Reasoning and Problem Solving
Step 1: 3D Shapes

National Curriculum Objectives:

Mathematics Year 1: (1G1b) Recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain the mistake made when labelling 3D shapes. Includes cubes, spheres, cuboids and square and triangular-based pyramids in the same orientation with visible perspective lines.
Expected Explain the mistake made when labelling 3D shapes. Includes cubes, spheres, cuboids, square and triangular-based pyramids, cylinders and cones in different orientations with some perspective lines visible.
Greater Depth Explain the mistake made when labelling 3D shapes. Includes cubes, spheres, cuboids, square and triangular-based pyramids, cylinders and cones in different orientations, with no perspective lines visible and use of real life objects.

Questions 2, 5 and 8 (Reasoning)
Developing Explain whether a statement is correct using knowledge of 3D shapes. Includes spheres, cuboids and cylinders in the same orientation with visible perspective lines.
Expected Explain whether a statement is correct using knowledge of 3D shapes. Includes cuboids, cylinders and cones in different orientations with some perspective lines visible.
Greater Depth Explain whether a statement is correct using knowledge of 3D shapes. Includes cubes, cylinders, square and triangular-based pyramids in different orientations, with no perspective lines visible and use of real life objects.

Questions 3, 6 and 9 (Problem Solving)
Developing Identify two 3D shapes that would fit the given parameter. Includes cubes, spheres, cuboids, square and triangular-based pyramids, cylinders and cones in the same orientation. Pictures provided for support.
Expected Identify two 3D shapes that would fit the given parameter. Includes cubes, spheres, cuboids, square and triangular-based pyramids, cylinders and cones in different orientations.
Greater Depth Identify two 3D shapes that would fit the given parameters using knowledge of shape properties. Includes cubes, spheres, cuboids, square and triangular-based pyramids, cylinders and cones in different orientations.
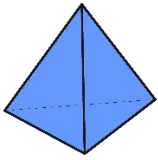
More Year 1 Shape resources.

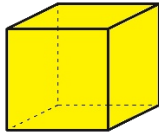## Did you like this resource? Don't forget to review it on our website.

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1a. The shapes below are labelled. Spot the mistake.

A. B. C.

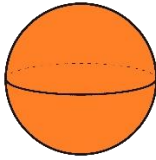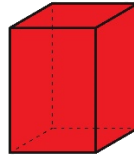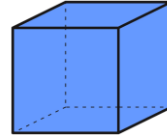| triangular-based pyramid | sphere | cube |

Explain your answer.

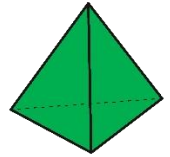**1b.** The shapes below are labelled. Spot the mistake.

A. B. C.

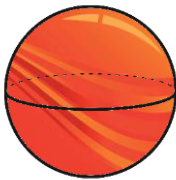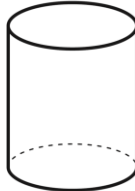| cube | cuboid | triangular-based pyramid |

Explain your answer.

2a. Shazir has collected this shape. She says,

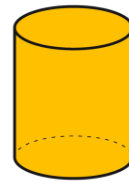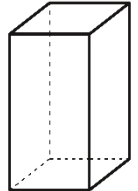My shape is a cylinder.

Is she correct? Explain your answer.

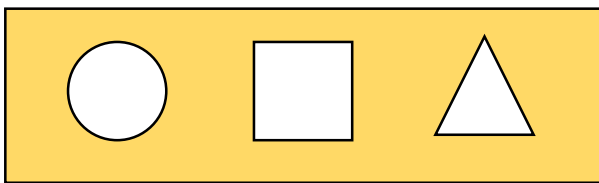**2b.** Cassius has collected this shape. He says,

My shape is a cuboid.

Is he correct? Explain your answer.

3a. Minnie posted some 3D shapes through the middle hole in her shape sorter below.
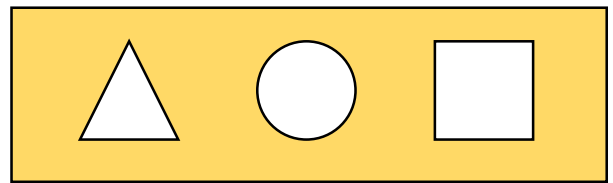
Which 3D shapes could she have posted? Give two possibilities.

3b. Lucas posted some 3D shapes through the middle hole in his shape sorter below.

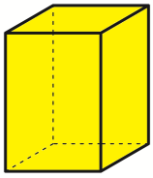Which 3D shapes could he have posted? Give two possibilities.

3D Shapes

3D Shapes
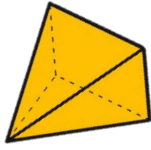
4a. The shapes below are labelled. Spot the mistake.

A.   B.   C.

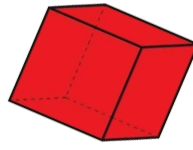| cuboid | cube | square-based pyramid |

Explain your answer.
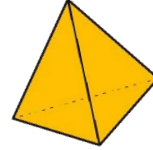
R

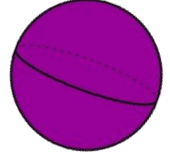**4b.** The shapes below are labelled. Spot the mistake.

A.   B.   C.

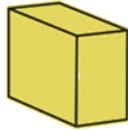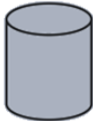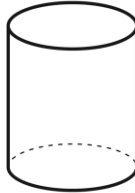| cube | square-based pyramid | sphere |

Explain your answer.

R

5a. Hannah has collected these shapes. She says,

All these shapes are cylinders.

Is she correct? Explain your answer.

R

5b. James has collected these shapes. He says,

All these shapes are cuboids.
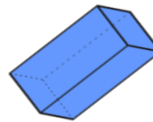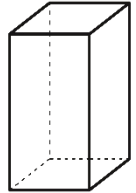
Is he correct? Explain your answer.

R

6a. Anna posted some 3D shapes through the middle hole in her shape sorter below.
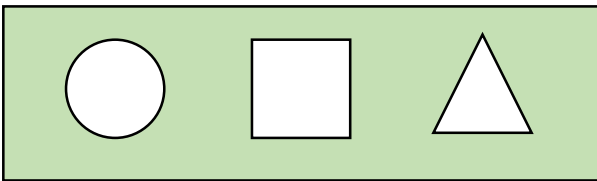
Which 3D shapes could she have posted? Give two possibilities.

PS

6b. Ken posted some 3D shapes through the middle hole in his shape sorter below.

Which 3D shapes could he have posted? Give two possibilities.

PS

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Reasoning and Problem Solving – 3D Shapes – Year 1 Expected

3D Shapes

3D Shapes

7a. The shapes below are labelled. Spot the mistake.

A.   B.   C.

| sphere | square-based pyramid | cuboid |

Explain your answer.

R

7b. The shapes below are labelled. Spot the mistake.

A.   B.   C.

| square-based pyramid | cylinder | cube |

Explain your answer.

R

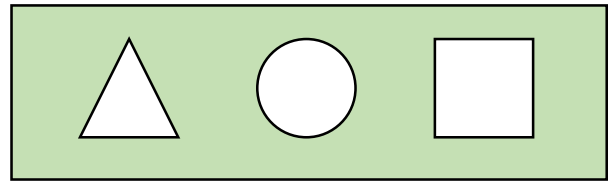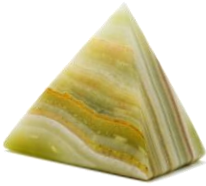**8a.** Sophie has collected these objects. She says,

> All these objects are cubes.
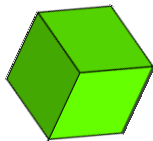
Is she correct? Explain your answer.

R

8b. Eric has collected these objects. He says,

> All these objects are square-based pyramids.

Is he correct? Explain your answer.

R

9a. Freya posted a 3D shape through the shape sorter below. The shape fitted through two of the holes.

Which 3D shape could she have posted?

PS

9b. Skylar posted a 3D shape through the shape sorter below. The shape fitted through the hole in any orientation.

Which 3D shape could she have posted?

PS

Reasoning and Problem Solving
3D Shapes

Developing

1a. B and C are the mistakes as the labels have been swapped (B is a cube, C is a sphere).
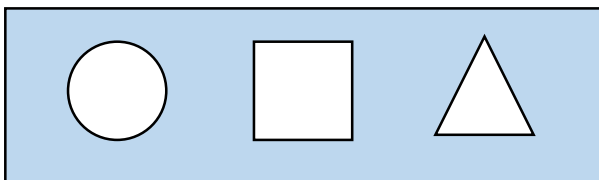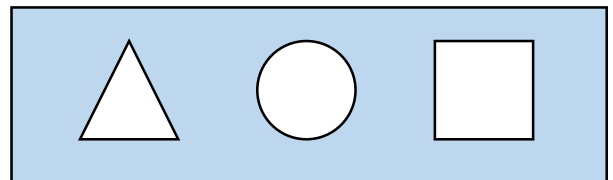
2a. She is incorrect because her shape is a sphere, not a cone.

3a. Cuboid and cube.

Expected

4a. B is the mistake because the shape is a cone, not a cube.

5a. She is incorrect because the third shape is a cuboid, not a cylinder.

6a. Various answers, for example: square-based pyramid, cube and cuboid.

Greater Depth

7a. A is the mistake because the shape is a cylinder, not a sphere.

8a. She is incorrect because the second shape is cylinder, not a cube.

9a. A square-based pyramid which would fit through the square and triangle holes.

Reasoning and Problem Solving
3D Shapes

Developing

1b. A and B are the mistakes as the labels have been swapped (A is a cuboid, B is a cube).

2b. He is incorrect because his shape is a cylinder, not a cuboid.

3b. Cylinder and cone.

Expected

4b. B is the mistake because the shape is a triangular-based pyramid, not a square-based pyramid.

5b. He is incorrect because the first shape is a cone, not a cuboid.

6b. Various answers, for example: cone, sphere and cylinder.

Greater Depth

7b. B and C are the mistakes as the labels have been swapped (B is a cube, C is a cylinder).

8b. He is incorrect because the third shape is a cylinder, not a square-based pyramid.

9b. A sphere which would fit through the circle hole (a cube would also fit in any orientation if the shape sorter was moved).

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Reasoning and Problem Solving – 3D Shapes ANSWERS