Week 13, Day 2
3-D shapes

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the Learning Reminders. They come from our PowerPoint slides.

2. Tackle the questions on the Practice Sheet. There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.

3. Finding it tricky? That’s OK… have a go with a grown-up at A Bit Stuck?

4. Have I mastered the topic? A few questions to Check your understanding.
   Fold the page to hide the answers!
Describe 3-D shapes.

A
This shape has 4 triangular faces. It has 4 vertices and 6 edges.

B
This shape has 6 square faces, 8 vertices and 12 edges.

C
This shape has 1 square face and 4 triangular faces.

D
This shape has 2 triangular faces and three rectangular faces, 6 vertices and 9 edges.

E
This shape has 2 square faces and 4 rectangular faces. It has 8 vertices and 12 edges.

F
This shape has 2 pentagonal faces and 5 rectangular faces. It has 10 vertices and 15 edges.

SPOILER below! Don’t look till you’ve tried!

Describe 3-D shapes.

A
This shape has 4 triangular faces. It has 4 vertices and 6 edges.

F - tetrahedron
This shape has 6 square faces, 8 vertices and 12 edges.

D - cube
This shape has 1 square face and 4 triangular faces.

E - square-based pyramid

This shape has 2 triangular faces and three rectangular faces, 6 vertices and 9 edges.

A - triangular prism
This shape has 2 square faces and 4 rectangular faces. It has 8 vertices and 12 edges.

B - cuboid
This shape has 2 pentagonal faces and 5 rectangular faces. It has 10 vertices and 15 edges.

C - pentagonal prism
Learning Reminders

Identify nets.

Below are nets of some of the 3-D shapes. Which nets could make which shapes?

SPOILER below! Don’t look till you’ve tried!
Practice Sheet Mild
Properties of 3-D shapes

1. Tick blue each shape with 5 faces.
2. Tick red each shape with more than 5 vertices.
3. Tick black each shape with an even number of edges.

- cuboid
- triangular prism
- square-based pyramid
- triangular-based pyramid

4. Tick each net that will make an open cube.
Practice Sheet Hot
Faces of prisms and pyramids

What different 3-D shapes can you make using the faces below? Write the name of each shape (e.g. triangle-based pyramid) and list the faces that would be on it. How many different 3-D shapes can you find? All shapes are drawn to scale.

Challenge
Tyrone wants to make a triangular prism. He uses G, L and F. What shapes will he need to draw to be the other two faces? Draw the net of his prism.

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Practice Sheets Answers

Properties of 3-D shapes (mild)
1. 2. 3

cuboid

triangular prism

square-based pyramid

triangular-based pyramid

4.

Faces of prisms and pyramids (hot)

Cube = A, D, T, U, I, O
Tetrahedron = B, J, M, N (or P or Y)
Triangle-based pyramid = B (or J, M, N, P or Y) with any three of F, L, K, Q, X or Z
Square-based pyramid = A (or D, I, O, T or U) with any four of F, L, K, Q, X or Z
Triangular prism = any two of B, J, M, N, P and Y with either C, S and V or G, H and R

Challenge

Tyrone needs to draw two rectangles. These have a long side the length of the long side on G. They have a short side the length of the long side on F.

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You will need:
• Scissors and sticky tape

What to do:
• Some of the nets below and on the next page will make a cube, and some won’t!
  Which do you think will work…?
• Cut them all out and have a go!
• Do the nets that ‘work’ share any properties?
  What about the nets that don’t ‘work’?
Check your understanding

Questions

What do we call a circular-based pyramid?

How many vertices does a pyramid with a pentagon base have?

How many edges does a prism with pentagon ends have?

True or false?
• A prism always has two parallel faces
• A pyramid cannot have any parallel faces

Sketch the net of a cuboid with no ‘lid’.
Check your understanding

Answers

What do we call a circular-based pyramid? A cone.

How many vertices does a pyramid with a pentagon base have? 6. The five around the base plus the apex.

How many edges does a prism with pentagon ends have? 15. Five at either ‘end’, plus five joining the two pentagons at either end.

True or false?
- A prism always has two parallel faces False, it will always have at least one pair, the shape at either end, e.g. the triangles of a triangular prism, but can have more, e.g. a cuboid which has three pairs of parallel faces.
- A pyramid cannot have any parallel faces. True since, apart from the base, the faces are all sloped to the apex.

Sketch the net of a cuboid with no ‘lid’.
Below is an example: the net should have 5 squares joined.

```
+---+---+---+
|   |   |   |
+---+---+---+
|   |     |
+---+---+---+
```

A straight line of 5 squares is an example of one arrangement that doesn’t work.