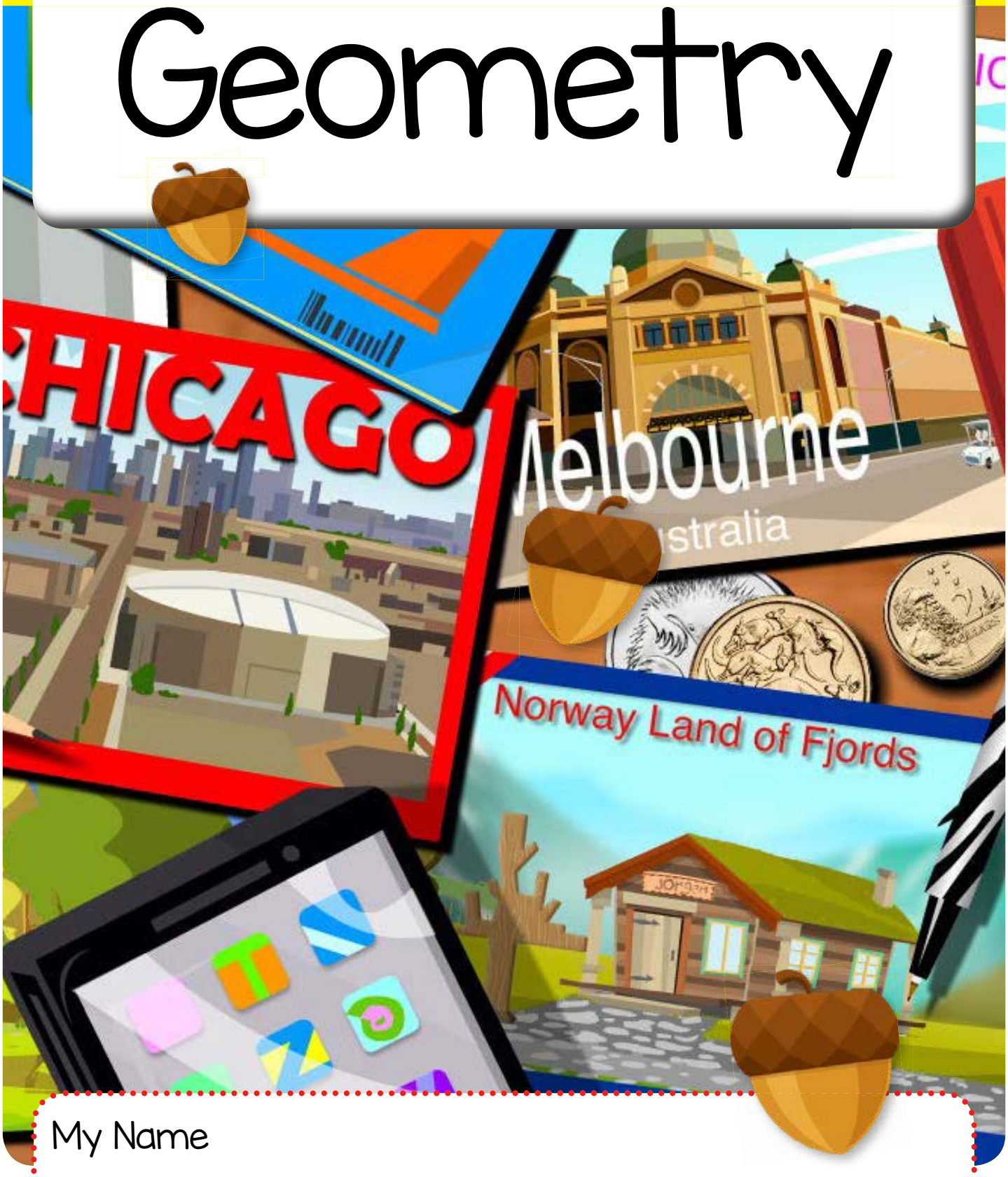
YEAR 3 STUDENT BOOK

Mathseeds

Geometry



My Name

www.mathseeds.com.au

Mathseeds Geometry Year 3 Student Book

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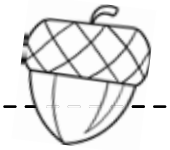


The **Mathseeds** program teaches children the core maths and problem solving skills needed to be successful at school.

Each online lesson begins by introducing and modelling a mathematical concept. The child then completes a wide range of activities to practise the new skill. These activities present the content in many different ways, so children learn to use and apply each new skill in a variety of situations.

This book is designed to supplement the online program with more exercises in the core mathematical concepts. Each unit focuses on a topic within the main learning strand, presenting a series of pen and paper activities, word problems, puzzles and games to practise their skills and understanding.

The topics in this book align with the following components of the Australian Curriculum:

Australian Curriculum content codes and descriptions

ACMMG063 - Make models of three-dimensional objects and describe key features

ACMMG064 - Identify angles as measures of turn and compare angle sizes in everyday situations

ACMMG065 - Create and interpret simple grid maps to show position and pathways

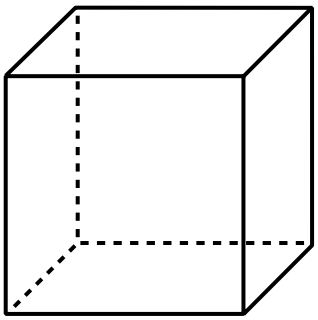
ACMMG066 - Identify symmetry in the environment

Basic 3D objects

3D objects

1 Name the shapes.

a



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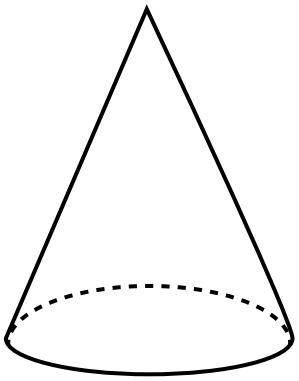

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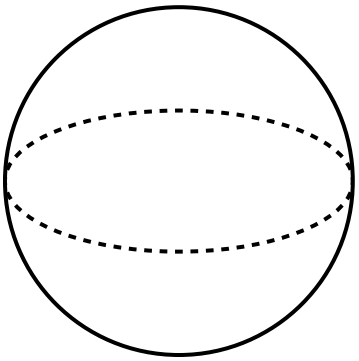

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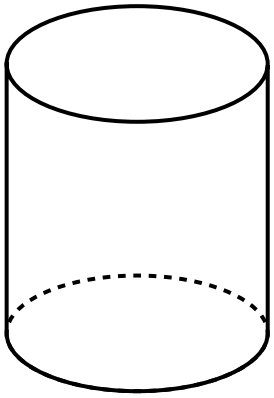


2 Which shapes have a curved surface? _____

3 Count the flat faces in these shapes:

a _____ **b** _____ **d** _____

4 Count the edges in each shape:

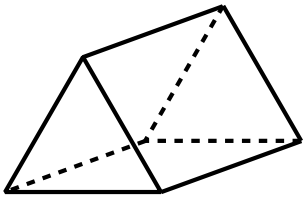
a _____ **b** _____ **c** _____ **d** _____

5 Which shape has 6 vertices? _____

Prisms

1 Colour the end faces of these prisms. **2** Name each prism.

a



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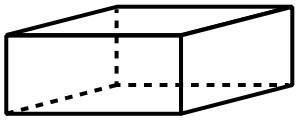

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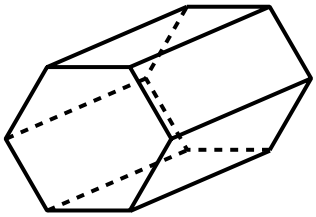

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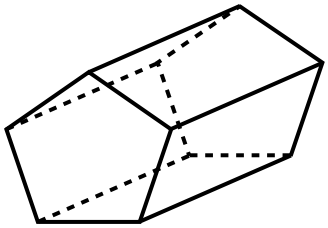


3 Draw the faces for each prism.

Prism	Faces							
a Triangular								
b Rectangular								
c Hexagonal								
d Pentagonal								

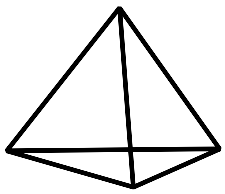
4 Sometimes the end face of a prism is called a "base". Colour the base shapes in the chart above.

5 What do you notice about all the other faces?

Pyramids

1 Colour the bases of these pyramids. **2** Name each pyramid.

a



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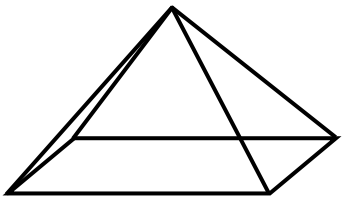

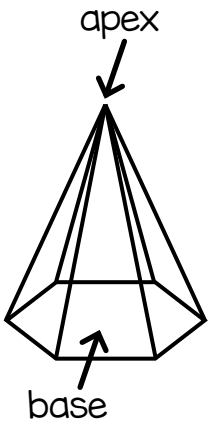

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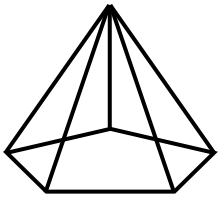

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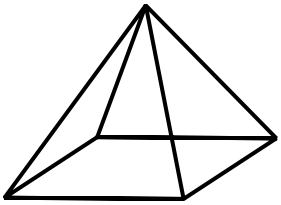


3 What does a pyramid have that a prism does not? _____

4 Draw the faces for each pyramid.

Prism	Faces							
a Triangular								
b Rectangular								
c Pentagonal								
d Square								

5 Colour the base shapes in the chart above.

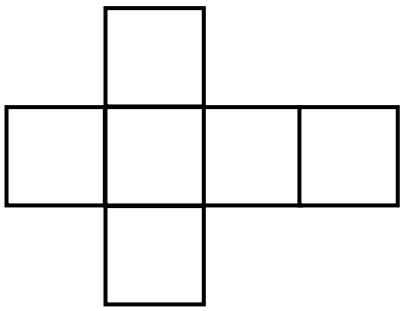
6 What do you notice about all the other faces?

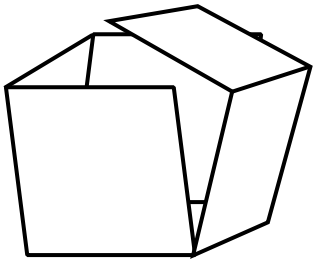
_____

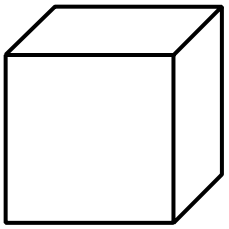
_____

Cube nets

This is a cube net. It has 6 square faces.
It folds up to make a cube.





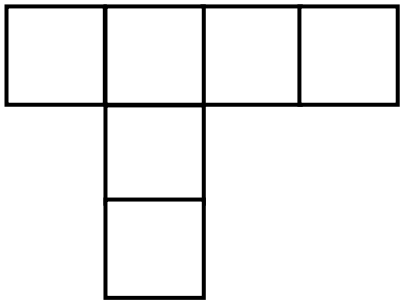


1 Some of the nets below fold up to make a cube.

Some do not. Colour the cube nets in blue.

Try to imagine folding them up, or you could copy the nets onto spare paper, cut them out and try folding them up.

a



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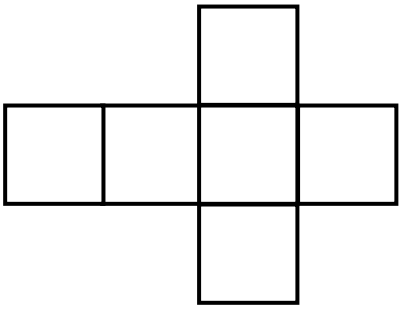

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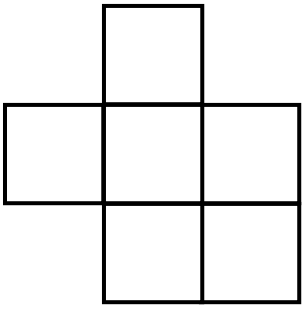

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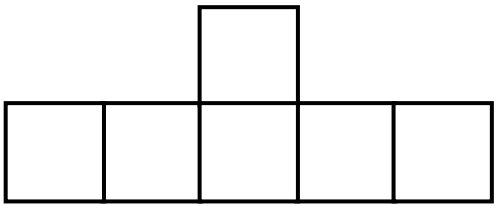

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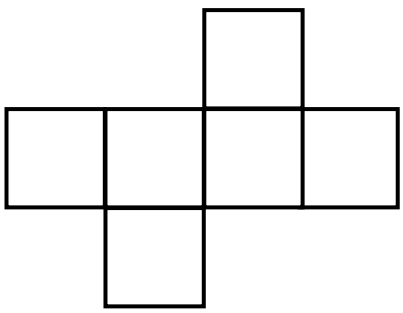

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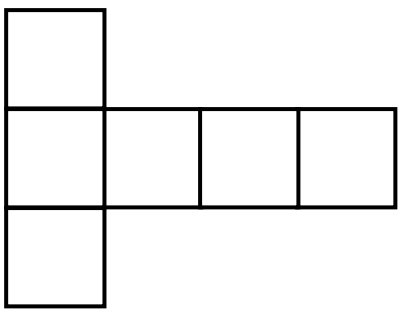
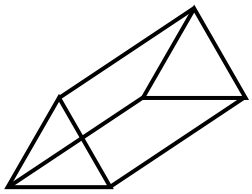


Nets

1 Name the 3D objects. **2** Match the 3D objects to their nets.

a



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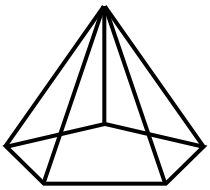

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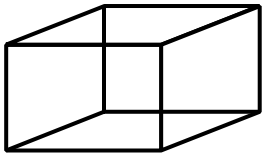

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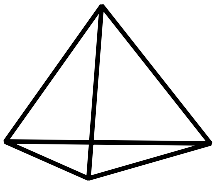

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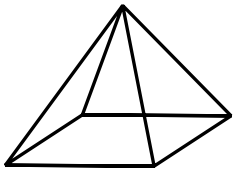
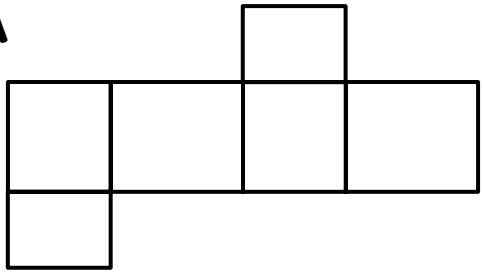


A



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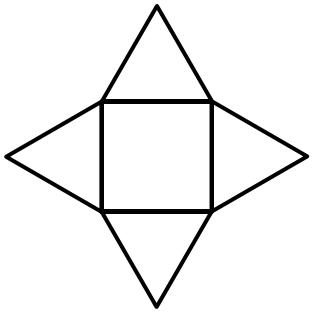

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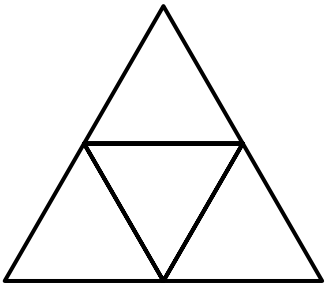

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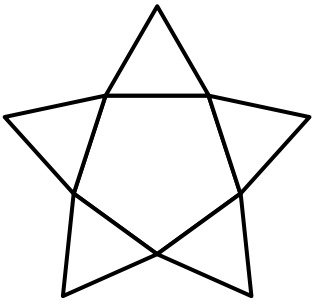

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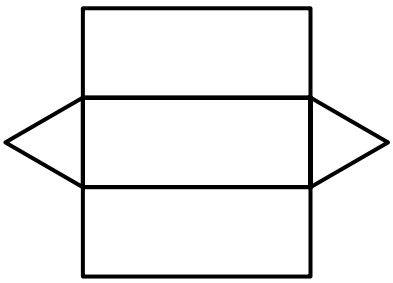
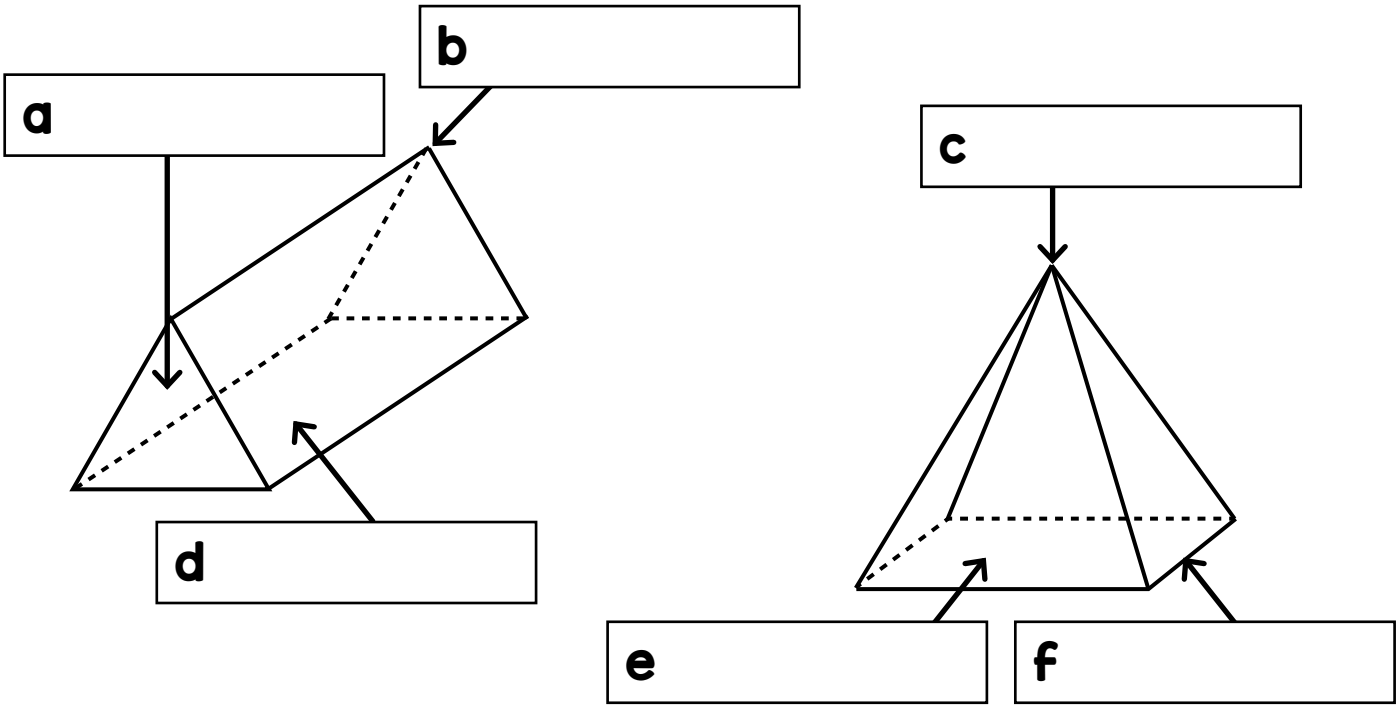


Prisms and pyramids

1 Label the features of these shapes. Use the word bank.

Word bank

vertex base face apex edge



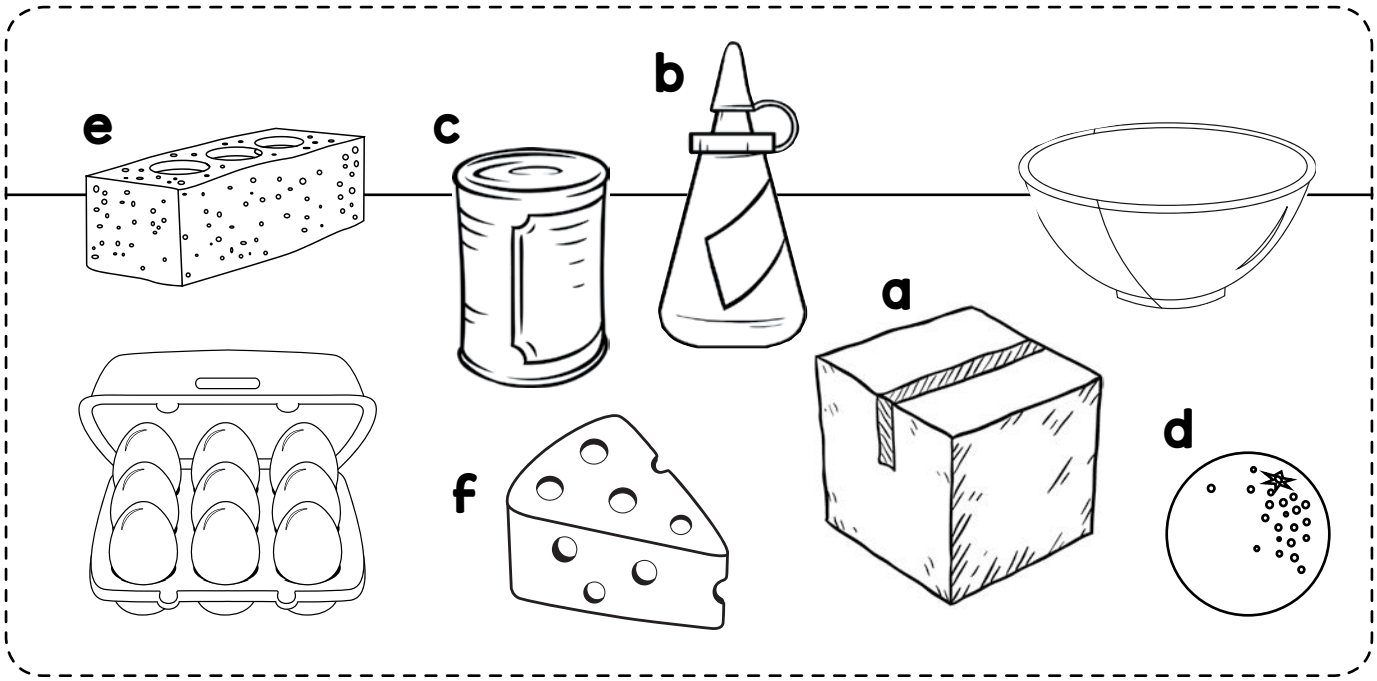
2 Draw the net for these shapes.

a square prism

b rectangular pyramid

3D objects

1 Name the 3D objects in the picture.



a _____ **b** _____

c _____ **d** _____

e _____ **f** _____

2 Draw a real-life object for these 3D shapes:

a pyramid

b cylinder

Who am I? problems

3D objects

1 Use the clues to name and draw each 3D object.

a I have an apex and a base.
I have 1 curved surface
and 1 flat face.

I am a _____.

b I have 6 flat faces.
They are all the same shape and size.
I have 8 vertices.

I am a _____.

c I have one curved surface.
I also have 2 flat faces
and 2 edges.

I am a _____.

d I have an apex and a base.
My sides are all triangles
and there are 4 of them.

I am a _____.

e I have 5 flat faces.
Most of my faces are triangles
but one is not.

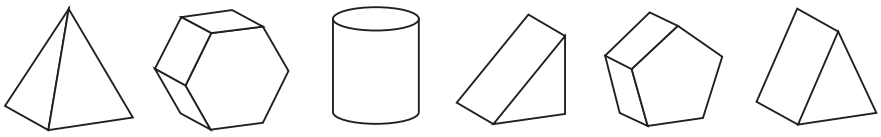
I am a _____.

3D games

I SPY

Play with a group of 4 or more. No equipment needed.

1. One person is the 'spy'. The spy describes an object in the room, using only geometrical terms for 3D objects, eg faces, surfaces, curved, flat, edges, apex, base, vertices.
2. Everyone else tries to guess what the object is.
3. When someone guesses correctly, it is their turn to be the spy. If no one guesses, the spy gets another turn. (Any disputes about the accuracy of the spy's description should be settled by a group vote.)



3D BINGO

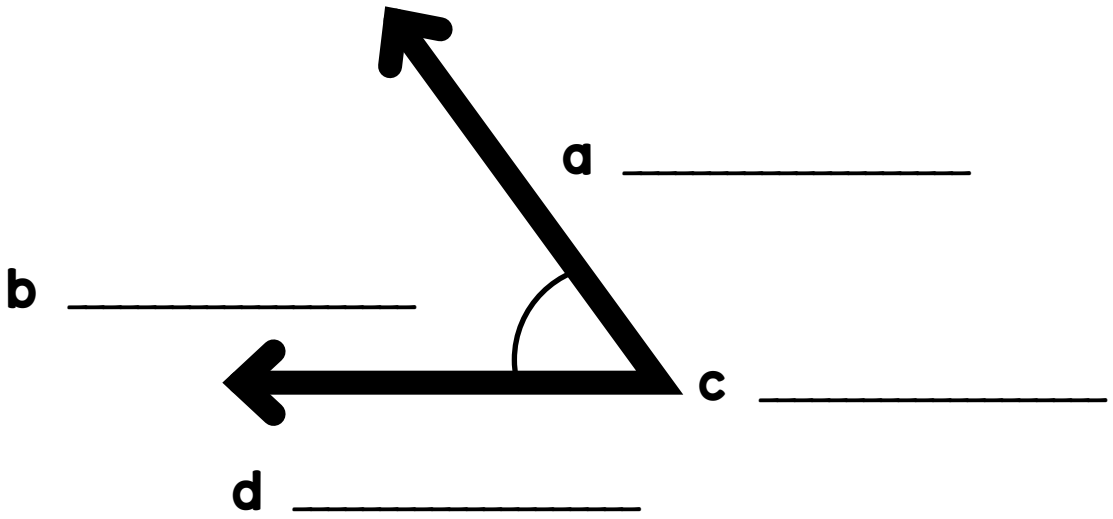
Play in small groups or as a class. You all need pen and paper.

1. One person is the 'caller'. They run the game for the players.
2. Each player rules up a grid, four columns across and four rows down. In each square draw a 3D object (you can repeat objects).
3. The caller calls out a feature of a 3D object, eg 'I curved surface, 6 flat faces, 2 edges, an apex, 6 vertices, a square base ...'
4. Anyone who has that feature in one or more of the shapes on their grid can cross off I shape.
5. Repeat steps **3** and **4** until someone has a complete row or column crossed off and calls 'Bingo!' The winner becomes the caller for the next game.

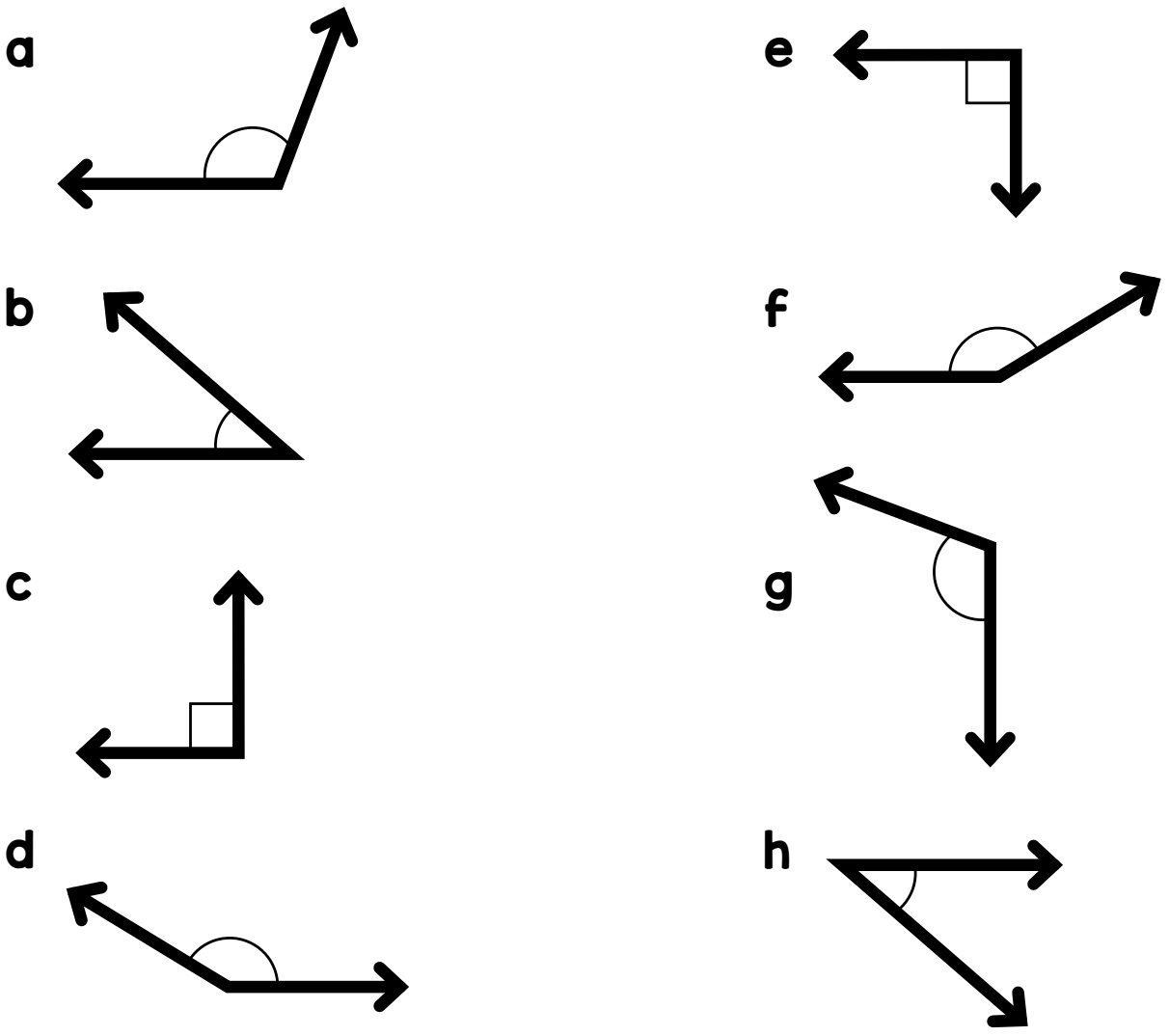
Angles

1 Name the parts of the angle.

arm
angle
vertex
arm



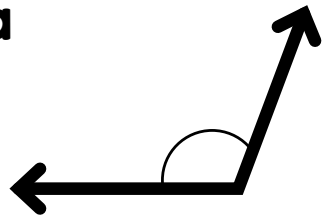
2 Connect the angles that are the same size.



Right angles

1 Colour the right angle red.

a



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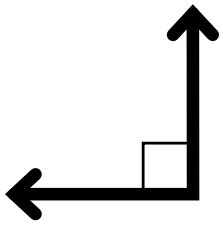

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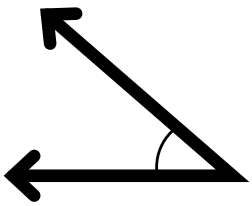
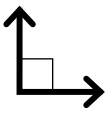


2 Draw the right angle symbols in red. Eg 

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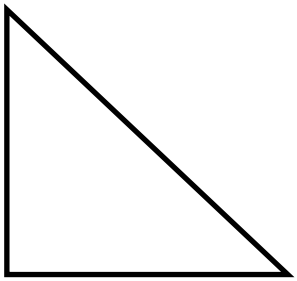

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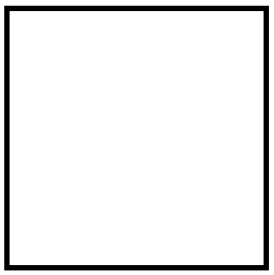

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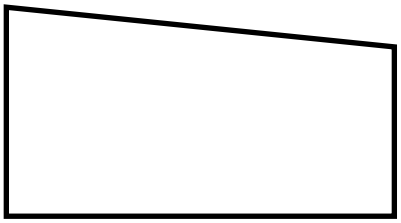
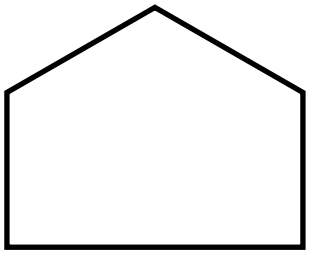
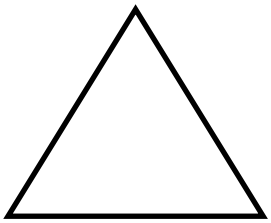


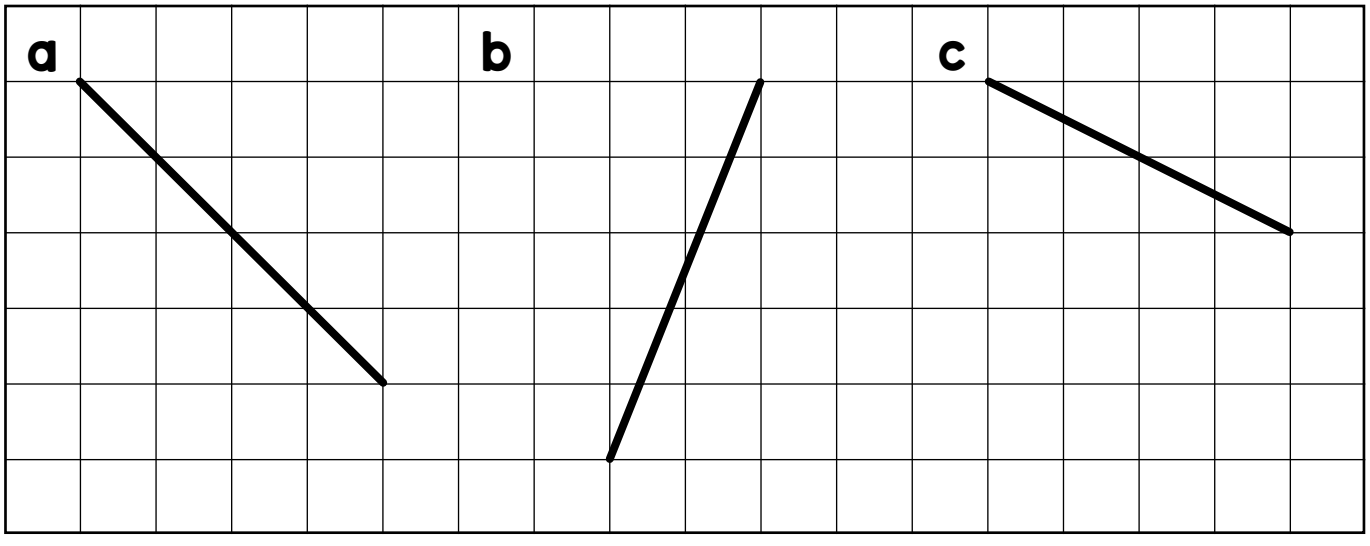
e



f



3 Complete these right angle triangles.

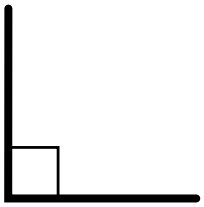


Perpendicular lines

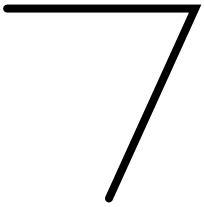
When two lines meet at a right angle, they are called perpendicular lines. Perpendicular lines can extend beyond their meeting point.

1 Circle the perpendicular lines.

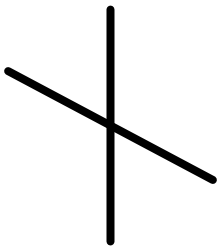
a



b



c



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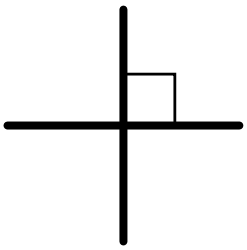
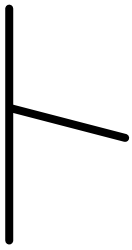


e



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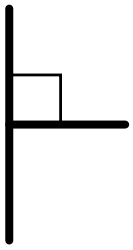
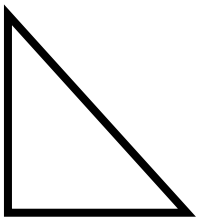
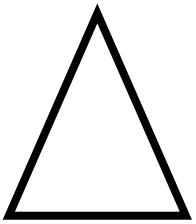


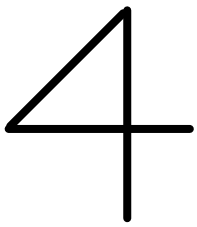
g



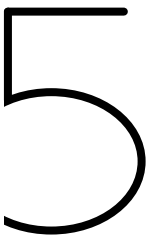
h



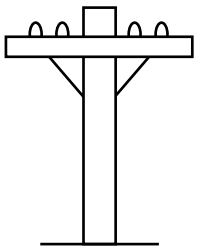
i



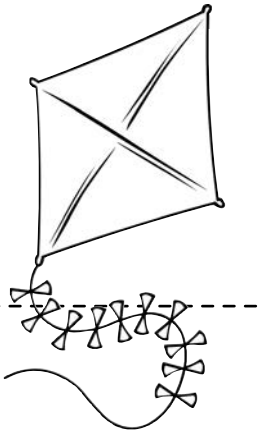
j



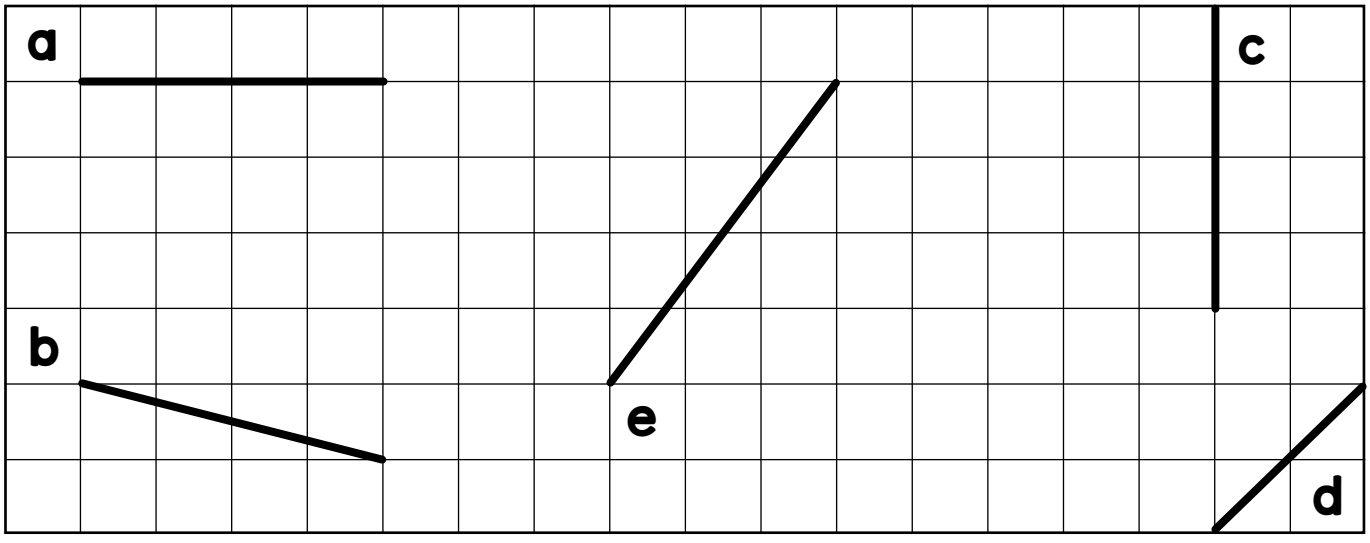
k



l



2 Draw a perpendicular line to each given line. Mark the right angles.



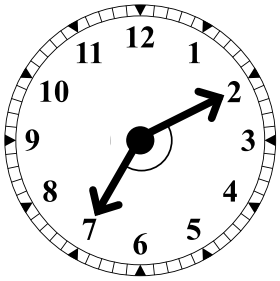
Angle sizes

1 **a** Which is a right angle? _____

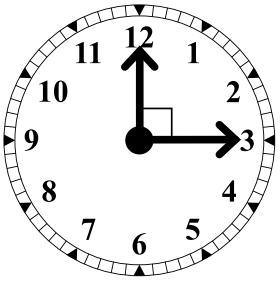
b Which is smaller than a right angle? _____

c Which is larger than a right angle? _____

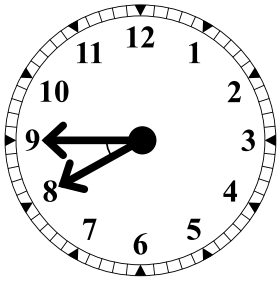
A



B

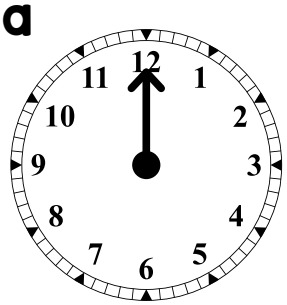


C

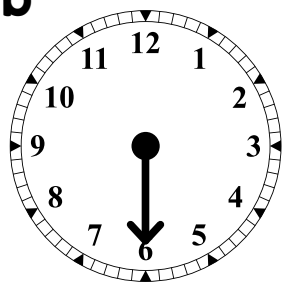


2 Draw the missing clock arms. Make 4 different right angles.

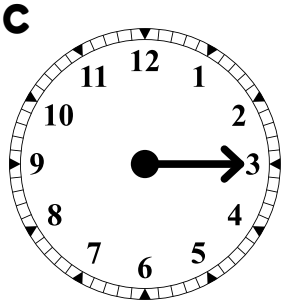
a



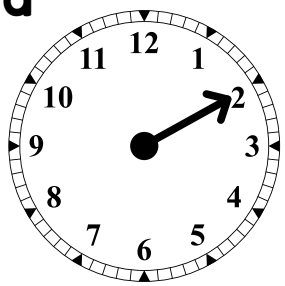
b



c

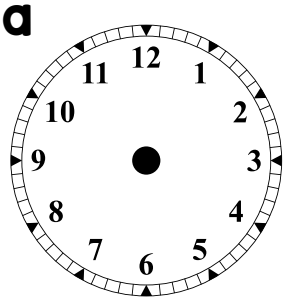


d

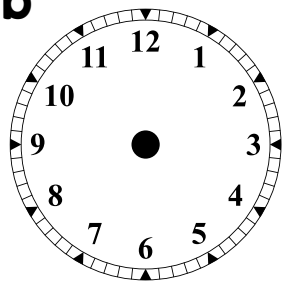


3 Make 4 angles <u>smaller</u> than a right angle.

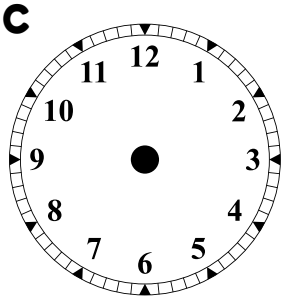
a



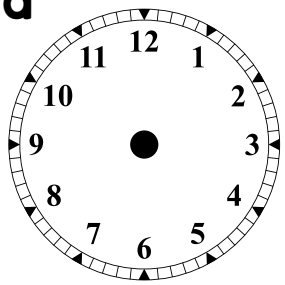
b



c

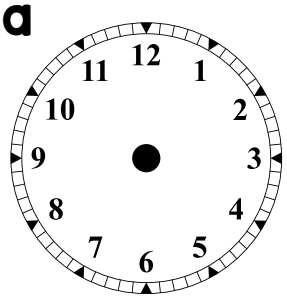


d

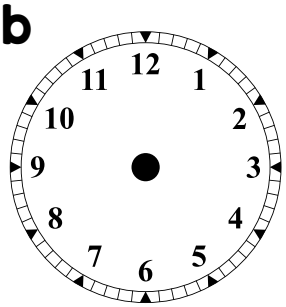


4 Make 4 angles <u>larger</u> than a right angle.

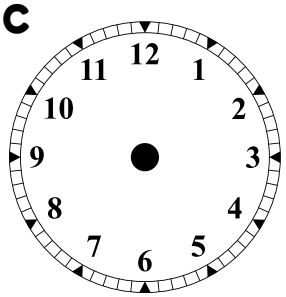
a



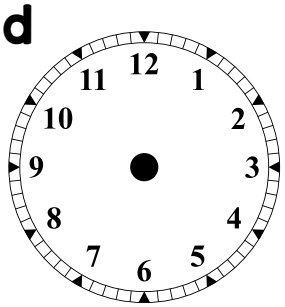
b



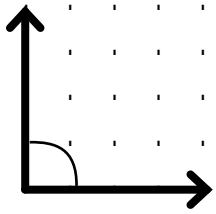
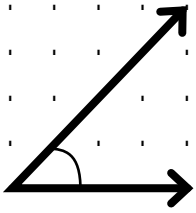
c



d



Comparing angles

	Copy the angle.	Draw a larger angle.	Draw a smaller angle.
	**1a**	**1b**	**1c**
	**2a**	**2b**	**2c**
	**3a**	**3b**	**3c**

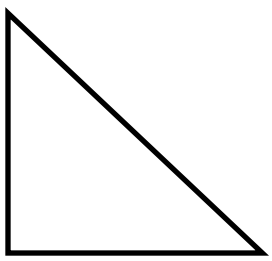
4 Angle **1a** is a right angle. Which angles are:

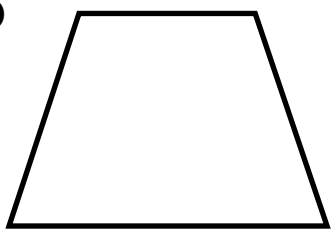
a smaller than a right angle? _____

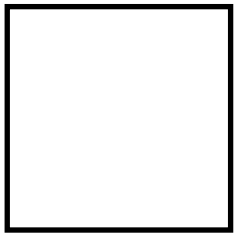
b larger than a right angle? _____

c Did you draw any other right angles? _____

5 Colour right angles red. Colour smaller angles blue. Colour larger angles green.

a 

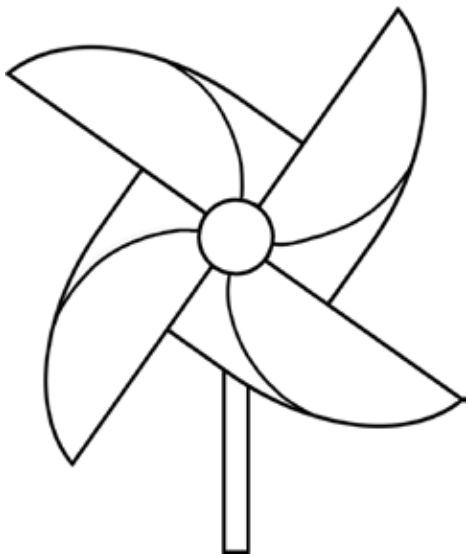
b 

c 

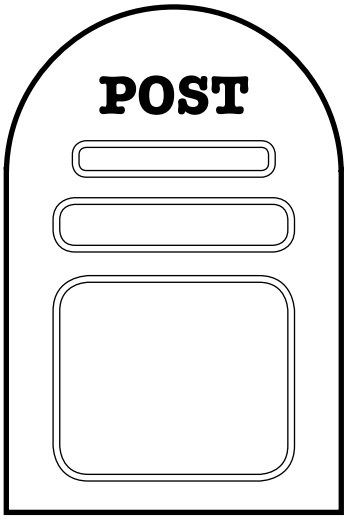
Angles in objects

1 Mark every right angle in each picture.

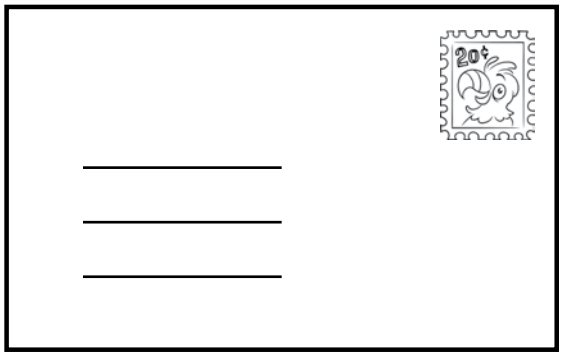
a



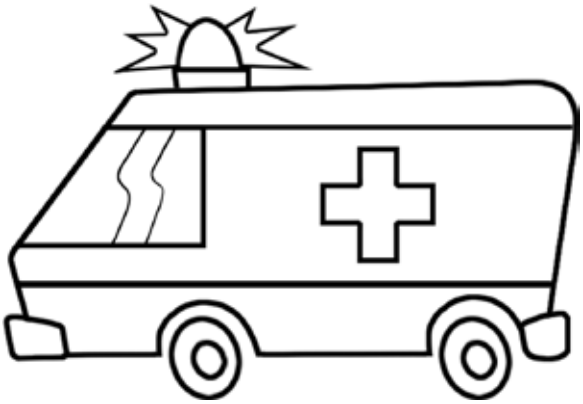
b



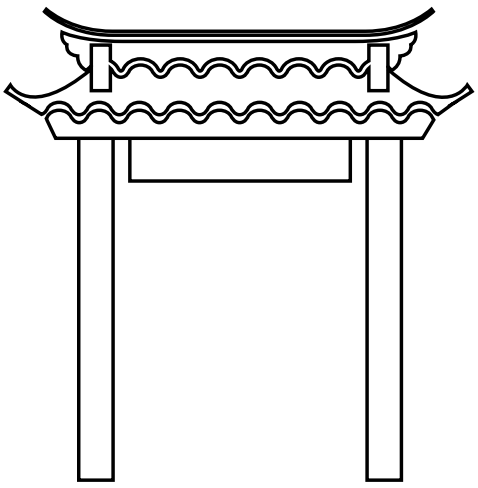
c



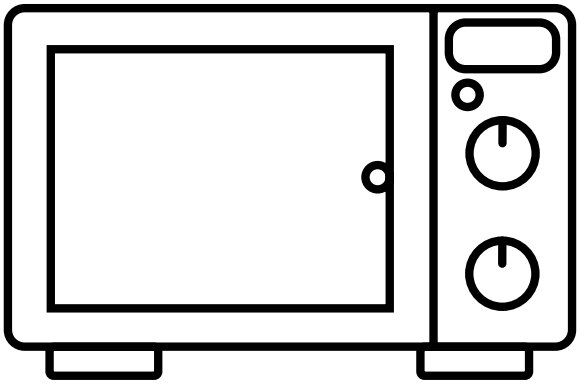
d



e



f



Angle problems

Angles

1 Draw each shape. All sides are straight lines.

a Shelly draws a 4-sided shape with 4 right angles.

b Sandi draws a different 4-sided shape with 4 right angles.

c Marlin draws a 4-sided shape with just 2 right angles.

d Mack draws a 3-sided shape with 1 right angle.

e Zander draws a 5-sided shape with 2 right angles.

f River draws a 4-sided shape with no right angles.

2 Murray draws a picture of a building using all of these shapes. Can you?

Angle games

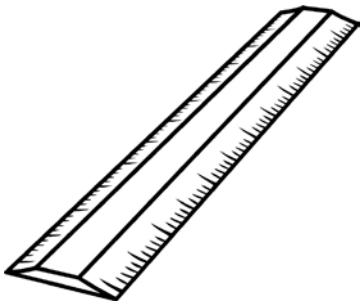
LAST LINES

Play in a pair ☺☺ or a trio ☺☺☺. You need a piece of grid paper (see page 41).

1. Player A: Draw along one of the grid lines. Your line can be any length, but it must start and end on a corner.
2. Player B: Draw along a grid line that is perpendicular to Player A's line. Your line can be any length, but it must start from the previous line or cross it.
3. Take turns drawing perpendicular lines until you run out of room. The last person to draw a line is the winner.

SURPRISE DRAWING

Play in a pair ☺☺ or a trio ☺☺☺. You need a blank piece of paper , a pencil and a ruler.



1. Player A: Draw a straight line of any length on the paper.
2. Player B: Draw a straight line coming off the first line at an angle.
3. Take turns drawing one line each, making more angles and trying to create a picture of something. Don't talk to each other—you can point, and shake or nod your head to show each other what to do.

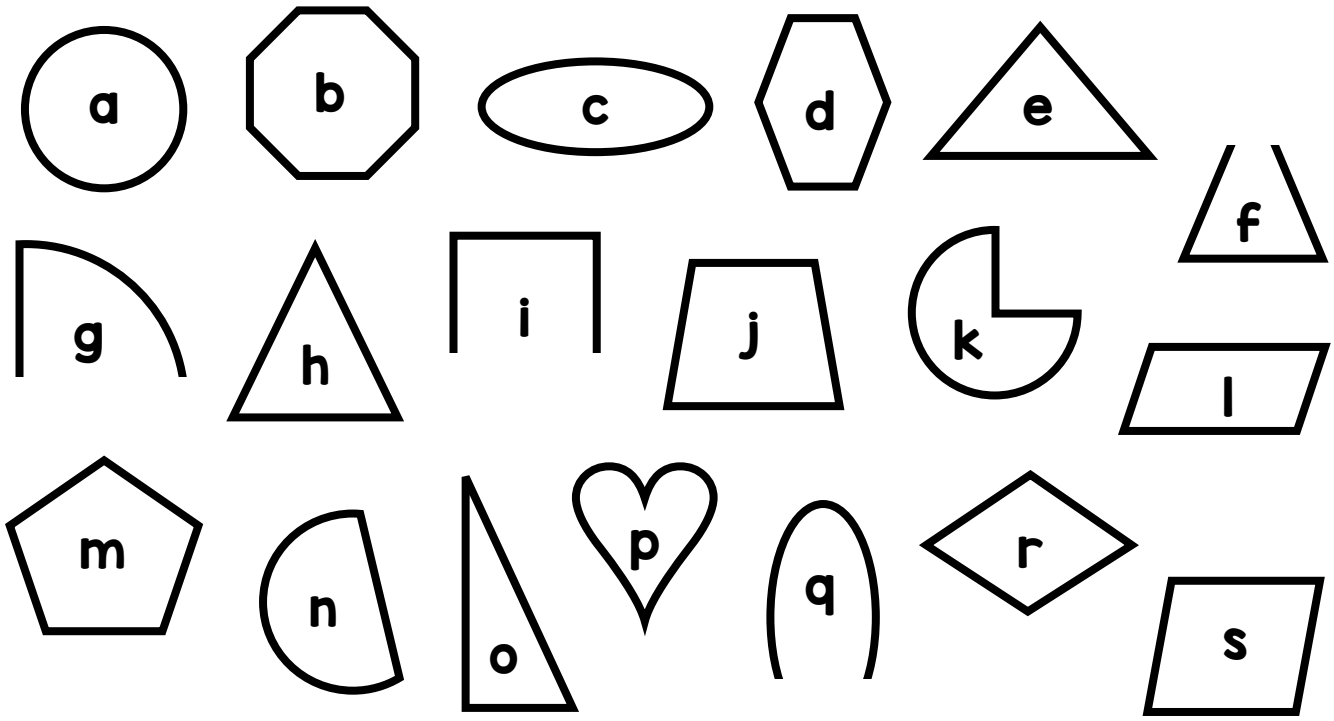
Harder version: Repeat the process without any communication—no words, gestures, pointing, nodding or shaking your head. Can you still make a recognisable picture?

Polygons

1 Circle the correct words to define a polygon.

A polygon is a flat / solid shape with straight / curved, open / closed sides.

2 Colour the polygons.



3 Explain why each of these shapes is NOT a polygon.

a _____

f _____

g _____

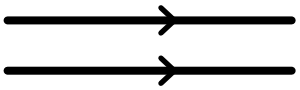
k _____

p _____

q _____

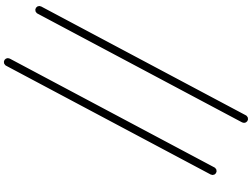
Parallel lines

When two lines run next to each other and are always the same distance apart, they are called parallel lines.
Parallel lines never meet. Extend these lines with your ruler to check.

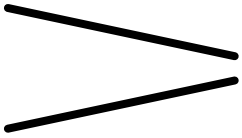


1 Mark all parallel lines with arrow markers.

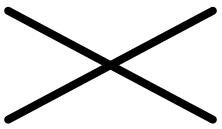
a



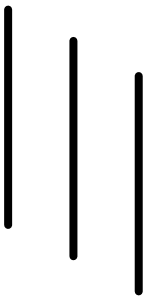
b



c



d



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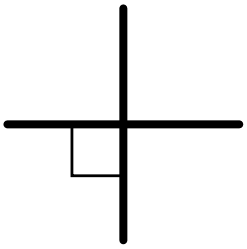

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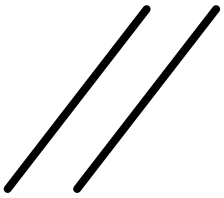

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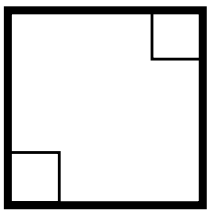
h

i



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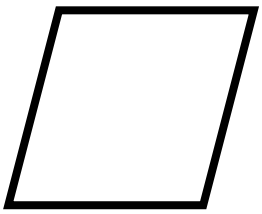

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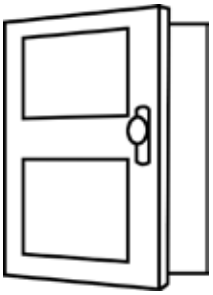

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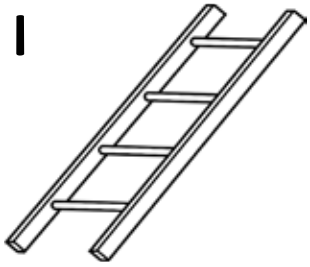
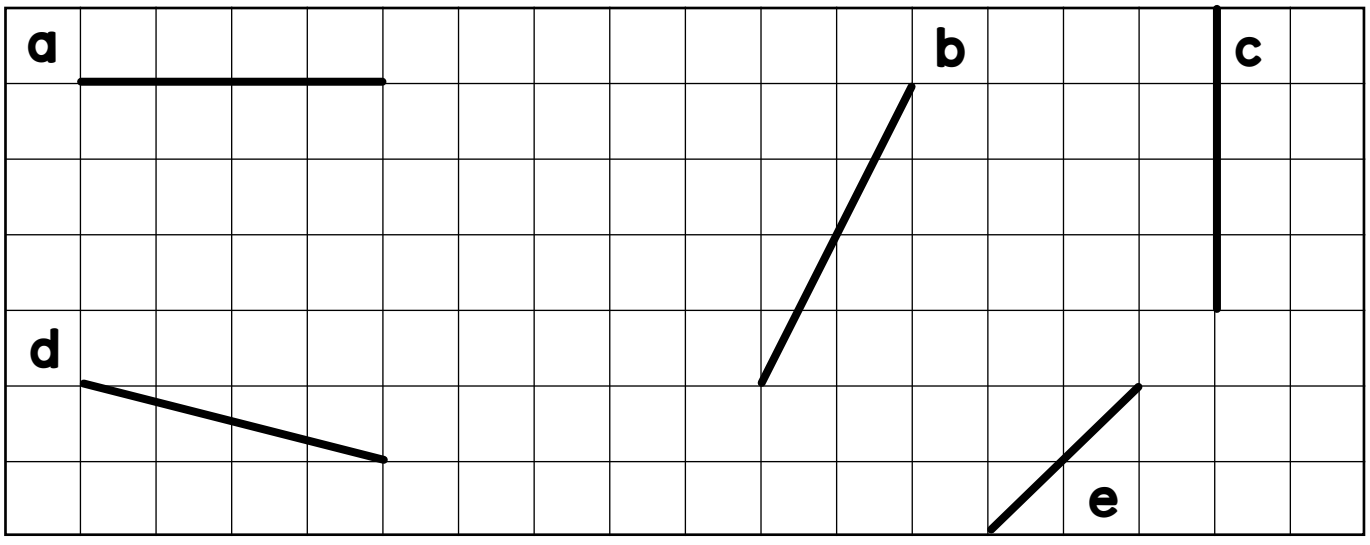
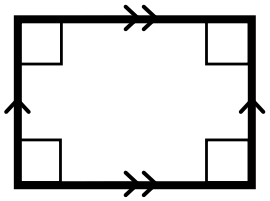
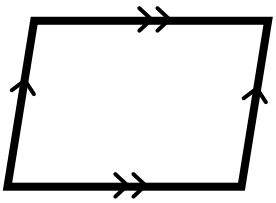
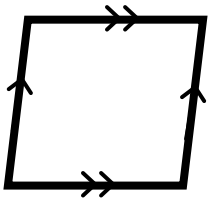
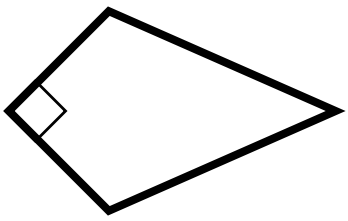


2 Draw a parallel line for each given line. Add arrow markers to both lines.



Quadrilaterals

1 Fill in the table.

Shape name	Parallel sides	Right angles	Diagram
rectangle	**a**	**b**	
c	2 pairs	4	**d**
e	2 pairs	**f**	
rhombus	**g**	**h**	
trapezium	**i**	2	**j**
k	0	1	

Quadrilateral descriptions

2D shapes

1 Complete the definition of a quadrilateral.

solid flat closed open two three four five

A quadrilateral is a _____, _____ shape with _____ sides and _____ vertices.

2 Draw two quadrilaterals that fit each description.

	Description	Draw two quadrilaterals
a	Two pairs of parallel sides. Opposite sides are equal.	
b	Two pairs of parallel sides. All sides are equal.	
c	One pair of parallel sides.	

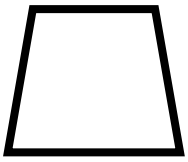
3 Draw a quadrilateral with no parallel sides.

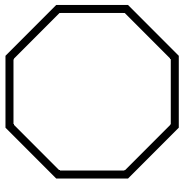
Quadrilateral comparisons

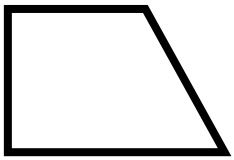
	Pair of shapes	**a** What is something they have in common?	**b** What is one difference between them?
1	square rhombus		
2	square rectangle		
3	square parallelogram		
4	parallelogram rectangle		
5	parallelogram rhombus		
6	rhombus rectangle		

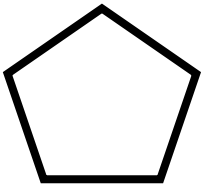
Angles in shapes

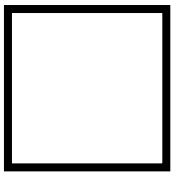
1 Colour the right angles red. Colour the angles smaller than a right angle in blue. Colour the angles larger than a right angle in green.

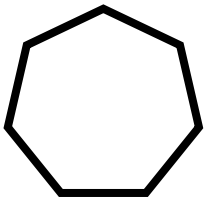
a 

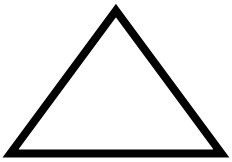
b 

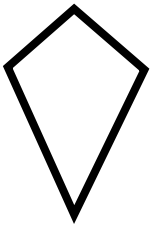
c 

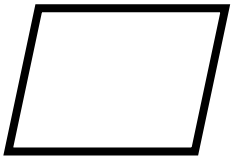
d 

e 

f 

g 

h 

i 

2 Draw two other shapes with NO right angles.

a

b

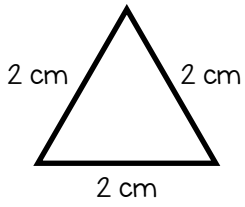
3 Draw two other shapes with at least one right angle.

a

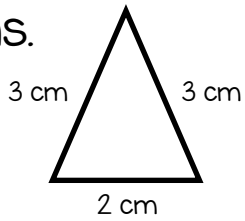
b

Regular and irregular shapes

Regular shapes have all the same size angles and all the same length sides. For example, this triangle:



Irregular shapes have at least one different sized angle and the sides are not equal lengths. For example, this triangle:



1 Draw one of each.

a Regular quadrilateral

b Irregular quadrilateral

c Regular pentagon

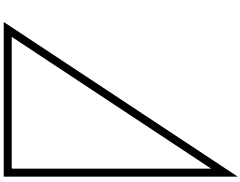
d Irregular pentagon

e Regular hexagon

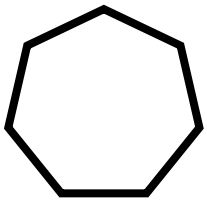
f Irregular hexagon

2 Colour the irregular shapes in blue. Colour the regular shapes in pink.

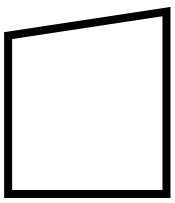
a



b



c



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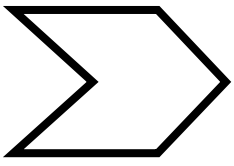
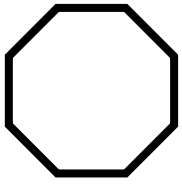


e



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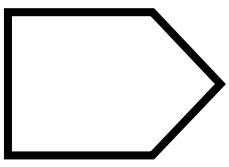

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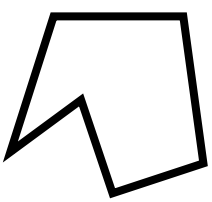

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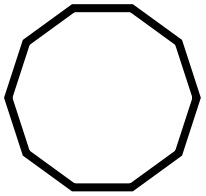
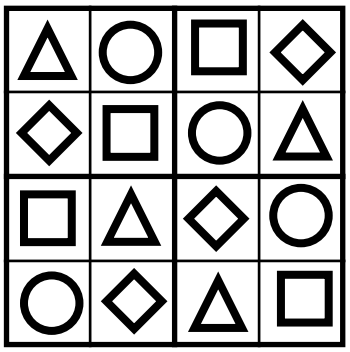


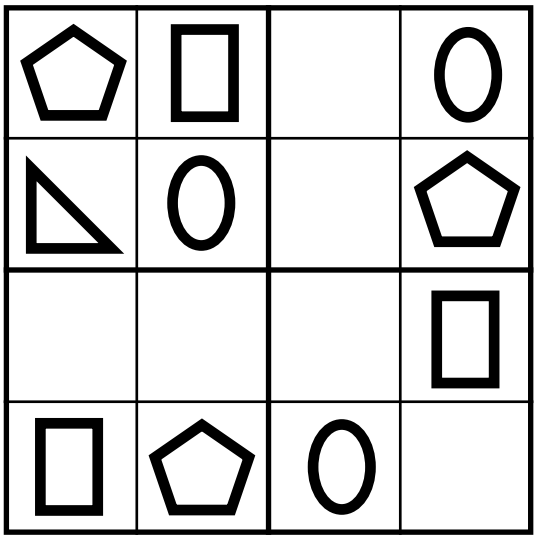
2D shape sudoku

Each row, column and larger square must have 1 of each shape.
For example:



1 Can you complete these?

a



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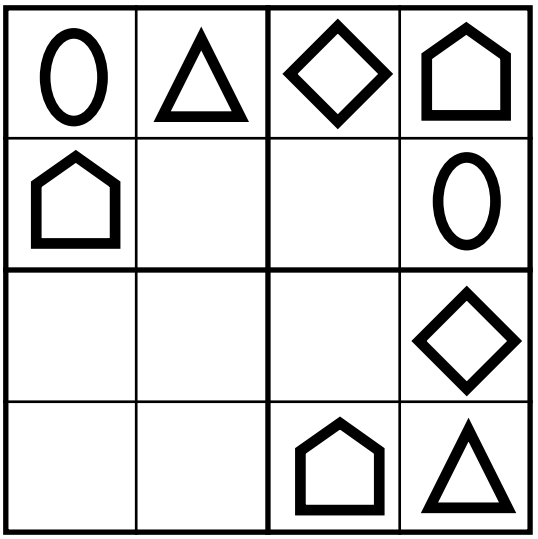

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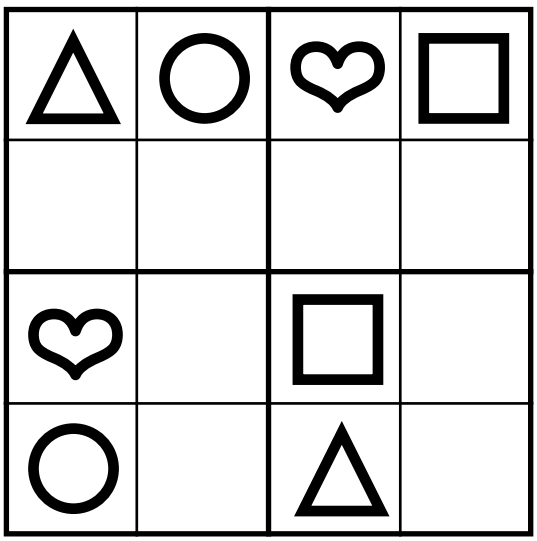

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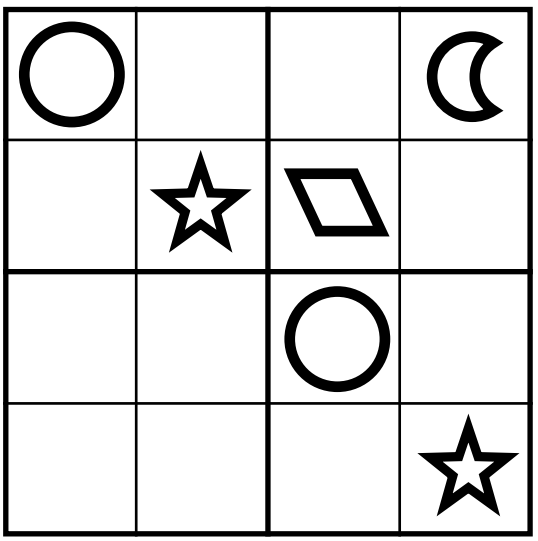
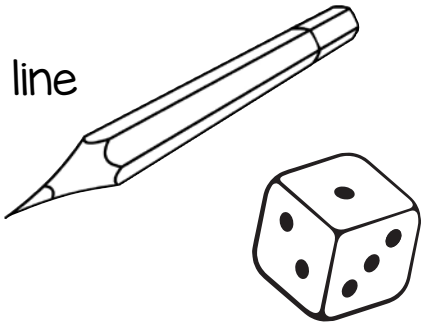


Guess my shape game

Play in groups of any size from 2 to 30. You need 1 die.

You all need pencils and paper, or whiteboards and pens.

1 One person is the 'drawer'. They roll the die to pick a type of 2D shape:



- 1 = 1 line, eg circle, oval, wavy or straight line
- 2 = 2 lines, eg semicircle, heart, angle
- 3 = triangle
- 4 = quadrilateral
- 5 = pentagon
- 6 = hexagon

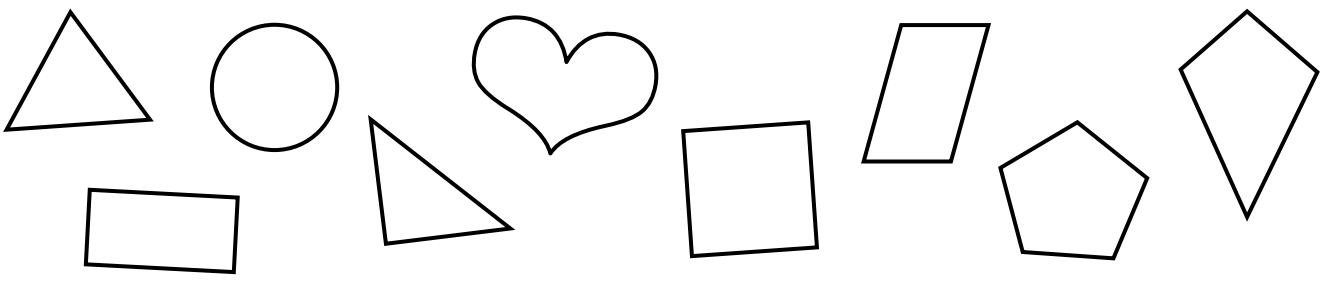
2 The drawer draws a shape of that type and keeps it a secret. Eg, they roll a 3 and draw a right-angle triangle.

3 A player asks a question about the shape, eg *Does your shape have 3 sides?* The drawer answers 'yes' or 'no'.

4 All players use the answer to draw their guesses and hold them up.

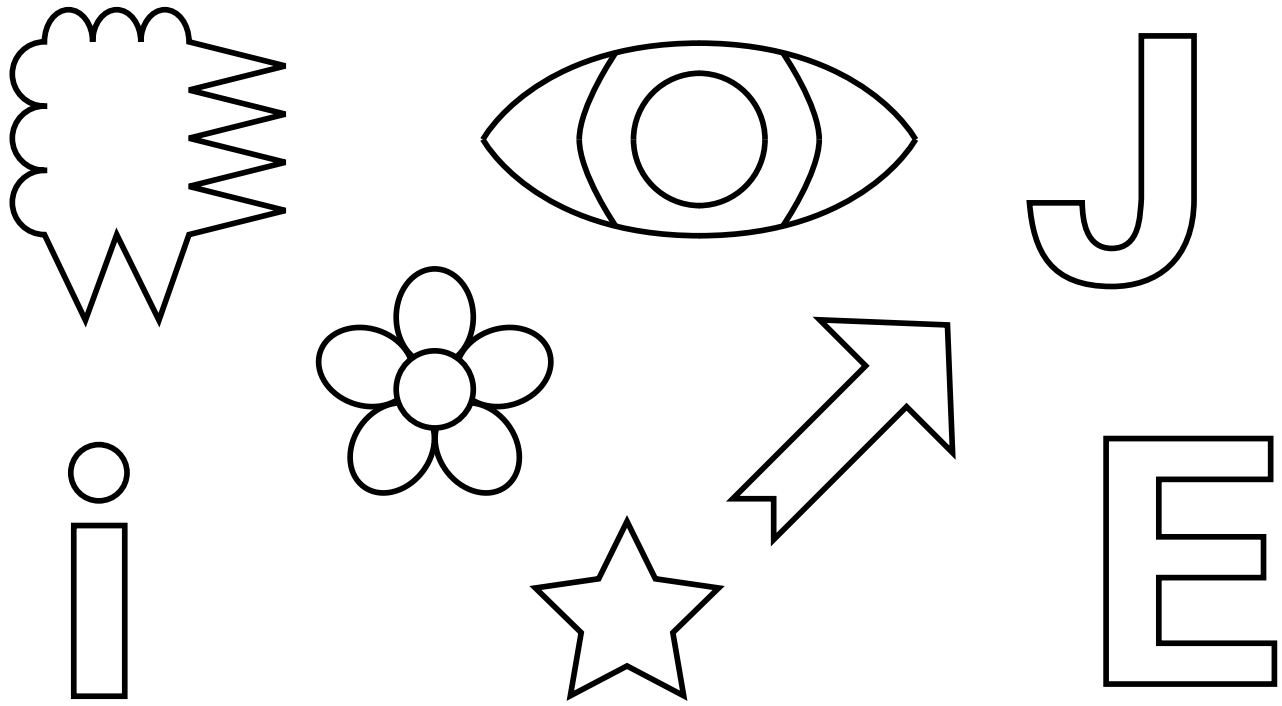
5 The drawer answers 'correct' or 'incorrect' to each guess. If no one is correct, repeat steps **3** and **4**.

Continue until someone wins by drawing the correct shape. They become the drawer for the next round.

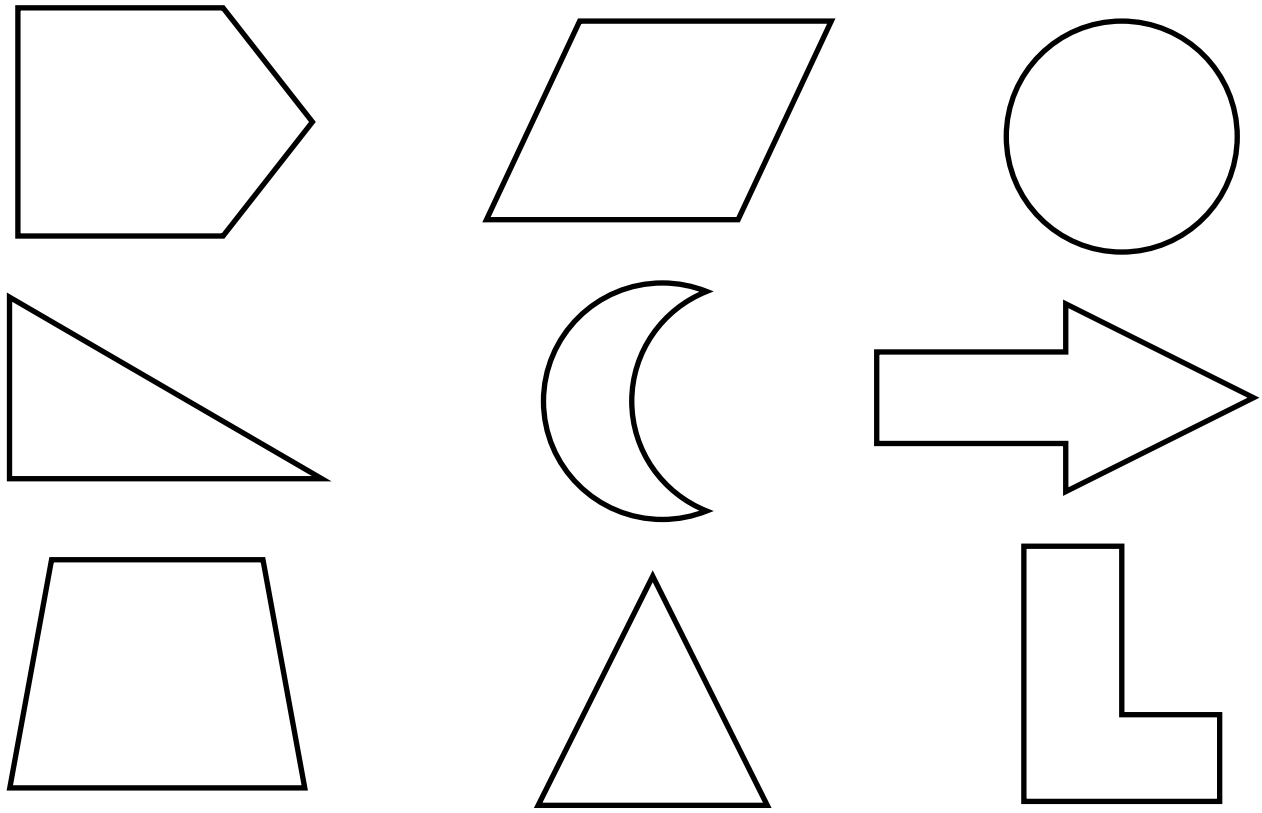


Symmetrical or not?

1 Colour the symmetrical shapes.

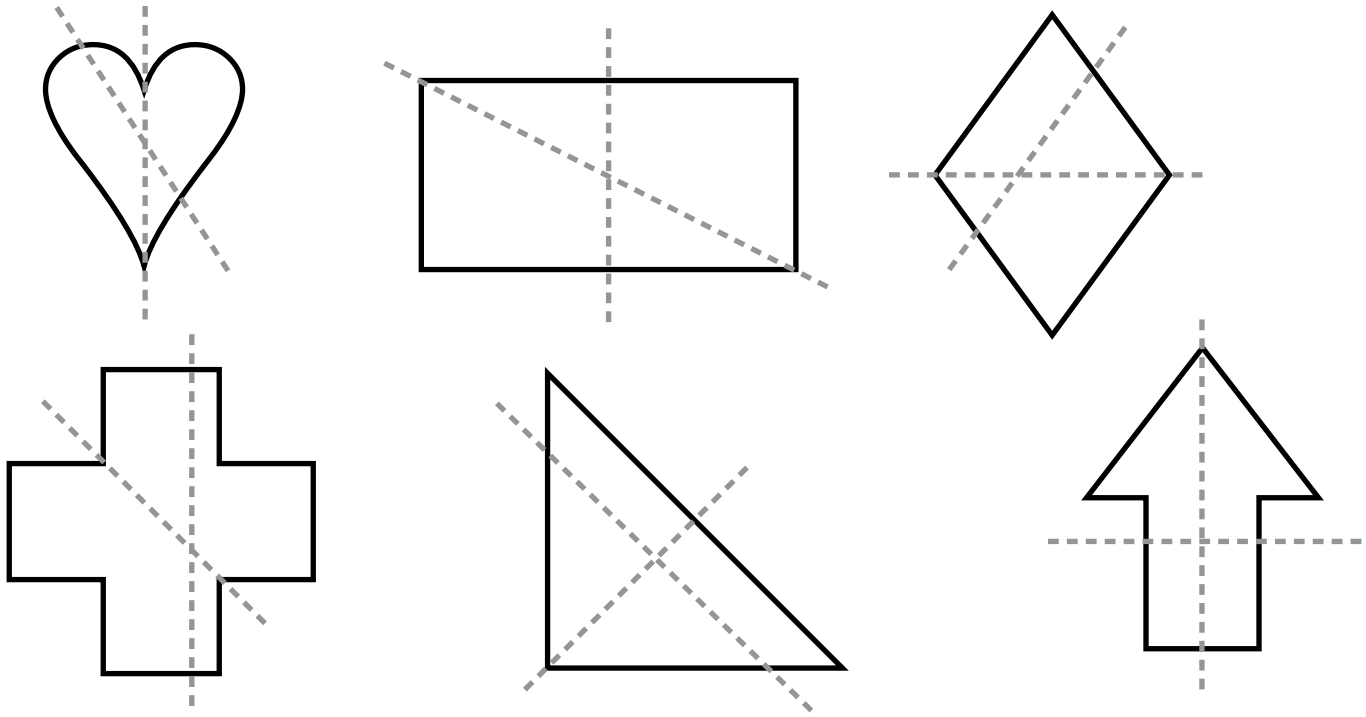


2 Draw a line of symmetry on the symmetrical shapes.

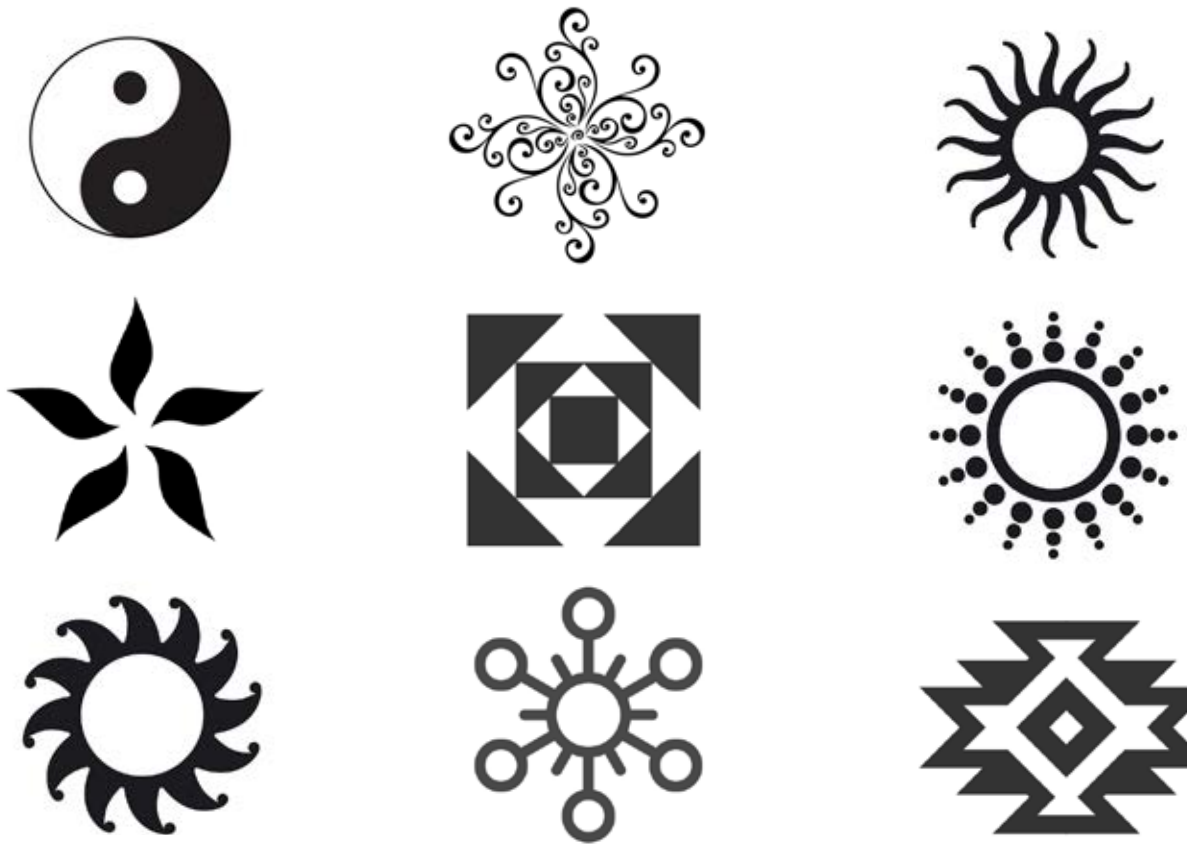


Lines of symmetry

1 Trace over the lines of symmetry.

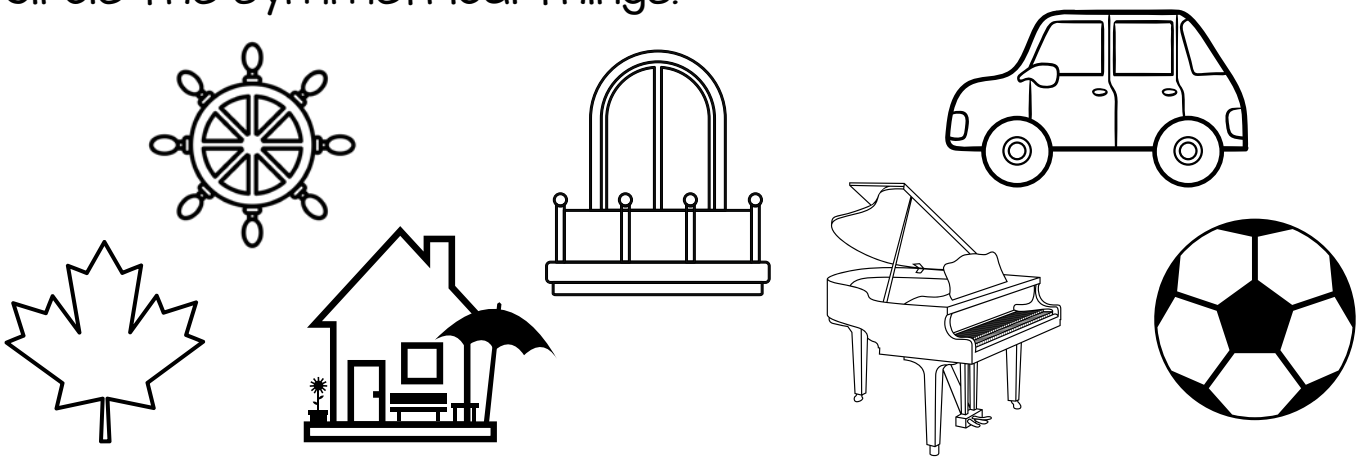


2 Draw a line of symmetry on the patterns that are symmetrical.

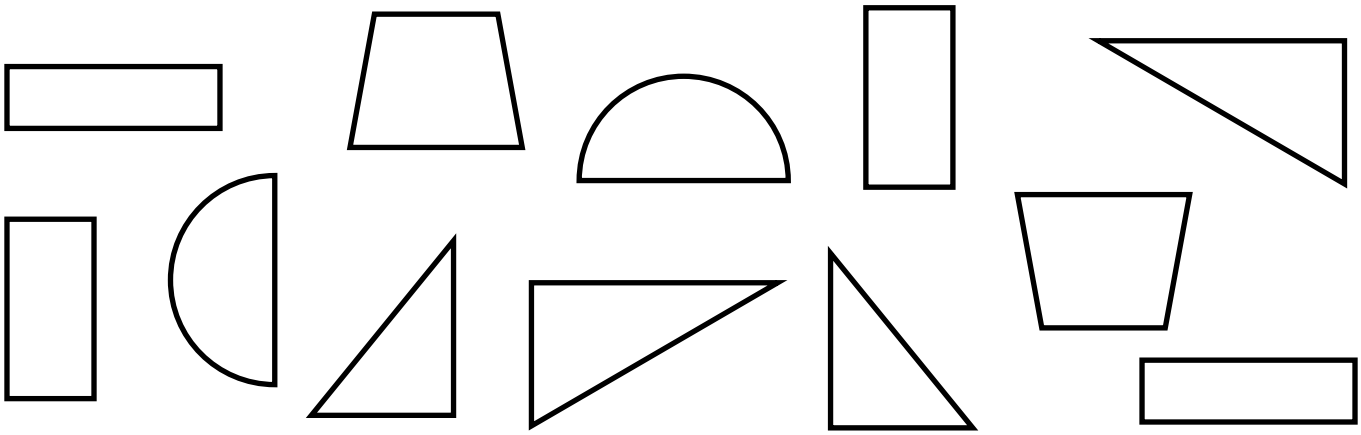


Identify symmetry

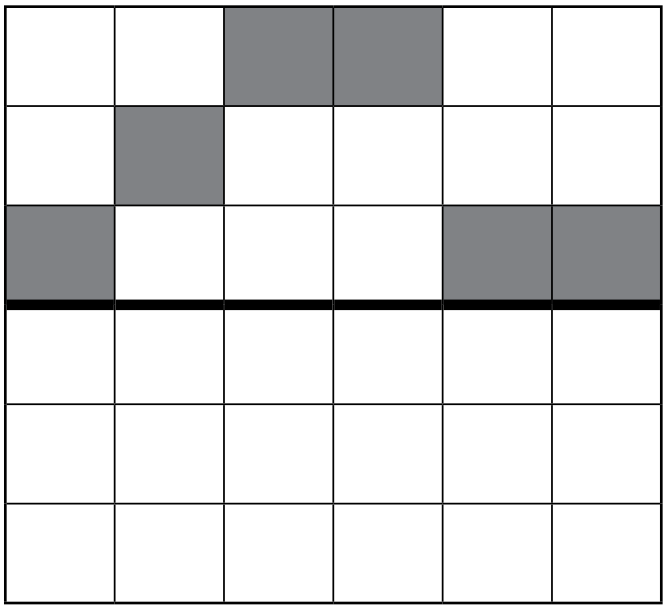
1 Circle the symmetrical things.

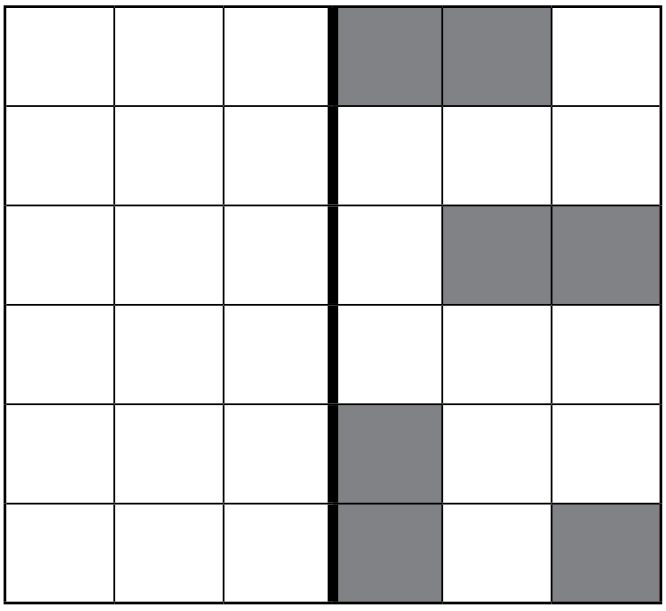


2 Colour the symmetrical halves in matching colours.

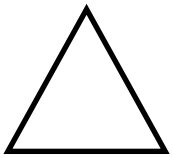
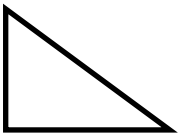
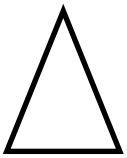
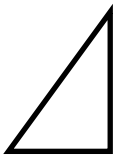
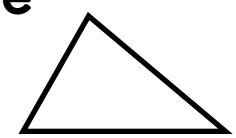
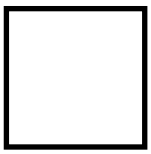
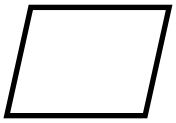
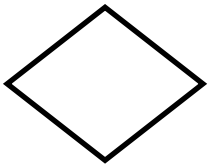
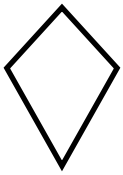
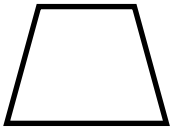
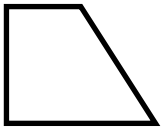
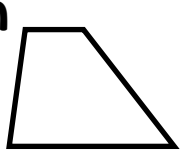
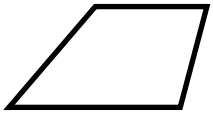
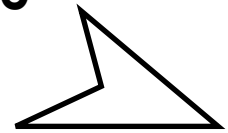
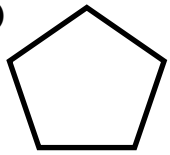
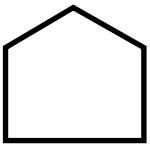
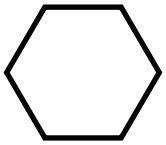
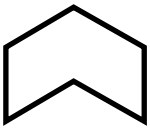


3 Complete the symmetrical patterns.





Symmetry in shapes

a 	**b** 	**c** 	**d** 	**e** 
f 	**g** 	**h** 	**i** 	**j** 
k 	**l** 	**m** 	**n** 	**o** 
p 	**q** 	**r** 	**s** 	**t** 

1 Colour any <u>non-symmetrical</u> 2D shapes.

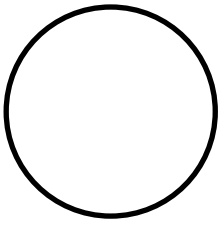
2 **a** Draw one line of symmetry on each <u>symmetrical</u> shape above.

b Can you draw more lines of symmetry on any of the symmetrical shapes?

c Write the number of lines of symmetry you drew under each shape.

3 **a** Draw a line of symmetry on this circle.

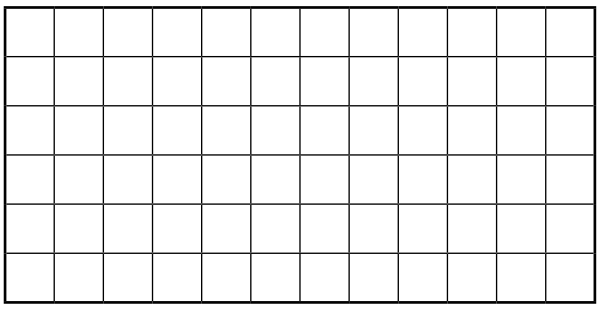
b How many lines of symmetry does a circle have? _____



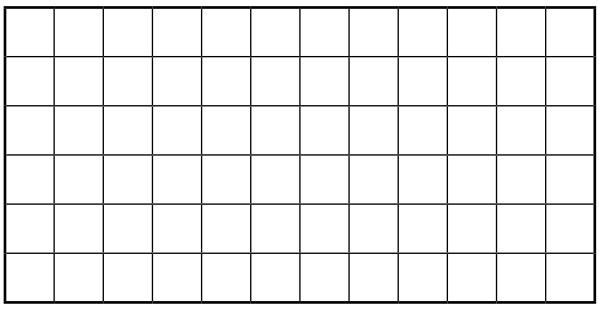
Symmetry problems

1 Pippa says she can draw a symmetrical 2D shape with 1 right angle for every type of polygon from 3 to 6 sides. Is it possible?

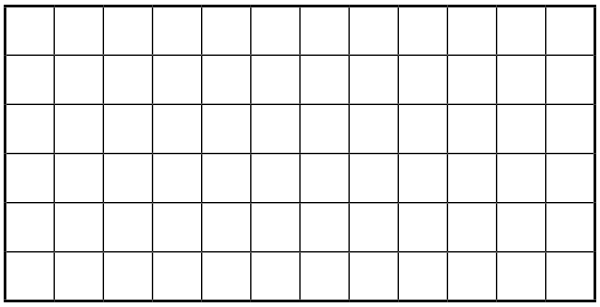
a 3 sides



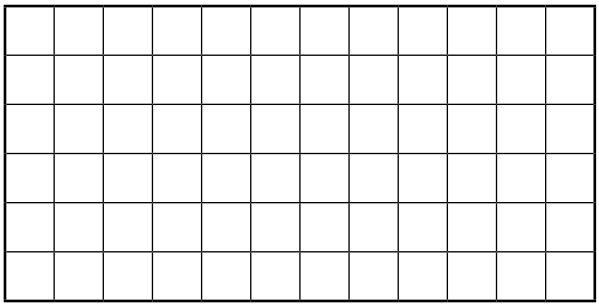
b 4 sides



c 5 sides

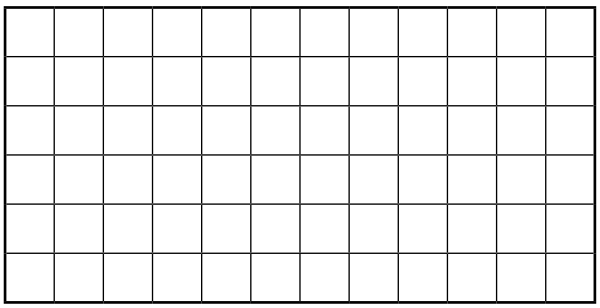


d 6 sides

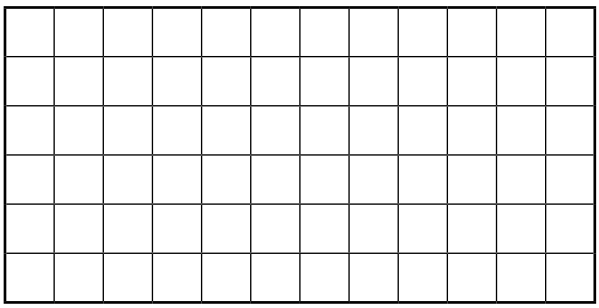


2 Ping says he can draw a symmetrical 2D shape with 2 right angles for every type of polygon from 3 to 6 sides. Is it possible?

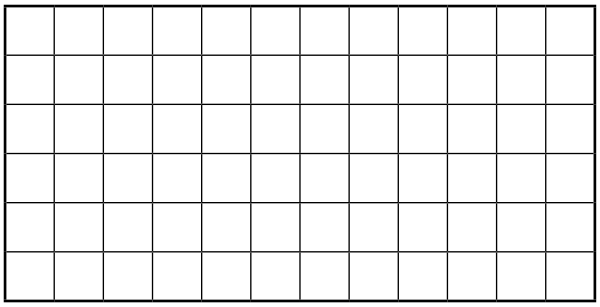
a 3 sides



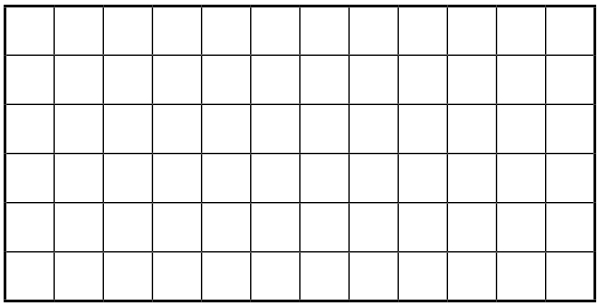
b 4 sides



c 5 sides



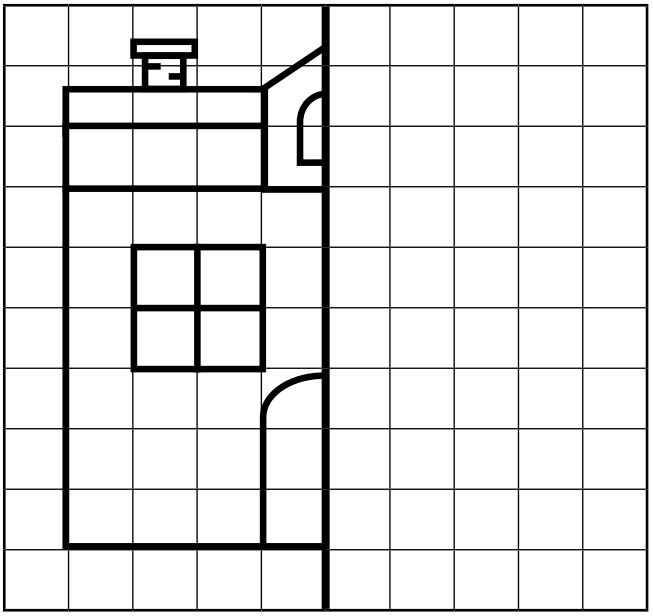
d 6 sides

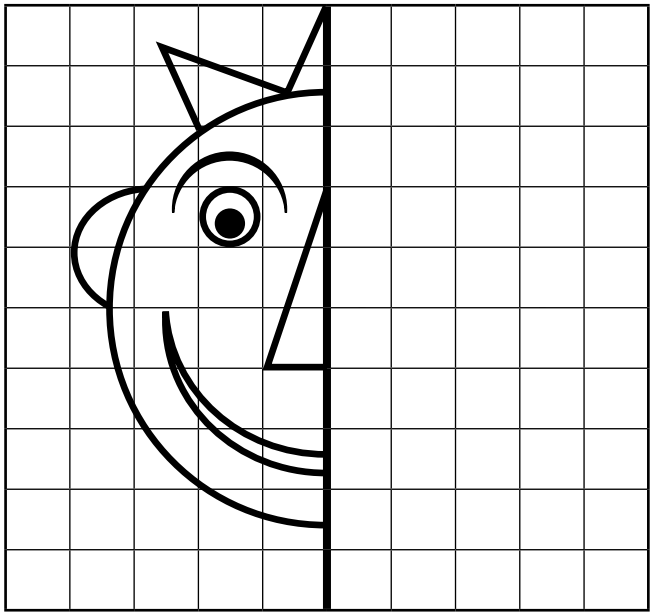


Symmetrical pictures

Symmetry

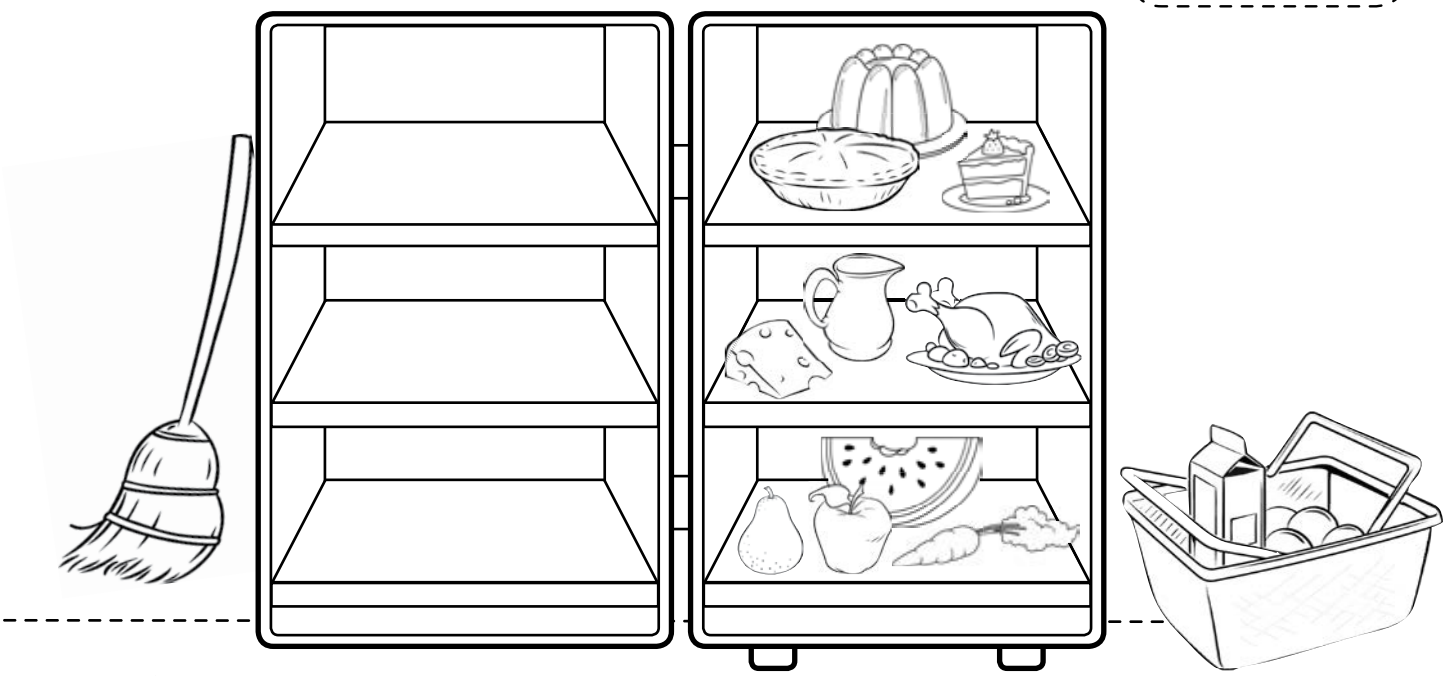
1 Complete the symmetrical pictures.





2 Draw your own symmetrical picture.

Location



1 Complete the sentences.

a The apple is to the _____ of the pear.

b The pie is in _____ of the jelly.

c The watermelon is _____ the apple.

d The cheese is _____ the pie.

e The jug is to the _____ of the chicken.

f The pear is on the _____ shelf.

g The jelly is on the _____ shelf.

h The chicken is on the _____ shelf.

i The cake is _____ the chicken.

2 Draw these items on the empty shelves.

a Juice is on the left side of the bottom shelf.

b A jar of jam is right in the middle.

c Milk is on the top shelf to the right of a banana.

d A chocolate bar is left of the jam.

e Eggs are at the bottom, on the right.

f There is a jar of honey next to the jam.

Compass directions

Location

1 Label the points on the compass: North, South, East, West. Remember the phrase *Never Eat Soggy Weetbix* to help you.

2 Use this map of the world and the compass to answer these questions.

a Which continent is just south of Europe? _____

b Which continent is west of Europe? _____

c Which continent is west of Australia? _____

d Which continent is east of Australia? _____

e Which continent is north of South America? _____

f Which continent is west of North America? _____

g Which ocean is east of the Americas and west of Africa?

_____

h Which ocean is south of Asia and east of Africa?

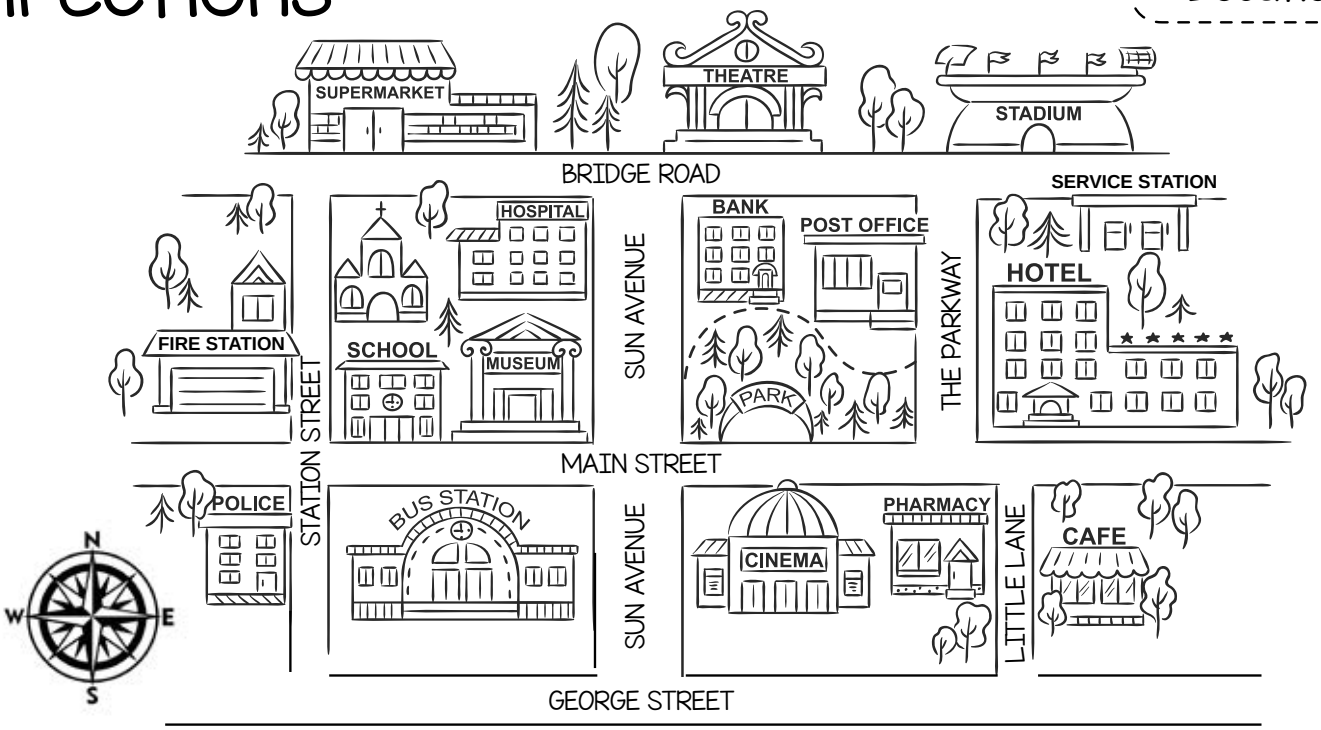
_____

i Which ocean is east of Asia and west of the Americas?

_____

Directions

Location



1 Tom is staying at the hotel.

a If he heads down Little Lane, turns east on George Street, then enters the building on his left, where is he? _____

b If Tom leaves there, goes west along George Street, then turns right and goes to the end of Station Street, where is he? _____

c If he leaves that place, heads east, turns right at Sun Avenue and enters the 2nd building on his right, where is he? _____

2 Write directions for these trips:

a A class from the school is going on an excursion to the theatre. How can they get there?

_____

_____

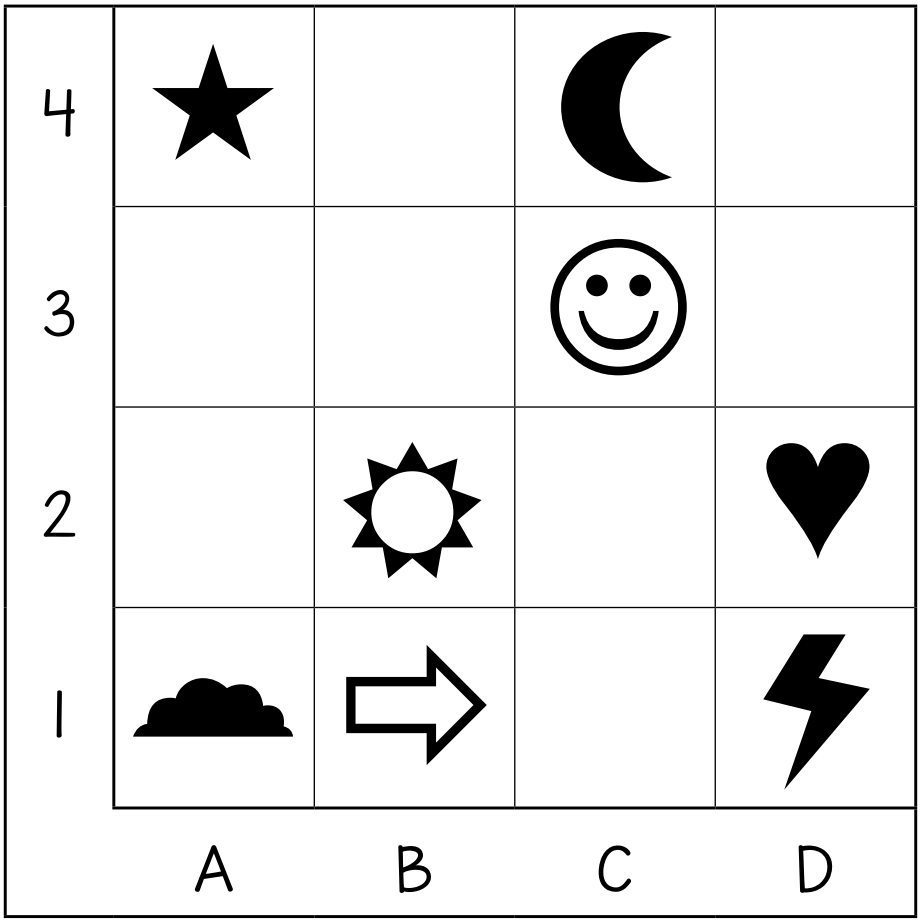
b I just got off the bus and now I'm heading to the stadium. How do I get there?

_____

_____

Coordinates

Location



1 Write the coordinates for

a the star. ___ ___ **b** the heart. ___ ___

c the cloud. ___ ___ **d** the lightning. ___ ___

2 What shape is at these coordinates?

a C4 _____ **b** C3 _____

c B2 _____ **d** B1 _____

3 Draw these shapes at these coordinates.

a a triangle at D4 **b** a circle at C2

c a rectangle at B3 **d** a square at A3

4 Which coordinates have no image now?

___ ___ ___ ___ ___ ___ ___ ___

Map reading

Location

	A	B	C	D	E	F
6						
5						
4						
3						
2						
1						

1 Write the coordinates for these items.

a monkey ___ ___ **b** owl ___ ___

c fox ___ ___ **d** bear ___ ___

e lion ___ ___ **f** koala ___ ___

2 What is at these coordinates?

a A4 _____ **b** B6 _____

c C3 _____ **d** D6 _____

e B1 _____ **f** F4–5 _____

3 Where are the toilets located? ___ ___ & ___ ___

4 Where can you go for first aid? ___ ___ & ___ ___

5 Where can you go to eat? ___ ___ & ___ ___

6 Where are the hippos? ___ ___ & ___ ___

7 What are the empty squares for?

(a) more animals (b) a path (c) it's a mistake

Make a map

Location

1 Use the grid below to make a simple map of your school.

5							
4							
3							
2							
1							
	A	B	C	D	E	F	G

2 Write the coordinates for each building.

a your classroom ____ ____

b the office ____ ____

c the hall ____ ____

d the playground ____ ____

3 What is at these coordinates?

a A5 _____ **b** G1 _____

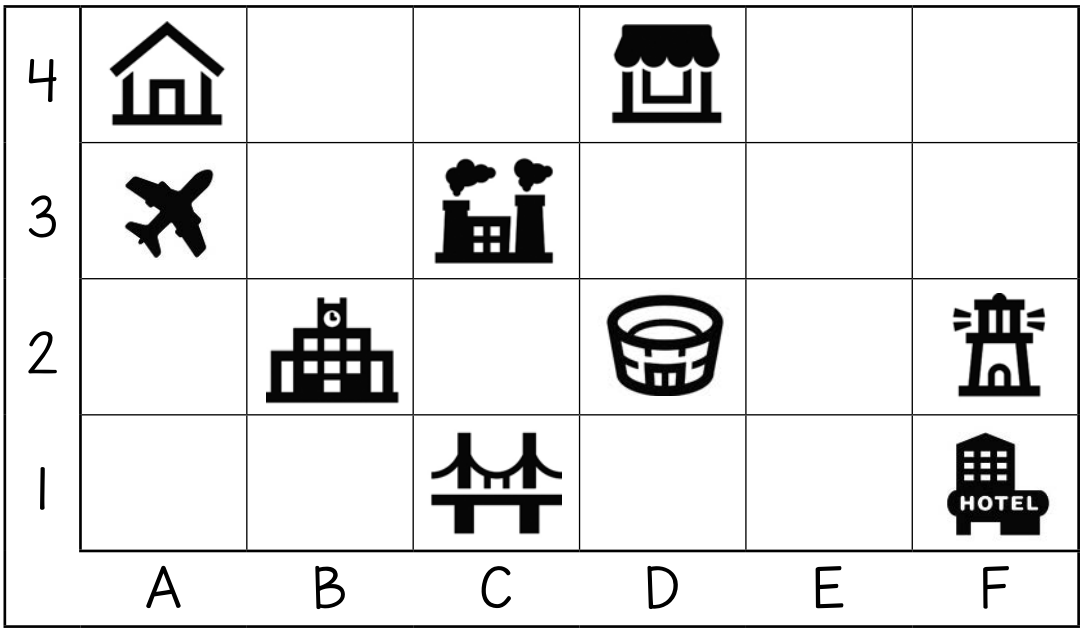
c C3 _____ **d** E2 _____

e B1 _____ **f** F4 _____

Map problems

Location

1 Draw Sara's usual walking route on the map.
Start at home in A4 and go east to the corner shop.
Turn right and head south to the stadium.
Turn left and head east to the lighthouse.
Turn right and walk to the hotel, then turn right and go to the bridge. Head north to the factory and then walk west to the airport.



2 Write the coordinates for Sara's walking route.

___ ___ → ___ ___ → ___ ___ → ___ ___ →
___ ___ → ___ ___ → ___ ___ → ___ ___

3 Use the map to answer these questions.

a Which compass direction does Sara walk in to get home from the airport? _____

b How many squares on the map does Sara walk through? _____

c If each square is 100 m, how far does Sara walk? _____

d What are the coordinates for the school? ___ ___

e Draw a park in the square at A1.

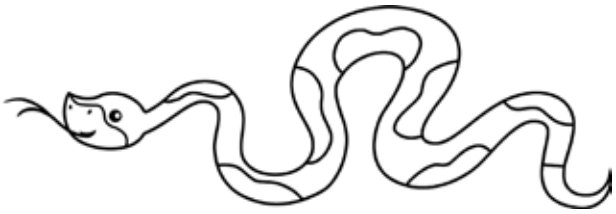
Coordinate games

Location

COLOUR THE SNAKES

Play in pairs ☺☺. You need coloured pencils ✎✎ and two 10 x 10 grids each (see page 42).

1. Hide your grids from each other. On one of your grids draw a set of snakes:
   - 1 snake that is 2 squares long
   - 2 snakes that are 3 squares long
   - 2 snakes that are 4 squares long
   - 1 snake that is 5 squares long



2. Take turns guessing where your opponent's snakes are by saying coordinates. Eg:

   'Is there a snake on B9?' 'Yes!' Colour in that square on your second grid.

   'Is there a snake on H2?' 'No!' Cross out that square on your second grid.

   The winner is the player who colours in all their opponent's snakes first.

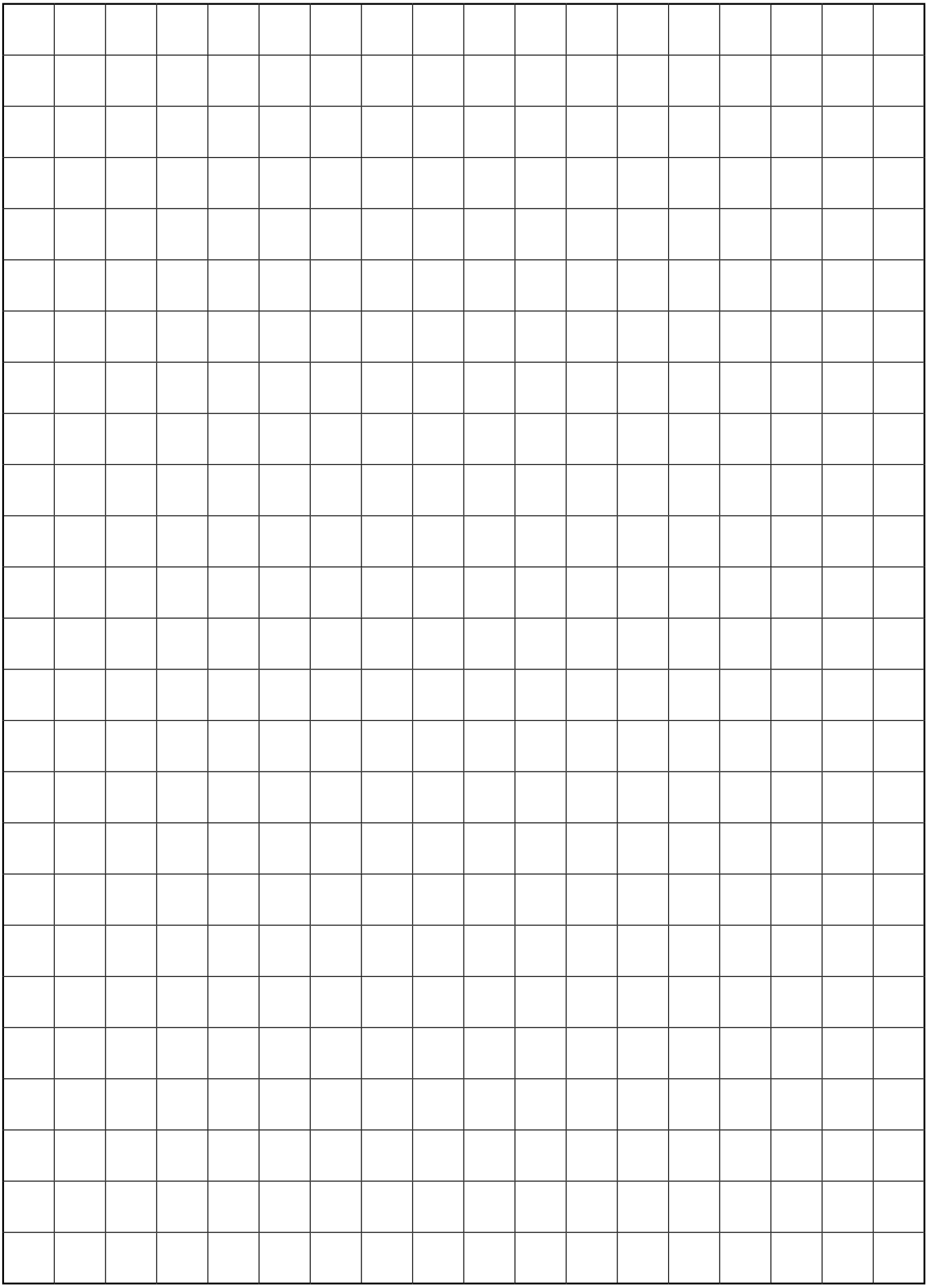
COLOUR COORDINATES

Play in a pair ☺☺ or a trio ☺☺☺. You need a 10 x 10 grid (see page 42), a coloured pencil each, a 1–10 spinner and an A–J spinner (see page 43).

1. Player A: Spin both spinners to get a pair of coordinates. Colour that square on the grid.
2. Player B: Spin both spinners to get a pair of coordinates. Colour that square in a different colour to Player A.
3. Take turns spinning and colouring in squares. If a player spins a pair of coordinates that is already coloured, they miss that turn.
4. Continue until the grid is full, or 5 successive spins have not given a blank pair of coordinates. The winner is the player with the most squares in their colour.

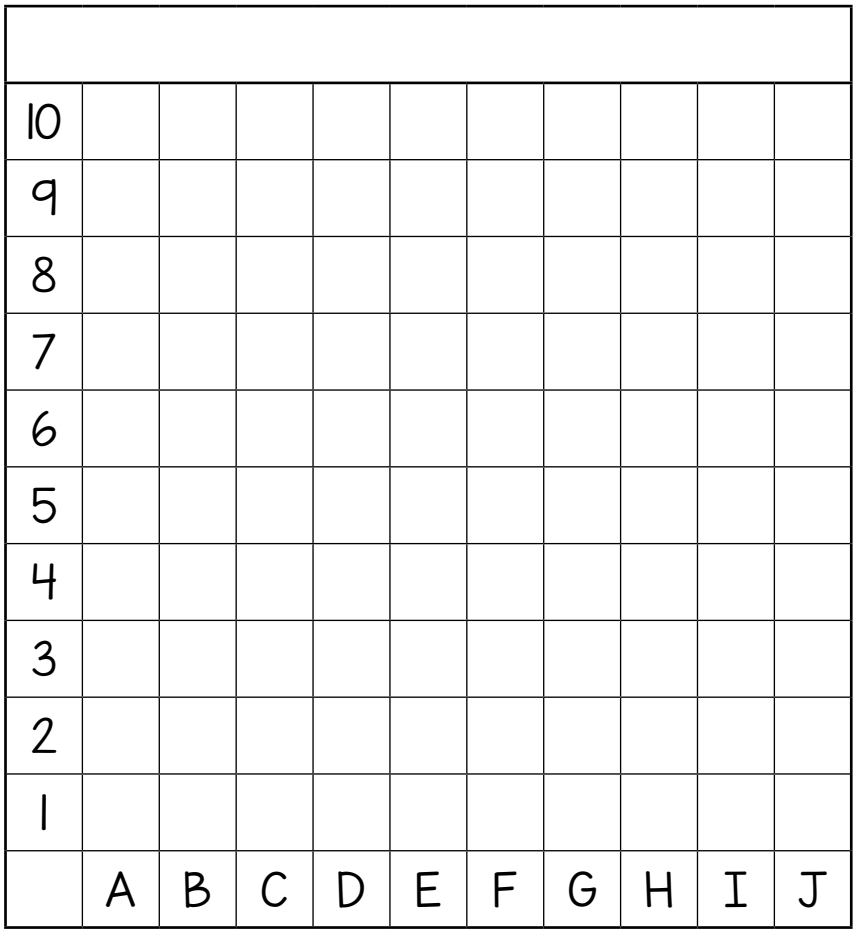
Harder version: Play on a larger grid (see page 41) and/or with more people.

Grid paper

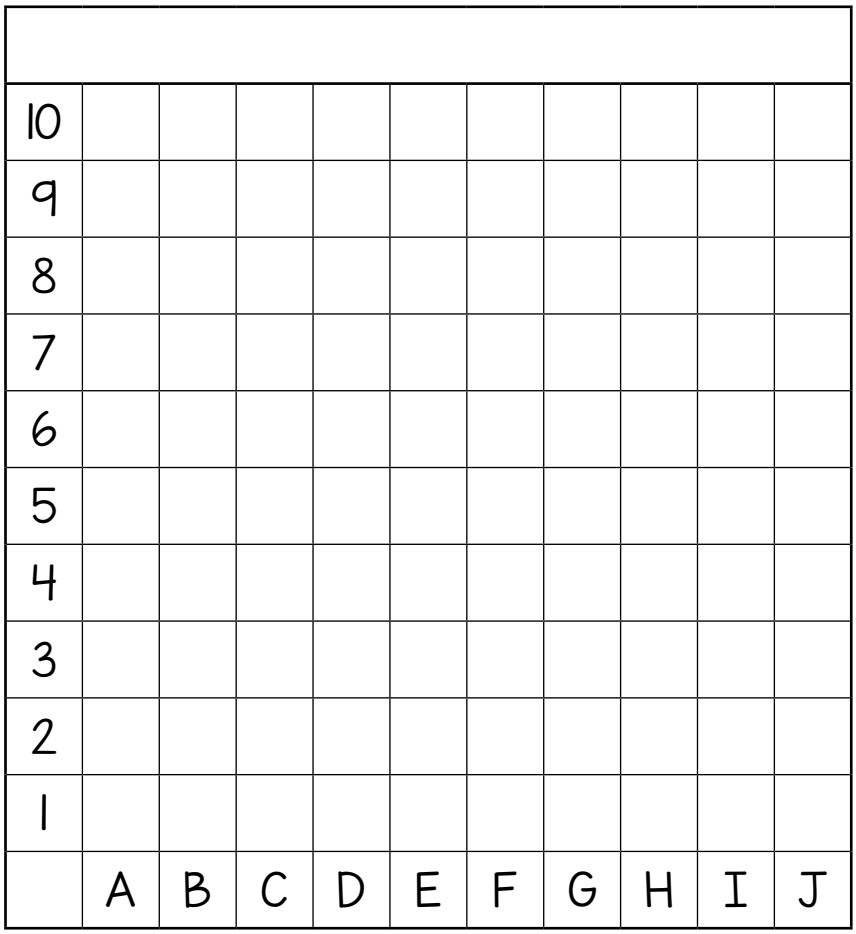


10 x 10 coordinate grids

Resources



10										
9										
8										
7										
6										
5										
4										
3										
2										
1										
	A	B	C	D	E	F	G	H	I	J



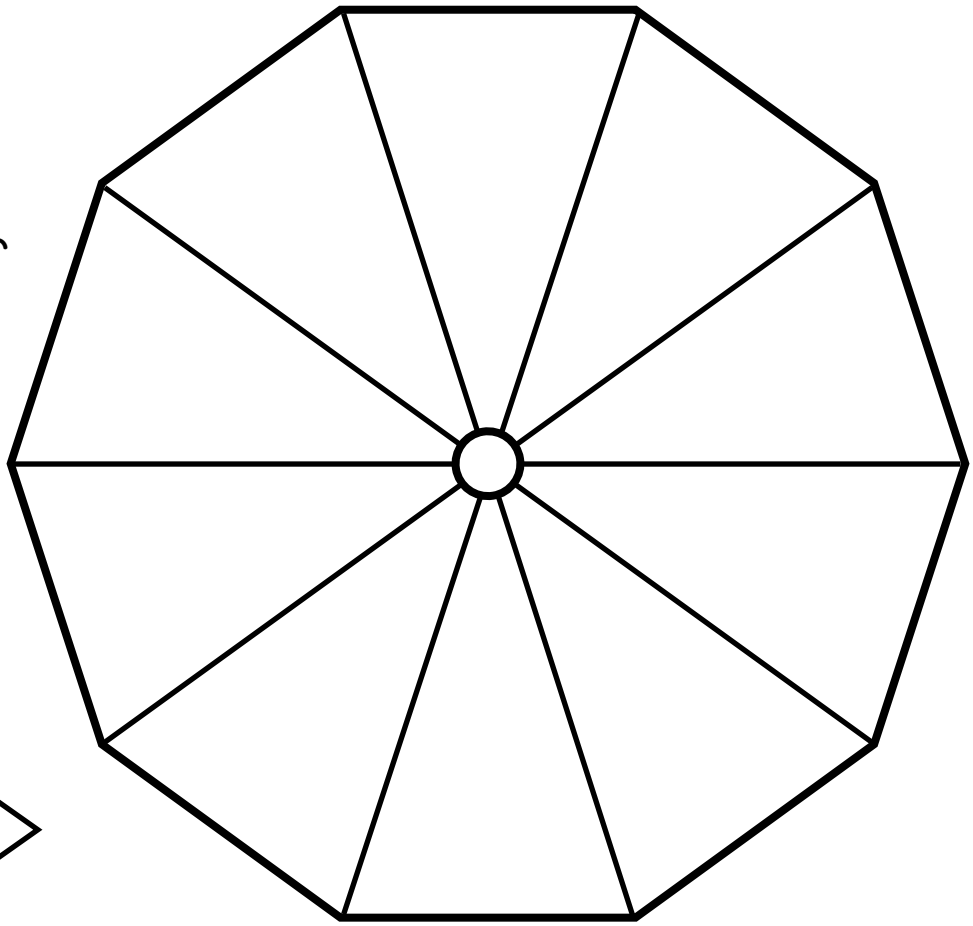
10										
9										
8										
7										
6										
5										
4										
3										
2										
1										
	A	B	C	D	E	F	G	H	I	J

10-sided spinner

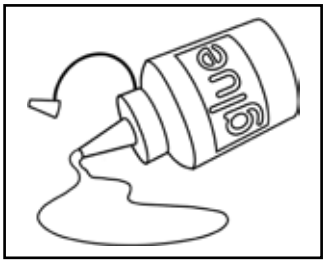
Resources

Materials:

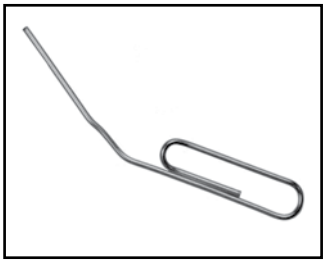
- cardboard
- paper clip
- paper fastener (split pin)
- sticky tape
- scissors.



1 Print or glue the spinner and the arrow onto cardboard. Write on the numbers 1–10 or the letters A–J. You could laminate them to make them last longer.

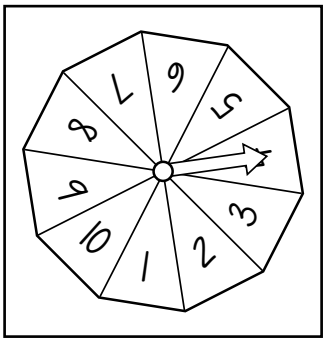


2 Bend out one end of the paper clip to make the spinning pointer.



3 Insert the split pin with the paper clip on it through the centre of the spinner.

4 Split the back of the pin and tape the ends down. The top of the split pin should sit about 1 cm above the card to allow the paper clip pointer to spin freely.



5 Tape the arrow onto the paper clip.