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

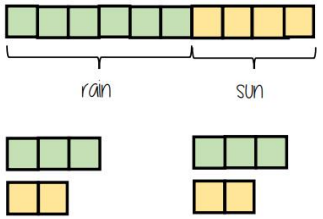
Cancel down the ratio to its lowest form

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

6:4

÷ by 2

3:2



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

Best Buys

Have a directly proportional relationship

To calculate best buys you need to be able to compare the cost of one unit or units of equal amounts

	Shop A	Shop B
	4 cans for £1.20	3 cans for 93p
	£1.20 ÷ 4	£0.93 ÷ 3
Cost per item	1 can is £0.30 Or 30p	1 can is £0.31 Or 31p

Shop A is the best value as it is 1p cheaper per can of pop

	Shop A	
	4 cans for £1.20	3 cans for 93p
	4 ÷ £1.20	3 ÷ £0.93
Cost per pound	£1 buys 3.333 cans of pop	£1 buys 3.23 cans of pop

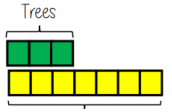
Shop A is still shown as being the best value but pay attention to the unit you are calculating, per item or per pound

Best value is the most product for the lowest price per unit

Ratio as a fraction

Trees: Flowers

3 : 7



Ratio

There are 3 parts for trees

Fraction of trees

Fraction

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

Tree parts 3 + Flower parts 7 = 10

Units are important:

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

Useful Conversions

mm ⇄ cm (×10 / ÷10) ⇄ m (×100 / ÷100) ⇄ km (×1000 / ÷1000)

g ⇄ kg (×1000 / ÷1000)

ml ⇄ L (×1000 / ÷1000)

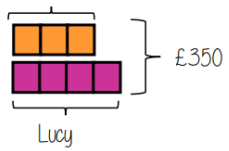
Sharing a whole into a given ratio

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

Model the Question

James: Lucy

3 : 4



Find the value of one part

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

£350 ÷ 7 = £50

□ = one part = £50

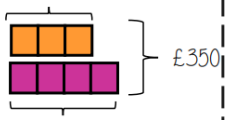
Put back into the question

James: Lucy

(×50) 3 : 4 (×50)

£150 : £200

James = 3 x £50 = £150



Lucy = 4 x £50 = £200

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

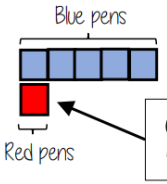
Inside a box are blue and red pens in the ratio 5:1
If there are 10 red pens how many blue pens are there?

Model the Question

Blue : Red

5 : 1

□ = one part = 10 pens



One unit = 10 pens

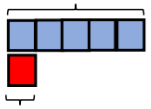
Put back into the question

Blue : Red

(×10) 5 : 1 (×10)

50 : 10

Blue pens = 5 x 10 = 50 pens



Red pens = 1 x 10 = 10 pens

There are 50 Blue Pens

Direct Proportion

As one variable changes the other changes at the same rate

This is a multiplicative change

4 cans of pop = £2.40

4 cans of pop = £2.40 (×0.5) → 2 cans of pop = £1.20

This multiplier is the same in the same way that this would be for ratio

4 cans of pop = £2.40 (×3) → 12 cans of pop = £7.20

Sometimes this is easiest if you work out how much one unit is worth first e.g. 1 can of pop = £0.60

Direct Proportion - Algebraically

Y is directly proportional to x. When x is 4, y is 20

a) Write an equation connecting x and y

$y = kx$

$20 = k \times 4$

$k = 5$

$y = 5x$

a) Work out the value of y when x is 10

$y = 5x$

$y = 5 \times 10$

$y = 50$

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