

Building and jewellery ratios

Solve missing value ratio problems using multiplication and division



1 A bracelet manufacturer makes bracelets with beads arranged in repeating patterns. The total number of beads in a bracelet must be within the range 15 – 20.

Using \times and \circ to represent two types of beads, draw two possible bracelet designs with the following ratios:

- a** 1 : 2 **b** 3 : 1

2 A builder has laid some patios using cream and grey coloured slabs. The ratio of cream to grey slabs in the designs is 2 : 3. Calculate the number of grey slabs and the total number of slabs for designs with:

- a** 8 cream slabs **b** 20 cream slabs **c** 36 cream slabs

1 A necklace manufacturer makes necklaces with beads arranged in repeating patterns. The total number of beads in a necklace must be within the range 40 – 60.

a Using \times and \circ to represent two types of beads, draw two possible necklace designs with the ratio 2 : 3.

b List the exact number of beads that can be used to make necklaces for each of the ratios below.

- i** 3 : 5 **ii** 2 : 5 **iii** 1 : 8

2 A builder has to make concrete for a number of jobs.

a Calculate how much sand and gravel he will need for each job if the ratio of cement : sand : gravel is 1 : 2 : 4.

- i** To concrete in a bird table, he uses 3 buckets of cement. **ii** To concrete in a garden seat, he uses 4 bags of cement. **iii** To make a garden path, he uses 8 full wheelbarrows of cement.

b Using the same ratio of cement : sand : gravel, calculate how much sand he uses to make:

- i** 14 full buckets of concrete to fix a new gate
ii 35 full wheelbarrows of concrete to lay a base for a conservatory.

3 A new town has permission to build homes in the following proportions:

- 10% are large detached houses (D)
- 20% are town houses (T)
- 30% are semi-detached houses (S)
- 40% are apartments (A)



a In Phase 1 of the building, there are 400 homes. Calculate how many of each type there are.

b In Phase 2 of the building, there are 100 town houses. How many homes are there in Phase 2?

c At the end of Phase 3, there are 380 town houses in total (Phases 1, 2 and 3). Calculate how many homes there are in the new town altogether.

Challenge 3

1 A necklace manufacturer makes necklaces with three different beads arranged in repeating patterns. The total number of beads in a necklace must be within the range 50 – 80.

a Using \times , \circ and \square to represent the beads, draw two possible necklace designs with the ratio 1 : 2 : 3.

b List the exact number of beads that can be used to make necklaces for each of the ratios below.

- i** 1 : 4 : 5 **ii** 3 : 4 : 6 **iii** 4 : 13 : 2

2 A builder has laid some patios using three sizes of slabs. The ratio of small : medium : large slabs in the designs is 3 : 5 : 1. Calculate the number of each size of slabs for designs with:

- a** 18 small slabs **b** 25 medium slabs **c** 90 slabs

