

# Reasoning and Problem Solving

## Properties of Shape – Year 4

### About This Resource

This resource is aimed at Year 4 Expected and has been designed to give children the opportunity to consolidate the skills they have learned Summer Block 5 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

Identify angles

Compare and order angles

Triangles

Quadrilaterals

Lines of symmetry

Complete a symmetric figure

### National Curriculum Objectives

Mathematics Year 4: (4G2a) [Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes](#)

Mathematics Year 4: (4G2b) [Identify lines of symmetry in 2-D shapes presented in different orientations](#)

Mathematics Year 4: (4G2c) [Complete a simple symmetric figure with respect to a specific line of symmetry](#)

Mathematics Year 4: (4G4a) [Identify acute and obtuse angles and compare and order angles up to two right angles by size](#)

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# Amazing Maze Craze



Farmer Doug has asked your school to think of ways to use his spare field. He will share any money he makes with the school. Your class has suggested planting a maze. You are helping to make sure the idea becomes reality!

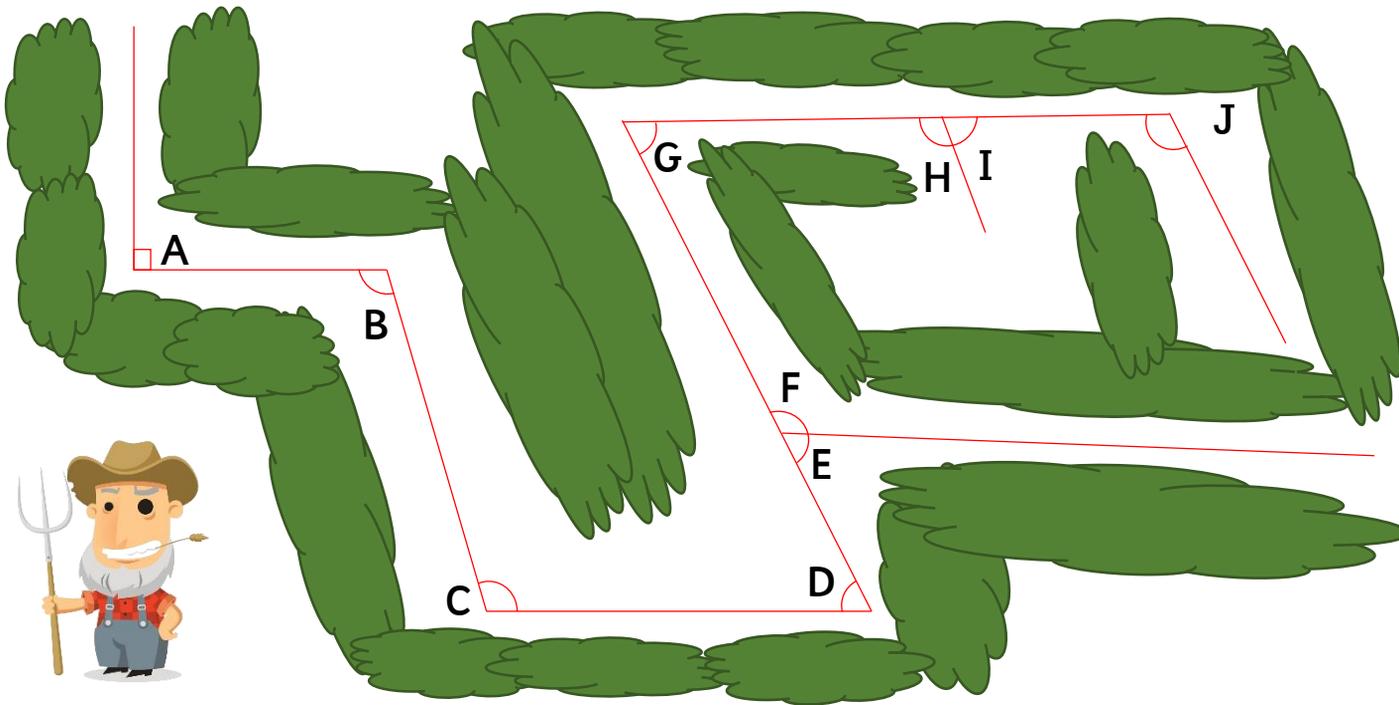
The maize needs to be fully accessible for people with all sorts of mobility needs.

The corners must all be planted at obtuse angles to ensure crutch and wheelchair users can move freely.

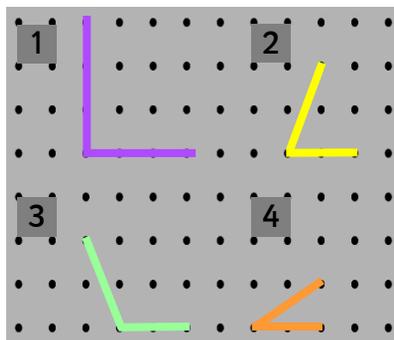


1. Tick any corners which will need to be widened.

A	B	C	D	E	F	G	H	I	J
<input type="checkbox"/>									



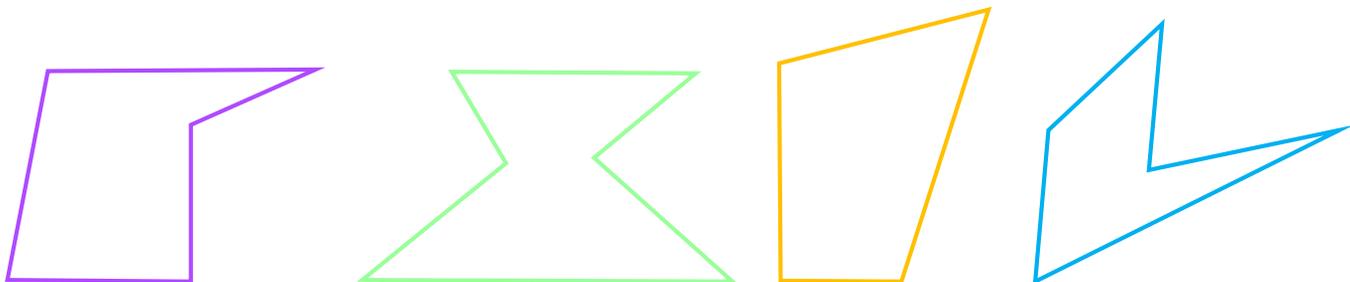
Inside the maze there are challenge tasks for the families to work on together. There is a giant rubber band peg board with the challenge to create 4 angles in order from smallest to largest.



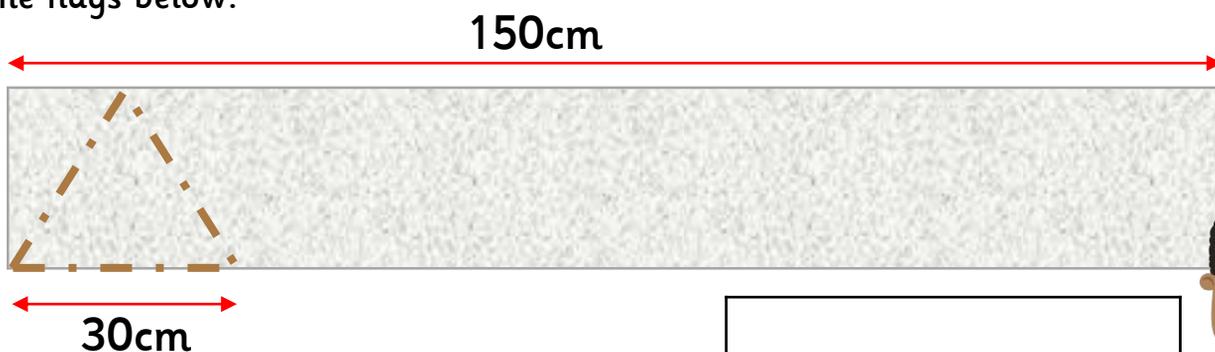
2. Did they get it right? Explain your answer.

The second challenge in the maze is a shape board, families have to compare the size of the angles.

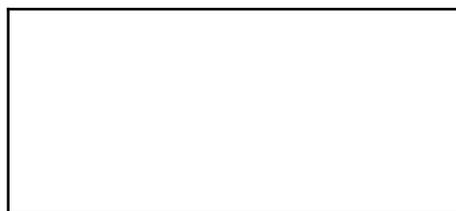
3. Tick the smallest angle and circle the largest in each irregular shape.



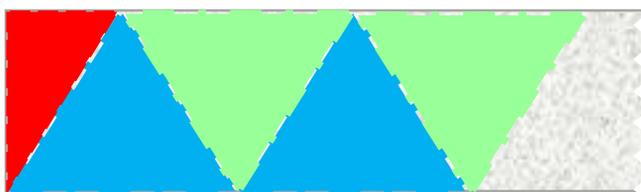
The families will have a long flag to wave overhead if they get lost (or give up!) and need to be rescued. Farmer Doug only has limited fabric and he has drawn his plan for the flags below.



4. How many more equilateral triangles can he fit on the fabric? Explain your answer.



One of your class mates has spotted there are different types of triangles which could be used for the flags. Farmer Doug decides he will have blue equilateral triangle flags, red right angled triangle flags and green isosceles triangle flags.



5. Has he coloured coded the first few flags correctly? Explain your answer.



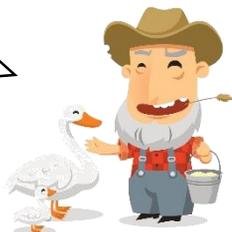
Farmer Doug has ordered 3 mirrors for the a crazy mirror challenge but he can't remember the name of the shapes he ordered.



6. Using the clues work out the shapes of the mirrors he has ordered?

The first had 4 equal sides, 2 acute and 2 obtuse angles.

I know one had 2 sets of parallel sides. One set equal but shorter than the other set. 2 acute 2 obtuse angles.



The third had 4 right angles and 2 pairs of equal parallel sides, one pair longer than the other.

He wants to order two more mirrors, he draws you a clue.

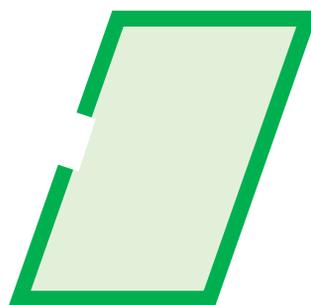
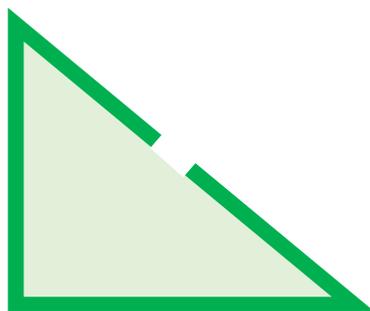
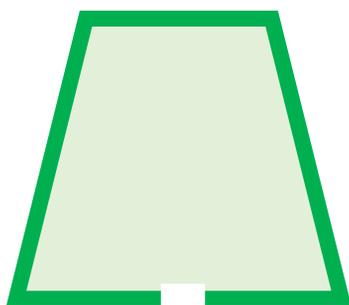


7. Describe the mirrors for the order form below:

	Mirror shape name	Number of parallel Sides	Number of internal angles	Type of angles: acute or obtuse
A				
B				

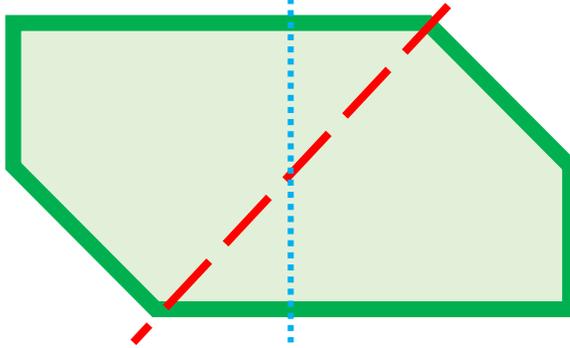
You have so many ideas for the challenges you need to change the maze plan to fit them all in!

8. If extra hedges were planted in the shapes below, how could they be split to create two symmetrical areas for each space?



9. Tiger and Shannon cannot agree how to split this space so it is symmetrical.

The dotted blue line makes two symmetrical spaces.



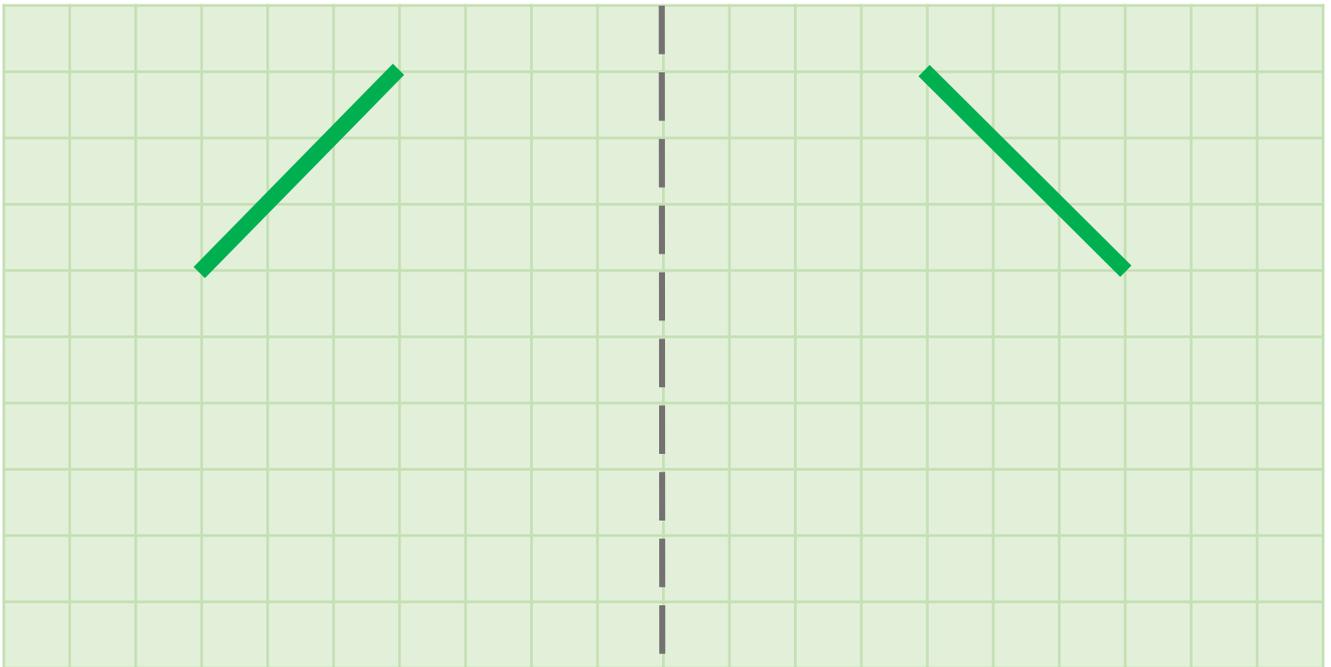
The red dashed line makes two symmetrical spaces.



Can you help them agree? Explain your answer.

The maze is such a success you decide to extend using some existing hedges.

10. Design your own symmetrical space using the hedges already given. Your space can be any shape so long as it is symmetrical.. let your imagination run wild!



Well done! Your tourist attraction has been awarded a 'must visit' rosette from the local summer activities magazine. Here are some of the customer comments...



A great day out!

So much fun!

All the family loved it!  
We'll come again.

Great puzzles,  
fun to complete!

Looks like you'll be busy all summer long!

**classroomsecrets.com**

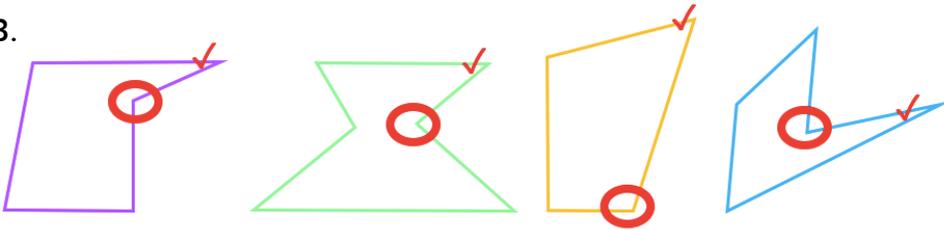
## Reasoning and Problem Solving – Properties of Shape – Year 4

1.

A	B	C	D	E	F	G	H	I	J
✓			✓	✓		✓		✓	

2. They have not got it right. The largest angle is number 3, then 1, then 2, then 4. They should either move the angles around or decrease the size of number 3 to between 2 and 4 then they would be correct. The people before have ordered in terms of the length of the sides instead of the size of the angle.

3.



4. 9 more triangles will fit on the the fabric, 5 in the position of the example and 4 in the spaces between those (plus 2 right angled triangles).

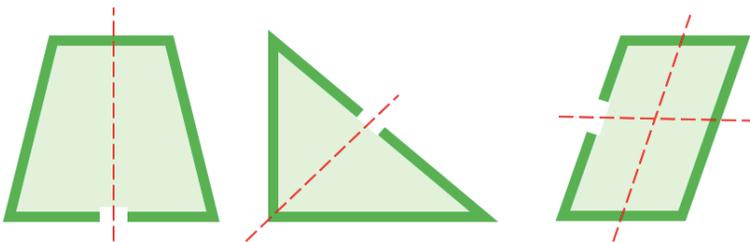
5. No he hasn't the spaces between the equilateral triangles will also be equilateral triangles so should be blue. The two at the edges will be right angled triangles, so the red triangle is correct.

6. The first is a rhombus, the second a parallelogram and the third is a rectangle.

7.

	Mirror Shape Name	Number of pairs of parallel Sides	Number of internal angles	Type of angles: acute or obtuse?
A	Pentagon	0	5	all obtuse
B	Hexagon	3	6	all obtuse

8.



*Children may mark either of the lines of symmetry on the parallelogram.*

9. The shape has no lines of symmetry, the angles and lengths of the sides make it an irregular non symmetrical shape.

10. *Children may design any shape they choose so long as it is symmetrical at the point of the dotted line and includes the given hedges.*