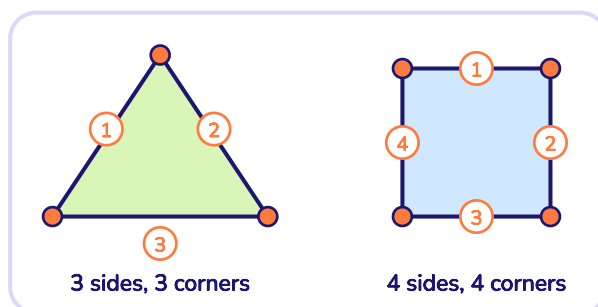
A slice of pizza looks like a shape with three straight sides. It is a **triangle**. A dinner plate is perfectly round, so it looks like a **circle**. A cell in a honeycomb has six sides, so it is a **hexagon**.

3. Sides and corners

D Sides and corners

A **side** is a straight line that is part of a shape. A **corner** is the pointy place where two sides meet.

To count, point to each side with your finger and say a number. Start at one corner and go around the shape. Do not count a side twice!



Shape	Sides	Corners
triangle	3	3
square	4	4
rectangle	4	4
hexagon	6	6
circle	0	0

P Good to know

For these flat shapes, the number of sides is the same as the number of corners. A circle has no corners and no straight sides, because it is curved all the way around.

M How to count the sides of a shape

1. Put a small dot on one corner. This is your starting point.
2. Touch the first side and say “one”.
3. Move along the shape, touching each side and counting on: two, three, four, and so on.
4. Stop when you are back at the dot. The last number you said is the number of sides.

E**Example 2: Count the corners**

Look at a book cover. It has four straight sides: two long and two short. It also has four corners. So the cover is a **rectangle**, and **4** sides and **4** corners match.

4. The solid shapes**D****Solid shapes**

A solid shape takes up space. You can pick it up, turn it, and look at it from many sides. We call it a 3D shape.

Here are four solid shapes you can find at home and at school.

**cube****cone****cylinder****sphere**

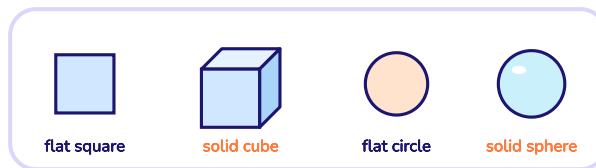
A **cube** looks like a die (the kind you roll in a game) or a building block. It has **6** flat faces, and every face is a square. A **cone** looks like a party hat or an ice cream cone: it has one flat round face and one pointy tip. A **cylinder** looks like a soup can: it has two flat round faces, one on top and one on the bottom. A **sphere** looks like a ball. It is round all the way around and has no flat faces.

**Be careful!**

A ball is not a circle. A circle is flat, like a drawing. A ball is a sphere, and it is solid. The same is true for a box and a square: the box is a cube or another solid, and the square is flat.

5. Flat or solid?

Some flat shapes hide inside solid shapes. If you press a block into clay, the flat face leaves a print. A cube leaves a square. The bottom of a can leaves a circle.



M How to tell flat from solid

1. Ask yourself: "Can I pick it up and hold it?"
2. If yes, it is a **solid** shape. If it is only a drawing, it is a **flat** shape.
3. Solid shapes can roll, slide, or stack. Flat shapes just lie on the page.

E Example 3: Flat or solid?

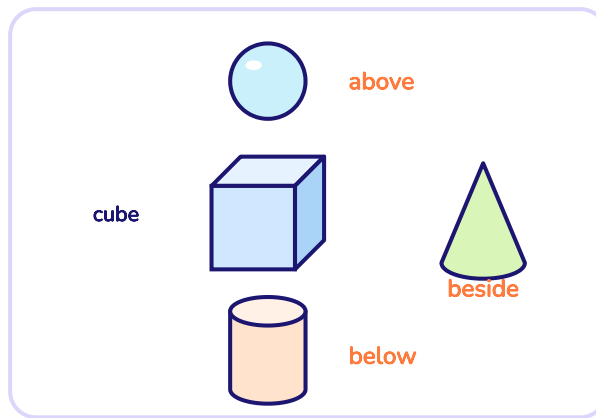
A paper card cut in the shape of a star is flat. A basketball is solid, and its name is **sphere**. A can of beans is solid, and its name is **cylinder**. The picture of a circle in your notebook is flat.

! Zyro's tip

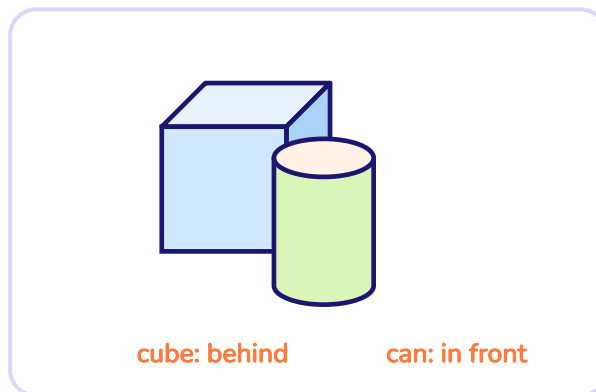
On my planet we use a simple trick: if it can roll, it has a round part. Balls and cans roll, but a cube does not roll easily because its faces are flat. Try it with your own blocks!

6. Where is it? Position words

Position words tell us where one thing is compared with another. These words are important: **above**, **below**, **beside**, **next to**, **in front of** and **behind**.



In the picture, the ball is **above** the box because it is higher up. The can is **below** the box because it is lower down. The cone is **beside** the box, or **next to** the box, because it stands at its side.



Now look at the cube and the can. The can is **in front of** the cube because it is closer to you. The cube is **behind** the can because it is farther away.

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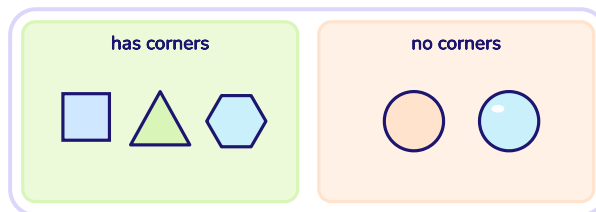
Example 4: Tell where it is

Your teddy bear sits on the top shelf and your toy cars sit on the bottom shelf. The bear is **above** the cars. The cars are **below** the bear. If a book stands right next to the bear, then the book is **beside** the bear.

7. Describing and sorting shapes

To **describe** a shape, tell how it looks. You can say: “It has four sides and four corners,” or “It is round and it can roll.” An **attribute** is one fact about a shape, like its number of sides, its number of corners, or whether it is curved.

To **sort** shapes, put the shapes that share an attribute in the same group.



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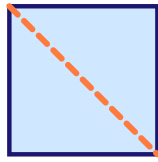
How to sort shapes

1. Choose one attribute, for example “has corners”.
2. Look at each shape and ask: “Does it have this attribute?”
3. Put it in the “yes” group or in the “no” group.
4. Count each group to check that no shape is missing.

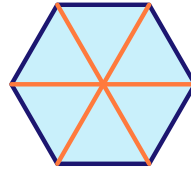
You can also describe shapes in your home. A window pane is a rectangle. A coin is a circle. A tent can look like a triangle. A tissue box is shaped like a solid with flat faces, and a globe is a sphere.

8. Building shapes from parts

Small shapes can join together to make bigger shapes. Two triangles that are the same can make one square. Six triangles can fit around one center point to make a hexagon. Two squares side by side make a rectangle.



2 triangles



6 triangles

P

Building facts

Put **2** triangles together to make a square. Put **6** triangles together to make a hexagon. Put **2** squares together to make a rectangle.

You can build with paper cutouts, pattern blocks, sticks, and clay. Solid shapes can be stacked too: a cone on top of a cylinder looks like a rocket!

Key takeaways

- Flat shapes (2D): square, circle, triangle, rectangle, hexagon.
- Solid shapes (3D): cube, cone, cylinder, sphere.
- A side is a straight line and a corner is where two sides meet. A triangle has **3** of each, a square and a rectangle have **4**, a hexagon has **6**, and a circle has none.
- Flat shapes lie on paper. Solid shapes can be held, turned, and stacked.
- Position words: above, below, beside, next to, in front of, behind.
- Sort shapes by attributes such as corners, sides, flat or solid, and round or not round.
- Small shapes can build bigger shapes.



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