

# Reasoning and Problem Solving

## Step 5: Patterns with 2D and 3D Shapes

### National Curriculum Objectives:

Mathematics Year 1: (1G1a) [Recognise and name common 2-D shapes \[for example, rectangles \(including squares\), circles and triangles\]](#)

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 (Problem Solving)

**Developing** Create different patterns using 2 given 2D shapes. Includes squares, circles, triangles and rectangles.

**Expected** Create different patterns using 3 given 2D shapes. Includes squares, circles, triangles and rectangles in different orientations.

**Greater Depth** Create different patterns using 4 given 2D shapes. Includes squares, circles, triangles and rectangles in different orientations and with some mixed dimensions.

Questions 2, 5 and 8 (Problem Solving)

**Developing** Create a pattern using the three given clues. Using 2 shapes including squares, circles, triangles and rectangles.

**Expected** Create a pattern using the four given clues. Using 3 shapes including squares, circles, triangles and rectangles.

**Greater Depth** Create a pattern using the four given clues. Using 4 shapes including squares, circles, triangles and rectangles.

Questions 3, 6 and 9 (Reasoning)

**Developing** Identify a mistake made when drawing around 3D shapes to create a pattern. Using 2 shapes, including squares, circles, triangles, rectangles, cubes, spheres, cuboids and triangular-based pyramids.

**Expected** Identify a mistake made when drawing around 3D shapes to create a pattern. Using 3 shapes including squares, circles, triangles, rectangles, cubes, spheres, cuboids, square and triangular-based pyramids, cylinders and cones in different orientations.

**Greater Depth** Identify a mistake made when drawing around 3D shapes to create a pattern. Using 4 shapes including squares, circles, triangles, rectangles, cubes, cuboids, spheres, cones and pyramids and prisms with a variety of shaped bases in different orientations and with some mixed dimensions.

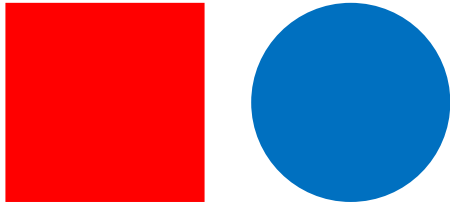
More [Year 1 Shape](#) resources.

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

# Patterns with 2D and 3D Shapes

# Patterns with 2D and 3D Shapes

1a. Make a pattern using only these shapes.



PS

1b. Make a pattern using only these shapes.



PS

2a. Use these clues to create a pattern and then repeat it.

1. The 2<sup>nd</sup> shape in the pattern is a triangle.
2. The 1<sup>st</sup> shape in the pattern is a yellow circle.
3. The triangle is blue



PS

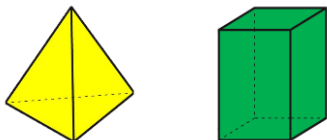
2b. Use these clues to create a pattern and then repeat it.

1. The 1<sup>st</sup> shape in the pattern is a square
2. The 2<sup>nd</sup> shape in the pattern is a red circle.
3. The square is green.

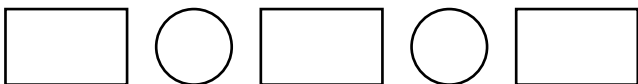


PS

3a. Milly is drawing around the 3D shapes below to create a pattern.



Here is the pattern she has created.

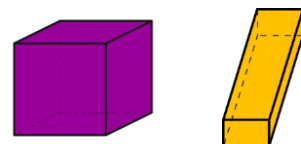


What has Milly done wrong? Explain your answer.



R

3b. Joe is drawing around the 3D shapes below to create a pattern.



Here is the pattern he has created.



What has Joe done wrong? Explain your answer.



R

## Patterns with 2D and 3D Shapes

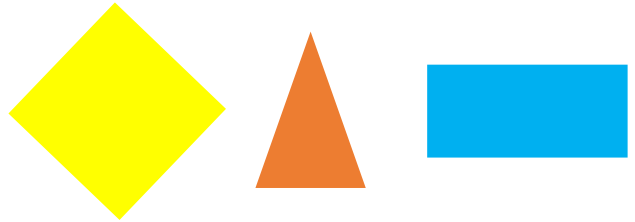
## Patterns with 2D and 3D Shapes

4a. Make a pattern using only these shapes.



PS

4b. Make a pattern using only these shapes.



PS

5a. Use these clues to create a pattern and then repeat it.

1. The last shape in the pattern is a blue circle.
2. The 1<sup>st</sup> shape in the pattern is a square.
3. The 2<sup>nd</sup> shape in the pattern is a yellow triangle.
4. The square is red.



PS

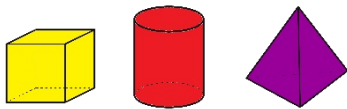
5b. Use these clues to create a pattern and then repeat it.

1. The 1<sup>st</sup> shape in the pattern is a yellow circle.
2. The last shape in the pattern is a rectangle.
3. The 2<sup>nd</sup> shape in the pattern is a green square.
4. The rectangle is blue.

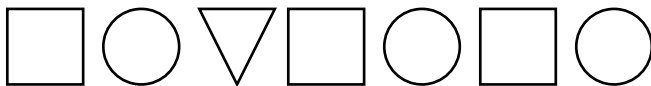


PS

6a. Sophie is drawing around the 3D shapes below to create a pattern.



Here is the pattern she has created.

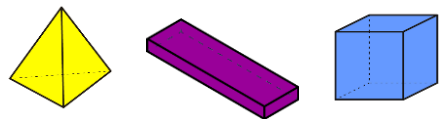


What has Sophie done wrong? Explain your answer.

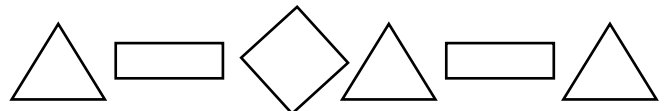


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6b. Harry is drawing around the 3D shapes below to create a pattern.



Here is the pattern he has created.



What has Harry done wrong? Explain your answer.

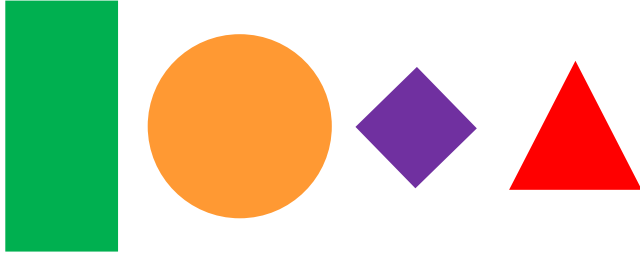


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## Patterns with 2D and 3D Shapes

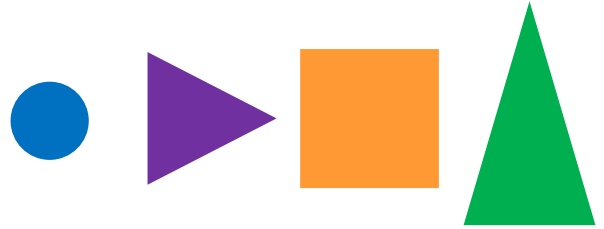
## Patterns with 2D and 3D Shapes

7a. Make a pattern using only these shapes.



PS

7b. Make a pattern using only these shapes.



PS

8a. Use these clues to create a pattern and then repeat it.

1. The 2nd shape in the pattern is a green triangle.
2. The last shape in the pattern is a blue square.
3. The shape after the triangle is a red circle.
4. The 1st shape is a yellow rectangle.



PS

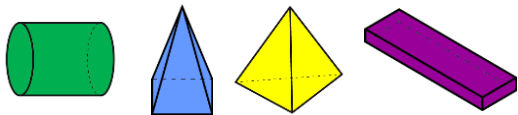
8b. Use these clues to create a pattern and then repeat it.

1. The 3rd shape in the pattern is a yellow circle.
2. The 1st shape is a blue rectangle.
3. The shape after the circle is a green square.
4. The shape before the circle is a red triangle.

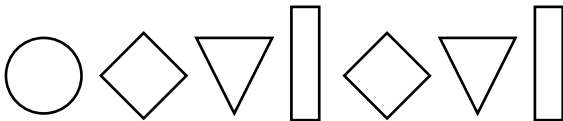


PS

9a. Mihal is drawing around the 3D shapes below to create a pattern.



Here is the pattern he has created.

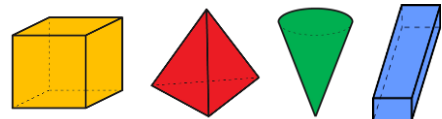


What has Mihal done wrong? Explain your answer.

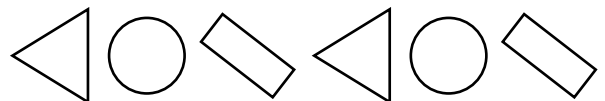


R

9b. Azrah is drawing around the 3D shapes below to create a pattern.



Here is the pattern she has created.



What has Azrah done wrong? Explain your answer.



R

## Reasoning and Problem Solving Patterns with 2D & 3D Shapes

### Developing

- 1a. Various answers, for example: circle, square, circle, square
- 2a. The pattern will be; yellow circle, blue triangle repeated.
- 3a. Milly has drawn around the wrong shape because the triangular based pyramid does not have a circular surface.

### Expected

- 4a. Various answers, for example: triangle, rectangle, circle, triangle, rectangle, circle
- 5a. The pattern will be; red square, yellow triangle, blue circle repeated.
- 6a. Sophie should have drawn around the pyramid after drawing around the cylinder each time.

### Greater Depth

- 7a. Various answers, for example: circle, square, triangle, rectangle
- 8a. The pattern will be; yellow rectangle, green triangle, red circle, blue square repeated.
- 9a. Mihal should have drawn around the cylinder after drawing around the cuboid each time.

## Reasoning and Problem Solving Patterns with 2D & 3D Shapes

### Developing

- 1b. Various answers, for example: triangle, rectangle, triangle, rectangle
- 2b. The pattern will be; green square, red circle, repeated.
- 3b. Joe has drawn around an extra shape because the cube and cuboid do not have a triangular surface.

### Expected

- 4b. Various answers, for example: square, rectangle, triangle, square, rectangle, triangle
- 5b. The pattern will be; yellow circle, green square, blue rectangle repeated.
- 6b. Harry should have drawn around the cube after drawing around the cuboid each time.

### Greater Depth

- 7b. Various answers, for example: triangle, triangle, square, circle
- 8b. The pattern will be; blue rectangle, red triangle, yellow circle, green square repeated.
- 9b. Azrah has only drawn around 3 shapes. She has not drawn around the cube.