

## Ratios - Level 5-6

**Ratios** are used to show how much of one thing there is compared to another thing.

Ratios will be written in two ways, either in words "2 to 1" or as "2:1". Both are read the same way.

A question involving **ratios** will often ask you to find out how many of one thing there is.

### Worked Example

- 20 sweets are shared between James and Sasha in the ratio 1:3, how many sweets do James and Sasha each receive?

The first step is to look at what the ratio means for each sweet that James gets, Sasha gets three so we can expect Sasha to have more sweets than James in our answer.

The ratio 1:3 means that 4 parts are shared between the boys.

To find out how many sweets are in 1 part, we divide 20 by 4.  $20 \div 4 = 5$  sweets are in 1 part.

Since James gets one part, we now know that he receives 5 sweets.

Sasha gets 3 parts, so we times the number of sweets in 1 part by 3.  $3 \times 5 = 15$  sweets in 3 parts.

Keywords:

- Ratio
- Comparison

Sasha gets 15 sweets.

### Check

We can write this back in ratio form as the number of sweets James has to Sasha is. 5:15 We know there has to be 20 sweets in total so we can check that we have shared all 20 sweets out by adding the numbers of sweets that James and Sasha have.  $5 + 15 = 20$ , so this supports our answer.

### Questions

- What is the simplest form of the following ratios?

(a) 6:15

**Solution:** 2:5

(b) 2:8

**Solution:** 1:4

(c) 4:12

**Solution:** 1:3

(d) 9:3

**Solution:** 3:1

(e) 4:2

**Solution:** 2:1

(f) 10:14

**Solution:** 5:7

2. John and Sam stand on a pair of scales, together they weigh 200kg, if the ratio of John and Sam's weights is 2:3, how heavy is Sam?

**Solution:**

Sum the sides of the ratio, to convert the ratio into two fractions.

$$2 + 3 = 5$$

Therefore, Sam weighs  $3 \div 5$ 's of 200kg.

Sam weighs 120kg.

3. A recipe for a cake requires 200g of flour, 100g of butter, 50g of sugar and 2 eggs. The cake recipe indicates that the cake will serve 4. How much of each ingredient is necessary for the cake to serve 8?

Hint: What is the ratio of cake servings?

**Solution:**

Create a ratio between the people that the recipe serves (4) and the people to serve (8).

4:8

Simplify the ratio.

1:2

So it takes 2 lots of each ingredient, for every 1 in the recipe.

This means:

- 400g of flour
- 200g of butter
- 100g of sugar
- 4 eggs

4. John and Sam run a race, in total the race takes them 1 hour, however John is twice as fast as Sam. How long does Sam take to finish the race?

**Solution:**

Create a ratio between John's time, and Sam's.

1:2

Therefore, Sam took twice (2 times) as long as John.

$$2 \times 1\text{hour} = 2\text{hours}$$