

SHAPES, SHAPES EVERYWHERE

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Albatros

**SHAPES,
SHAPES
EVERYWHERE**

The world around us is full of shapes. Why do we see them everywhere? What shapes do we recognize? And what do they tell us?

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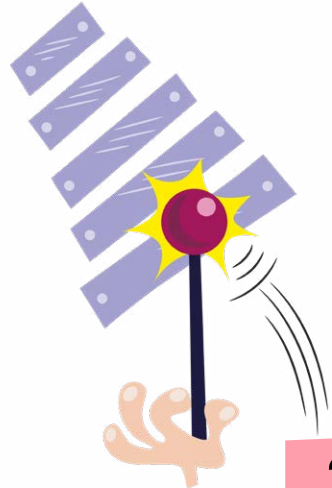
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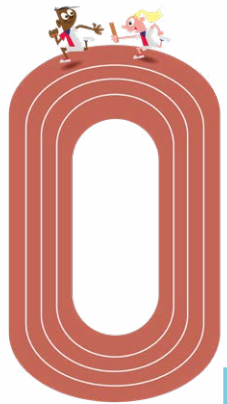
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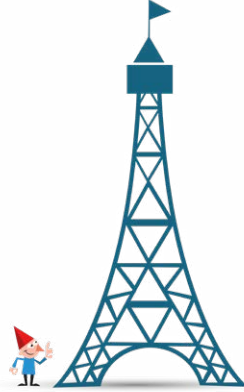
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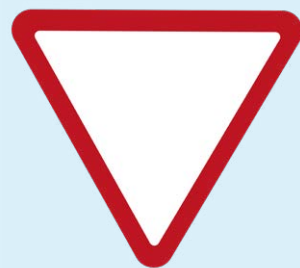
WHAT ARE SHAPES

and how are they important to us?

Take a look around. Much of what you see is made up of shapes you've been familiar with your whole life: rectangles, squares, circles, and triangles. We find them everywhere and in all kinds of forms. Shapes have many properties that make them very effective, and lots of things wouldn't work without them.



First of all, let's brush up on a few shapes:



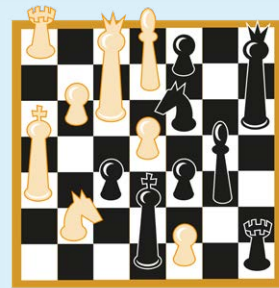
This traffic sign is in the shape of a triangle.



This pizza is in the shape of a circle.

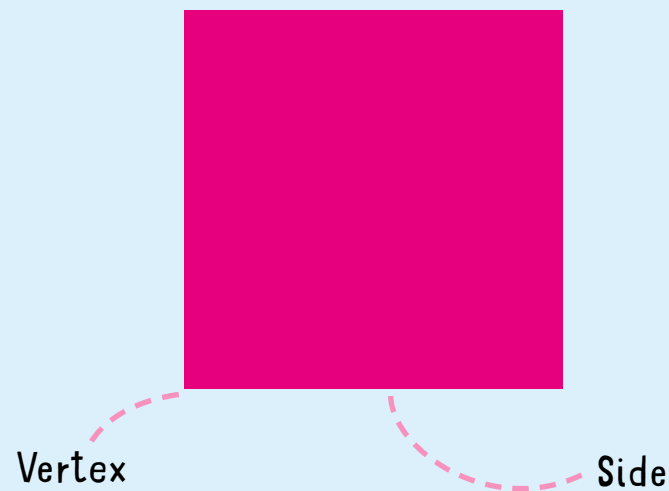


This textbook is in the shape of a rectangle.



This chessboard is in the shape of a square (and is also divided into squares).

When we talk about **shapes**, we mean simple objects on a flat plane—that is to say, flat objects that have two dimensions (length and width) and that can be drawn on a sheet of paper.



Shapes usually have **sides**, and the number of sides helps us tell the difference between individual shapes. The place where the sides meet is called the **vertex**.

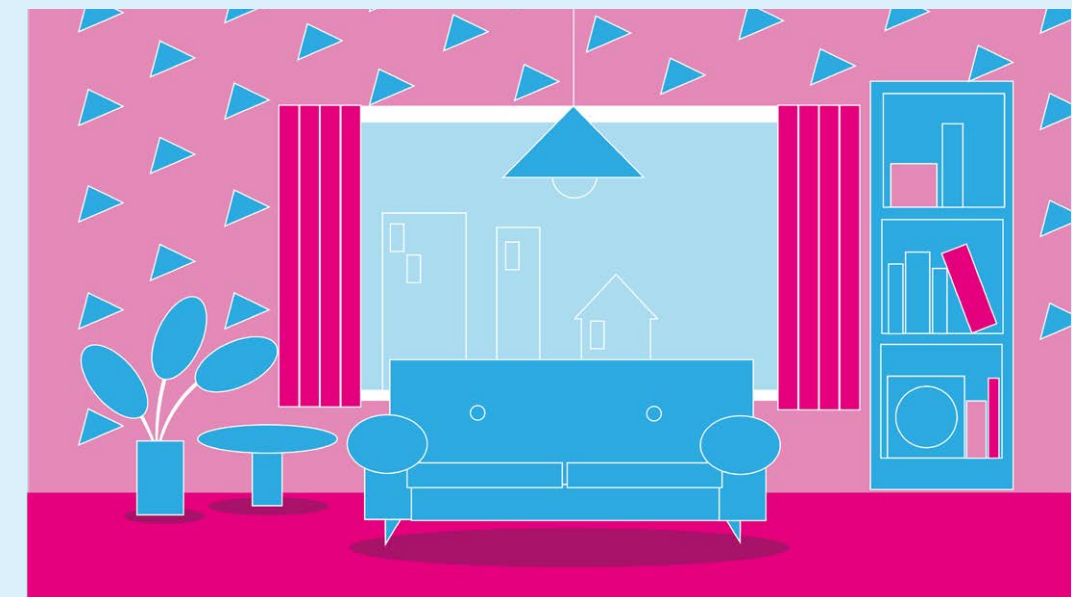
The science of shapes is called **geometry**.

To explain what makes some shapes special, let's look at two important properties of the sides of geometric shapes: being **parallel** and being **perpendicular**.

Perpendicular lines

meet at a right angle.

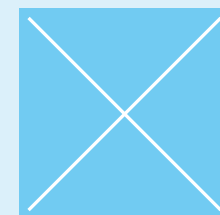
For example, the sides of a wardrobe are perpendicular to the floor, pointing up toward the ceiling. Similarly, trees grow perpendicular to the ground, pointing up toward the sun.



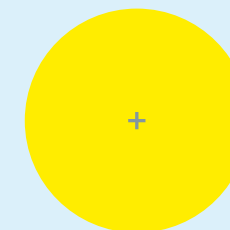
Parallel lines—like parallel roads you drive down—are lines that do not cross over each other. They are like roads without an intersection. Even if we could stretch them to infinity, they would always be straight and would never meet or cross each other.

Can you find the parallel and perpendicular lines in this room?

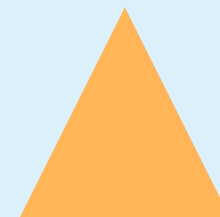
And now it's time to look at basic shapes and their properties . . .



A **square** has four sides of the same length. The opposite sides are parallel. The adjacent sides are perpendicular. And that's not all—when we connect the opposite vertices, we create diagonals, and they too are perpendicular to each other!



A **circle** has only one side. It also has an infinite number of vertices, since every point on a circle is a vertex. Fascinating, isn't it?



A **triangle** has three sides and therefore three vertices. The sides can be different lengths, and two of them can be perpendicular.



A **rectangle** differs from a square in that it has two opposite pairs of sides that are the same length, but one pair is a different length than the other. They are also parallel and perpendicular to each other, but the diagonals of the rectangle are not perpendicular.

OK, enough geometry! Let's go take a look at the world of shapes!



We've created a rectangular protest sign. We are protesting against pineapple on pizza!



The rectangular traffic sign says that we can't go more than 20 miles per hour as we approach the school.

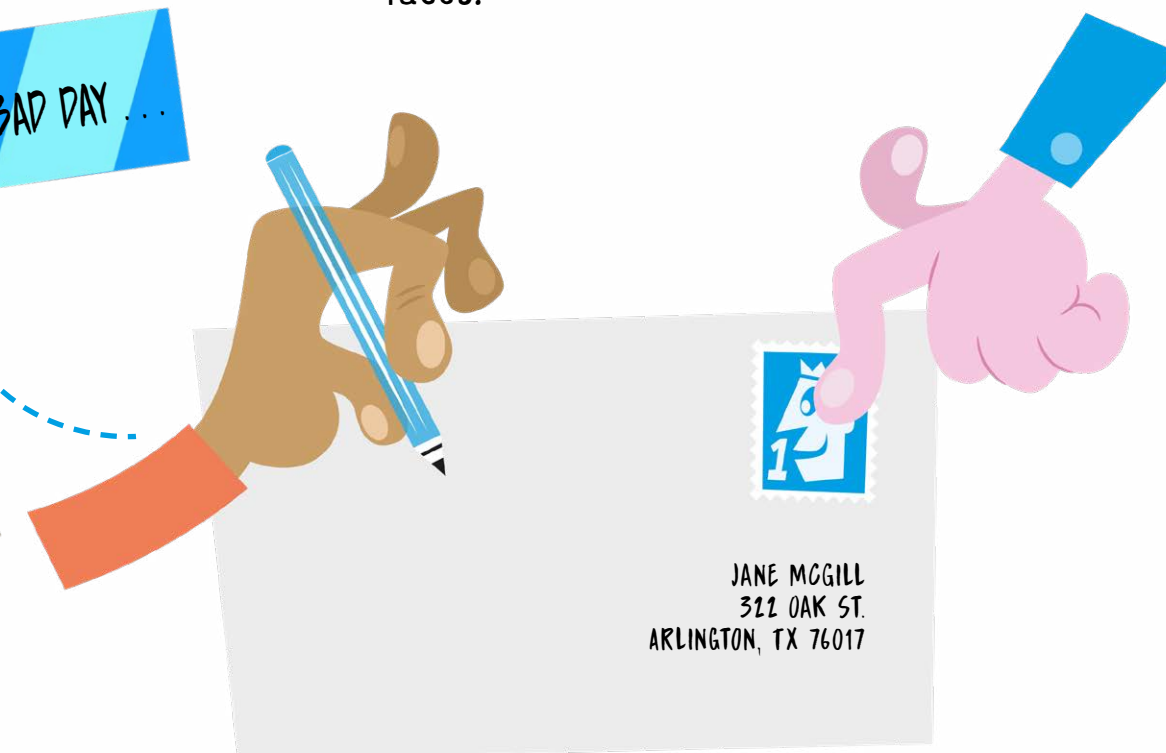


Emojis in cell phone messages and tablets help us show our emotions. When we see these yellow circles, we can imagine our friends' faces.

Tom can't find the emergency exit! Luckily he noticed this rectangular sign!



Just stick a rectangular stamp on the letter to Grandma and it will get there safely.



Shapes that make it easier TO COMMUNICATE

People might speak a ton of different languages, but shapes help us understand what we want to say more easily. Thanks to the rectangular stamp and the round postmark, the postcard that we're impatiently awaiting will arrive. And thanks to the message on the fridge, we're able to read what we have to buy.

Every flag with shapes represents one letter. *Ahoy!*



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Shapes that create **ORDER**

Shapes allow us to look at schedules, read instructions or directions, and even pay the right price in a store. Some shapes announce rules needed to avoid chaos around us. They can be flexible (for example, you can switch off your alarm clock to get more sleep), but there are also some very strict shapes. Traffic signs are a good example, and it makes sense to obey them at all times.

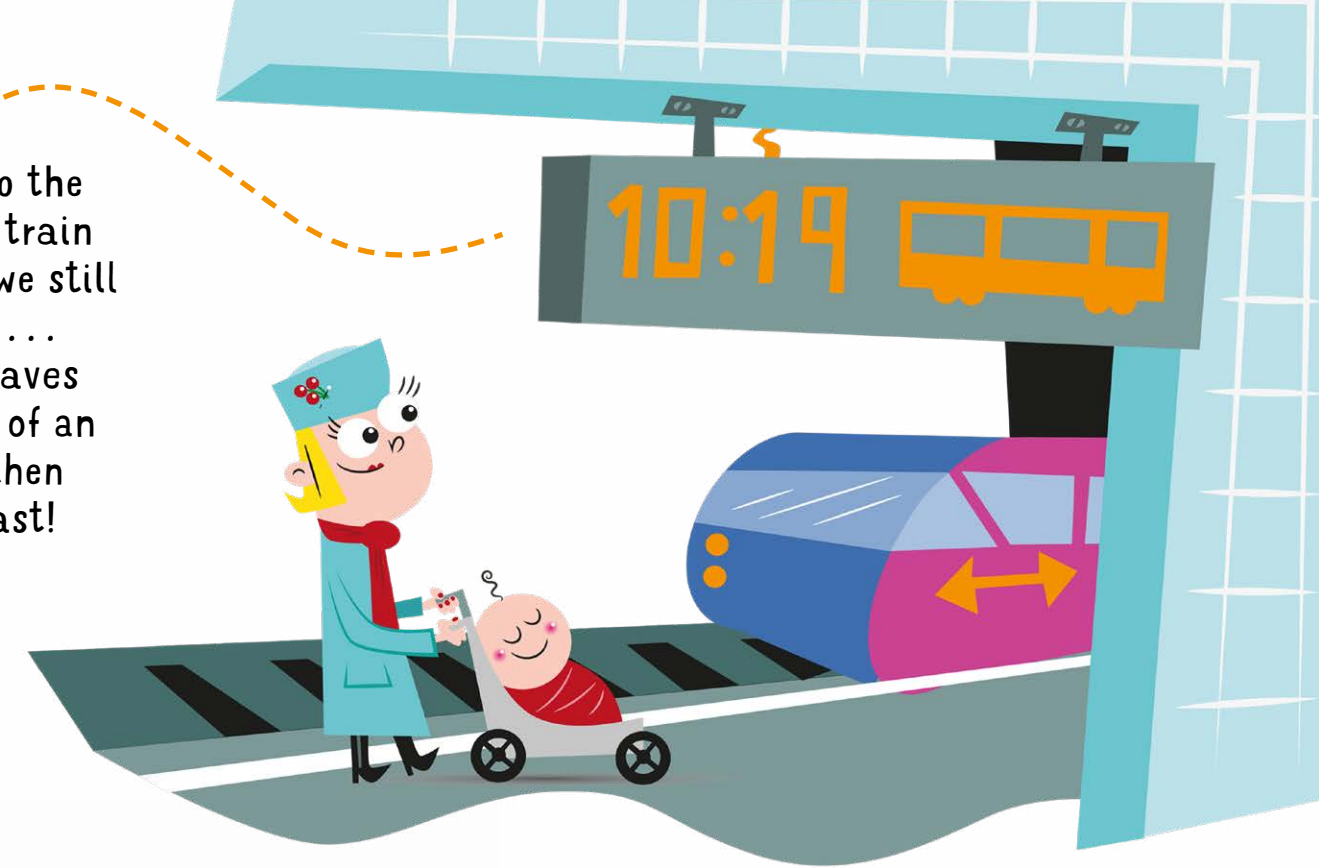


What do we have
now, Victor? Math
or PE? Why don't you
take a look at the
schedule on the
board?



If drivers spot white
rectangles on the road,
they should stop and
allow people to cross
the road safely. Shall
we help you cross to the
other side?

According to the
rectangular train
station sign, we still
have time ...
Our train leaves
in a quarter of an
hour. And then
home at last!



A circular clock
face is merciless!
Get up and go to
school, it's already
morning!



John wants to know
how much cough
syrup to take. But
how is he ever going
to find out from these
long rectangular
instructions?

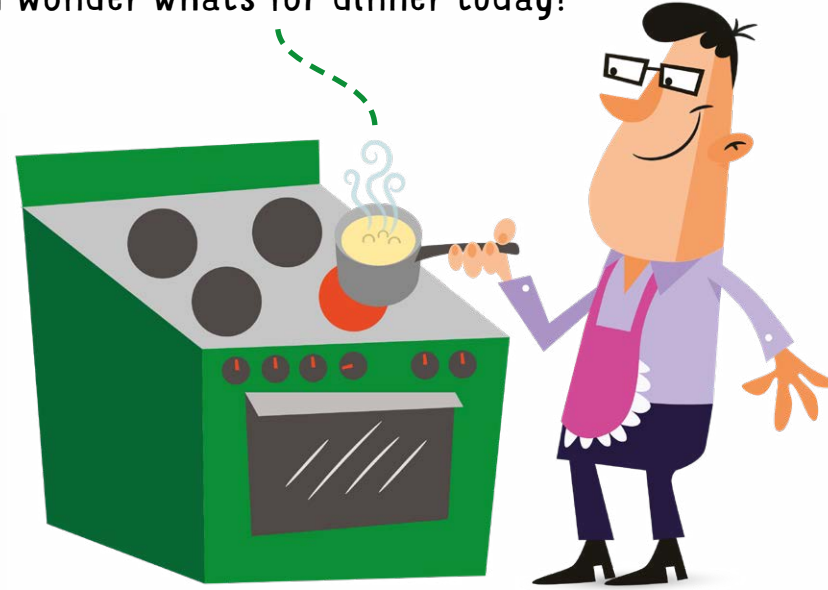


When Anna pays
with a rectangular
dollar bill, she
receives change in
the form of some
round coins.

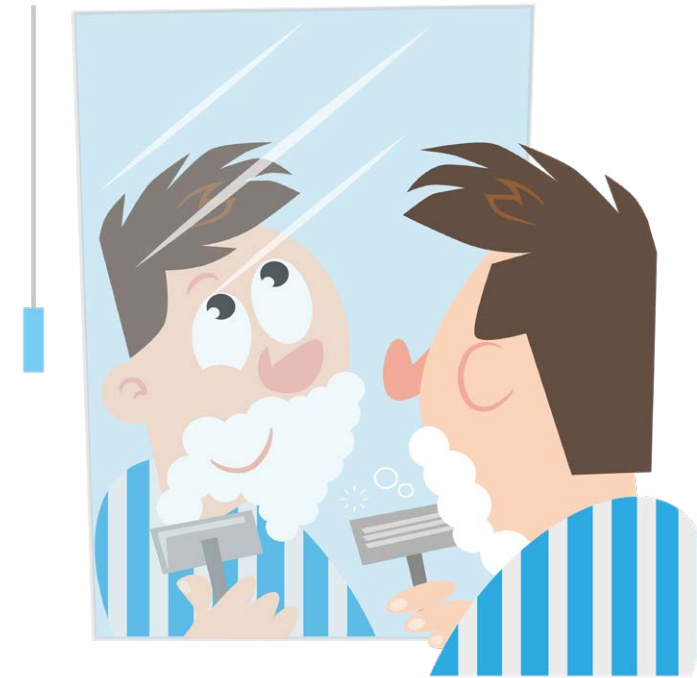
George cuts the lemon into perfect round slices to make lemonade. Watch out for those fingers!



The burners on the stove are as round as the bottoms of pans. I wonder what's for dinner today?



Today, Mike is shaving for the first time and looking in the rectangular mirror to make sure he doesn't miss even the tiniest whisker.



No one makes blankets from crocheted squares quite like my Grandma Matilda!



Shapes AT HOME

We see them all around our homes. Slices of bread, cheese, or cucumber have their own specific shapes. Plates and dishes are usually round. And what about the bathroom? The rectangular mirror above the sink helps us make ourselves look like we're walking out of a fashion magazine every day.

Mom's prepared triangular sandwiches for the kids to take to school. Don't take them all, Tommy!

My cousins use so many makeup tools to do their makeup! Round powder boxes and puffs, rectangular eye shadow—it's way too complicated for me!



Shapes as SYMBOLS

Some shapes remind us so much of a particular meaning that they have become symbols used in all cultures. So we can use the shapes instead of words. Think about a rectangular flag. If you look at the flags people wave at sports stadiums or Fourth of July parades, you know what they support.

But shapes can also symbolize important values in life. The rings that the bride and groom exchange at weddings tell us about their devotion to each other.

The bride and groom are exchanging rings as a sign of their loyalty. Who's got the rings?

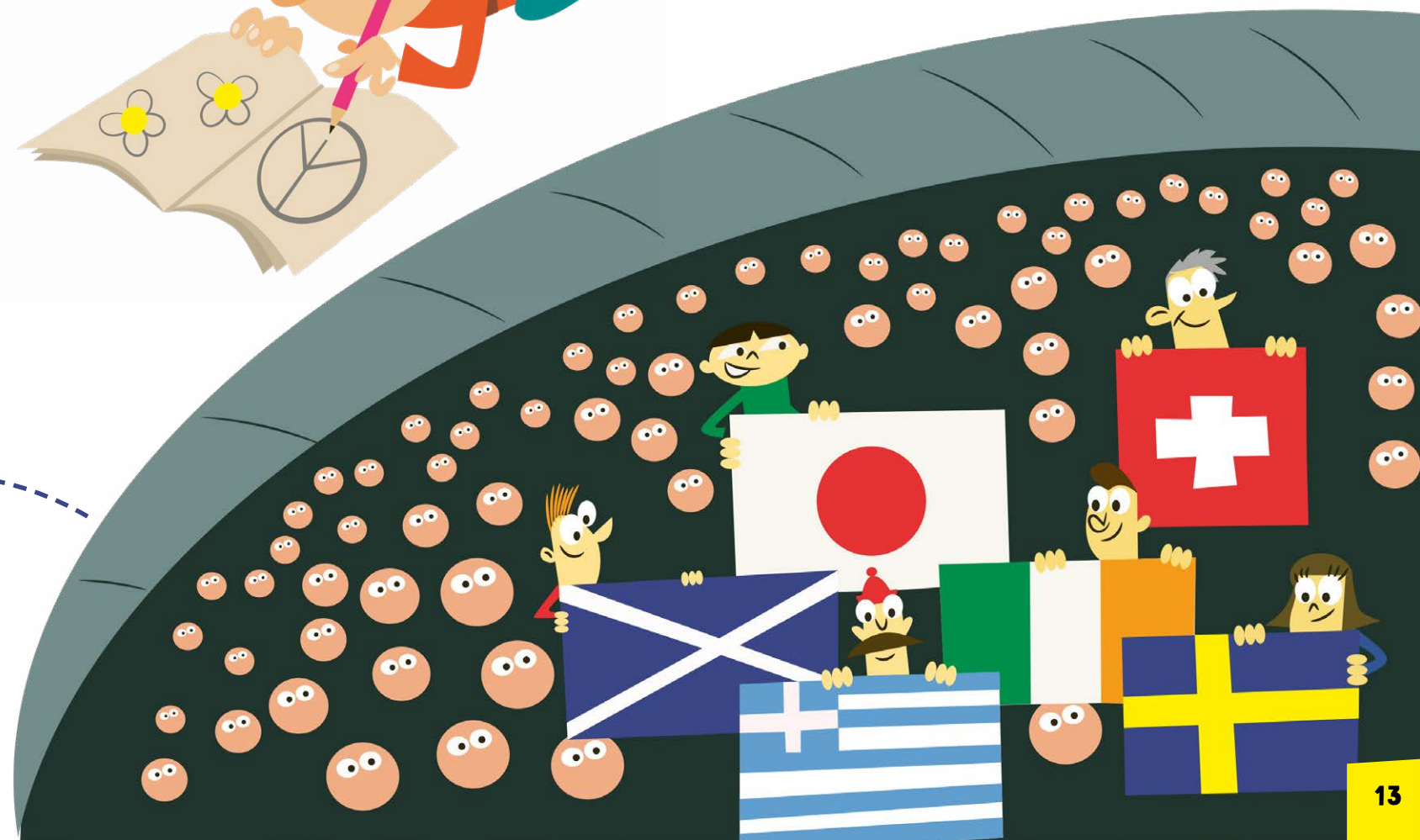
As you can see in the pie chart, 20% of viewers watched the last episode, and according to the bar chart, the popularity of the series keeps increasing.

The triangles on these doors suggest a laboratory experiment might be going on inside.

Fans from all over the world come together at this international sporting event, waving national flags to support their country's athletes. Go team!

Arrows in the shape of a triangle are the symbol for recycling. The waste in this bin will be recycled and used to make new products.

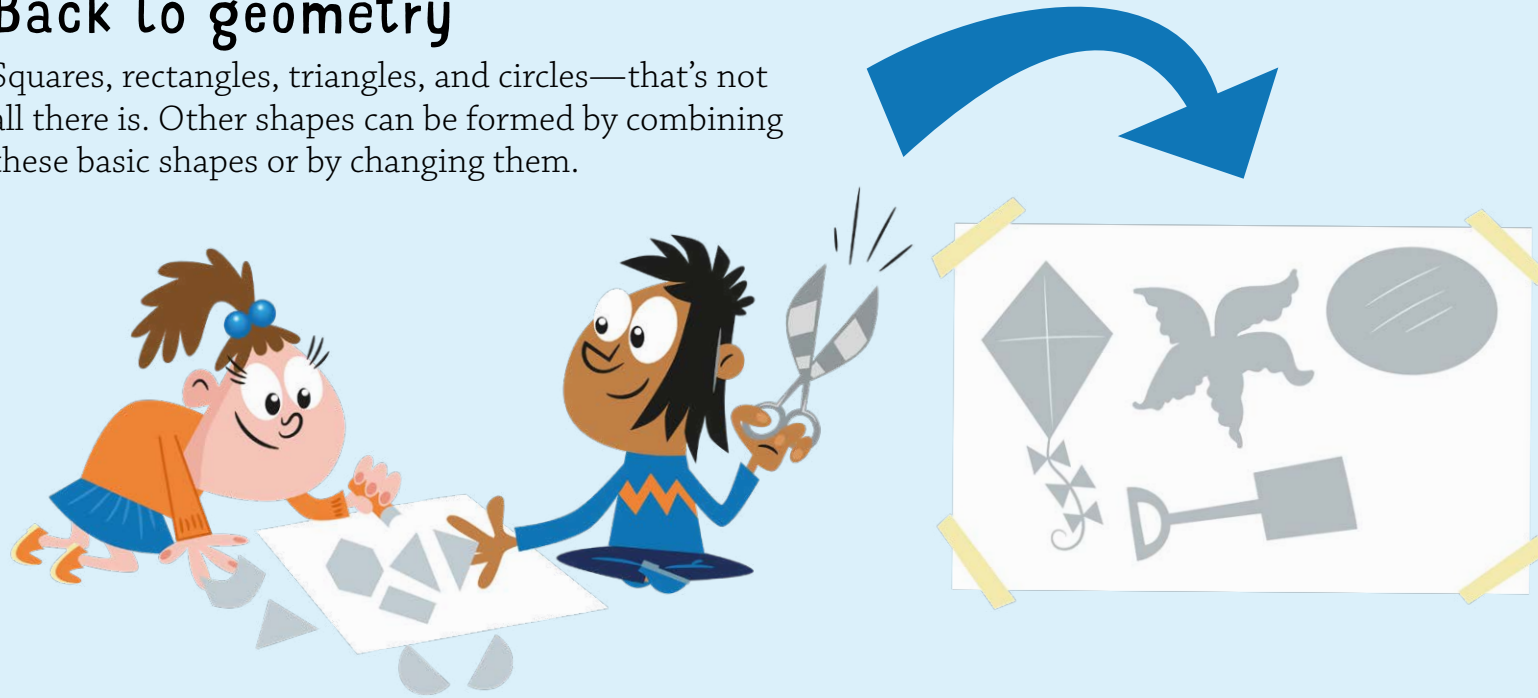
Jacob is drawing the symbol of peace in his notebook. He may or may not know that the circle with four lines was originally the sign used by the campaign against nuclear weapons.



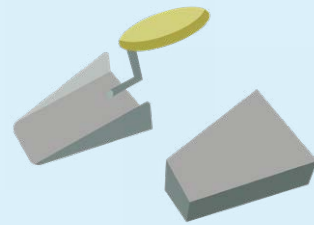
OTHER FLAT SHAPES

Back to geometry

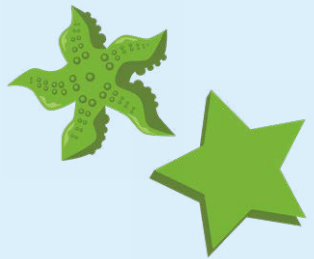
Squares, rectangles, triangles, and circles—that's not all there is. Other shapes can be formed by combining these basic shapes or by changing them.



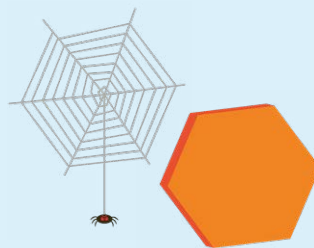
What other flat shapes do you know?



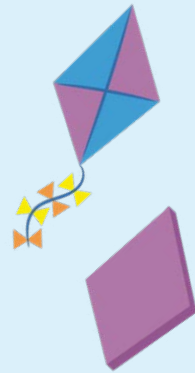
A **trapezium** is quadrilateral, which means it has four sides. One pair of its opposite sides are parallel, but of different lengths.



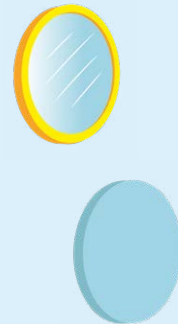
A **star**, in this case a five-pointed star, is also a polygon.



A **hexagon** has six sides. If all the sides are the same length, they form a regular hexagon, which we can see in the shapes of honeycombs and cobwebs.



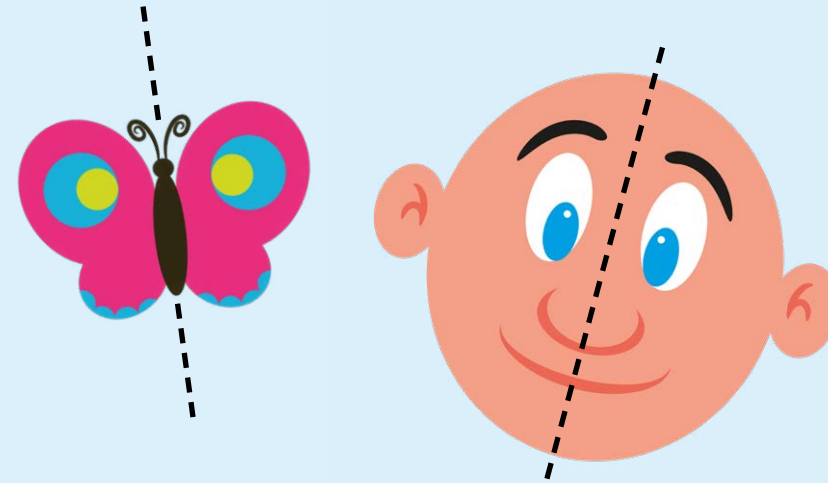
All sides of a **rhombus** are the same length. Its opposite sides are parallel and its diagonals are perpendicular to each other. But unlike with a square, its diagonals are of different lengths. Also, the adjacent sides are not perpendicular to each other.



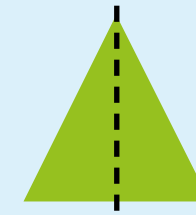
An **oval**, like a circle, has no sides or angles and its outline is formed by an infinite number of vertices. So how is it different from a circle? The vertices of a circle are all exactly the same distance from its center, which is not the case with an oval. An oval is shaped more like an egg.

Axisymmetry

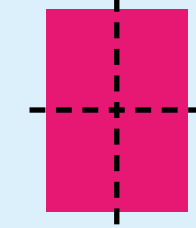
Certain geometric shapes are **symmetrical** along one or more **axes**. What does this mean? Well, imagine a shape cut out of paper. When you fold it down the middle—that is to say, along its axis—it divides into two exact halves that match each other at all points.



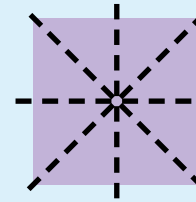
We also find symmetry in everyday life.



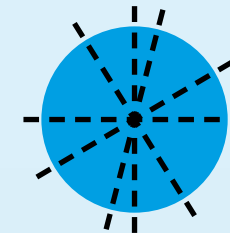
Some shapes, such as isosceles **triangles**, have only one axis of symmetry.



Other shapes, such as **rectangles** or rhombuses, have two axes of symmetry.



A **square** is symmetrical along four axes.



A **circle**—which just always has to be special now, doesn't it?!—has an infinite number of axes of symmetry.

We can also talk about shapes without talking about geometry. A detective can catch a criminal by the pattern on his shoe, and a locksmith can copy the shape of a key and create duplicate keys for a whole family. In short, the world really is full of shapes. So where else can we find them?



On the following pages, you'll find examples of everything we have just learned about . . .

Let's follow the arrows.
The signpost says we're
going the right way.



Shapes that help us find our WAY AROUND

Because they are clearly recognizable, even from a distance, shapes act as invaluable aids when we are trying to find our way or get a quick sense of where we are. With traffic signs, the shape has a meaning. Do you know which sign shape means "caution" and which means "prohibited"?



We can immediately recognize Italy on a map—it's famously shaped like a boot!

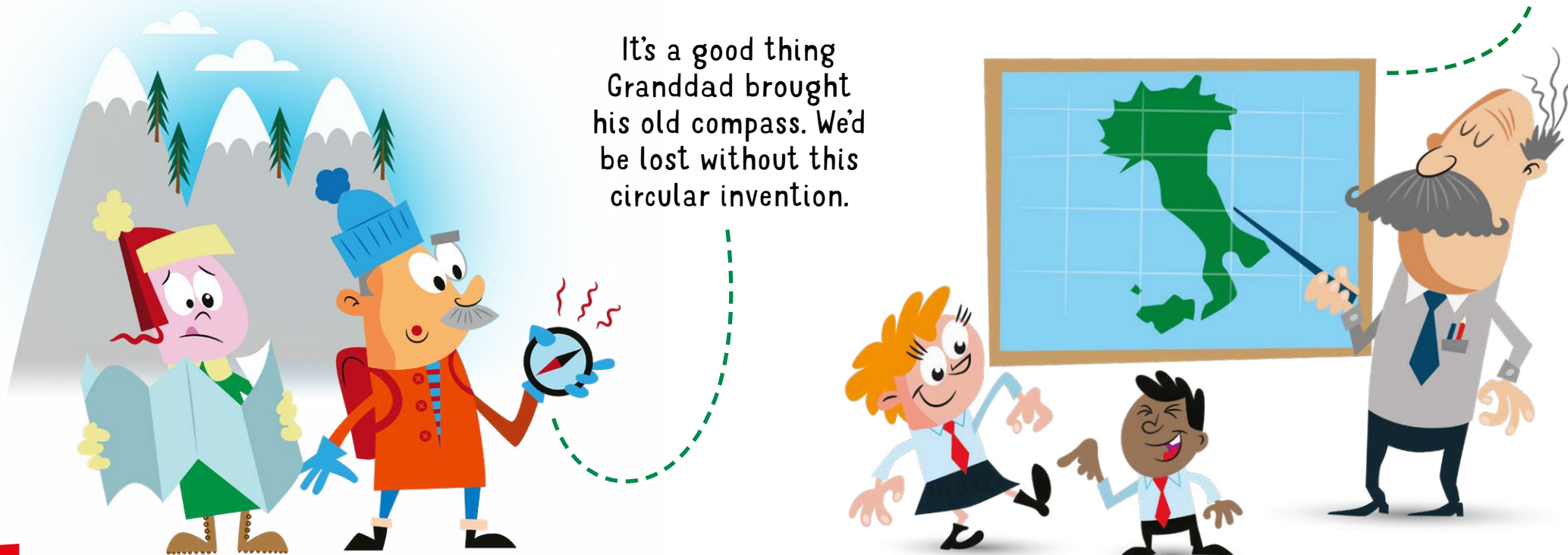
Every map needs a legend. This tells us the meaning of the individual shapes so we know how to find our way on the map.

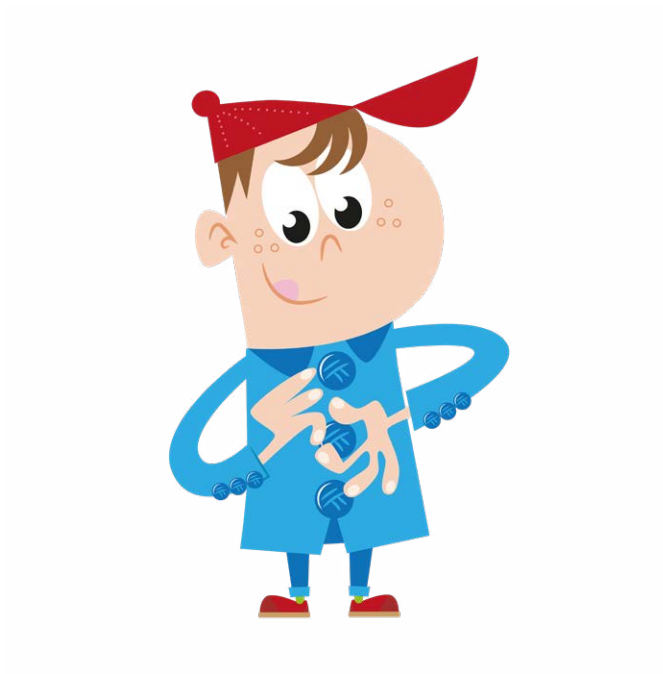
Look, a sign for the emergency room! They'll surely be able to tell you whether you have the flu or pneumonia.

Rob is always confused. Are restrictive traffic signs in the shape of a triangle or an octagon?



It's a good thing Granddad brought his old compass. We'd be lost without this circular invention.





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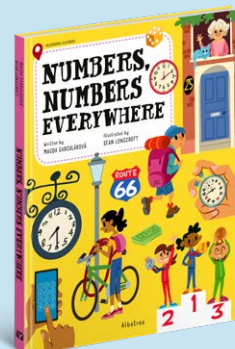
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Everything around us is made of basic shapes. Whether you're at home or on the street, you'll find circles, squares, rectangles, and triangles everywhere, and they also combine to make up other more complex shapes. We use some to help us communicate, and we wear others to look nice. Believe it or not, some shapes can even save our lives! Are you curious to learn what else shapes can do? Well then come immerse yourself in the fun world of shapes.

Check out the other
release in this series:



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