Mathletics

Series B Student

Geometry

My name

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Series B – Geometry

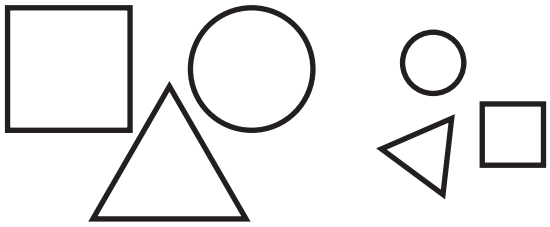
Contents

Series Author:

Rachel Flenley

2D shape – sorting

2D shapes are flat shapes. We can sort shapes in lots of different ways. How do you think we have sorted these 2D shapes?



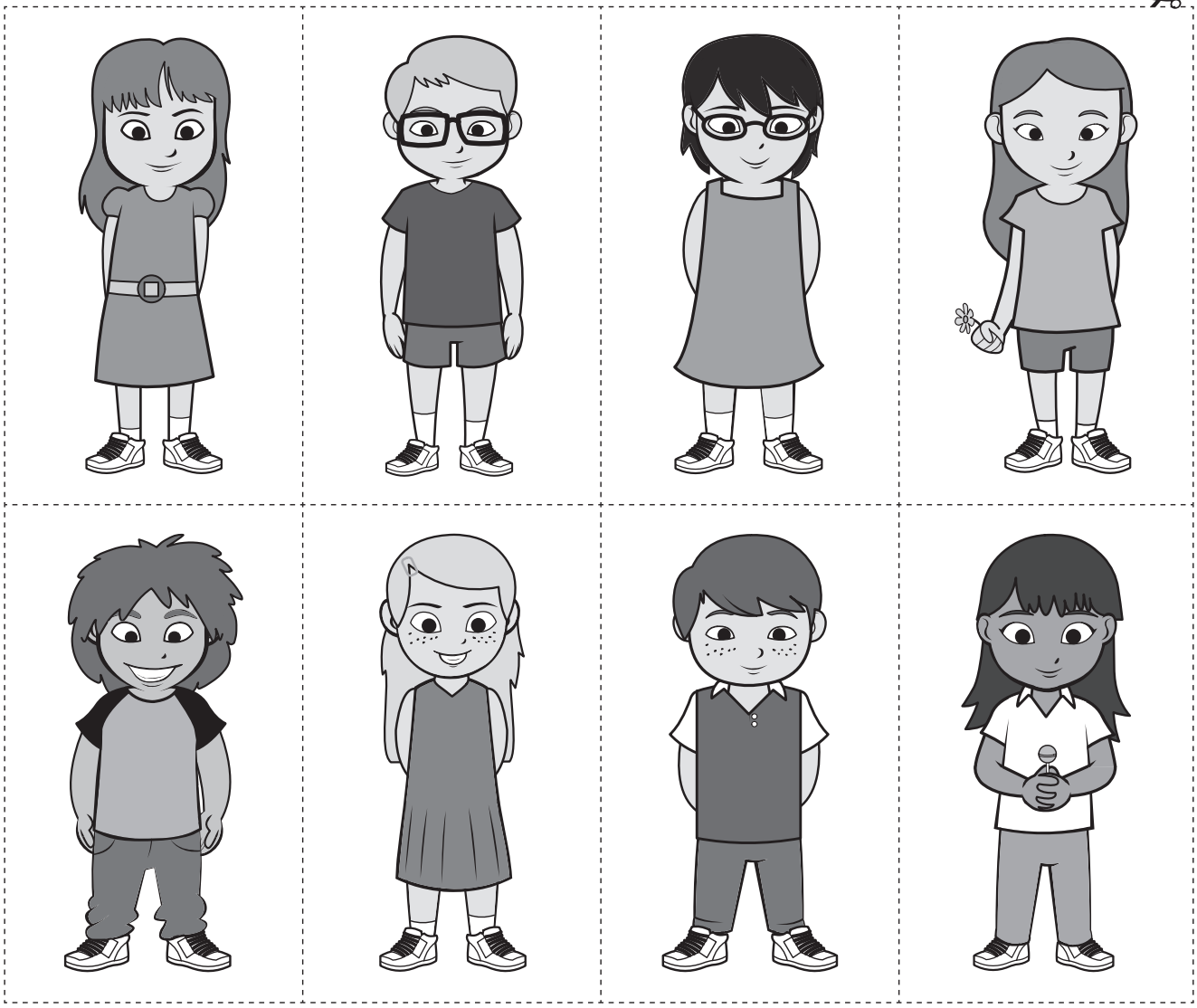
Can you think of another way we could sort them?

C copy

1 Cut out these children and look at them.

a Sort them one way. Tell someone how you did it.

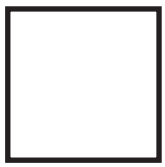
b Sort them another way. Tell someone how you did it.



2D shape – squares and rectangles

1 Draw some squares.

2 These shapes are confused. They are not sure what they are! Can you help them by answering 'yes' or 'no'?

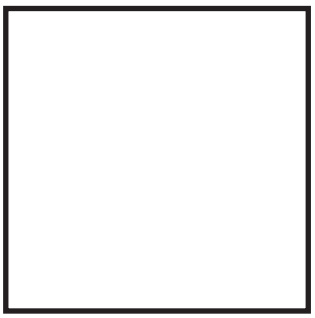


Am I a square?

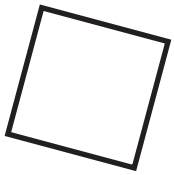
_____

Am I a square?

_____

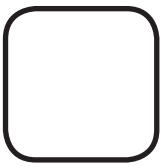


Am I a square? _____



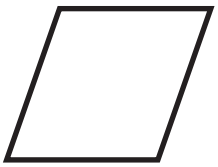
Am I a square?

_____



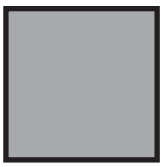
Am I a square?

_____



Am I a square?

_____



Am I a square?

_____

3 What is a square? Write or tell someone.

2D shape – squares and rectangles

You will need:  a partner  2D shapes

What to do:

a Trace and name the shapes.

square

rectangle

b How are these shapes **the same**? Use shapes to help you work this out.

c How are they **different**?

What to do next:

One of you will be the rectangle spotter. The other one will be the square spotter. Look around your room – every time you find one, put a tick below.

Are there more squares or rectangles in your classroom?

2D shape – circles and ovals

1 **a** Trace these and say the names out loud.

b Close your eyes and draw them in the air.

c What feels **the same** when you draw them?

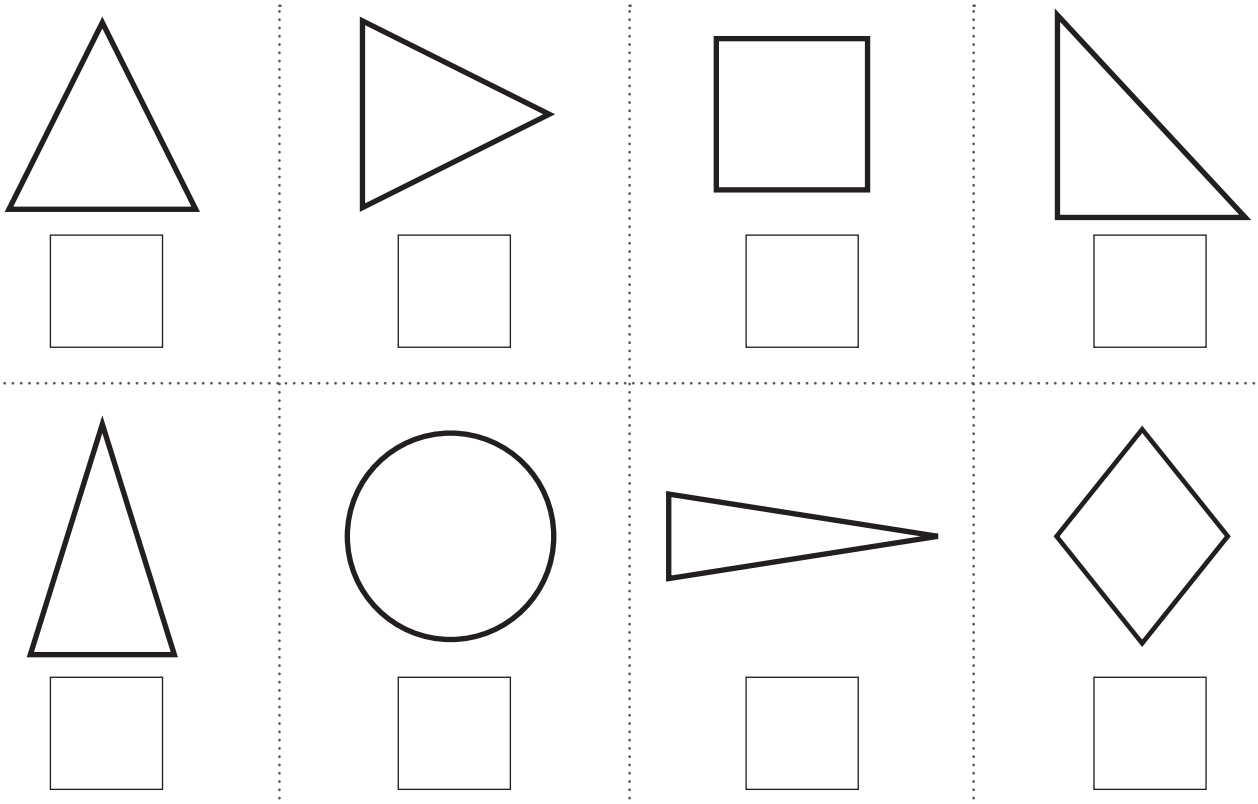
d What feels **different**?

2 Draw a person, using only ◯ and ⬭. Decorate them.

2D shape – triangles

1 Pretend you have to describe a triangle to someone who doesn't know what it is. What would you say? Write it here. You can draw some as well if that helps.

2 These shapes all want to join the triangle club. Are they allowed to? ✔ the ones that can. ✘ any that can't.



3 Use masking tape to make 3 different triangles on the carpet. Ask someone to look at them. Do they agree that they are all triangles?

2D shape – triangles

You will need: scissors red and green pencils

C copy

What to do:

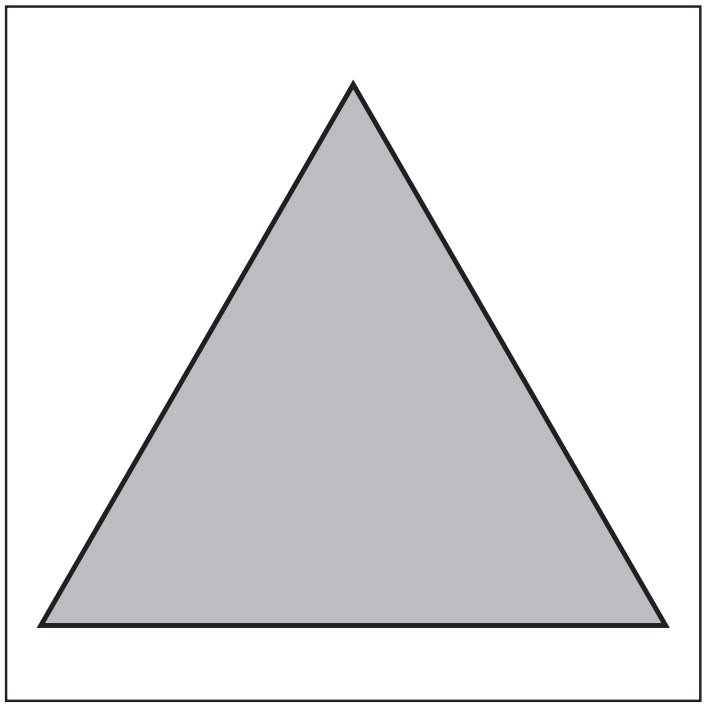
Cut out the . Colour 1 side red and 1 side green.

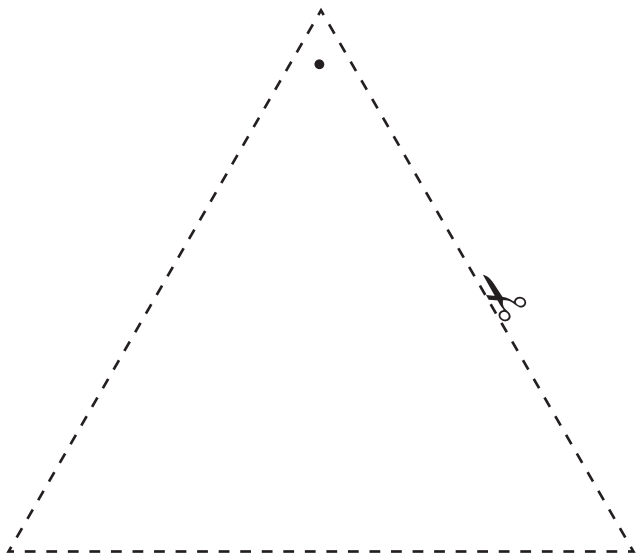
How many different ways can you fit the onto the ?

Use the dot to help you remember where you are up to.

Here is one way g. Here is another r.

How many different ways can you find?

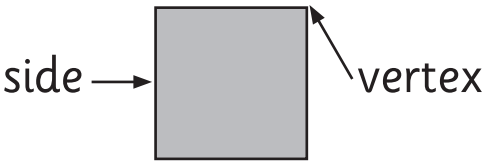




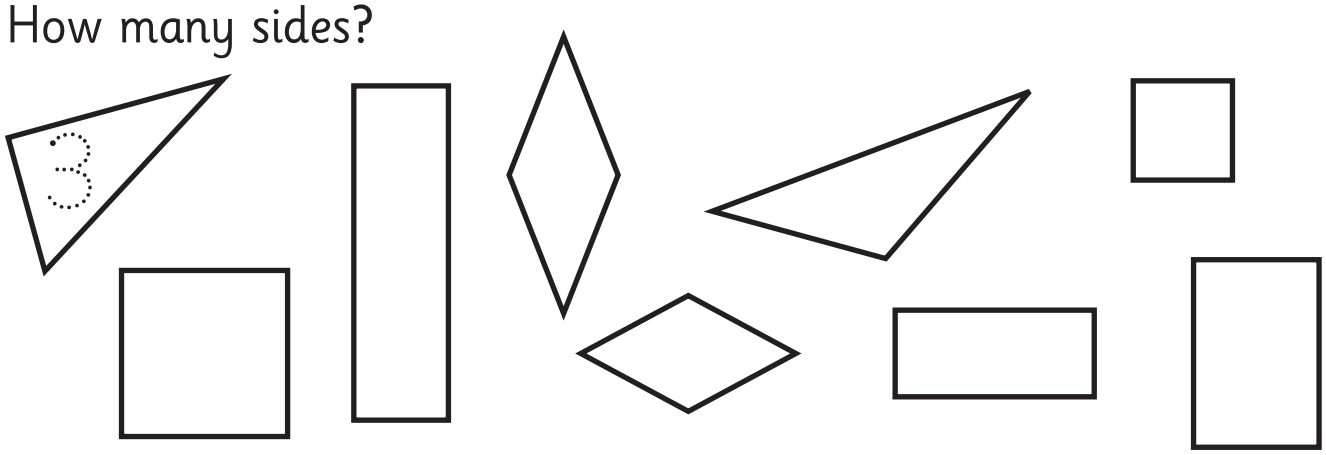
2D shape – sides and vertices

Shapes can have sides and vertices.

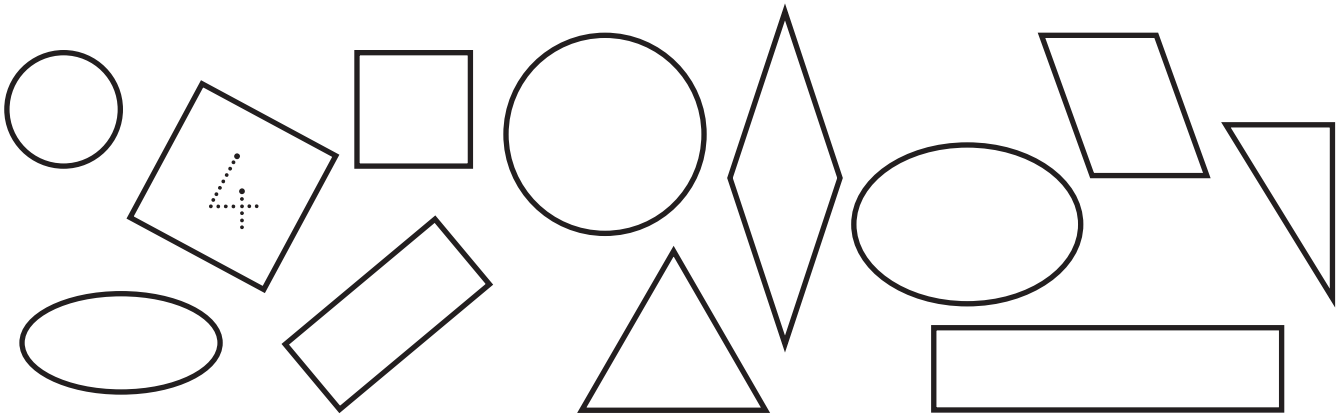
The maths word for corner is vertex. A vertex is the point where 2 sides meet. If there is more than one vertex, we call them vertices.



1 How many sides?



2 How many vertices?

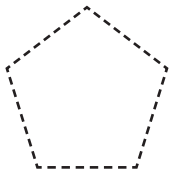
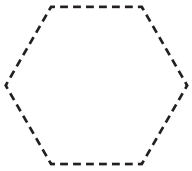


3 How many sides and vertices?

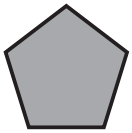
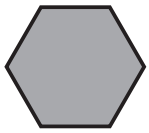
	Shape	Sides	Vertices
a	triangle		
b	square		
c	rectangle		

2D shape – pentagons and hexagons

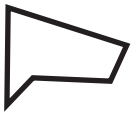
1 Trace these and say the names out loud.


pentagon

hexagon

2 How many sides and vertices?

	Shape	Sides	Vertices
a	pentagon 		
b	hexagon 		

Did you know ALL 5-sided shapes are called pentagons and ALL 6-sided shapes are called hexagons? They don't always have to look like  or  . They just need the right number of straight sides.

This is still a pentagon. 

This is still a hexagon. 

3 Draw these shapes.

a 2 different pentagons

b 2 different hexagons

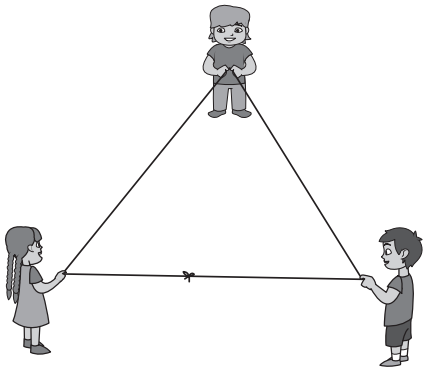
2D shape – explore

You will need: 3 partners scissors string

What to do:

Cut a long piece of string and tie the 2 ends together. Make a triangle using the string and your group. Will you need all 4 people to do this? Why or why not?

Now make a different triangle.



What to do next:

Make a square. Now turn it into a rectangle. How did you do this?

Can you make a pentagon and then a hexagon? You may need to get some more people to help you.

Is it possible to make a circle this way? Show and explain your results to your teacher and classmates.

2D shape – explore

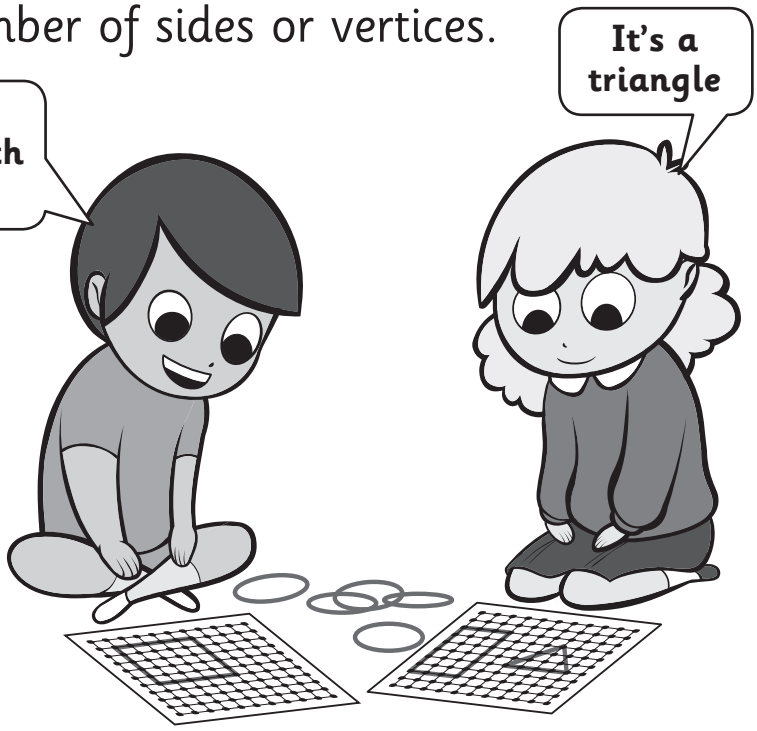
You will need: a partner, 2 geoboards and rubber bands

What to do:

Take turns telling each other to make a shape on their geoboard. The catch is, you can't say the name of the shape, you can only talk about things like the number of sides or vertices.

Your partner then names the shape they made. Is it the shape you wanted them to make? Talk through any differences.

Make 3 shapes each.



What to do next:

Now, sit with your backs to each other. Take turns telling each other to make specific shapes such as:

'Let's make a square. Each side has to be 4 nails long' **or**
'Let's make a triangle. All the sides have to be the same length.'

Both of you make the shapes on your geoboards and then compare.

2D shape – explore

You will need:  a partner  2D shapes

What to do:

Share the shapes between the 2 of you. Find a way to sort **your** blocks into 2 groups. You could sort by shape, size or colour. Record how you did it here.

Compare your way with your partner's way. Did you sort them differently?

What to do next:

Now sort your shapes into 3 groups. Record how you did it here.

Compare your way with your partner's way.

Find one other way to sort your shapes. Compare. Record how you did it here.

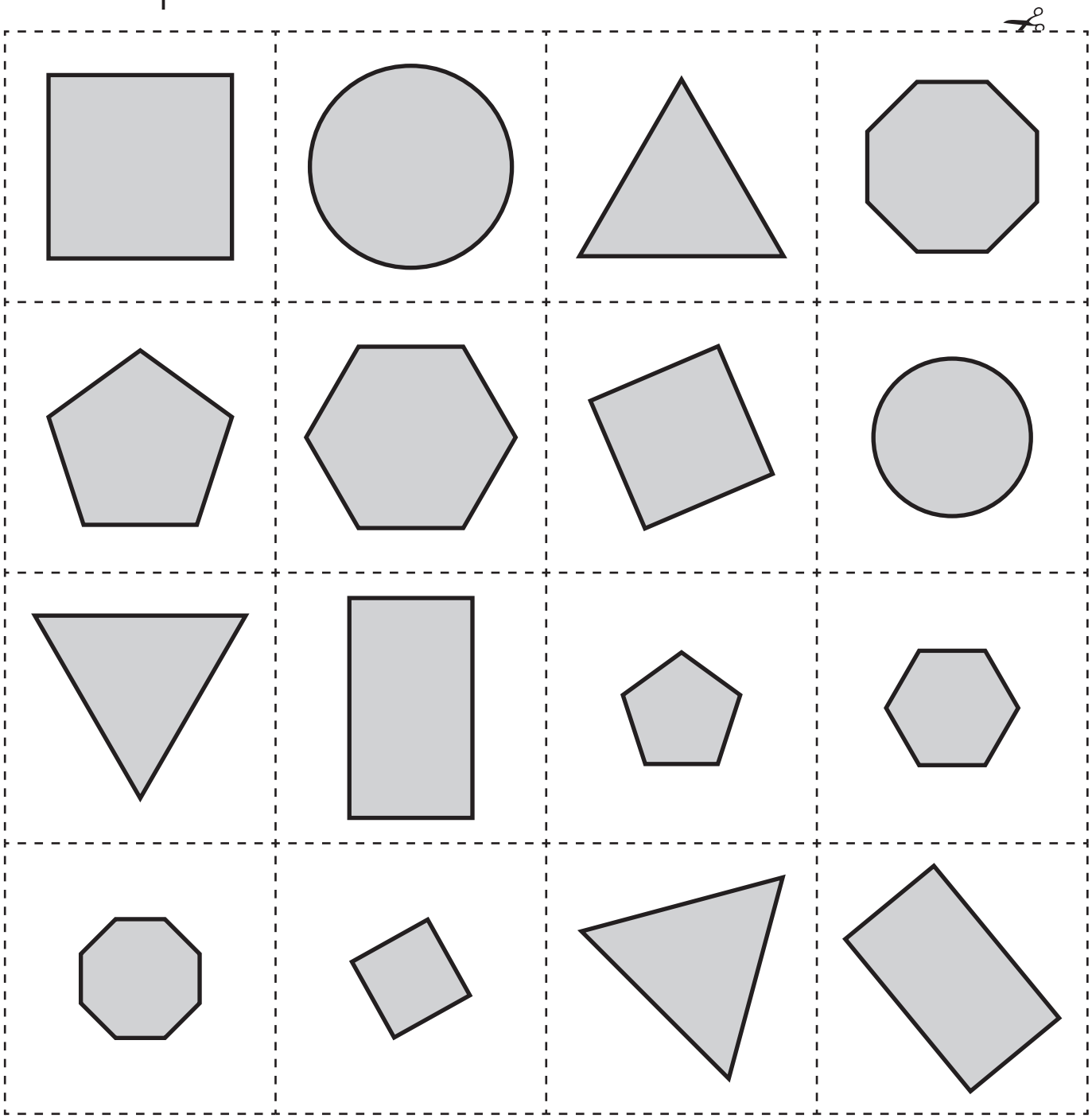
2D shape – explore

You will need: a partner scissors

copy

What to do:

Cut out the shape cards. Combine your cards with your partner's cards and play Shape Snap. Watch out – the shapes might be different sizes or in a different position, but they could still be the same shape!

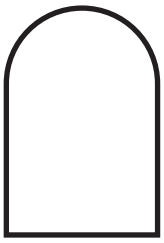


2D shape – explore

You will need:  a partner  2D shapes

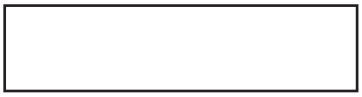
What to do:

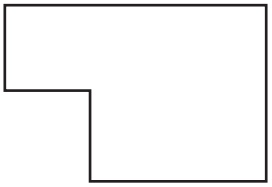
Look at this shape.

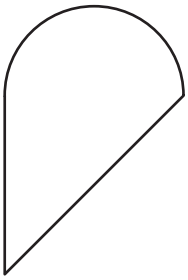


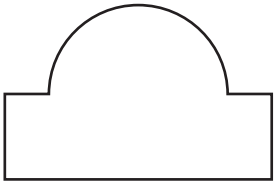
Which 2 shapes have been joined together to make it? Use the shape blocks to help you work it out. Draw them next to it.

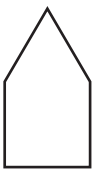
Try these ones. Draw the shapes for each one.

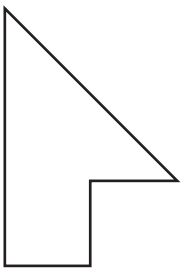












2D shape – explore

You will need:  straws or lolly sticks  blue-tack or tape

What to do:

Choose a shape to make. Make it with your equipment.

Finish the statement:

I made a _____.

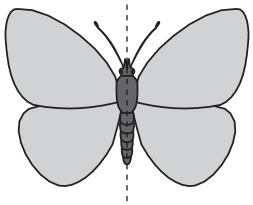
I know it is a _____ because ...

What to do next:

Find 2 people who made the same shape as you. What reasons did they give? Do you want to add to or change your reasons?

2D shape – symmetry

This picture of a butterfly is symmetrical. If we fold it along the dotted line, both sides match exactly.



C copy

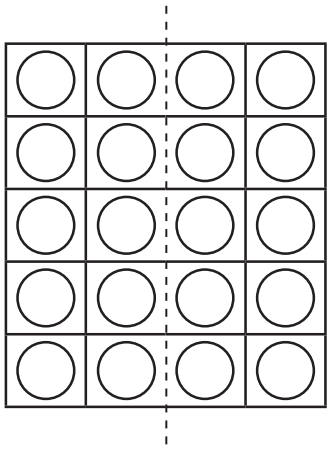
1 Look at the pictures. Tick the ones that match if folded along the dotted line. If it helps, cut them out and fold them.

2D shape – symmetry

1 Use different coloured pencils to colour 1 side of each picture. Switch with a partner and colour the other side of their picture to make them symmetrical.

a

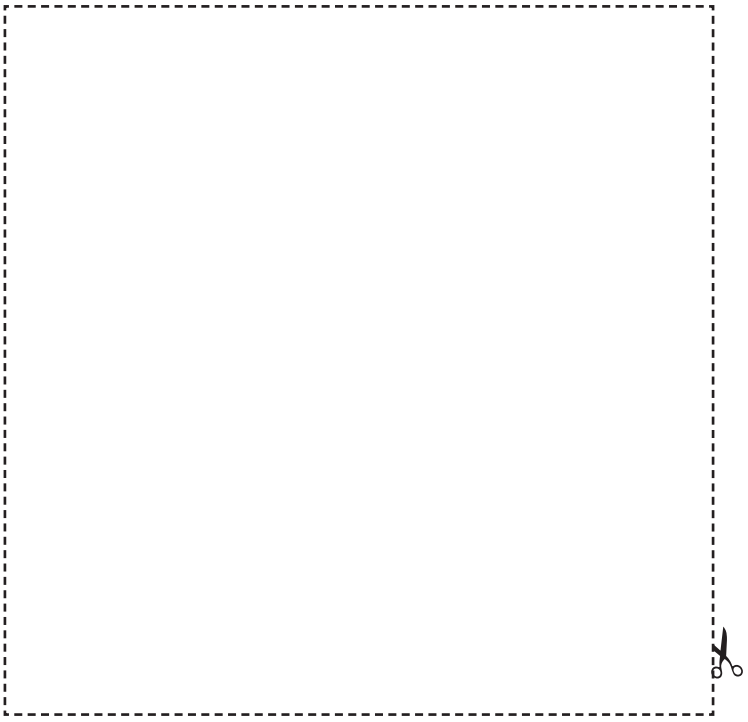
b



2 Cut out the square below and fold it in half.

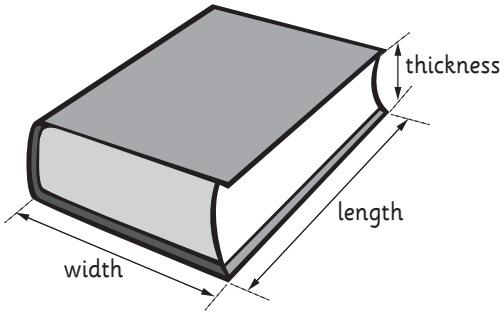
a Is a square symmetrical? _____

b Is there only 1 way you can do it? How many ways can you fold the square in half and make the sides the same?

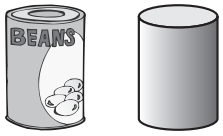


3D shape – solids

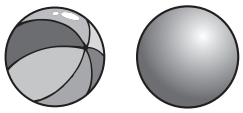
A 3D shape is anything that has length, width and thickness. 3D things can be any shape or size. They are also sometimes called solids.



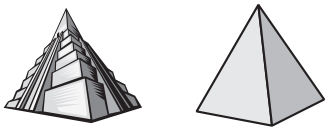
Common 3D shapes



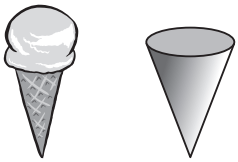
cylinder



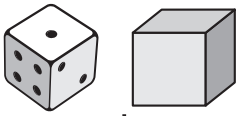
sphere



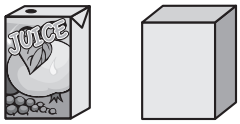
pyramid



cone



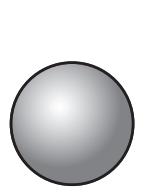
cube

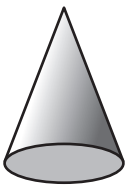


cuboid

1 Look around your classroom. What 3D shapes can you spot? Record the shapes you find in the box.

3D shape – recognising shapes


sphere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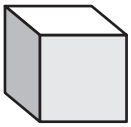
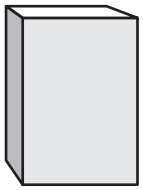
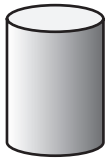
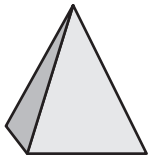

cube


cuboid


cylinder


pyramid

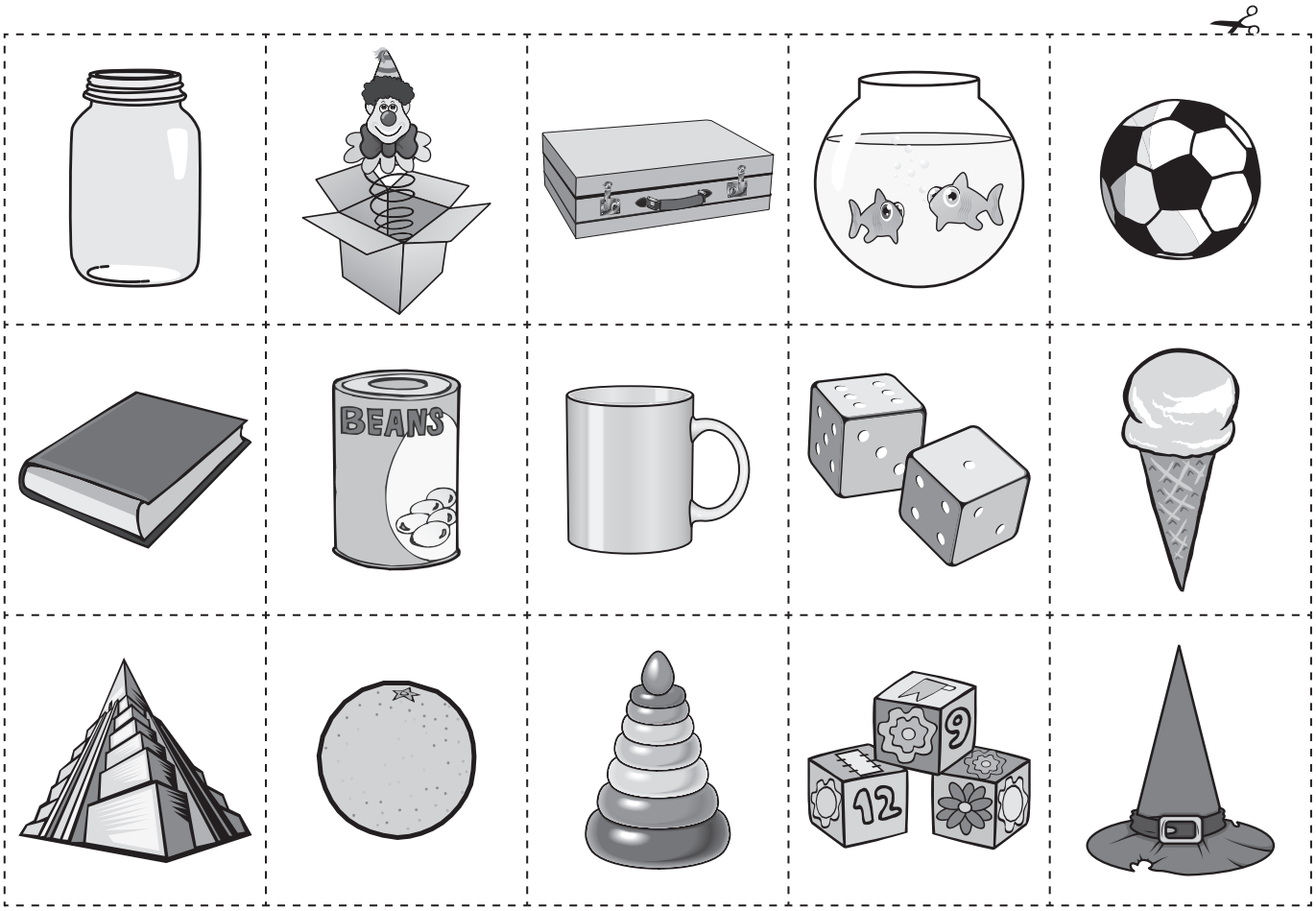
You will need:  a partner  scissors

copy

What to do:

Cut out the tiles below and place each one in the correct box on the following page.

When you have finished, share your work with a partner. Do you agree about which shapes belong where?



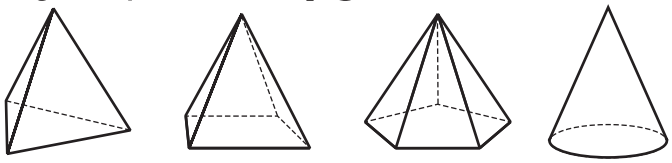
3D shape – recognising shapes

Sphere	Cylinder
Cone	Pyramid
Cube	Cuboid

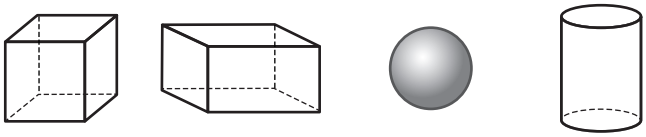
3D shape – pyramids

Some 3D shapes belong to a group called **pyramids**.

These are all pyramids.



These are NOT pyramids.



You will need: a partner 3D shapes

What to do:

Look at the shapes above or find examples in your classroom. What makes a shape a member of the pyramid group? Record your thinking here.

What to do next:

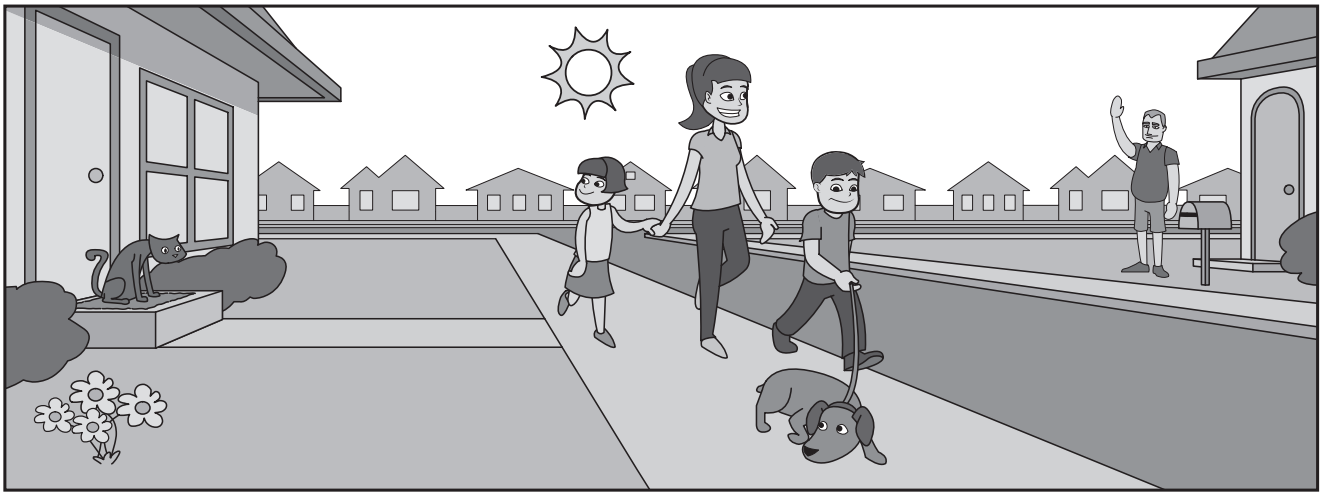
Do pyramids stack? Try stacking some and see. If you can do it, explain how. If not, why do you think this is?

Position – language

1 What are some words you use to tell us where something is? Write them. Share your ideas with someone else and see if you can add to your list.

next to behind

2 Look at the picture and choose the position words to finish the sentences.



a The  is _____ the  .

b The  is _____ the  .

c The  is _____ the mat.

d The  is _____ from the  .

e The  is _____ the  .

f Write your own sentence.

under
next to
far away
on
below
in front of
between

Position – language

1 Draw some things in your classroom that you can go:

under	**over**	**around**

2 What can you see that is:

in front of your teacher's desk?	**behind** your teacher's desk?	**next to** your teacher's desk?

3 You will need a partner. Take turns giving each other simple instructions like 'I want you to go **over** 2 things and then **under** 1 thing'. The playground is a good place to do this activity.

Position – language

1 Draw:

a a girl **next to** the sandpit.

b a boy **on** the slide.

c 2 flowers **under** the climbing frame.

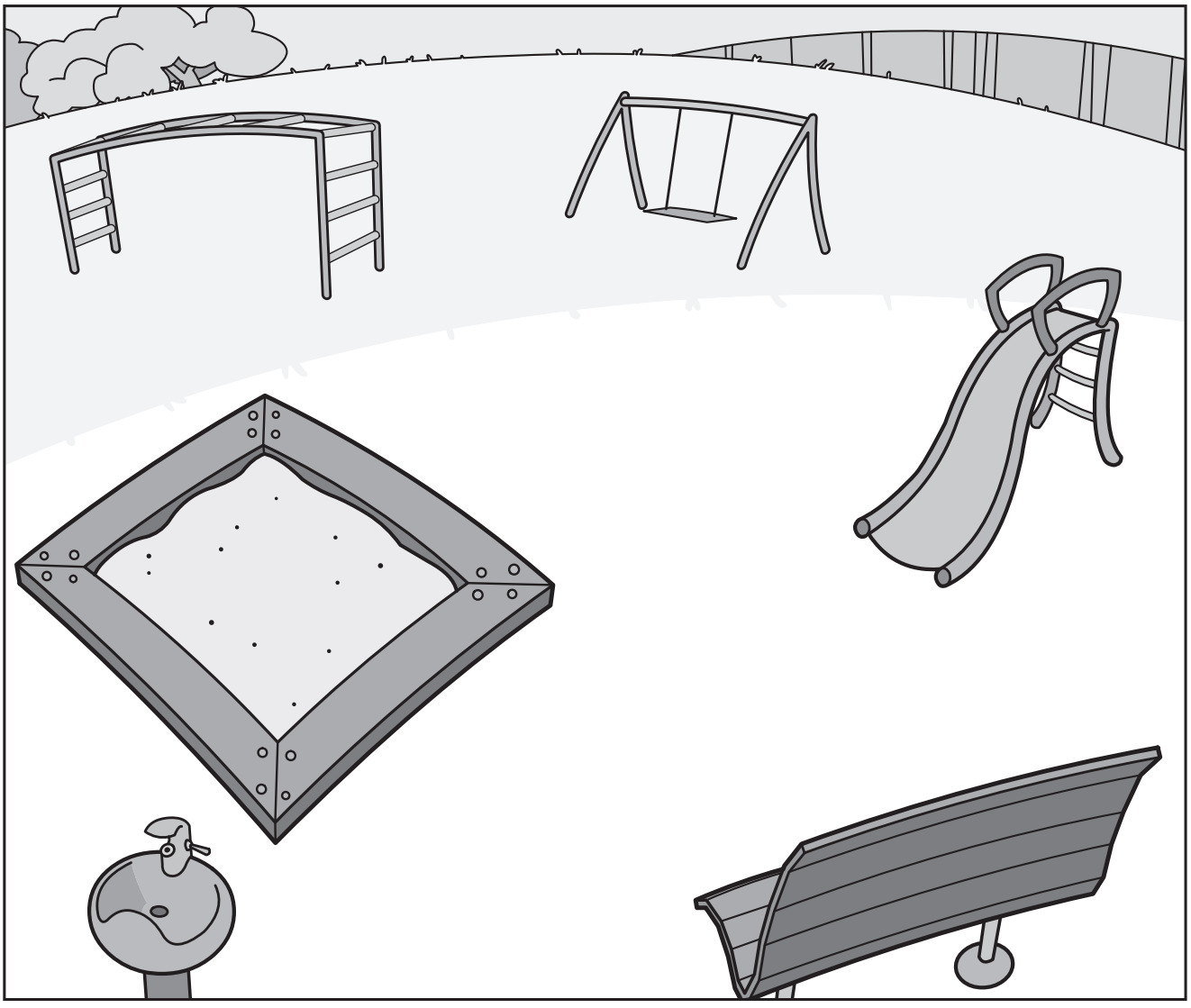
d a boy **beside** the water fountain.

e a bucket and spade **in** the sandpit.

f a girl **behind** the swing.

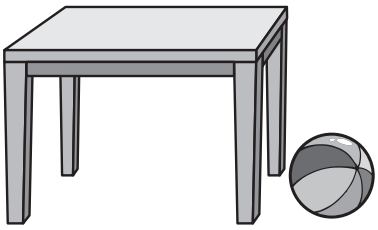
g yourself. Where are you?

I am _____.

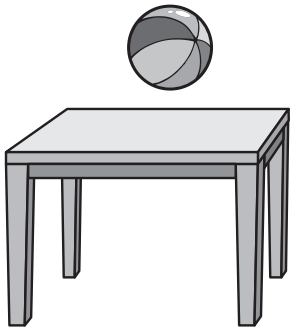


Position – positional vocabulary

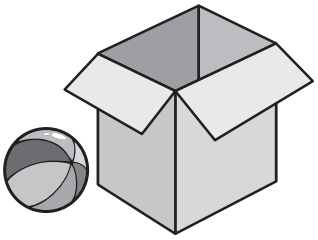
1 Circle the word that describes the position of the ball in each picture.



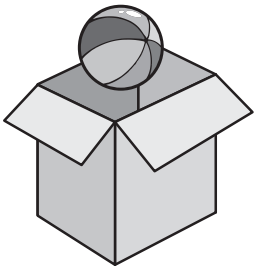
a next to far



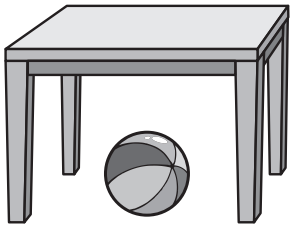
b under over



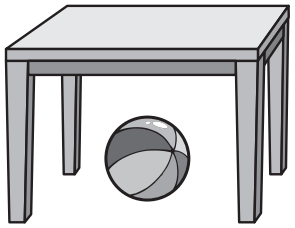
c beside under



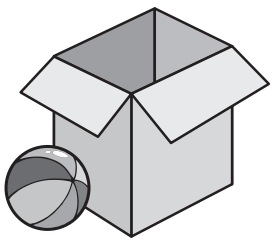
d above below



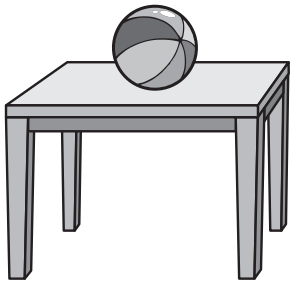
e under over



f above below

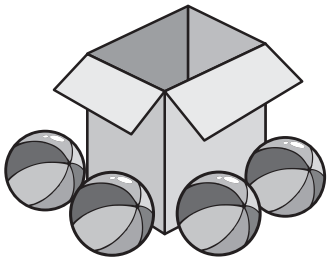


g inside outside

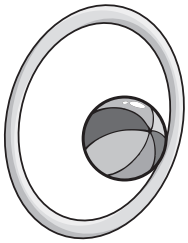


h on under

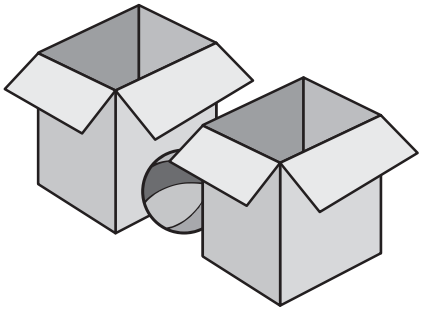
Position – positional vocabulary



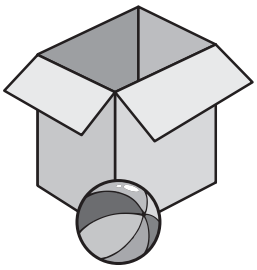
i above around



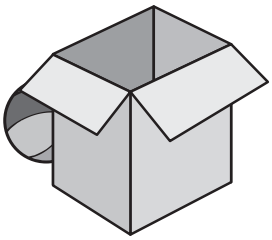
j through below



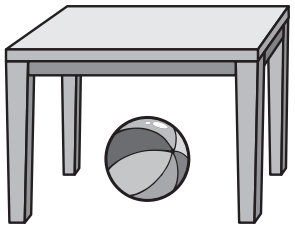
k between below



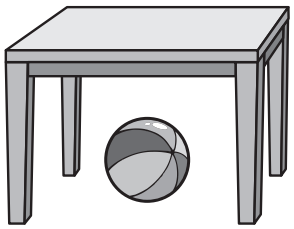
l in front behind



m in front behind



n above under



o top bottom

p top bottom

Position – visual memory

You will need:  a tray  a tea towel  classroom objects

What to do:

Put some objects (stapler, pencil, glue stick, etc) on a tray.

Let your partner look at them for 5 seconds, then cover the tray.

Take 1 object away without letting your partner see what it is.

Show them the tray again.

Can they guess which object is missing?

Swap roles. Play 3 times each.

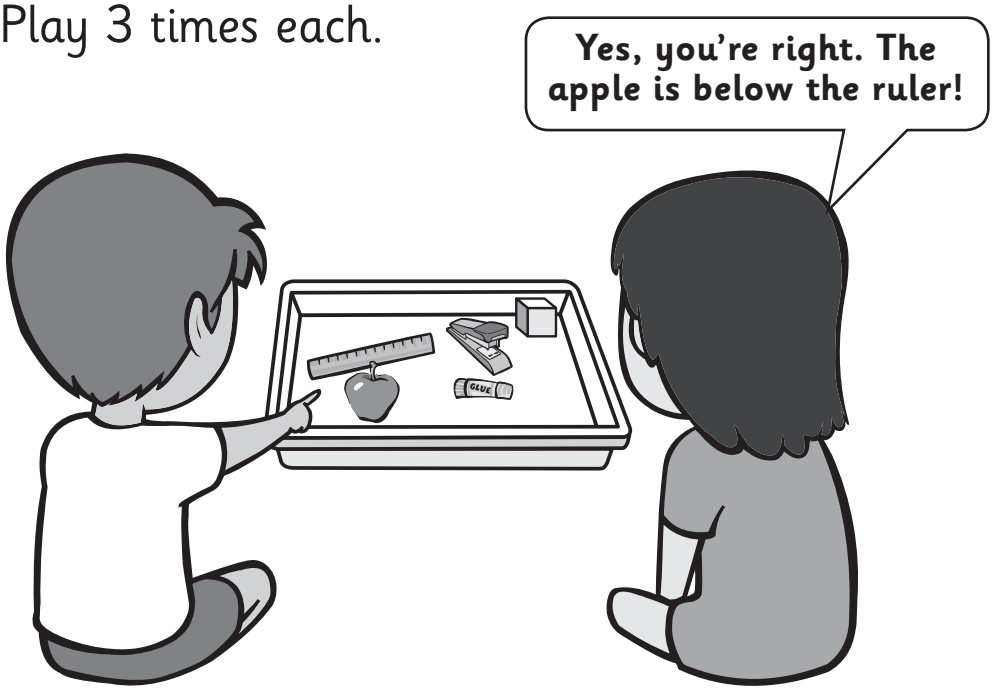
What to do next:

This time, make sure you are sitting side by side.

Show the tray for 5 seconds then cover it.

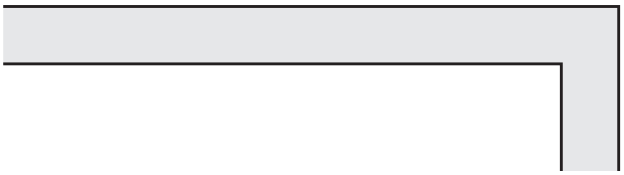
Ask your partner where something is. Are they right?

Swap roles. Play 3 times each.



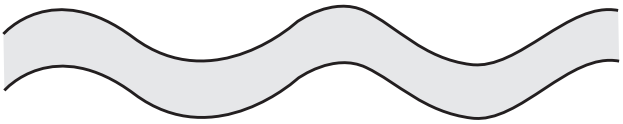
Position – paths and directions

1 **a** If you walked a path that looked like this from above, where could you be going?

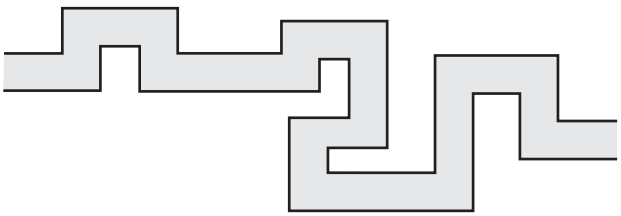


b Make up a story that would fit this walk. Write it here.

2 What about this path? Where could you be walking?

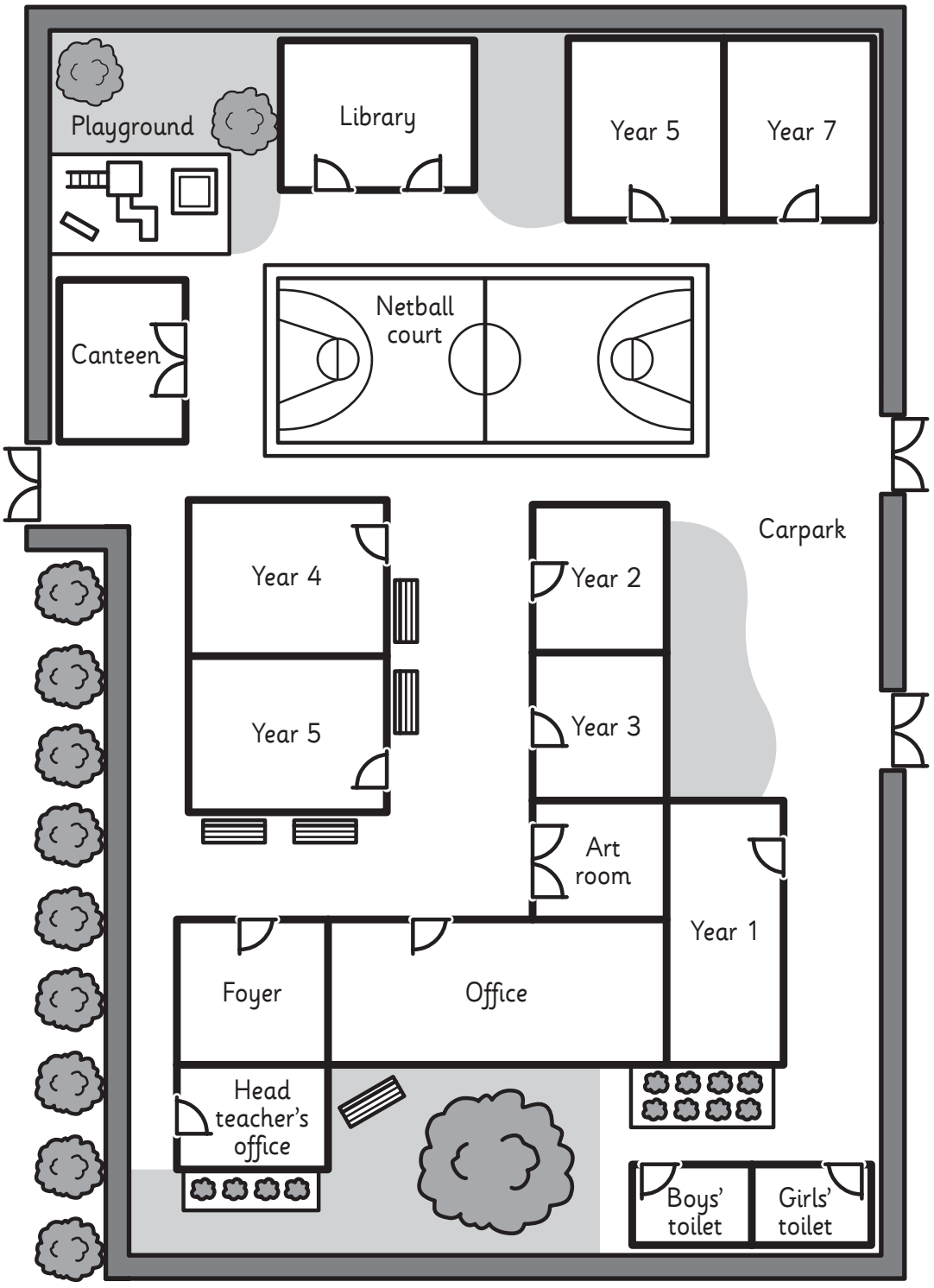


3 Now try this path.



Position – paths and directions

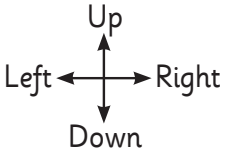
1 Show 1 way from the library to the Year 1 classroom. Explain your way to someone.

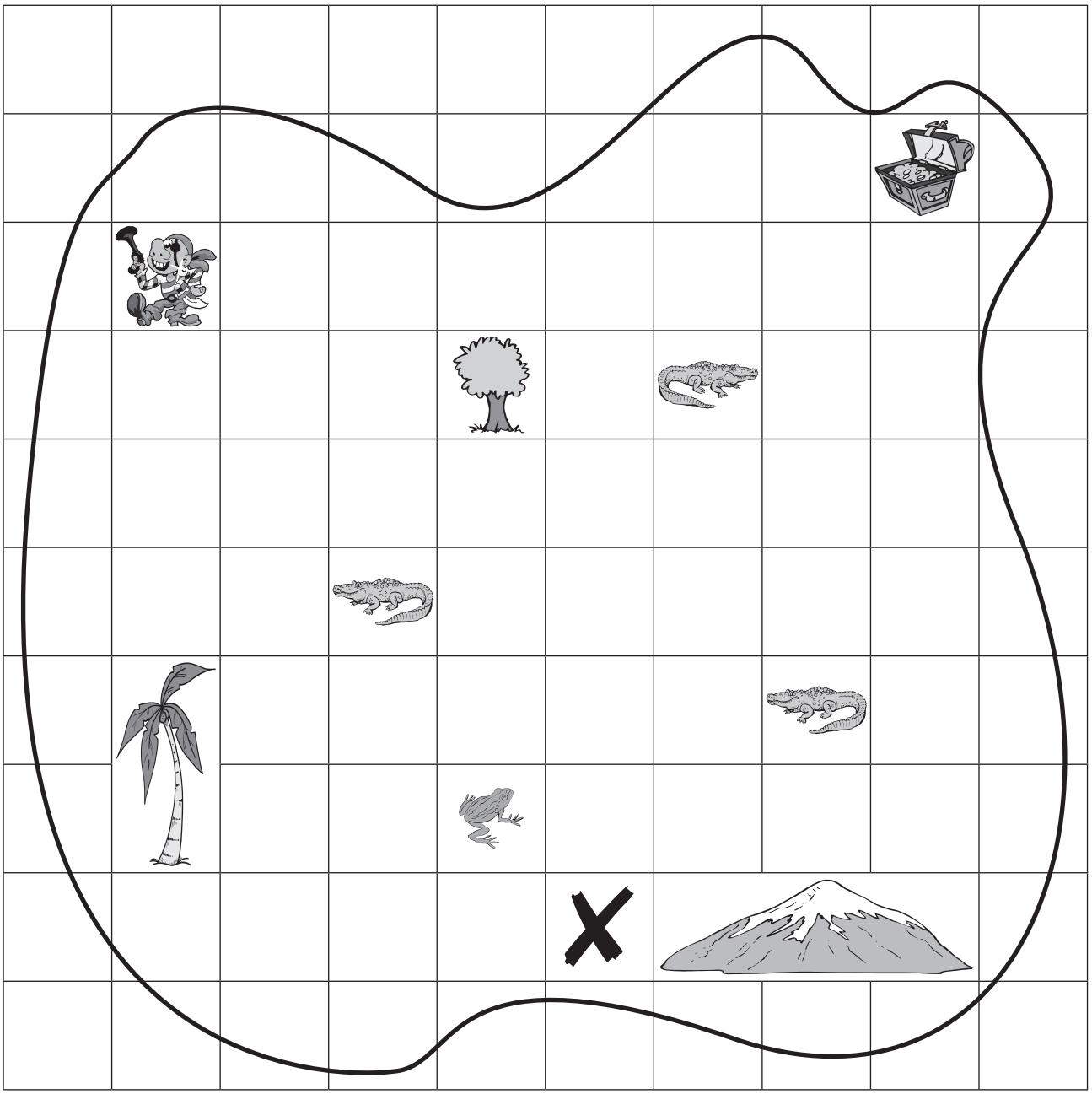


2 Show 2 different ways from the library to the Year 1 classroom.

Position – paths and directions

1 Follow the directions to get from the ✕ to the treasure. Colour and count the squares as you go.





Up 3	Left 1	Up 1	Left 2	Up 2	Right 5	Up 1	Right 1

2 Can you find a shorter path? You must go around any obstacles. Colour this path a different colour. Can you write the directions to match?

Position – mapping

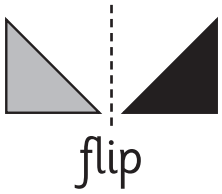
You will need:  pencils

What to do:

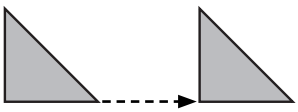
Draw a map of your bedroom. Sketch it lightly. When you get home, check your map. Did you remember correctly or do you need to make some changes? Once you are happy, colour and label your map.

Position – flip, slide, turn

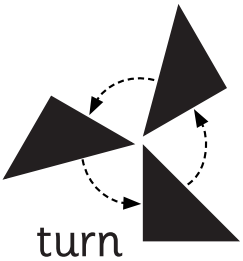
We can flip, slide and turn shapes.



flip



slide

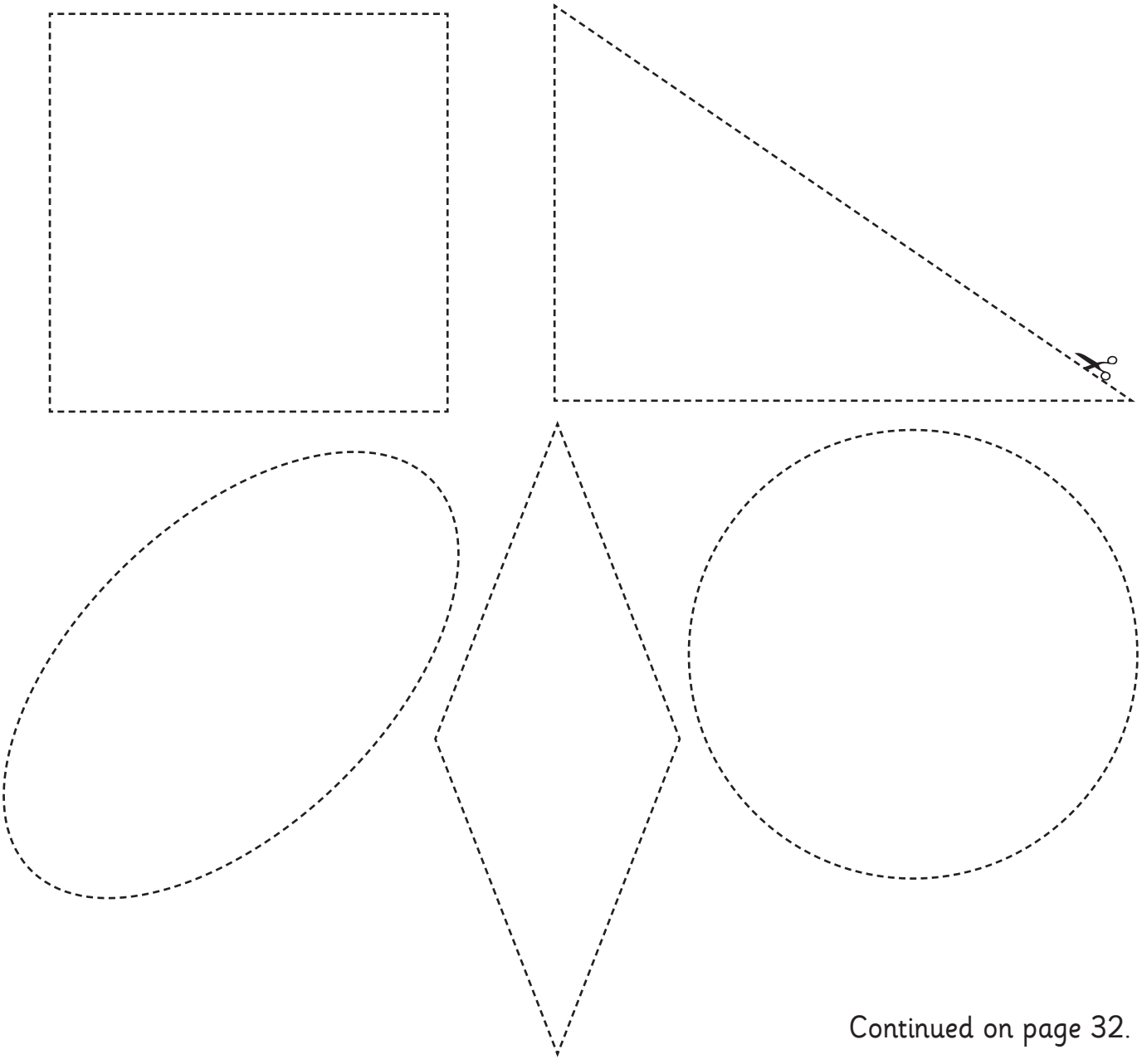


turn

C copy

What to do:

Cut out these shapes. Colour 1 side of each shape grey and the other side black.



Continued on page 32.

Position – flip, slide, turn

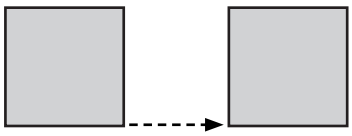
Continued from page 31.

What to do next:

Look at the shape on the left and then in its new position on the right. Did we flip, slide or turn it to make it look like that? Use your shapes to help you find out.

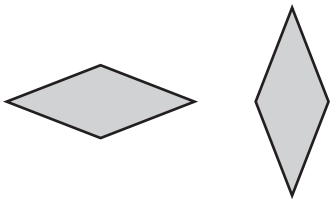
1 Colour the right word.

a



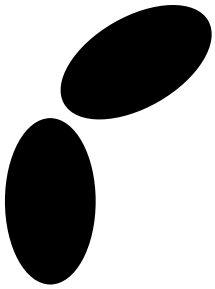
flip slide turn

b



flip slide turn

c

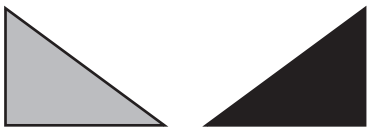


flip slide turn

d

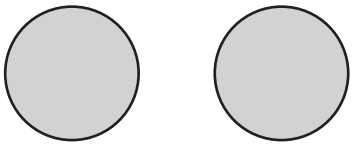
flip slide turn

e



flip slide turn

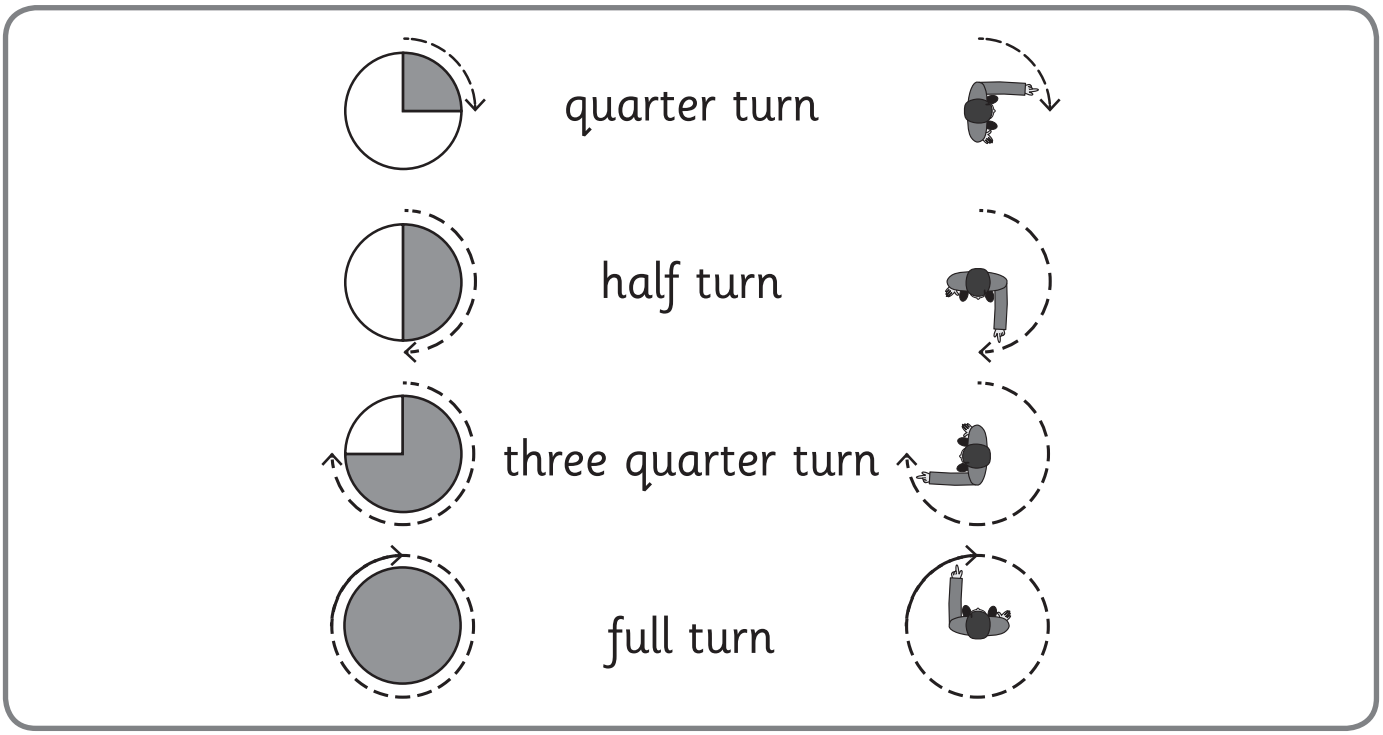
f



flip slide turn

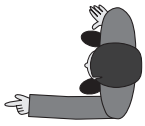
2 When we make patterns with 2D shapes, we often flip, slide and turn them to make them fit. Get some pattern blocks and create a pattern. Notice what you are doing each time you fit a block. Tell someone about some of your flips, slides and turns.

Position – making turns



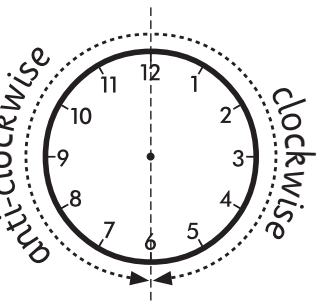
1 Write the turn that each person has made to move between the first and second position.

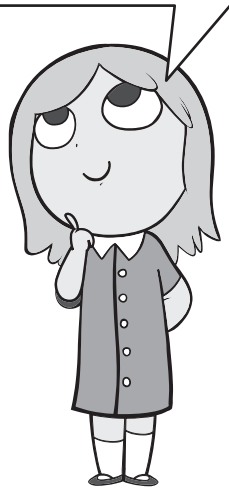
a   _____

b   _____

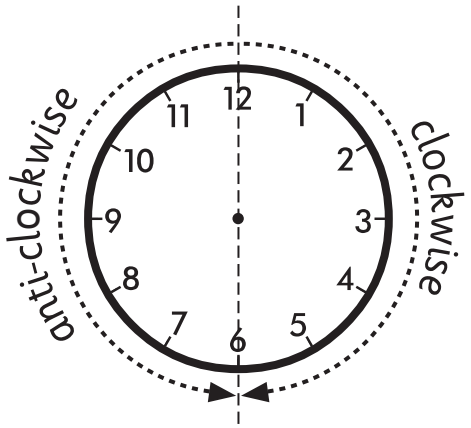
c   _____

You can turn in two directions: clockwise and anti-clockwise.





Position – making turns

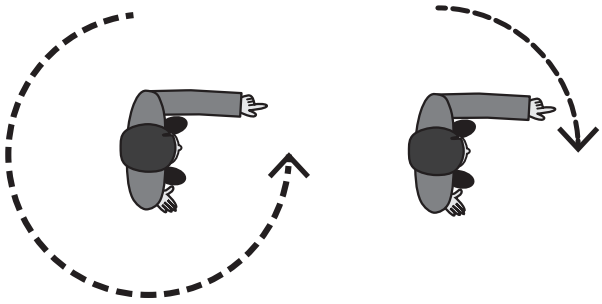


You can turn in two directions clockwise or anti-clockwise.

'Clockwise' is the direction turned by the hands of a clock.

'Anti' means against, so **'anti-clockwise'** is the opposite direction to the way the hands of a clock turn.

This man has made a turn. To get to his final position he could have made a quarter turn clockwise or a three quarter turn anti-clockwise.



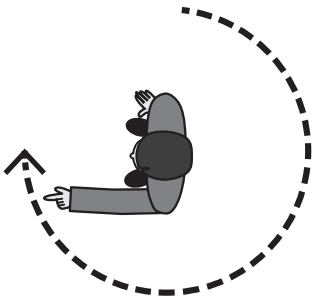
three quarter turn anti-clockwise

quarter turn clockwise

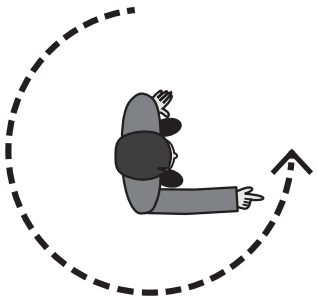
1 Write whether these turns are clockwise or anti-clockwise.

a

b



c



_____ _____ _____