



Representing 3-D shapes

- Drawing solid shapes on plain paper
- Drawing solid shapes on isometric paper

Keywords

You should know

explanation 1

1 Sort these words into groups of 2-D shapes and 3-D shapes.

Circle	Cube	Square	Triangle
Cone	Rectangle	Prism	Parallelogram
Pyramid	Rhombus	Cuboid	Cylinder

2 Match each shape to its label.

Cone

Cylinder

Square-based pyramid

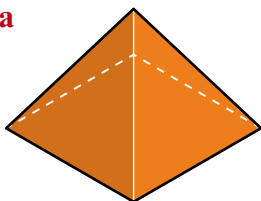
Cube

Triangular prism

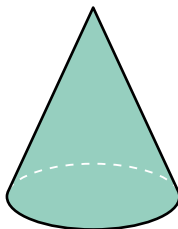
Cuboid

Tetrahedron

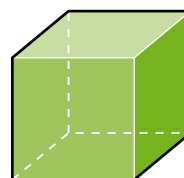
a



b



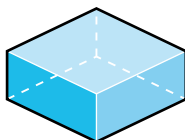
c



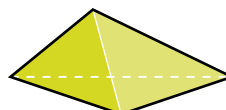
d



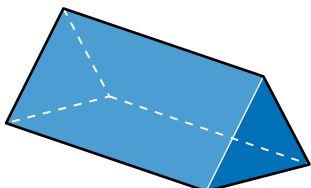
e



f



g

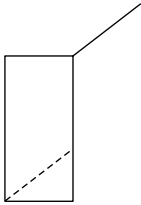


explanation 2

3 Here are some partly completed sketches of 3-D objects.

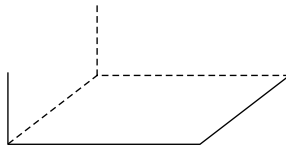
Copy and complete them.

a



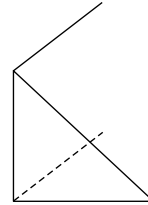
Cuboid

b



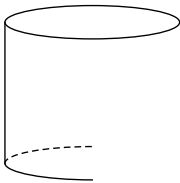
Cuboid

c



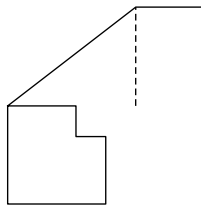
Triangular prism

d



Cylinder

e



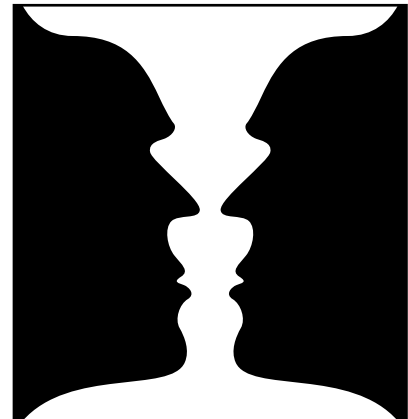
Prism

4 Look at the picture.

Can you see two faces?

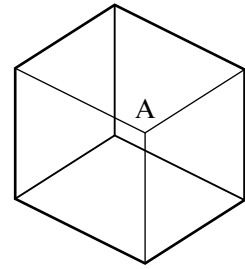
Can you see a vase?

Can you switch between the two views?

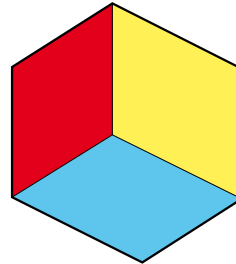
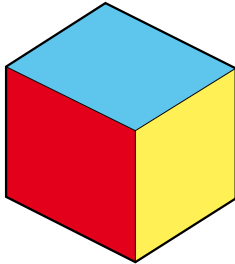


5 This diagram represents a shape made from glass so that you can see all of its edges.

- a i** Look at the cuboid and picture the vertex at *A* *closest* to you.
- ii** Now picture it with the vertex at *A* *furthest* from you.



You should see two different views!

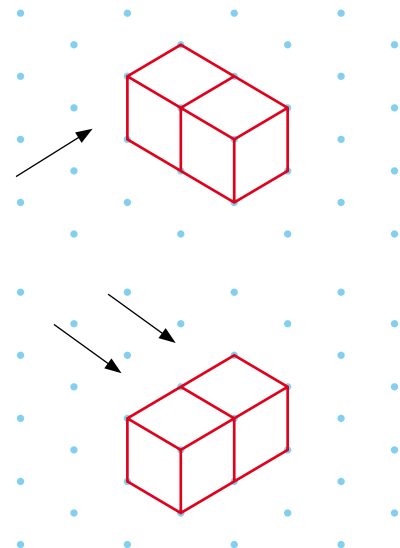


- b** Copy the original diagram but replace three of the solid lines with dotted lines to show a cuboid with the vertex at *A* *closest* to you.
- c** Make another copy of the diagram but, this time, replace three different solid lines with dotted lines to represent a cuboid with the vertex at *A* *furthest* from you.

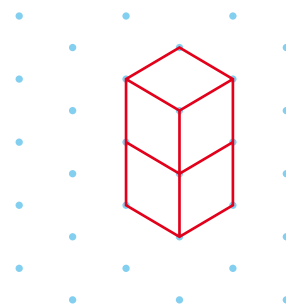
explanation 3

6 This diagram shows two cubes drawn on isometric dotty paper.

- a** Copy the diagram and add an extra cube where the arrow is pointing to make a block of three cubes in a straight line.
- b** Copy this diagram and add two extra cubes where the arrows are pointing to make two rows of two cubes.
- c** Draw a diagram on isometric paper to show three rows of two cubes.

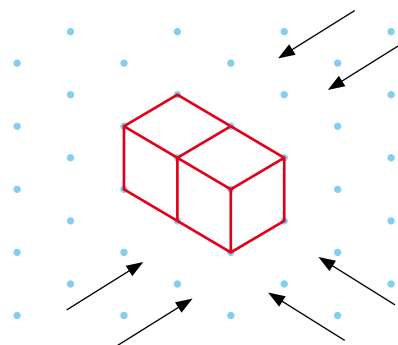


- 7** This diagram shows one cube stacked on top of another.



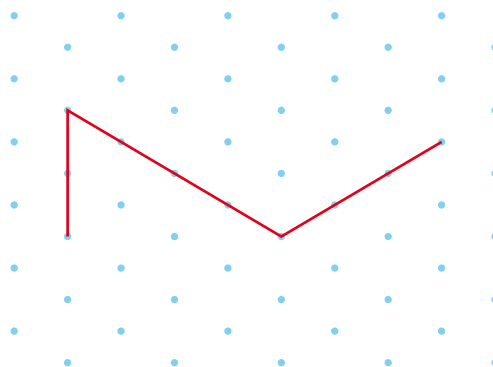
- a** Copy the diagram and add a third cube at the base of the stack.
- b** Add 3 more cubes to show two stacks of three cubes.

- 8** Eight cubes can be placed together to make a larger cube.
- Draw extra cubes where the arrows are pointing to show how this would look on isometric paper.



- 9** Use isometric paper to draw a cube that is 3 cm by 3 cm by 3 cm.

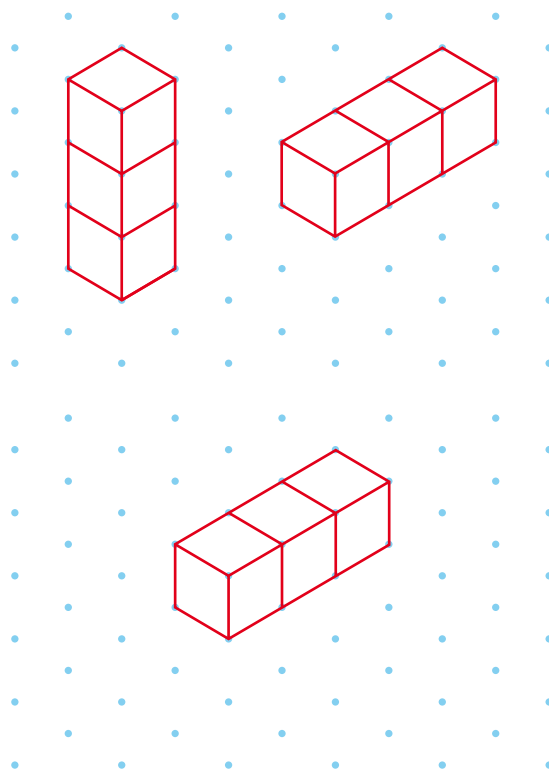
- 10 a** Copy and complete this drawing of a cuboid with base 4 cm by 3 cm and height 2 cm.
- b** Draw a cuboid with base 4 cm by 2 cm and height 3 cm.
- c** Draw a cuboid with base 3 cm by 2 cm and height 4 cm.
- d** What do you notice about your three diagrams?



- 11 a** Draw a cuboid with base 2 cm by 3 cm and height 1 cm on isometric paper.
- b** Draw a cuboid with base 4 cm by 6 cm and height 2 cm on isometric paper.

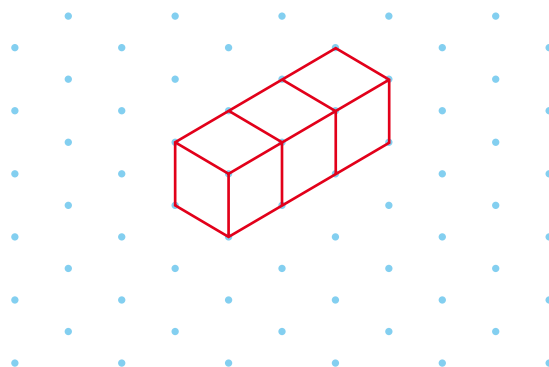
12 a Copy the first diagram and add a cube to show the letter L standing up.

b Copy the second diagram and add a cube to show the letter L lying down.



13 a Copy this diagram and add two cubes to show the letter T standing up.

b Copy this diagram and add two cubes to show the letter T lying down.

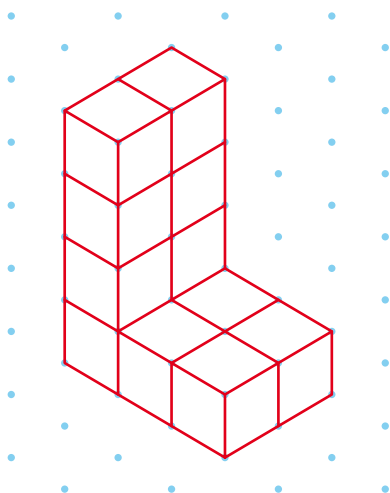


14 Try drawing other letters in different positions using isometric paper. You could try the letters like C, E, F, I, J, M, O, S, U or Y!

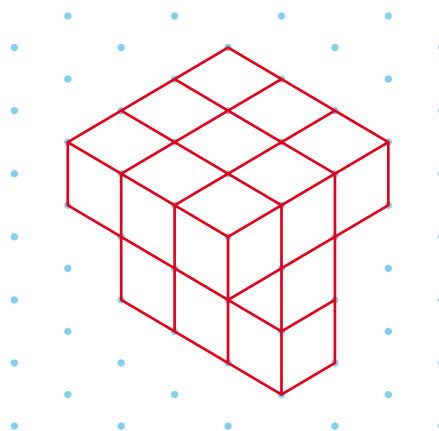
explanation 4

15 Find the volumes of these shapes.

a



b



16 Draw a cuboid with volume 12 cm^3 on isometric paper.