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
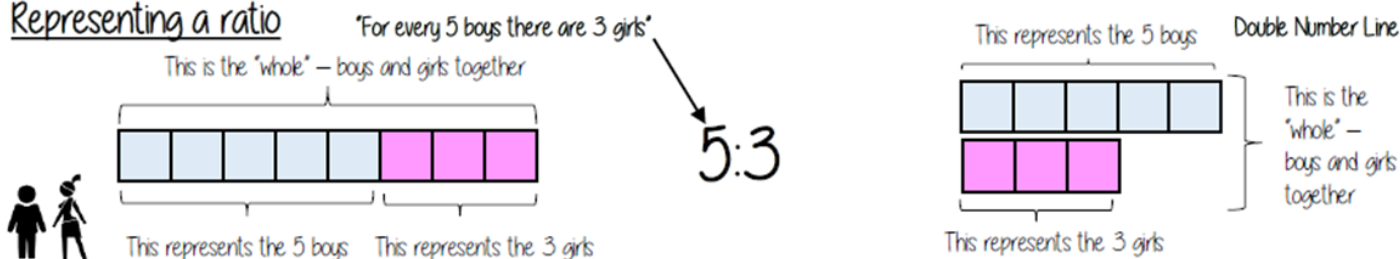- Solve ratio problems given a part

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
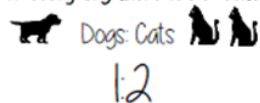**Scale:** the comparison of something drawn to its actual size.

Representing a ratio

"For every 5 boys there are 3 girls"

This is the "whole" – boys and girls together

5:3

This represents the 5 boys   This represents the 3 girls

Double Number Line

This represents the 5 boys

This is the "whole" – boys and girls together

This represents the 3 girls

Order is Important
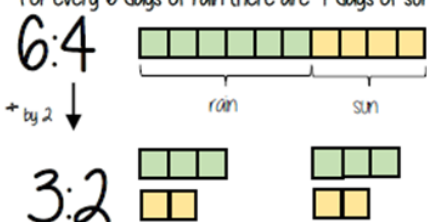
"For every dog there are 2 cats"

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

Cancel down the ratio to its lowest form

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

6:4

÷ by 2 ↓

3:2

rain   sun

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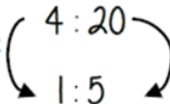
"For every 3 days of rain there are 2 days of sun" – when this happens twice the ratio becomes 6:4

Ratio 1:n (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

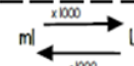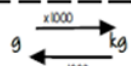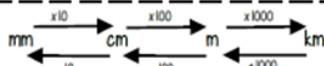The question states that this part has to be 1 unit. Therefore Divide by 4

4 : 20
1 : 5

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

H 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

mm ×10 → cm ×100 → m ×1000 → km
     ←÷10   ←÷100   ←÷1000

g ×1000 → kg
   ←÷1000

ml ×1000 → L
    ←÷1000

Sharing a whole into a given ratio

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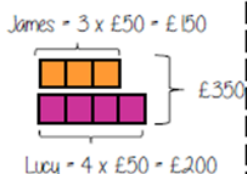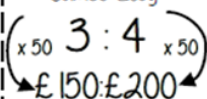
Model the Question

James: Lucy

3 : 4

James
£350
Lucy

Find the value of one part

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

£350 ÷ 7 = £50

☐ = one part = £50

Put back into the question

James: Lucy

(×50) 3 : 4 (×50)
£150:£200

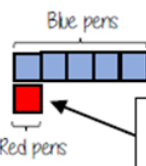James = 3 × £50 = £150
£350
Lucy = 4 × £50 = £200

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?
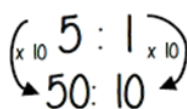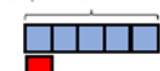
Model the Question

Blue : Red

5 : 1

Blue pens

Red pens

☐ = one part = 10 pens   One unit = 10 pens

Put back into the question

Blue : Red

(×10) 5 : 1 (×10)
50: 10

Blue pens = 5 × 10 = 50 pens

Red pens = 1 × 10 = 10 pens

There are 50 Blue Pens

Ratio as a fraction
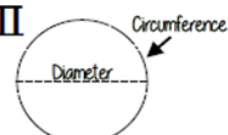
Trees: Flowers

3 : 7

Trees

Flowers

There are 3 parts for trees

Fraction of trees

Number of parts of in group / Total number of parts = 3/10

Tree parts 3 + Flower parts 7 = 10

Pi Π

Circumference

Diameter

The ratio of a circles circumference to its diameter