

Group activity – nets of 3D shapes



Objectives

- To work out the pattern (net) for a 3-D shape.
- To draw an accurate net of a 3-D shape using given dimensions.
- To cut out the net and construct the chosen 3-D shape.
- To calculate the surface area and volume of the constructed shapes (Level 1 learners and above).

To Begin

Work in pairs.

Look at the **3-D shapes** provided. Can you name them?

Choose a shape. Now imagine that it is opened out and laid flat on the table to make a pattern (or net) for this shape.

Can you describe to your partner what the pattern would be like?

Ask your tutor for some examples of nets of 3-D shapes. Can you name the shapes?

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Activity 1

Sketch a pattern for one of the shapes (your sketch does not have to be to scale).

Measure the 3-D shape (height, width, length) and write the dimensions of the sides on your pattern.

Open up the shape, lay it flat and **check** that your pattern is correct. If it is not, can you see why?

Activity 2

Now **draw** an accurate net of:

A cube of height 12 cm, length 12 cm and width 12 cm

or

A cuboid of height 10cm, length 8cm and width 8 cm

or

A cuboid of height 16 cm, length 8 cm and width 5 cm

Cut out your net and fold and stick it with sellotape to make your chosen shape.

Stop here if you are currently working at Entry 2 or 3

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Level 1 and 2 learners continue with Activity 3.

Activity 3

Calculate the surface area and volume of your shape and state the units.
You **must show all your working out** even if you use a calculator.

Useful information		
To find	What to multiply	Units
Area of a rectangle	Length (l) x width (w)	mm ² cm ² m ²
Volume of a cuboid	Length (l) x width (w) x height (h)	mm ³ cm ³ m ³

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Tutor notes

The following sites are useful sources of nets for printing and constructing.

<http://www.senteacher.org/wk/3dshape.php>

<http://gwydir.demon.co.uk/jo/solid/index.htm>

Adult Numeracy

MSS2/E2.2 Describe the properties of common 2-D and 3-D shapes. (a) Know the relevant vocabulary for describing 2-D and 3-D shapes, e.g. corner, angle, face, side.

MSS1/L1.9 Work out the area of rectangles. (a) Know that area is a measure of surface

(b) Know what measurements are required to calculate area, and how to obtain them

(c) Know that measurements must be in the same units before calculating area

(d) Know that the area of a rectangle = length x width

(e) Know that area is measured in square units

MSS1/L1.10 Work out simple volume e.g. cuboids

(a) Know that volume is a measure of space

(b) Know what measurements are required to calculate volume, and how to obtain them

(c) Know that measurements must be in the same units before calculating volume

(d) Know that the volume of a cuboid = length x width x height (or depth)

(e) Know that volume is measured in cubic units.

MSS2/L2.1 Recognise and name a range of mathematical 2-D representations of 3-D objects, e.g. in maps and plans. (a) Know the accepted conventions for representing 3-D objects, e.g. contour lines, representation of a cuboid.

<http://www.excellencegateway.org.uk/page.aspx?o=sflcurriculum>

Functional Maths

Ideal for underpinning the following Coverage and Range statements.

E2 Know properties of simple 2D and 3D shapes

E3 Recognise and name simple 2D and 3D shapes and their properties

L1 Work out areas and perimeters in practical situations

L1 Construct geometric diagrams, models and shapes

L2 Recognise and use 2D representations of 3D objects

L2 Find area, perimeter and volume of common shapes

<http://www.ofqual.gov.uk/qualification-and-assessment-framework/89-articles/238-functional-skills-criteria>