

MATHS SUMMER KNOWLEDGE ORGANISERS



Year 5 Unit 9

Decimals and Percentages

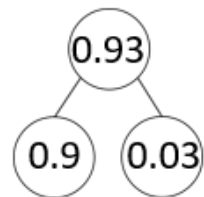
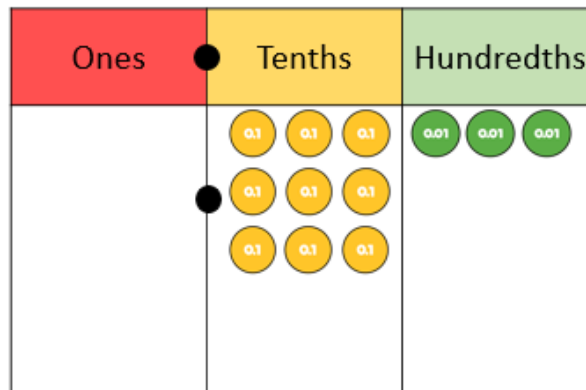


Decimal Place Value

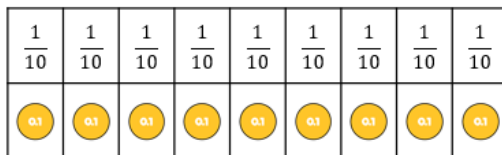
0.93



10 ones = 1 ten
10 tenths = 1 whole
10 hundredths = 1 tenth



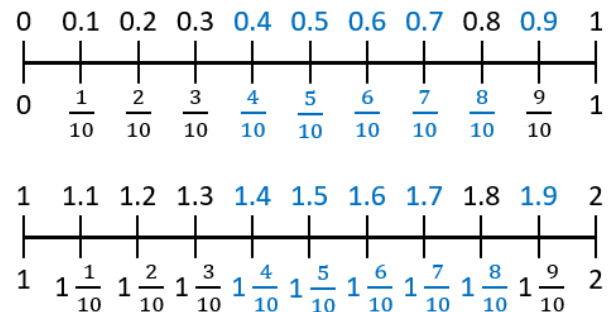
Tenths



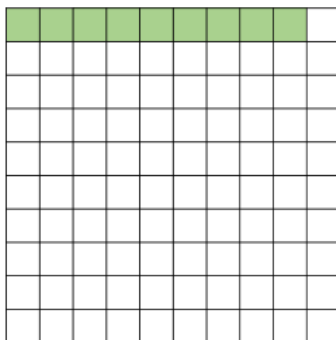
The fraction represented is $\frac{9}{10}$

The decimal represented is 0.9

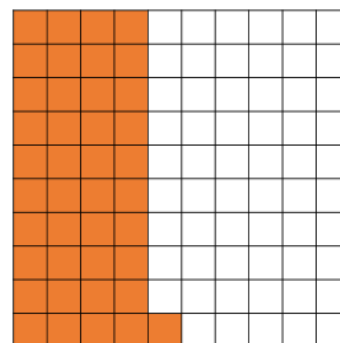
The fraction $\frac{9}{10}$ is equivalent to the decimal 0.9



Hundredths



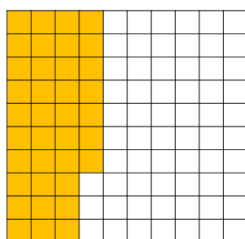
Fraction $\frac{9}{100}$
Decimal 0.09



How many hundredths are shaded? $\frac{41}{100}$

Write this number of hundredths as a decimal. 0.41

Percentages

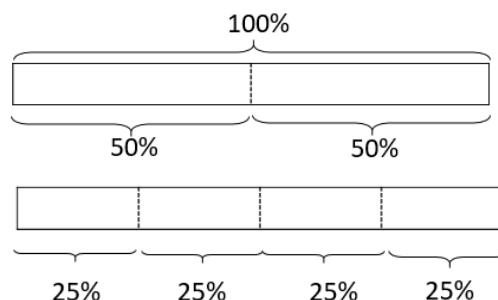


Percent means parts out of 100

There are 37 parts out of a hundred shaded.

This is 37%

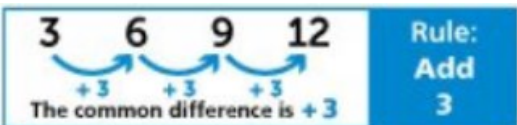
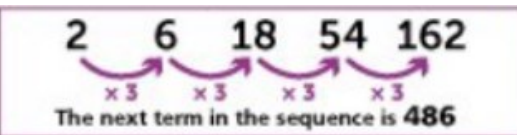
What is 100%?

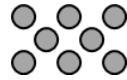
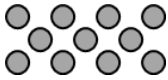


Year 6 to 7 Transition Unit

Algebraic Thinking



Ascending order	Arranged from smallest to largest	 14, 15, 18, 23
Descending order	Arranged from largest to smallest	 123, 101, 99, 53, 1
Sequence	An ordered set of numbers or shapes according to a rule	 100, 80, 60, 40, 20
Term	One of the numbers in a sequence	6, 12, 18, 24 18 is the 3rd term 95, 80, 65, 50 95 is the 1st term
Linear Sequence	The difference between the terms is always the same.	
Geometric Sequence	Each term is made by multiplying the previous term by a constant	

Linear Sequence		
1st Term	2nd Term	3rd Term
		
5	8	11
Rule: Add 3 to the previous term		

Non-Linear Sequence			
1st Term	2nd Term	3rd Term	4th Term
3	4	6	9
	1st term add 1	2nd term add 2	3rd Term add 3
Rule: The difference increases by 1 each time			

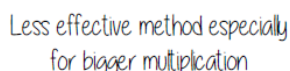
Fibonacci Sequence	
0, 1, 1, 2, 3, 5, 8, 13, 21, 34	
3rd Term	$0+1 = 1$
4th Term	$1+1 = 2$
Rule: The next term is found by adding the 2 previous terms	

Geometric Sequence	
2, 10, 50, 250, 1250	
2nd Term	$2 \times 5 = 10$
4th Term	$10 \times 5 = 50$
Rule: Multiply the previous term by 5	

$6 \times 3 = 18$

Factor Factor Product

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Multiplication with decimals

Make adjustments to your answer to match the question: $0.2 \times 10 = 2$
 $0.3 \times 10 = 3$
 Therefore $6 \div 100 = 0.6$

$$3584 \div 7 = 512$$

5 1 2

$$\div 24 = \div 6 \div 4$$

Break up the divisor using factors

()

n^a $\sqrt{n}$

$\div$ $\times$

$+$ $-$

Addition or Subtraction

 $\frac{1}{2} \times \text{Base} \times \text{Perpendicular height}$

A triangle is half the size of the rectangle it would fit in

Parallelogram/ Rhombus
Base x Perpendicular height



Lily: 10 blocks
Annie: 7 blocks
Ezra: 5 blocks

24 in total

Lily Annie Ezra



The mean number of blocks would be 8 each

100s	10s	1s
		●●●

$\times 100$

100s	10s	1s
●●●		

$$3 \times 100 = 300$$

$$0.03 \times 100 = 3$$

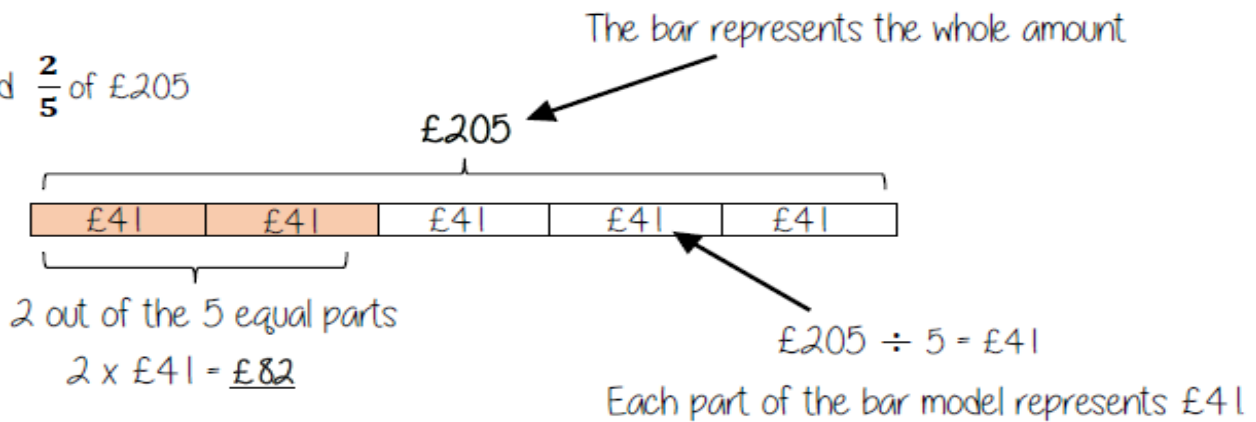
Year 7 Unit 7

Fractions and percentages of an amount



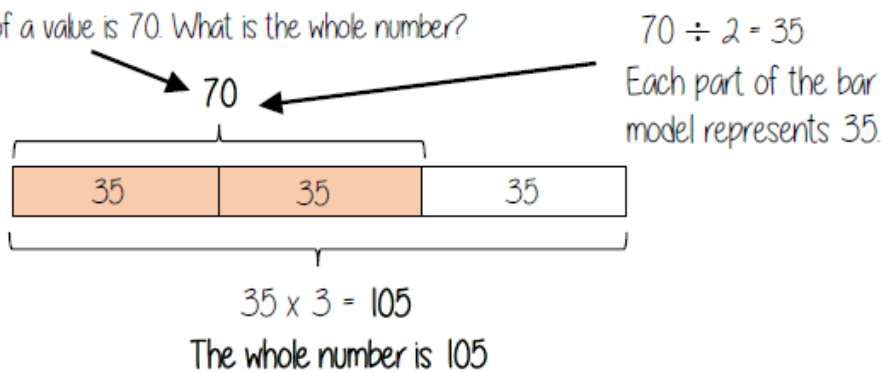
Finding a fraction of a given amount

Find $\frac{2}{5}$ of £205

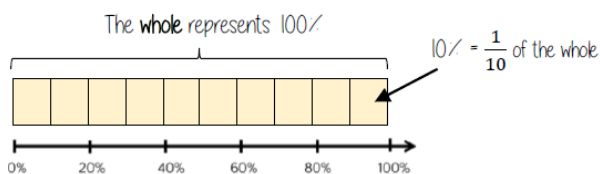


Finding the whole from a given fraction

$\frac{2}{3}$ of a value is 70. What is the whole number?



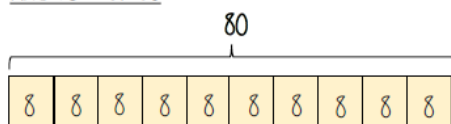
Find the percentage of an amount using mental methods.



$$10\% = \frac{1}{10} \text{ of the whole} \quad 50\% = \frac{5}{10} = \frac{1}{2} \text{ of the whole}$$

$$20\% = \frac{2}{10} = \frac{1}{5} \text{ of the whole} \quad 5\% = \frac{1}{20} \text{ of the whole}$$

Find 65% of 80



For bigger percentages it is sometimes easier to take away from 100%

Method 1:

$$\begin{aligned} 65\% &= 10\% \times 6 + 5\% \\ &= (8 \times 6) + 4 \\ &= 52 \end{aligned}$$

Method 2:

$$\begin{aligned} 65\% &= 50\% + 10\% + 5\% \\ &= 40 + 8 + 4 \\ &= 52 \end{aligned}$$

Find the percentage of an amount using a calculator.



Using a multiplier

Find 65% of 80

Fraction, decimal, percentage conversion

$$65\% = \frac{65}{100} = 0.65 \quad \leftarrow \text{The multiplier}$$

$$0.65 \times 80 = \underline{52}$$

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Year 8 Unit 9

Multiplying and Dividing Fractions

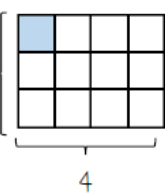


Unit Fractions	Fractions with a numerator of one,	 
Reciprocal	A pair of numbers that multiply together to give 1	Fraction $\frac{2}{3}$ $\rightarrow$ Reciprocal $\frac{3}{2}$

Multiplying Unit Fractions

$$\frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$$

Modelled:



Parts shaded

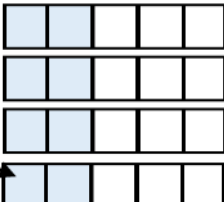
Total number of parts in the diagram

Multiplying by an integer = repeated addition

$$4 \times \frac{2}{5} \rightarrow \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5}$$

Integer (Whole number)

Each part represents $\frac{1}{5}$



How many parts are shaded?
What each part represents

$$= \frac{8}{5}$$

$$= 1 \frac{3}{5}$$

Multiplying non-unit fractions

$$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$$

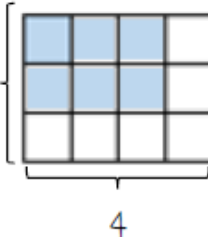
Shade in 3 parts

Repeat it on this many rows

This many columns

This many rows

Modelled:



Parts shaded

Total number of parts in the diagram

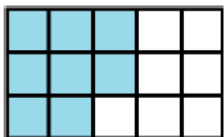
Dividing by any fraction

$$\frac{2}{5} \div \frac{3}{4}$$

Multiplying by a reciprocal gives the same outcome

$$\frac{2}{5} \times \frac{4}{3}$$

Represented



$$= \frac{8}{15}$$

Dividing an integer by a unit fraction



$$1 \div \frac{1}{4} = 4$$

How many quarters are in 1?

"There are 4 quarters in 1 whole. Therefore, there are 20 quarters in 5 wholes"

$$5 \div \frac{1}{4} = 20$$

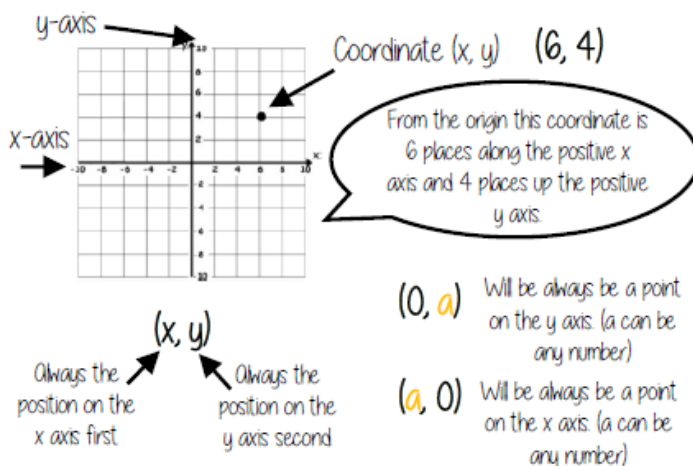
Year 8 Unit 10 Cartesian Plane



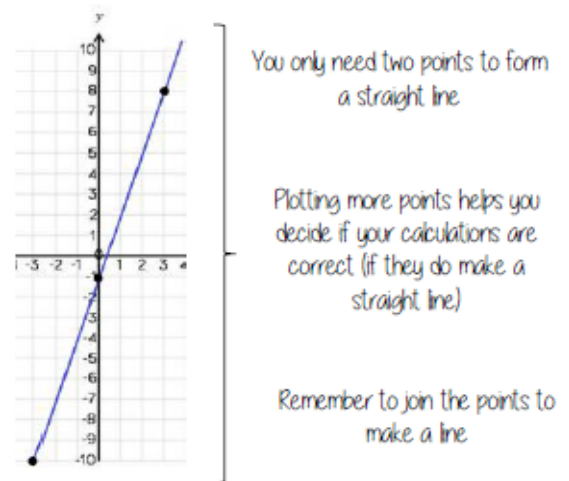
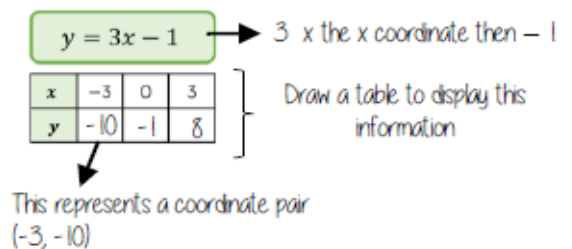
Quadrant	The four quarters of the coordinate plane
Horizontal	A straight line from left to right parallel to the x-axis
Vertical	A straight line from top to bottom, parallel with the y axis
Origin	(0,0) on a graph, the point where the 2 axes cross

Intercept	Where lines cross
gradient	The steepness of a line
Parallel	Lines that stay the same distance apart and never meet

Coordinates in all 4 quadrants

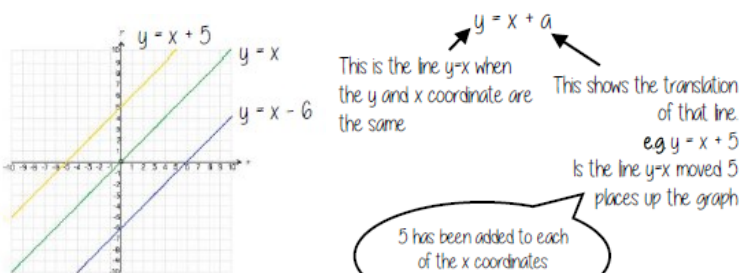


Plotting a $y=mx+c$ graph



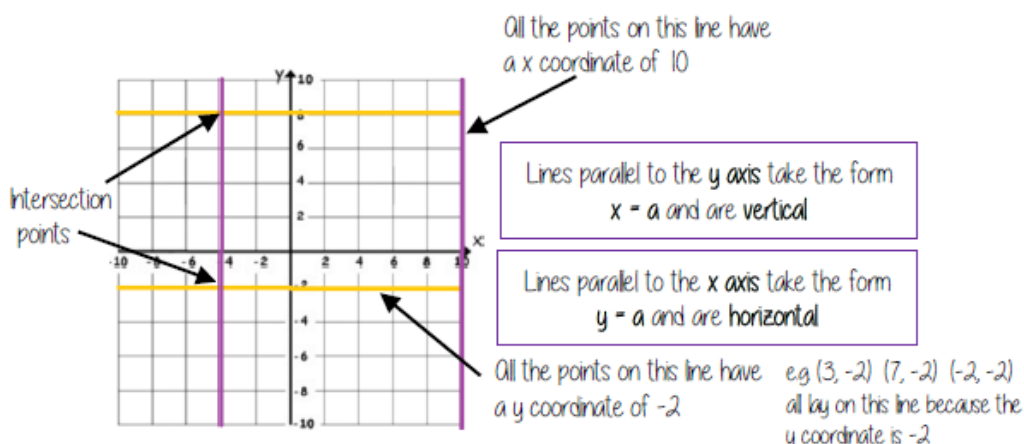
Lines in the form $y=x+a$

All of the lines are parallel as the value of x is the same



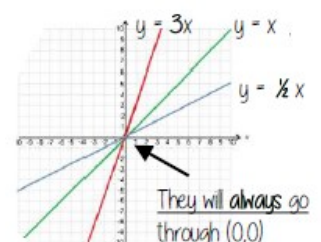
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Lines parallel to the x and y axis



Lines in the form $y=kx$

The greater the value of k, the steeper the line will be



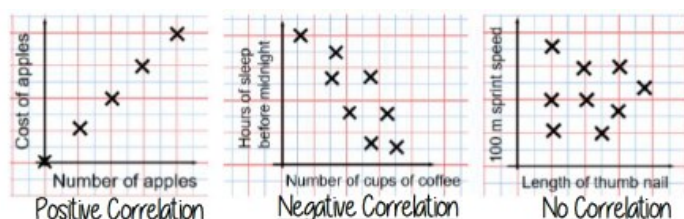
Year 8 Unit 11 Representing Data



Frequency	The number of times a particular data value occurs
Quantitative	Numerical data
Qualitative	descriptive data, colour, name, place.
discrete	Quantitative or qualitative data that only takes certain values

continuous	Quantitative data that has an infinite number of possible values
correlation	The mathematical definition for the type of relationship
Line of best fit	A straight line on a scatter graph that represents the data
outlier	A point that lies outside of the trend of the graph.

Linear Correlation



As one variable increases so does the other variable

As one variable increases the other variable decreases

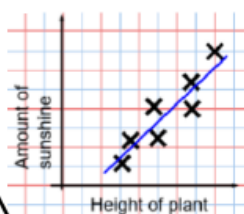
There is no relationship between the two variables

Line of best fit

The Line of best fit is used to make estimates about the information in your scatter graph

Things to know:

- The line of best fit **DOES NOT** need to go through the origin (The point the axes cross)
- There should be approximately the same number of points above and below the line (It may not go through any points)
- The line extends across the whole graph



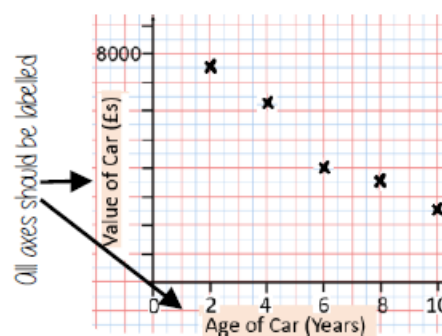
It is only an estimate because the line is designed to be an average representation of the data

It is always a straight line.

Plot and use a Scatter Diagram

Age of Car (Years)	2	4	6	8	10
Value of Car (£s)	7500	6250	4000	3500	2500

This data may not be given in size order
The data forms information pairs for the scatter graph
Not all data has a relationship



The axis should fit all the values on and be equally spread out

Explain the relationship verbally

"This scatter graph shows as the age of a car increases the value decreases"

Grouped Data

If we have a large spread of data it is better to group it. This is so it is easier to look for a trend. Form groups of equal size to make comparisons more valid and spread the groups out from the smallest to the largest value.

Discrete Data
The groups do not overlap

Cost of TV (£)	Tally	Frequency
101 - 150		7
151 - 200		11
201 - 250		5
251 - 300		3

We do not know the exact value of each item in a group – so an estimate would be used to calculate the overall total (Midpoint)

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