

Notes – Nets of 3D shapes



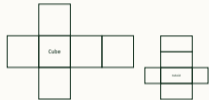
Key idea

A net is a flat 2D plan that folds along edges to make a 3D shape. The same 3D shape can have many different nets. All faces must be present and connected.

Steps to identify a net

1. Count the faces. Does the net have the right number? (Cube = 6, cuboid = 6, pyramid = 5, tetrahedron = 4)
2. Check shapes match. Are the faces the correct polygons?
3. Visualise folding. Imagine bending each face along the edge.
4. Check overlaps. No faces should overlap when folded.
5. Check gaps. There should be no gaps between faces.

Common nets



A cube has 11 distinct nets. A cuboid also has a net of 6 rectangles (3 pairs of equal size).

Common mistake

Thinking any 6 connected squares form a cube net. In fact, if a cross arm is more than 2 squares long, it won't fold correctly.

Notes – Nets and surface area



Example 1: Cube net

A cube of side 3 cm has net area = $6 \times (3 \times 3) = 54 \text{ cm}^2$. The net is the surface area of the cube.

Example 2: Cuboid box

A $5 \times 3 \times 2$ cm box: $SA = 2(5 \cdot 3 + 5 \cdot 2 + 3 \cdot 2) = 62 \text{ cm}^2$.

Example 3: Opposite faces

In a cube cross net, the two squares at the ends of the cross are opposite each other when folded.

Example 4: Open box

An open box net has 5 faces (no top). Its surface area excludes the missing top face.

Try these

1. Draw a cube net of side 2 cm.
2. Find surface area of a 4 cm cube.
3. Identify opposite faces in a cross net.

Common mistake

Forgetting that opposite faces never share an edge in a net. In the cross net, the top and bottom squares are opposite.