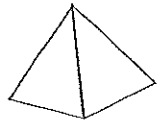
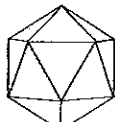


## Three-dimensional shapes (solids)

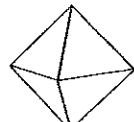
Three-dimensional (3-D) shapes are so called because they have length, breadth and thickness (or height). There are only five Platonic solids, that is solids that have faces that are regular polygons. (Remember that a regular polygon is a plane figure with all sides equal, for example an equilateral triangle, a square, etc.)



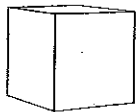
tetrahedron



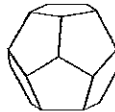
icosahedron



octahedron

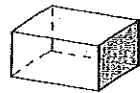


cube (hexahedron)

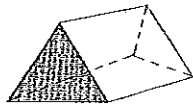


dodecahedron

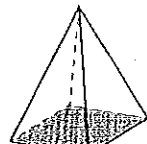
There are other named solids, for example:



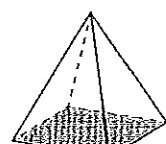
rectangular prism



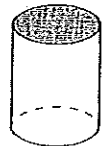
triangular prism



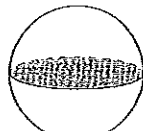
square pyramid



rectangular pyramid



cylinder



sphere



cone



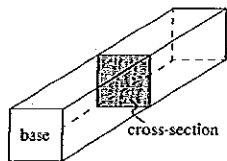
hemisphere

### Prisms

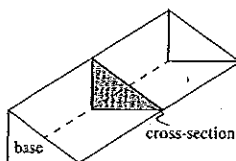
A prism is a 'box-shaped' solid whose end faces are identical polygons that are parallel. Either of the end faces is called the base of the prism.

A flat 'slice' of a solid cut across the solid is called a cross-section of the solid. A prism has identical cross-sections along its length, that are the same shape and size as its base. A prism is named according to the shape of its base.

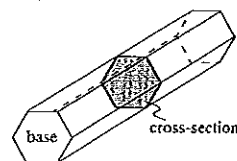
Here are some examples of prisms:



Square prism



Triangular prism



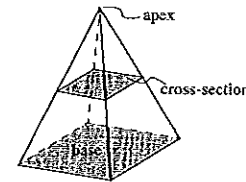
Hexagonal prism

## Skillsheet 11-02 Three-dimensional shapes (solids) continued

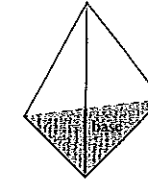
### Pyramids

A pyramid is a solid whose side faces are triangles that meet at a pointed top called the apex of the pyramid. The bottom face, opposite the apex, is called the base of the pyramid. A pyramid is named according to the shape of its base.

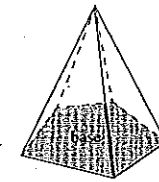
Here are some examples of pyramids:



Square pyramid



Triangular pyramid

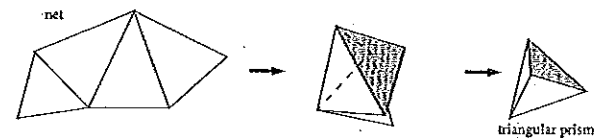
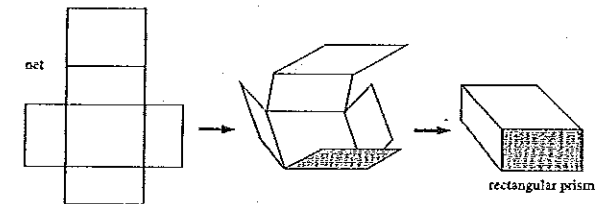


Pentagonal pyramid

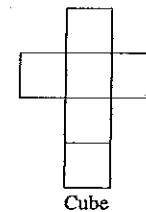
### Nets of solids

A three-dimensional shape, made of cardboard, could be cut along the edges and unfolded to make a flat shape. This flat shape is called a net of the solid. When the plane net of a solid is folded, every fold and join becomes an edge of the solid.

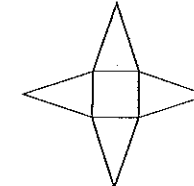
Two examples are shown below.



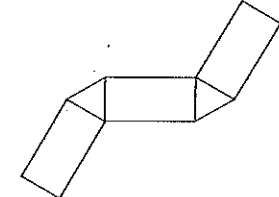
Here are some more examples of nets of solids:



Cube



Square pyramid




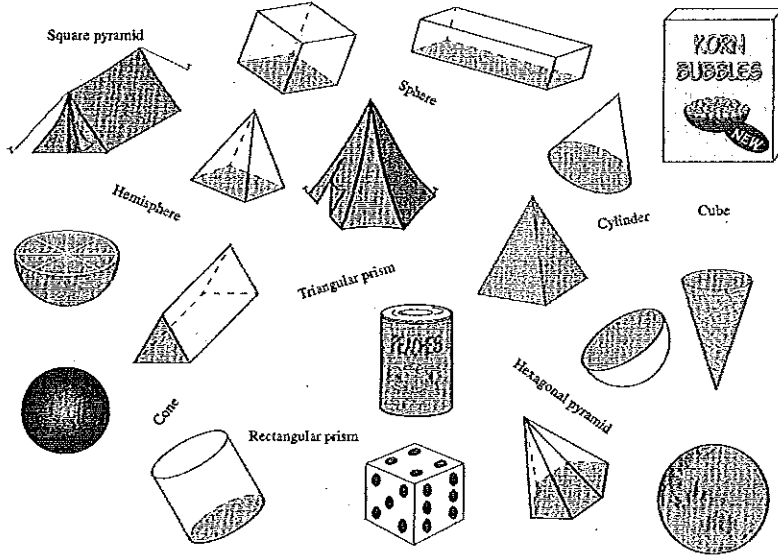
Triangular prism

**Skillsheet 11-02 Three-dimensional shapes (solids) continued**

**Exercises**

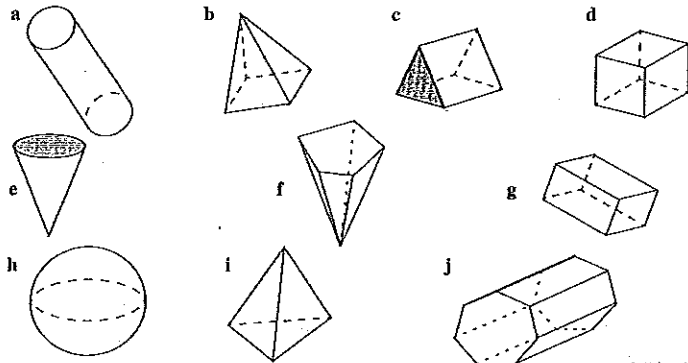
1 See if you can match each 3-D shape with its name and a physical object that has the shape. You will need to draw up a table like this. One has been done for you.

3-D shape	Name	Physical object
	sphere	Earth



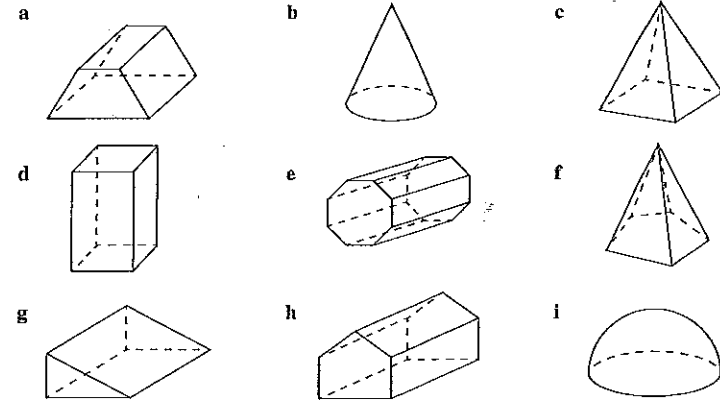
2 Copy each diagram.

- Write its name underneath it.
- Write the number of faces, vertices and edges for each figure.
- Work out the number of faces + number of vertices – number of edges for each figure.



**Skillsheet 11-02 Three-dimensional shapes (solids) continued**

3 Draw a cross-section of each of these solids.



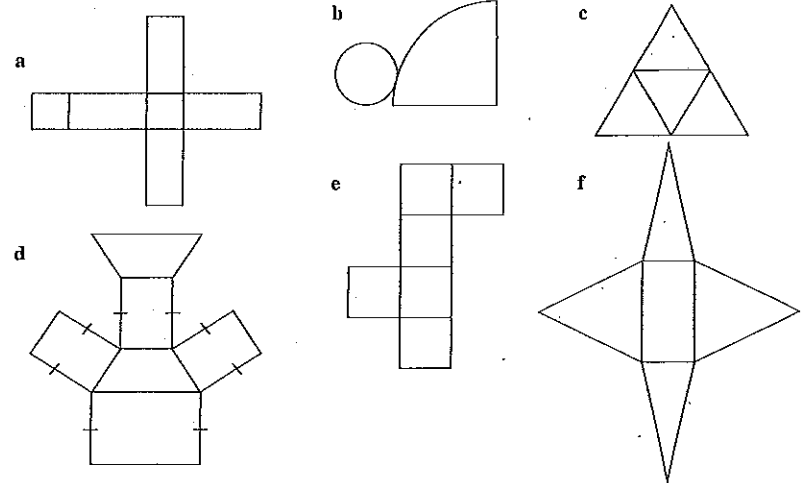
4 Which of the shapes in Question 3:

a are prisms?

b are pyramids?

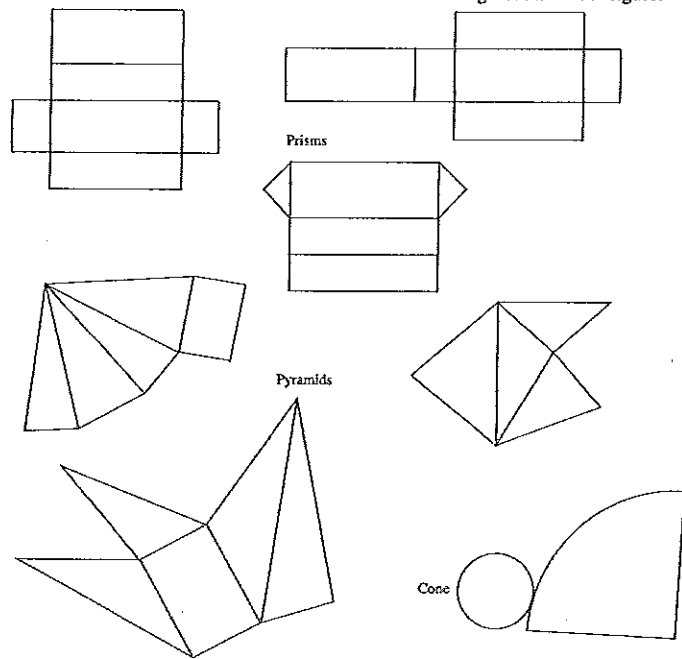
5 Choose from this list the solid that matches the nets shown below:

- triangular pyramid cone cube trapezoidal prism rectangular pyramid square prism



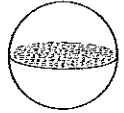





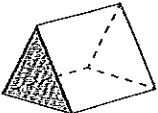
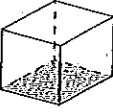

**Skillsheet 11-02 Three-dimensional shapes (solids) continued**

6 Photocopy the following nets onto stiff paper or light cardboard. It will be easier if you enlarge them. Cut out each net and fold it to make a three-dimensional figure. Name the figure.



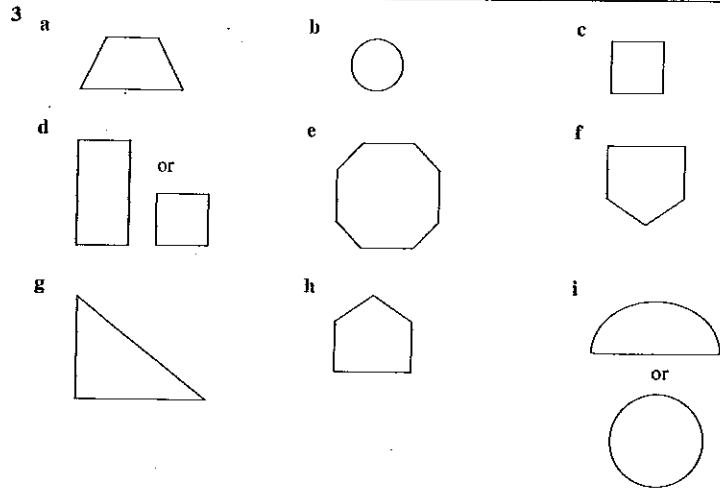
**Skillsheet 11-02 Three-dimensional shapes (solids) continued**

**Answers**

1	3-D shape	Name	Physical object
		sphere	Earth
		cylinder	can
		rectangular prism	box
		square pyramid	pyramid
		hexagonal pyramid	tent (tee-pee)
		cone	ice cream
		triangular prism	tent (A-frame)
		cube	dice
		hemisphere	half an orange

**Skillsheet 11-02 Three-dimensional shapes (solids) continued**

2	Shape	Faces	Vertices	Edges	$f+v-e$
a	cylinder	3	0	2	1
b	rectangular pyramid	5	5	8	2
c	triangular prism	5	6	9	2
d	cube	6	8	12	2
e	cone	2	0	1	1
f	pentagonal pyramid	6	6	10	2
g	rectangular prism	6	8	12	2
h	sphere	1	0	0	1
i	tetrahedron	4	4	6	2
j	heptagonal prism	9	14	21	2



4 a a, d, e, g, h

b c, f

5 a square prism

b cone

c triangular pyramid

d trapezoidal prism

e cube

f rectangular pyramid

