Ratio

Ratio compares the size of **one part** to **another part**

The blue hearts and the red hearts are in the ratio

3 : 2

For every 3 blue hearts there are 2 red hearts.

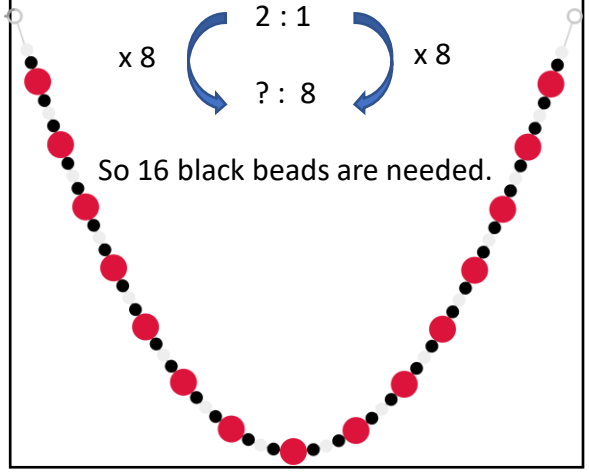
We can scale up or scale down ratios to help solve problems.

Example: A necklace had black to red beads in the ratio 2 : 1

How many black beads would you need if you had 8 red beads:

x 8 (2 : 1 / ? : 8) x 8

So 16 black beads are needed.



Simplifying Ratios

To simplify a **ratio** then divide all parts by a **common factor.**

(4 : 6 / 2 : 3)
Divide both parts by 2

(14 : 16 / 7 : 8)
Divide both parts by 2

(36 : 48 / 18 : 24 / 3 : 4)
Divide both parts by 2 and then by 6.

Keep simplifying until there are no more common factors as in the third example. Can you spot how to simplify this with just one division?

Sharing in a ratio

Steps:

1. Add the total parts of the ratio.
2. Divide the amount to be shared by the number of parts to find the value of 1 part.
3. Multiply each part of the ratio by this amount.

This method only works if you know the total amount!

Share £80 in the ratio 3 :2

1. Total parts = 3 + 2
   = 5
2. £80 ÷ 5 = £16
   Each part is worth £16
3. 3 x 16 = 48
   2 x 16 = 32

Answer £48: £32
You can check by adding together the final answer – it should equal the amount shared.

Write ratio as a fraction:

The denominator will always equal the sum of the parts.

Example: A Year 9 maths class had boys to girls in the ratio 2 : 3. What fraction of the class were boys?

2 + 3 = 5 so the denominator will be 5. 2 parts are boys so the fraction is

$$\frac{2}{5}$$

Harder questions – using a unitary method

Find out what one part of the ratio is worth using a unitary method.

Example: Money was shared in the ratio 3 : 2 : 5 between Ann, Bob and Cat. Given that Bob had £16, find out how much money was shared out.

A : B : C
3 : 2 : 5

Bob has two parts so
2 parts = 16
1 part = 8

Total = (3 x 8) + (2 x 8) + (5 x 8) = £80