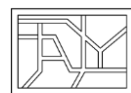


PROPORTIONAL REASONING...

Ratio and Scale

@whisto_maths



What do I need to be able to do?

By the end of this unit you should be able to:

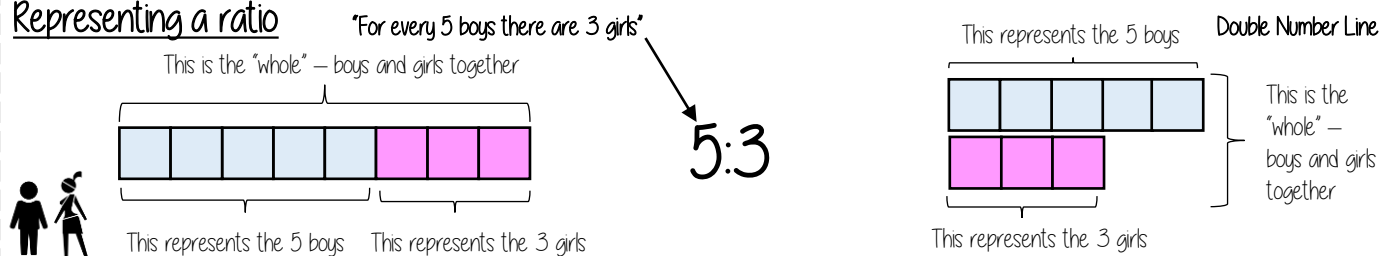
- Simplify any given ratio
- Share an amount in a given ratio
- Solve ratio problems given a part

Solutions should be modelled, explained and solved

Keywords

- Ratio:** a statement of how two numbers compare
- Equal Parts:** all parts in the same proportion, or a whole shared equally
- Proportion:** a statement that links two ratios
- Order:** to place a number in a determined sequence
- Part:** a section of a whole
- Equivalent:** of equal value
- Factors:** integers that multiply together to get the original value
- Scale:** the comparison of something drawn to its actual size.

Representing a ratio



Order is Important

"For every dog there are 2 cats"



Dogs: Cats
1:2

The ratio has to be written in the same order as the information is given

e.g. 2:1 would represent 2 dogs for every 1 cat ✗

Simplifying a ratio

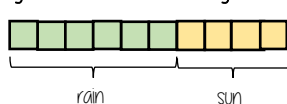
"For every 6 days of rain there are 4 days of sun"

6:4

+ by 2 ↓

3:2

"For every 3 days of rain there are 2 days of sun" - when this happens twice the ratio becomes 6:4.



Cancel down the ratio to its lowest form

Find the biggest common factor that goes into all parts of the ratio

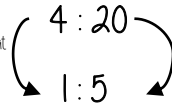
For 6 and 4 the biggest factor (number that multiplies into them is 2)

Ratio In (or n:1)

This is asking you to cancel down until the part indicated represents 1

Show the ratio 4:20 in the ratio of 1:n

The question states that this part has to be 1 unit. Therefore Divide by 4



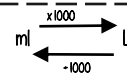
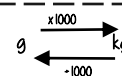
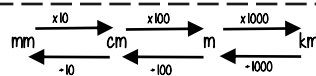
This side has to be divided by 4 too - to keep in proportion

**The n part does not have to be an integer for this type of question

Units are important:

When using a ratio - all parts should be in the same units

Useful Conversions



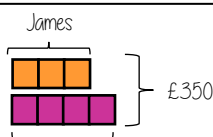
Sharing a whole into a given ratio

James and Lucy share £350 in the ratio 3:4. Work out how much each person earns

Model the Question

James: Lucy

3:4



Lucy

£350 ÷ 7 = £50

□ = one part = £50

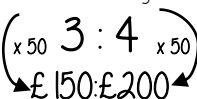
Find the value of one part

Whole: £350
7 parts to share between (3 James, 4 Lucy)

Put back into the question

James: Lucy

James = 3 x £50 = £150



Lucy = 4 x £50 = £200

Finding a value given 1:n (or n:1)

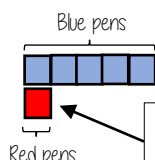
Inside a box are blue and red pens in the ratio 5:1. If there are 10 red pens how many blue pens are there?

Model the Question

Blue: Red

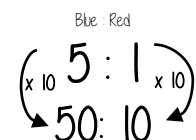
5:1

□ = one part = 10 pens



One unit = 10 pens

Put back into the question



Blue pens = 5 x 10 = 50 pens

Red pens = 1 x 10 = 10 pens

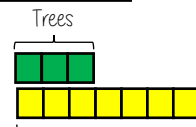
There are 50 Blue Pens



Ratio as a fraction

Trees: Flowers

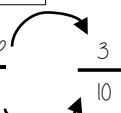
3:7



There are 3 parts for trees

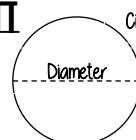
Fraction of trees

Number of parts in group
Total number of parts



Tree parts 3 + Flower parts 7 = 10

π



Circumference

The ratio of a circle's circumference to its diameter