

Knowledge Organiser: Mathematics

Year 7 Spring 1

Suggested websites: Maths Genie, Save My Exams and Corbett Maths

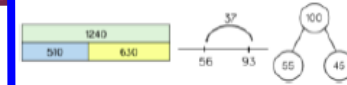


What do I need to be able to do?

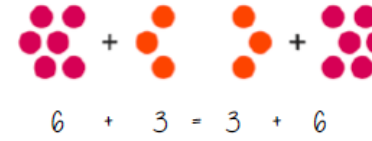
By the end of this unit you should be able to:

- Understand properties of addition/ subtraction
- Use mental strategies for addition/subtraction
- Use formal methods of addition/Subtraction for integers
- Use formal methods of addition/Subtraction for decimals
- Solve problems in context of perimeter
- Solve problems with finance, tables and timetables
- Solve problems with frequency trees
- Solve problems with bar charts and line charts

Addition/ Subtraction with integers



Addition is commutative



The order of addition does not change the result

- Modelling methods for addition/ subtraction
- Bar models
 - Number lines
 - Part/ Whole diagrams

Subtraction the order has to stay the same

$$360 - 147 = 360 - 100 - 40 - 7$$

- Number lines help for addition and subtraction
- Working in 10's first aids mental addition/ subtraction
- Show your relationships by writing fact families

Formal written methods

	H	T	O
	1	8	7
+	5	4	2

	H	T	O
	4	2	7
-	2	4	9

Remember the place value of each column. You may need to move 10 ones to the ones column to be able to subtract

Keywords

- Commutative:** changing the order of the operations does not change the result
- Associative:** when you add or multiply you can do so regardless of how the numbers are grouped
- Inverse:** the operation that undoes what was done by the previous operation. (The opposite operation)
- Placeholder:** a number that occupies a position to give value
- Perimeter:** the distance/ length around a 2D object
- Polygon:** a 2D shape made with straight lines
- Balance:** in financial questions – the amount of money in a bank account
- Credit:** money that goes into a bank account
- Debit:** money that leaves a bank account

Addition/ Subtraction with decimals

4	.	3	8	
7	.	9	0	+

0 can be used to fill empty places with value

The decimal place acts as the placeholder and aligns the other values



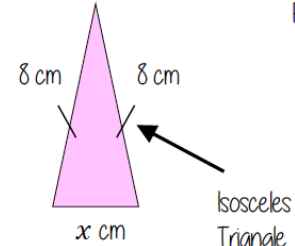
If [block] represents 1 instead of 100

$$5.43 + \frac{8}{10}$$

Revisit Fraction – Decimal equivalence
 $5.43 + 0.8$

Solve problems with perimeter

Perimeter is the length around the outside of a polygon



Isosceles Triangle notation

The triangle has a perimeter of 25cm
Find the length of x

$$8\text{cm} + 8\text{cm} + x\text{cm} = 25\text{cm}$$

$$16\text{cm} + x\text{cm} = 25\text{cm}$$

$$x\text{cm} = 9\text{cm}$$

Solve problems with finance

$$\text{Profit} = \text{Income} - \text{Costs}$$

Credit – Money coming into an account

Debit – Money leaving an account

Money uses a two decimal place system.
14.2 on a calculator represents £ 14.20

Check the units of currency – work in the same unit

Tables and timetables

Distance tables

London		Cardiff		Glasgow		Belfast	
211		493		177			
556		392					
518							

This shows the distance between Glasgow and London. It is where their row and column intersects

Bus/ Train timetables

	1005	1045	1130
Harton			
Bridge			
Aville			
Ware			

Each column represents a journey, each row represents the time the 'bus' arrives at that location

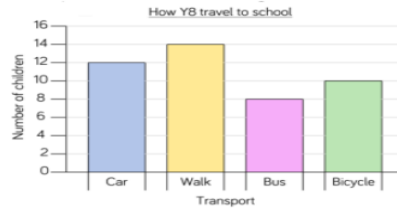
TIME CALCULATIONS – use a number line

Two-way tables

	H	T
H	HH	HT
T	TH	TT

Where rows and columns intersect is the outcome of that action

Bar and line charts



Use addition/ subtraction methods to extract information from bar charts.

e.g Difference between the number of students who walked and took the bus.
Walk frequency – bus frequency

When describing changes or making predictions.

- Extract information from your data source
- Make comparisons of difference or sum of values.
- Put into the context of the scenario

Knowledge Organiser: Mathematics

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What do I need to be able to do?

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

- Find a fraction of a given amount
- Use a given fraction to find the whole or other fractions
- Find the percentage of an amount using mental methods
- Find the percentage of a given amount using a calculator

Keywords

Fraction: how many parts of a whole we have

Equivalent: of equal value

Whole: a number with no fractional or decimal part

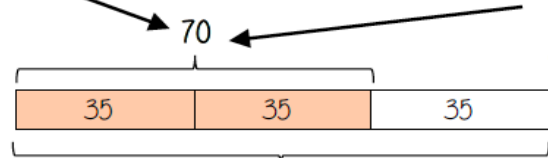
Percentage: parts per 100 (uses the % symbol)

Place Value: the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right

Convert: change into an equivalent representation, often fraction to decimal to a percentage cycle.

Use a fraction of amount

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



$70 \div 2 = 35$
Each part of the bar model represents 35.

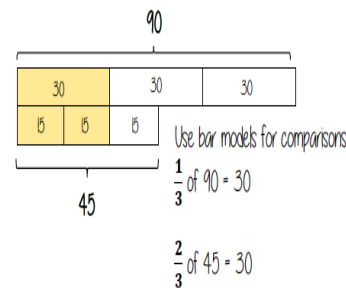
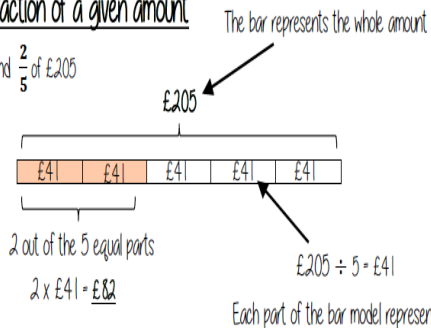
$35 \times 3 = 105$
The whole number is 105

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Fraction of a given amount

Find $\frac{2}{5}$ of £205



$\therefore \frac{1}{3}$ of 90 = $\frac{2}{3}$ of 45

Find the percentage of an amount (Calculator methods)



Using a multiplier
Find 65% of 80

Fraction, decimal percentage conversion
 $65\% = \frac{65}{100} = 0.65$ ← The multiplier

$0.65 \times 80 = 52$

Using the percent button

Find 65% of 80

This brings up the % button on screen
You will see 65%

Type 65

Press **SHIFT** **C** (%)

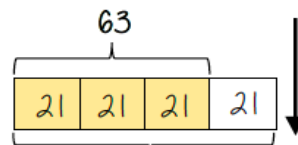
Press **X** 80 and then press =

You can also use the calculator to support non calculator methods and find 1% or 10% then add percentages together

"of" can represent "x" in calculator methods

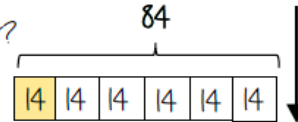
The wording of the question is important to setting up the bar model

$\frac{3}{4}$ of a number is 63.



Find the whole

What is $\frac{1}{6}$ of the number?



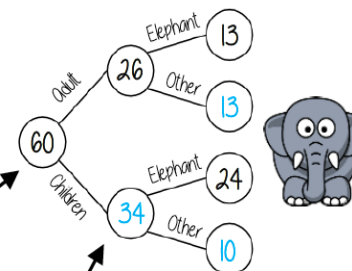
Use the whole to find a given part

= 14

Frequency trees

60 people visited the zoo one Saturday morning

26 of them were adults. 13 of the adult's favourite animal was an elephant. 24 of the children's favourite animal was an elephant.



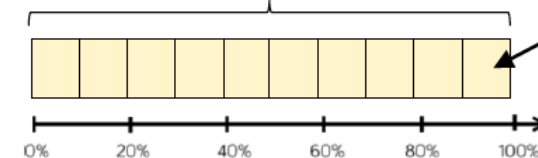
The overall total "60 people"

A frequency tree is made up from part-whole models. One piece of information leads to another

Probabilities or statements can be taken from the completed trees
e.g. 34 children visited the zoo

Find the percentage of an amount (Mental methods)

The whole represents 100%

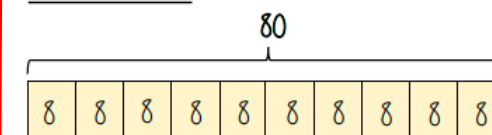


$10\% = \frac{1}{10}$ of the whole

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

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

Find 65% of 80



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

Method 1:
 $65\% = 10\% \times 6 + 5\%$
 $= (8 \times 6) + 4$
 $= 52$

Method 2:
 $65\% = 50\% + 10\% + 5\%$
 $= 40 + 8 + 4$
 $= 52$