

## How to Teach Ratio

Keep emphasizing that ratio and rate are about multiplying and dividing, and not adding and subtracting.

Below is one way to set out ratio questions. I have used this with Core Maths students with success. Note that I always write the Total of the number of parts, even if it isn't asked for. This is so the weaker students start each ratio question exactly the same way. After a while, you can suggest to your stronger students that they only need to write the parts needed in the question. Note: the traditional way to solve such problems is to set up a proportion, and solve the proportion. Use this method with students with good algebraic skills.

### Example

At the school tuckshop, the ratio of pies to sausage rolls sold is 3:2.

1. If 60 pies are sold, how many sausage rolls are sold?
2. If 60 pies and sausage rolls in total are sold, how many of each are sold?

### Solution

1. Write the ratio in words: Pies : Sausage Rolls : Total

Add Pies + Sausage Rolls to get Total.

Write 60 under Pies and underlines under sausage rolls and total.

Ask "what do I multiply 3 by to get 60?" (Ans: 20)

So I multiply 2 x 20 to get 40 sausage rolls.

I multiply 5 x 20 to get 100 pies and sausage rolls in total.

*For weaker students, first ask what to I multiply 3 by to get 6. Allow calculators as necessary; we don't want students to get stuck because they don't know number facts.*

### Setting out

1. Pies : Sausage Rolls : Total

$$\begin{array}{rcccl} & 3 & : & 2 & : & \underline{5} & & \\ \times 20 \swarrow & 60 & : & \underline{40} & : & \underline{100} & & \end{array}$$

There were 40 sausage rolls sold.

*I draw a curved arrow for each number, and the multiplication factor next to each arrow.*

2. Pies : Sausage Rolls : Total

$$\begin{array}{rcccl} & 3 & : & 2 & : & \underline{5} & & \\ \times 12 \swarrow & \underline{36} & : & \underline{24} & : & 60 & & \end{array}$$

There were 36 pies and 24 sausage rolls sold.

*Ask "What do I multiply 5 by to get 60?"*

If the ratio isn't "nice" then remind students that you can divide the bottom number by the top number to find the multiplier.

### Example

The length of a photograph is 12 cm and the width is 8 cm. I want to enlarge it so the width is 12 cm. What is the length of the enlargement?

Length : Width : Total

$$\begin{array}{rcccl} & 12 & : & 8 & : & \underline{20} & & \\ \times 1.5 \swarrow & \underline{18} & : & 12 & : & 30 & & \end{array}$$

The length of the enlargement is 18 cm.

To find the multiplier:  
 $12 \div 8 = 1.5$