Ratio and scale factors

- Use ratios to solve problems
- Solve scale factor problems

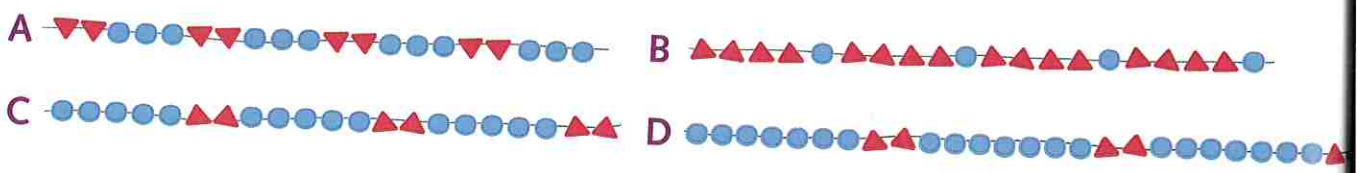
Challenge 1

1 Write each ratio in its simplest form.

a 6 : 12 **b** 6 : 18 **c** 24 : 30 **d** 28 : 21

e 45 : 81 **f** 42 : 60 **g** 50 : 60 **h** 55 : 121

2 Look at the bead necklaces below.



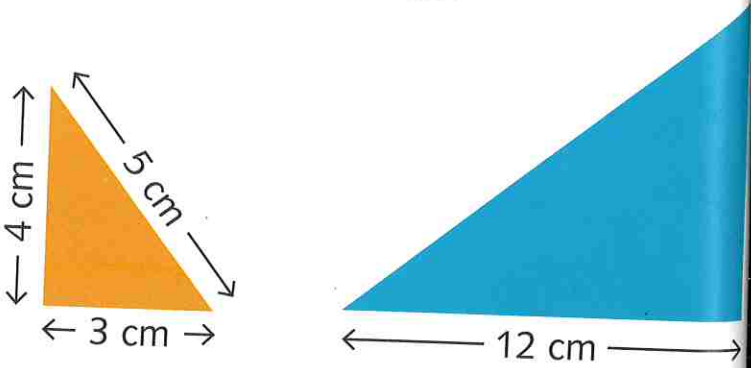
a In each case, write the ratio of triangular to circular beads.

b What is the proportion of triangular beads in each necklace?

3 These two triangles are similar.

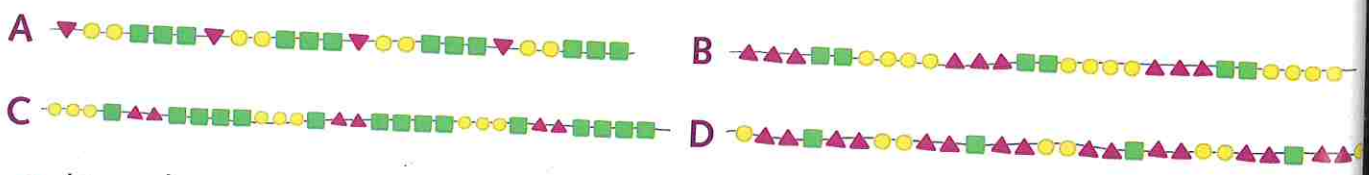
a Find the scale factor.

b Calculate the missing lengths of the larger triangle.



Challenge 2

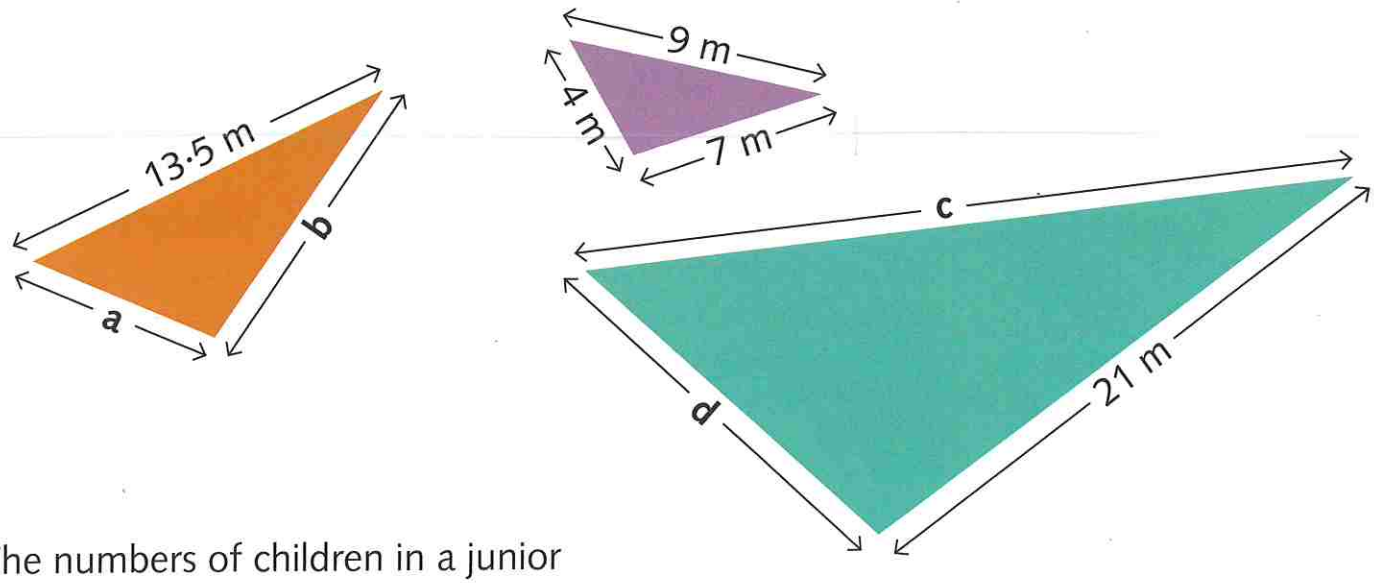
1 Look at the bead necklaces below.



a In each case, write the ratio of triangular : circular : square beads.

b What is the proportion of triangular beads in each necklace?

2 Here are three similar scalene triangles. Find the scale factor for each triangle and calculate the missing lengths.



3 The numbers of children in a junior school have been recorded here.

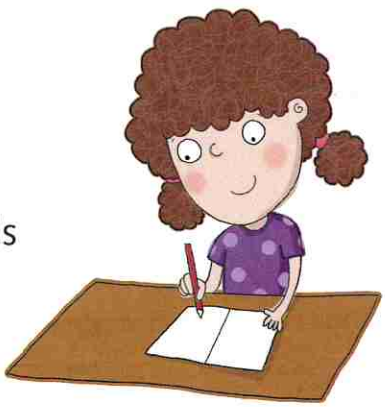
Year group	Total number of children	Ratio of boys to girls
Y3	80	5 : 3
Y4	84	3 : 4
Y5	90	8 : 7
Y6	85	9 : 8

a Use the information in the table to calculate:

- **i** the number of boys and girls in each year group
- **ii** the number of boys in the school
- **iii** the number of girls in the school.

b One new boy joins the school. What is the ratio of boys to girls in the whole school now?

You have red and blue beads.



a Determine at least five different patterns of beads that can be used to make a necklace of exactly 30 beads with a repeating pattern. Calculate the ratios of beads in the simplest form.

b Can you list all the possible repeating patterns?