Reasoning and Problem Solving
Properties of Shape – Year 2

About This Resource

This resource is aimed at Year 2 Secure and has been designed to give children the opportunity to consolidate the skills they have learned in Spring Block 3 Geometry: Properties of Shape.

The questions are based on a selection of the same 'small steps' that are addressed in the block, but are presented in a different way so children can work through the pack independently and demonstrate their understanding and skills.

Small Steps

Recognise 2D and 3D shapes
Count sides on 2D shapes
Count vertices on 2D shapes
Draw 2D shapes
Lines of symmetry
Sort 2D shapes
Make patterns with 2Dshapes
Count faces on 3D shapes
Count edges on 3D shapes
Count vertices on 3D shapes
Sort 3D shapes
Make patterns with 3D shape

National Curriculum Objectives

Mathematics Year 2: (2G2a) Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
Mathematics Year 2: (2G2b) Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
Mathematics Year 2: (2G3) Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
Mathematics Year 2: (2G1b) Compare and sort common 3-D shapes and everyday objects

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

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Joey and Janine are on an explorers' holiday. They have just received an urgent message from their team who are in the middle of the deserted caves of Abubayabu, in search of the hidden tomb of a great and magical king.

Joey & Janine, we need you! Explorer team stuck in desert. No idea how to solve clues 😣 . HELP!!

Looks like our holiday will have to wait!

Please help us! The quicker we finish the quicker we get back on holiday!

1. The team have made their way into the caves and are at the beginning of the journey down into the tomb.

The map has a puzzle to protect its hiding place.

These shapes have been carved into the cave wall.

Help solve the puzzle to access the map.

Write the names of the shapes in the order you would press them.

1st Shape: *The first is smooth with only one side.*
2nd Shape: *The next has four of each.*
3rd Shape: *The third has an even number of sides, more than all the others.*
4th Shape: *The fourth is the least of the corners here.*
5th Shape: *The next has the same sides as its number in order.*
6th Shape: *The final shape needs a bond of four to make its sides equal ten.*

Press the shapes in order to find the map in the den.

Name of Shape 1	Name of Shape 2	Name of Shape 3	Name of Shape 4	Name of Shape 5	Name of Shape 6

The map is freed. It shows a complex route of caverns, dangerous ravines to cross and a few more tricks and puzzles protecting the King's tomb. Keep going... IF YOU DARE!

2. In the first cavern you approach, there are ropes and pulleys holding poisonous arrows and enormous rocks high in the air, ready to drop if you trip the system.

To pass safely, you must complete the puzzle by drawing a line from the bottom of the page to the top, passing through shapes in order of their number of sides.

Hang on... there's an extra part of the puzzle! Draw the line only through the shapes at their line of symmetry. You can only cross a shape once.

Find and draw a safe route on the map to take you through the cavern.
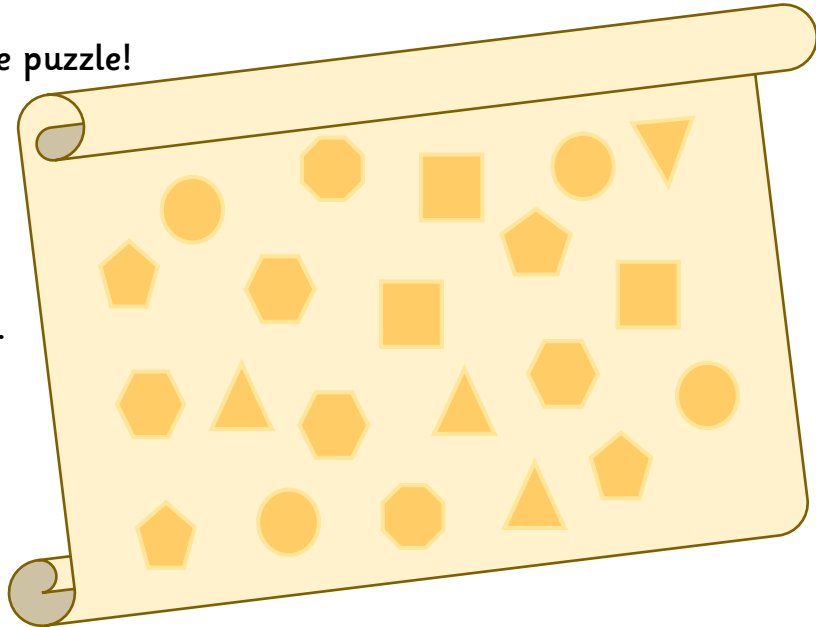
You've made it! Joey thinks he knows where to go next, but it doesn't look safe! A rickety rope bridge is stretched across a deep dark ravine, one wrong move and it will snap. Joey rushes ahead full of excitement.

LOOK OUT!!!

CRACK!!!

3. The rope on the bridge snaps! Which tool will fit the shape of the holes in the post below to reattach the rope and save Joey? Draw a line from the tool to the matching hole.

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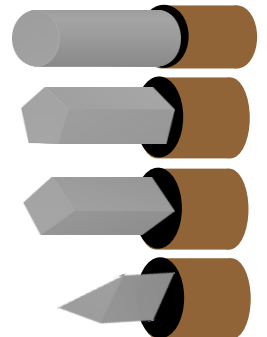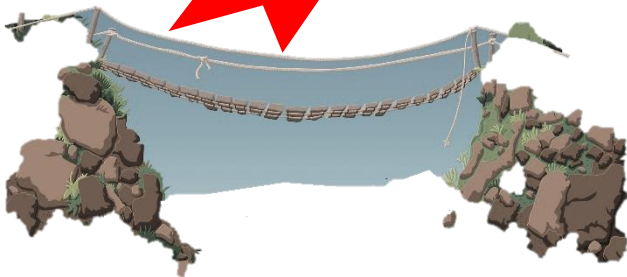
Phew! You made it, everyone is safely across the bridge.

The next cavern is blocked with a huge cylindrical rock. No matter who pushes or pulls, it just won't move.

Janine spots a puzzle on the wall and a pile of carved rocks, she can't work out how it all fits together. They need your help. Which rock goes into which hole?

4. Use the shape names to give Joanne instructions.
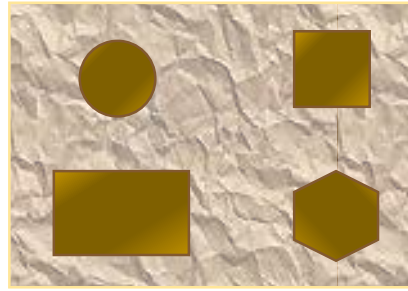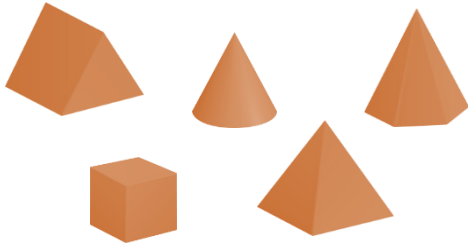
5. The stone has rolled aside to reveal a deep dark cavern. Walking into the darkness, the team come to a dark wall with pictures drawn upon the surface.

They are pictures drawn using 2D shapes of animals.
You need to draw another picture of an animal, made from only 2D shapes, to appease the animal Gods in the caverns below and protect the team.

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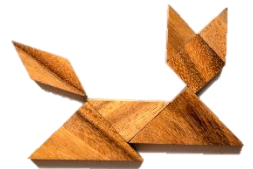
You have travelled safely through the darkest caverns and arrived at the animal temple. Your drawing has shown them you are respectful.

6. For the next puzzle you must name a 2D or 3D shape where the number of vertices matches the number of letter in the animals named:

Cat	
Mouse	
Monkey	
Lion	
Leopard	

In the final tunnel there is a balance which must be flat for the team to pass into the tombs beyond...

7. Using the list of 3D shapes, balance the scale so it would have the same number of faces on each end.

Cube, Cone, Cuboid, Triangular Prism, Triangular-Based Pyramid, Sphere.

You did it! The team enter the tomb and respectfully begin to pack up and dust off the artefacts for labelling, collection and transportation back to the museum.

Heading back out to the open desert, you have piles of packages to fit into your jeep.

8. You need to decide how to pack the jeep. Tell your team which order they should place the packages into the boot to ensure everything stacks neatly.
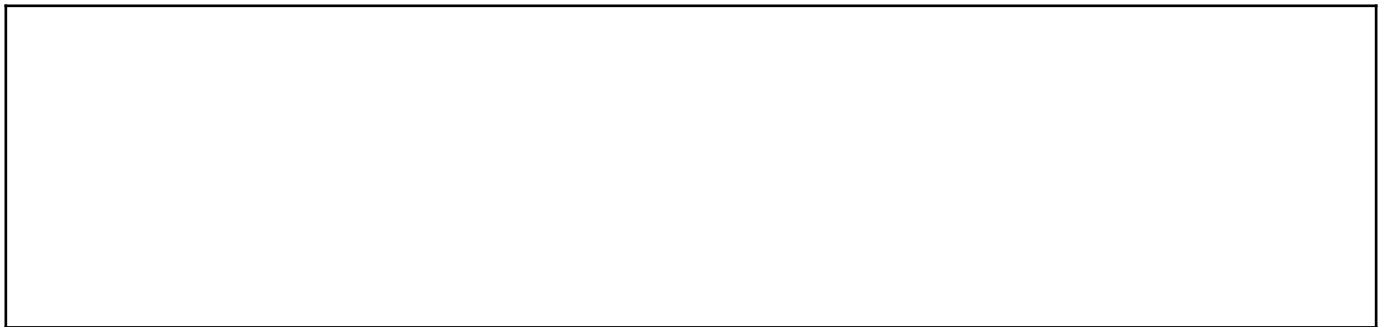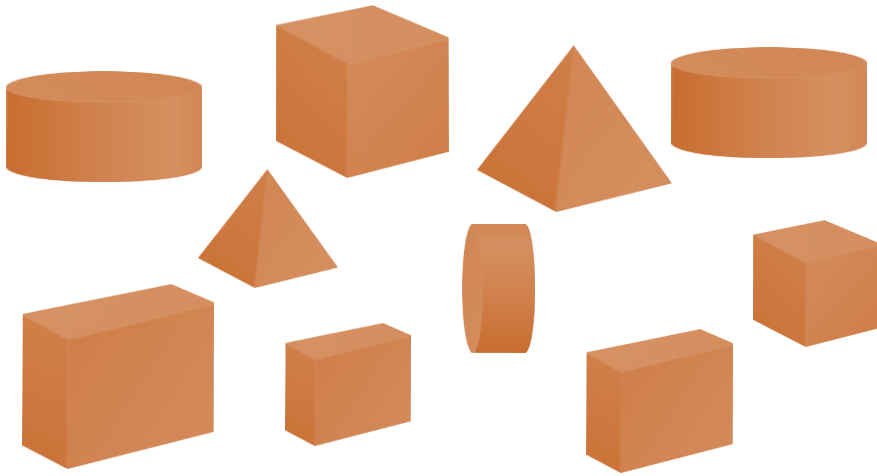
So, it's back to their holiday for Jo and Janine. Thanks for all your help!
Hang on where are they running off to?

Oh no!
They've left their passports in the tomb, and have to go through all those puzzles again...

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1.

Name of Shape 1	Name of Shape 2	Name of Shape 3	Name of Shape 4	Name of Shape 5	Name of Shape 6
Circle	Square	Octagon	Triangle	Pentagon	Hexagon

2. Routes may vary but must only pass through shapes via a line of symmetry and in order of number of sides i.e. circle, triangle, square, pentagon, hexagon, octagon. Example routes:
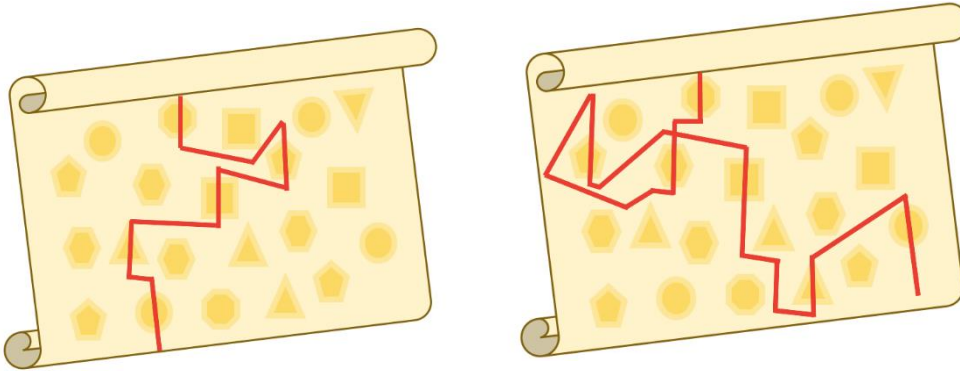
3. Lines matched as image below:
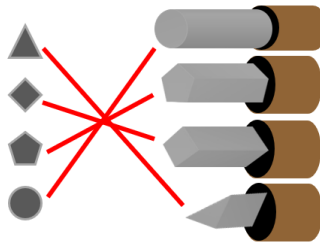
4. Children may write instructions in any order. The cone will fit in the circle. The square based pyramid and the cube will fit in the square hole. The hexagonal based pyramid will fit in the hexagon. The triangular prism will fit in the rectangular hole.

5. Children should use 2D shapes to create a animal picture such as the example given.

6.

Cat	Triangle
Mouse	Pentagon, Square-based pyramid
Monkey	Hexagon, Pentagonal-based pyramid, Triangular prism
Lion	Square, Pyramid
Leopard	Heptagon, Hexagonal-based pyramid

7.

Cube, Cone, Cuboid, Triangular Prism, Triangular-Based Pyramid, Sphere.

Cuboid = 6 faces
Sphere = 1 face
Triangular Prism = 5 faces

Cube = 6 faces
Cone = 2 faces
Triangular-Based Pyramid = 4 faces

Cube = 6 faces
Cone = 2 faces
Triangular-Based Pyramid = 4 faces

Cuboid = 6 faces
Sphere = 1 face
Triangular Prism = 5 faces

8. Pack the cuboids and cubes first to create a flat, stable base, then the cylinders with their circular faces down to maintain the flat surface. The square based pyramids can go on top or amongst the cylinders.

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Reasoning and Problem Solving – Year 2 – Answers