

Ratio

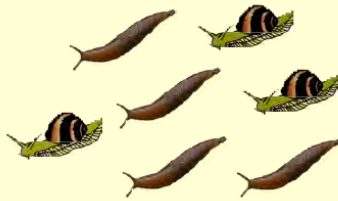
Understanding Ratio

We can use "ratios" to compare two different quantities.

This picture shows 4 slugs and 3 snails.

We say that "the ratio of slugs to snails" is 4 to 3.

or for short :- slugs : snails = 4 : 3.
(: is the symbol for ratio).



Simplifying Ratio

"Simplifying" a ratio is much the same as "simplifying" a fraction.

Remember :- $\frac{6}{8}$ can be simplified, since 6 and 8 are part of the "2 times" table.

$$\frac{6}{8} \Rightarrow \frac{6 \div 2}{8 \div 2} = \frac{3}{4}.$$

Similarly, the ratio 6 : 8 simplifies to 3 : 4.

Reduce the following ratios to their simplest form: a 4 : 6 b 5 : 25

a The highest common factor of 4 and 6 is 2.

So, divide both values by 2, giving 4 : 6 = 2 : 3.

$$+2 \quad \begin{array}{c} 4 : 6 \\ \curvearrowright \\ 2 : 3 \end{array} \quad +2$$

b The highest common factor of 5 and 25 is 5. So, divide both values by 5, giving 5 : 25 = 1 : 5.

Ratio from a Diagram

Look at the diagram below.

a What is the ratio of black to white?

b What proportion of squares is black?



a There is 1 black square to 3 white squares. The ratio is 1 to 3 or 1 : 3.

b The proportion of squares that are black is $\frac{1}{4}$.

Ratio Calculations/Equivalent Ratios

A batch of pink paint is made by mixing white and red in the ratio 4 : 1. If 12 pots of white paint are to be used, how much red paint is needed?

White	Red
$\times 3$ $\frac{4}{12}$	$\times 3$ $\frac{1}{3}$

The white element has been multiplied by 3 so the red element must be multiplied by 3 also. So 3 pots of red are needed.

Sharing Ratios/Dividing Quantities in a given Ratio/Proportional Division

Example

Bill and Ben share a raffle win of £400 in a ratio of 3 : 5.
How much will each receive ?

Solution :

Step 1 :-

Step 2 :-

Step 3 :-

Since the ratio is 3 : 5, there are (3 + 5) = 8 shares

Each share is worth (£400 ÷ 8) = £50

Bill has 3 shares (3 × £50) = £150

Ben has 5 shares (5 × £50) = £250

(Check that the total is £400).