Numeracy Across Learning

A Guide for Parents / Carers as to how various Numeracy Topics are approached within the School

Ullapool High School
2011

Introduction

This information booklet has been produced to try to make parents / carers more aware of how each particular topic is taught within the High School and to make use of these methods when assisting with their child to complete any work at home.

Teachers are also using the information in this booklet across the school leading to a more consistent approach in the use and teaching of Numeracy. Consequently an improvement in progress and attainment for all pupils will follow.

In addition to Numeracy experiences and outcomes from the Curriculum for Excellence we have included a few which are specific to Mathematics, but also used across learning within the school.

For any further information please contact me, either through the school office or via email – I am more than happy to assist in any capacity.

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Contents

Estimation and Rounding

I can use my knowledge of rounding to routinely estimate the answer to a problem, then after calculating, decide if my answer is reasonable, sharing my solution with others.
MNU 2-01a
I can round a number using an appropriate degree of accuracy, having taken into account the context of the problem.
MNU 3-01a
Having investigated the practical impact of inaccuracy and error, I can use my knowledge of tolerance when choosing the required degree of accuracy to make real-life calculations.
MNU 4-01a

The development of rounding progresses as follows:

- nearest 10,100 etc.,
- specified numbers of decimal places
- specified numbers of significant figures

Note: We always round up for 5 or above

WORKED EXAPMPLES

1. Round 74 to the nearest 10 = 70

2. Round 386 to the nearest 10 = 390

3. Round 347.5
   to the nearest whole number = 348
   to the nearest ten = 350
   or to the nearest hundred = 300

4. Round 7.51 to 1 decimal place = 7.5

5. Round 8.96 to 1 decimal place = 9.0

6. Round 3.14159 to 3 decimal places = 3.142
   to 2 decimal places = 3.14
   or to 3 significant figures = 3.14

Multiplication and Division by 10,100,20,400 …etc.

I have extended the range of whole numbers I can work with and having explored how decimal fractions are constructed, can explain the link between a digit, its place and its value.
MNU 2-02a
Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others.
MNU 2-03a
I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions.
MNU 3-03a
Having recognised similarities between new problems and problems I have solved before, I can carry out the necessary calculations to solve problems set in unfamiliar contexts.
MNU 4-03a

Multiplication & Division of whole numbers and decimals

- Whole number multiplication & division by 10, 100,…..
- Whole number multiplication & division by multiples e.g. 30, 200,….

Whole numbers

Example 1

25 X 10 = 250

H (100's)	T (10's)	Units
	2	5
2	5	0

In this example figures become 10 X (times) bigger
i.e. they move 1 place to left

2 Tens becomes 2 Hundreds and 5 Units become 5 Tens

Example 2

45000 ÷ 100 = 450

TTh (10000's)	Th (1000's)	H (100's)	T (10's)	Units
4	5	0	0	0
		4	5	0

In this example figures become 100 X (times) smaller
i.e. they move 2 places to right as shown in diagram

WE NEVER….. say "add or remove a zero"

Example 3

35 X 200

Two-step method: 35 X 2 = 70

70 X 100 = <u>7000</u>

Recognising that X 200

= X 2 then X 100

Example 4

84000 ÷ 200

Two-step method: 84000 ÷ 2 = 42000

42000 ÷ 100 = <u>420</u>

Recognising that ÷ 200

= ÷ 2 then ÷ 100

Decimals

Example 1

2.35 X 100 = 235

H	T	U	t	h
		2	3	5
2	3	5		

In this example figures become 100 times bigger
i.e. they move 2 places to the left

2 Units becomes 2 Hundreds,
3 tenths become 3 Tens
5 hundredths become 5 Units

Example 2

653 ÷ 100 = 6.53

H	T	U	t	h
6	5	3		
		6	5	3

In this example figures become 100 times smaller
i.e. they move 2 places to the right

We apply the same 2 – step method for decimal multiplication and division as for whole numbers.

WE NEVER….. "MOVE the decimal point!"

Subtraction

Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others.
MNU 2-03a
I can use a variety of methods to solve number problems in familiar contexts, clearly communicating my processes and solutions.
MNU 3-03a
Having recognised similarities between new problems and problems I have solved before, I can carry out the necessary calculations to solve problems set in unfamiliar contexts.
MNU 4-03a

In the development of subtraction we

- subtract using decomposition (as a written method)
- check by addition
- promote alternative mental methods where appropriate

Decomposition:

```
  6           3 9
2 7̸ ¹1        4̸ 0̸ ¹0
  3 8           7 4
-----         -----
2 3 3         3 2 6
```

Counting on: To solve 41 – 27, count on from 27 until you reach 41

Breaking up: To solve 41 – 27, subtract 20 then subtract 7

WE DO NOT.....

"borrow and payback"

Fractions

I have investigated the everyday contexts in which simple fractions, percentages or decimal fractions are used and can carry out the necessary calculations to solve related problems.
MNU2-07a
I can show the equivalent forms of simple fractions, decimal fractions and percentages and can choose my preferred form when solving a problem, explaining my choice of method.
MNU2-07b
I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real-life situations.
MNU 3-07a
By applying my knowledge of equivalent fractions and common multiples, I can add and subtract commonly used fractions.
MTH 3-07b
I can choose the most appropriate form of fractions, decimal fractions and percentages to use when making calculations mentally, in written form or using technology, then use my solutions to make comparisons, decisions and choices.
MNU 4-07A

The development of fractions progresses as follows:

- do simple fractions of 1 or 2 digit numbers e.g
  $\frac{1}{3}$ of 9 = 3 (9 ÷ 3); $\frac{1}{5}$ of 70 = 14 (70 ÷ 5)
- do simple fractions of up to 4 digit numbers e.g
  $\frac{3}{4}$ of 176 = 132 (176 ÷ 4 x 3)
- use equivalence of widely used fractions and decimals e.g. $\frac{3}{10}$ = 0.3

  find widely used fractions mentally
  find fractions of a quantity with a calculator
- use equivalence of all fractions, decimals and percentages
  add, subtract, multiply and divide fractions with and without a calculator

WORKED EXAMPLES

Add and Subtract	Multiply	Divide
Make the denominators equal	Multiply top and multiply bottom	Invert the second fraction
$\frac{1}{2}+\frac{1}{3}$ $=\frac{3}{6}+\frac{2}{6}$ $=\frac{5}{6}$	$\frac{2}{3}\times\frac{3}{4}$ $=\frac{6}{12}$ $=\frac{1}{2}$	$\frac{3}{4}\div\frac{2}{5}$ $=\frac{3}{4}\times\frac{5}{2}$ $=\frac{15}{8} = 1\frac{7}{8}$

Time Calculations

Using simple time periods, I can give a good estimate of how long a journey should take, based on my knowledge of the link between time speed and distance.
MNU 2-10c
Using simple time periods, I can work out how long a journey will take, the speed travelled at or distance covered, using my knowledge of the link between time, speed and distance.

MNU 3-10a
I can use the link between time, speed and distance to carry out related calculations.
MNU 4-10b

The development of time calculations progresses as follows:

- convert between the 12 and 24 hour clock (2327 = 11.27pm)
- calculate duration in hours and minutes by counting up to the next hour then on to the required time
- convert between hours and minutes (multiply by 60 for hours into minutes)

WORKED EXAMPLES

How long is it from 0755 to 0948?

0755 → 0800 → 0900 → 0948
(5 mins) + (1 hr) + (48 mins)

Total time 1 hr 53 minutes

Change 27 minutes into hours equivalent

27 min = 27 ÷ 60 = 0.45 hours

We do not..... **teach time as a subtraction or use a calculator with time differences**

Percentages

I have investigated the everyday contexts in which simple fractions, percentages or decimal fractions are used and can carry out the necessary calculations to solve related problems.
MNU 2-07a
I can show the equivalent forms of simple fractions, decimal fractions and percentages and can choose my preferred form when solving a problem, explaining my choice of method.
MNU 2-07b
I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real-life situations.
MNU 3-07a
I can choose the most appropriate form of fractions, decimal fractions and percentages to use when making calculations mentally, in written form or using technology, then use my solutions to make comparisons, decisions and choices.
MNU 4-07a

The development of percentages progresses as follows:

- Find 50%, 25%, 10% and 1% without a calculator and use addition to find other amounts
- Find percentages with a calculator using decimal equivalents e.g.

23% = 0.23
12.5% = 0.125
6% = 0.06

- Express fractions of a quantity as a percentage.

WORKED EXAMPLES ON NEXT PAGES

Percentages (Without Calculator)

Most pupils will be able to find simple percentages of quantities without the use of a calculator by equating percentage with fraction equivalent e.g.

25%	**=**	**$\frac{1}{4}$**
75%	**=**	**$\frac{3}{4}$**
50%	**=**	**$\frac{1}{2}$**
10%	**=**	**1/10**
20%	**=**	**1/5 etc….**

The "Ten Percent Method" is the one most commonly used within the maths department for various other percentages.

Finding Percentages of quantities :

Example 1

Find 45% of £37

Step 1	10% of £37	=	£37 $\div$ 10	=	£3.70
Step 2	40% of £37	=	£3.70 $\times$ 4	=	£14.80
Step 3	5% 0f £37	=	$\frac{1}{2}$ of £3.70	=	£1.85
Hence	45%	=	£14.80 + £1.85		
		=	£16.65		

Percentages (With Calculator)

(a) Finding Percentages of quantities :

Example 1

Find 63% of 1200	=	0.63 $\times$ 1200
	=	756

Example 2

Find 17.5% of 740 = 0.175×740
= 129.5

Example 3

Find 6% of 35 = 0.06×35
= 2.1

(b) Finding one quantity as a percentage of another

Example 4

42 pupils out of 75 have blue eyes.
What percentage is this?

Step 1 Fraction = $\frac{42}{75}$

Step 2 Decimal = $42 \div 75 = 0.56$

Step 3 Percentage = 56%

WE DO NOT.... Use the percentage button on the calculator because of inconsistencies between models

Proportion

I can show how quantities that are related can be increased or decreased proportionally and apply this to solve problems in everyday contexts.
MNU 3-08a

Using proportion, I can calculate the change in one quantity caused by a change in a related quantity and solve real-life problems.
MNU 4-08a

We expect pupils to be able to

- identify direct and inverse proportion
- record appropriate "headings" with the unknown on the right
- use the unitary method (i.e. find the value of 'one' first then multiply by the required value)
- if rounding is required we do not round until the last stage

WORKED EXAMPLES ON NEXT PAGE

Example 1 (Direct proportion)

> **1g of carbohydrates contains 19 kJ of energy.**
> **1g of fat contains 38 kj of energy.**
> **What is the ratio of energy contained in 1g of carbohydrates to 1g of fats?**

Note the order

	carbohydrate	:	fat	
	<u>carbohydrate</u>	:	**<u>fat</u>**	(carbohydrate to fat)
	19	:	38	
Divide by 19 (*Find what 1 unit equals)*				**Divide by 19**
	1	:	2	
	Answer 1	**:**	**2**	

Example 2 (Direct proportion)

> **25g of cheese contains 20g of fat.**
> **Find the weight of fat in 130g of cheese.**

Decide order – put **unknown** on **right hand side** i.e. weight of **fat**, thus

	Cheese	:	Fat	
	25	:	20	
Divide by 25 (*Find what 1 unit equals first*)				**Divide by 25**
	1	:	0.8	
Multiply by 130				**Multiply by 130**
	130	:	104	

Answer 104g of fat.

Example 3 (Inverse proportion)

The journey time at 60 km/h = 30 minutes, so what is the journey time at 50km/h?

	Speed (km/h)	Time (mins)	
	60	30	
Divide by 60 (*Find what 1 unit equals first)*			**Multiply by 60**
	1	1800	
Multiply by 50	50	36	**Divide by 50**

<u>Answer 36 minutes</u>

Co-ordinates

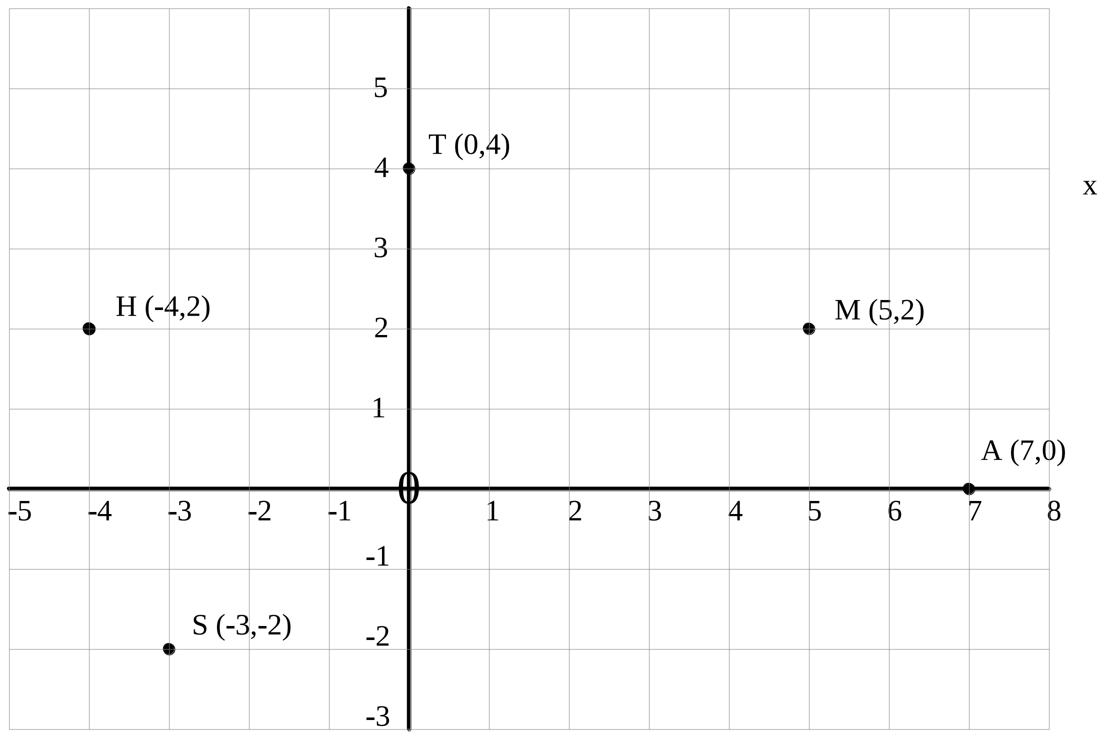
I can use my knowledge of the coordinate system to plot and describe the location of a point on a grid.
MTH 2-18a / MTH 3-18
I can plot and describe the position of a point on a 4-quadrant coordinate grid.
MTH 4-18a

We expect pupils to:

- use a co-ordinate system to locate a point on a grid
- number the grid lines rather than the spaces
- use the terms across/back and up/down for the different directions
- use a comma to separate as follows: 3 across 4 up = (3,4)

We expect pupil to progress to:

- use co-ordinates in all four quadrants to plot positions

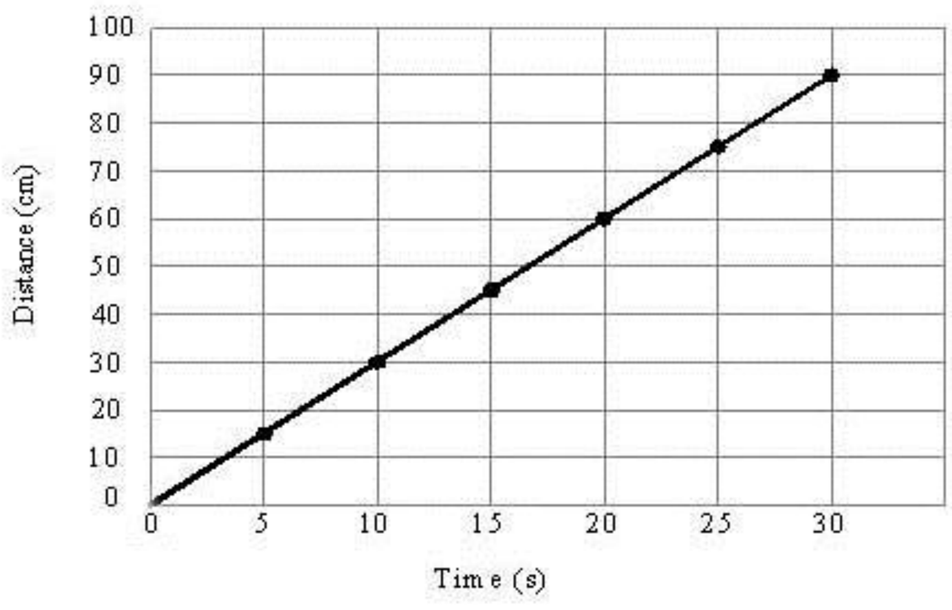


Line Graphs

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology.
MTH 2-21a / MTH 3-21a
I can select appropriately from a wide range of tables, charts, diagrams and graphs when displaying discrete, continuous or grouped data, clearly communicating the significant features of the data.
MTH 4-21a

We expect pupils to:

- use a sharpened pencil and a ruler
- choose an appropriate scale for the axes to fit the paper
- label the axes placing time or the variable that you control on the horizontal axis
- use an even scale
- number the lines not the spaces
- plot the points neatly (using a cross or dot)
- fit a suitable line: curved/line of best fit/straight line between points

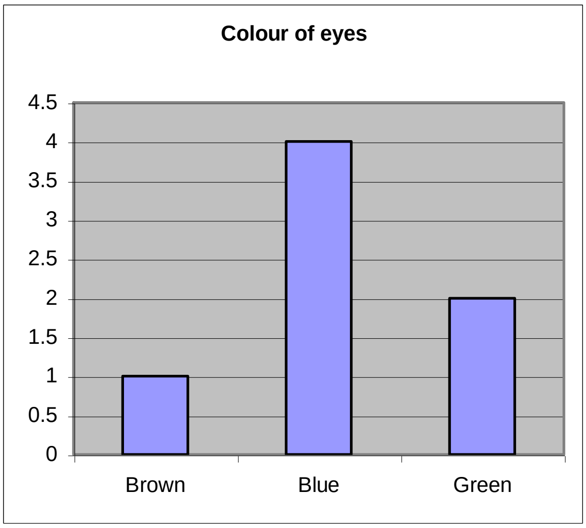


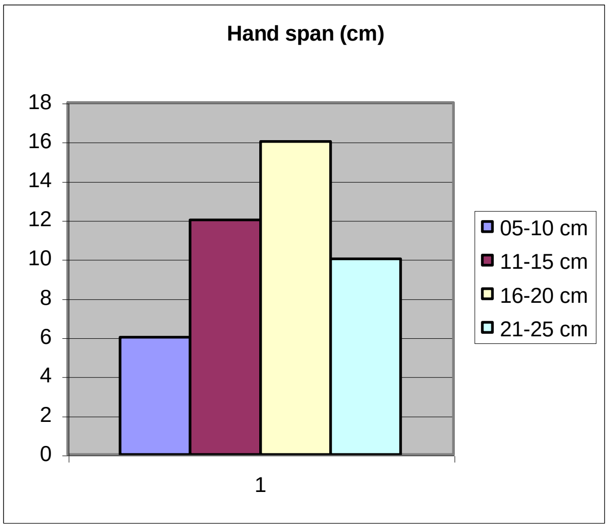
Bar Graphs

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology.
MTH 2-21a / MTH 3-21a
I can select appropriately from a wide range of tables, charts, diagrams and graphs when displaying discrete, continuous or grouped data, clearly communicating the significant features of the data.
MTH 4-21a

We expect pupils to:

- use a sharpened pencil and a ruler
- the origin should be clearly indicated but need not be zero
- label the axes
- label the bars in the centre of each bar
- bars should be of equal thickness
- label the frequency on the lines not on the spaces
- make sure there are spaces between the bars for discrete data
- shade the bars appropriately
- give the graph a title





Pie Charts

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology.
MTH 2-21a / MTH 3-21a / 4-21a

We expect pupils to

- Use a pencil
- Label all the slices or insert a key as required
- Give the pie chart a title

Progression is as follows:

- Construct pie charts involving simple fractions or decimals
- Construct pie charts of data expressed in percentages
- Construct pie charts of raw data

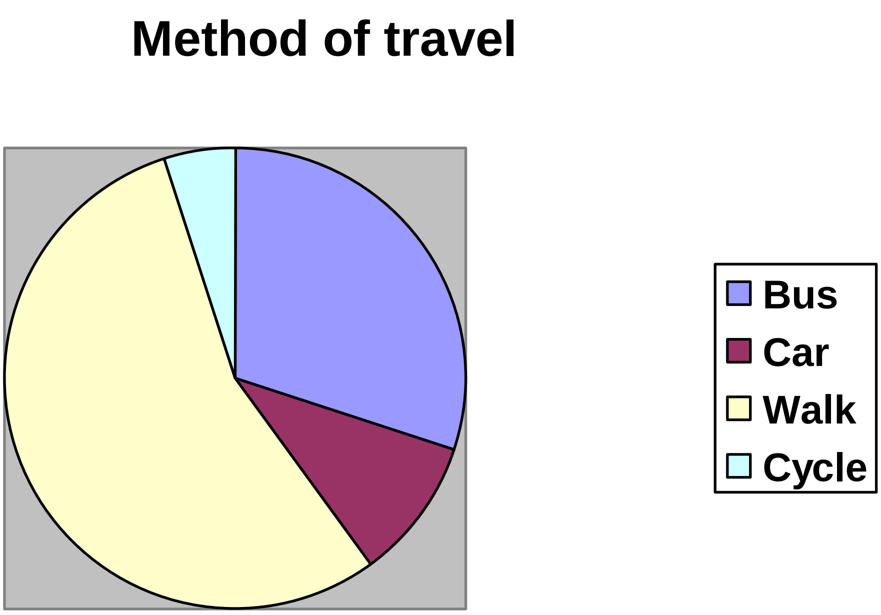
WORKED EXAMPLES ON NEXT PAGE

EXAMPLE 1 (Simple)

30% of pupils travel to school by bus, 10% by car, 55% walk and 5% cycle. Draw a pie chart to illustrate this data.

(In this example you find the angle percentage by dividing 360 degrees by 100 and X (times) by the percentage of each response)

Method of travel	Percentage (%)	Angle (°)
Bus	30	0.30 x 360 = 108
Car	10	0.10 x 360 = 36
Walk	55	0.55 x 360 = 198
Cycle	5	0.05 x 360 = 18



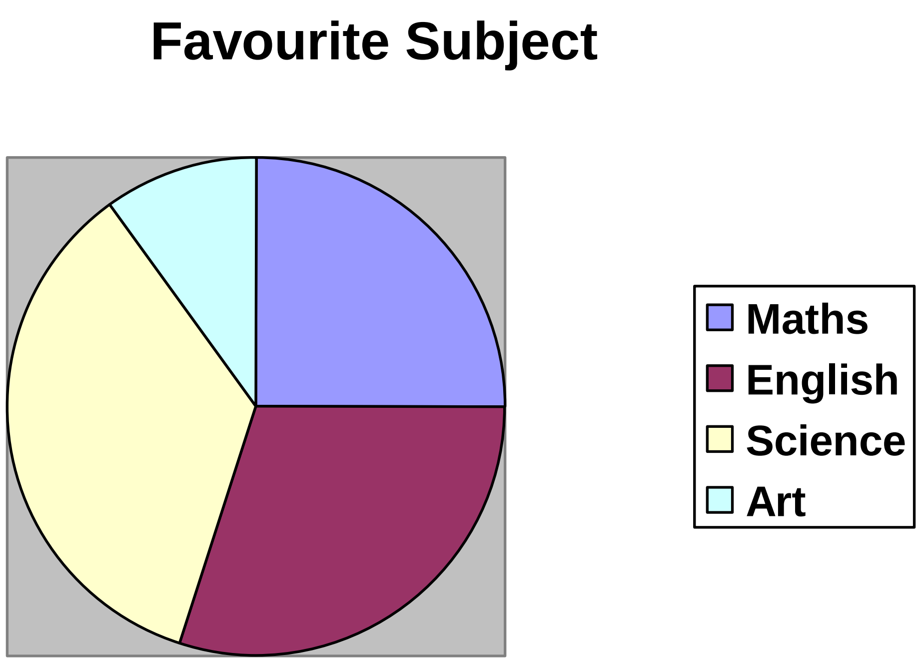
(Percentage Pie Chart Scales may be borrowed from Maths Department in order to cater for differentiation)

EXAMPLE 2 (From raw data)

20 pupils were asked "What is your favourite subject?"
Replies were Maths 5, English 6, Science 7 and Art 2

(In this example you find the angle percentage by dividing 360 degrees by the total responses and X (times) by the number of each response)

Favourite subject	Number of pupils	Angle (°)
Maths	5	5 ÷ 20 x 360 = 90
English	6	6 ÷ 20 x 360 = 108
Science	7	7 ÷ 20 x 360 = 126
Art	2	2 ÷ 20 x 360 = 36
Total	20	



Data Analysis

I can evaluate and interpret raw and graphical data using a variety of methods, comment on relationships I observe within the data and communicate my findings to others.
MNU 4-20a

In order to compare numerical information in real-life contexts, I can find the mean, median, mode and range of sets of numbers, decide which type of average is most appropriate to use and discuss how using an alternative type of average could be misleading.
MTH 4-20b

Progression in learning

- Analyse ungrouped data using a tally table and frequency column or an ordered list
- Calculate the range of a data set.

(In maths this is taught as the difference between the highest and the lowest values of the data set. Range is expressed differently in biology)

- Calculate the mean (average) of a set of data
- Use a stem and leaf diagram
- Median (central value of an ordered list)
- Mode (most common value) of a data set
- Obtain these values from an ungrouped frequency table

Correlation in scatter graphs is described in qualitative terms.
e.g. "The warmer the weather, the less you spend on heating" is negative correlation
e.g."The more people in your family, the more you spend on food" is positive correlation.

Probability is always expressed as a fraction

$$P\text{ (event)} = \frac{\text{number of favourable outcomes}}{\text{total number of possible outcomes}}$$

WORKED EXAMPLE ON NEXT PAGE

EXAMPLE

The results of a survey of the number of pets pupils owned were

3,3,4,4,4,5,6,6,7,8

Calculate the mean, median, mode and range for this set of data.

Mean: add all the numbers together and divide by the total number of items

$= (3 + 3 + 4 + 4 + 4 + 5 + 6 + 6 + 7 + 8) \div 10 = 5$

Median: the median is a number that splits a list into two equal parts.
To find the median

1. list the items (numbers) in order of size
2. if there is an odd number of items, find the middle one
3. if there is an even number of items, take the mean of the middle two

$= (4 + 5) \div 2 = 4.5$

Mode: the mode is the most frequent (common) value

$= 4$

Range = highest – lowest

$= 8 - 3 = 5$

NB In biology the range is expressed as " from 3 to 8"

Order of Operations or BODMAS

Having explored the need for rules for the order of operations in number calculations, I can apply them correctly when solving simple problems.
MTH 2-03c
I have investigated how introducing brackets to an expression can change the emphasis and can demonstrate my understanding by using the correct order of operations when carrying out calculations.
MTH 4-03b

BODMAS is the mnemonic, which we teach in maths to enable pupils to know exactly the right sequence for carrying out mathematical operations.

Scientific calculators use this rule to know which answer to calculate when given a string of numbers to add, subtract, multiply, divide etc.

For example

What do you think the answer to 2 + 3 x 5 is?
Is it (2 + 3) x 5 = 5 x 5 = 25 ? or 2 + (3 x 5) = 2 + 15 = 17 ?

We use BODMAS to give the correct answer.:

(B)rackets (O)rder (D)ivision (M)ultiplication (A)ddition (S)ubtraction

According to BODMAS, multiplication should always be done before addition, therefore 17 is the correct answer according to BODMAS and should also be the answer which your calculator will give if you type in 2 + 3 x 5 =

Order means a number raised to a power such as 2^2 or $(-3)^3$.

WORKED EXAMPLE ON NEXT PAGE

EXAMPLE

Calculate $4 + 70 \div 10 \times (1 + 2)^2 - 1$
according to the **BODMAS** rules.

Brackets 1st: $4 + 70 \div 10 \times \mathbf{(1 + 2)}^2 - 1$

$(1 + 2) = 3)$ leaves you with $4 + 70 \div 10 \times (3)^2 - 1$

Order (Power) 2nd: $4 + 70 \div 10 \times \mathbf{(3)^2} - 1$

$(3^2 = 9)$ leaves you with $4 + 70 \div 10 \times 9 - 1$

Division 3rd $4 + \mathbf{70 \div 10} \times 9 - 1$

$(70 \div 10 = 7)$ leaves you with $4 + 7 \times 9 - 1$

Multiplication 4th: $4 + \mathbf{7 \times 9} - 1$

$(7 \times 9 = 63)$ leaves you with $4 + 63 - 1$

Addition 5th: $\mathbf{4 + 63} - 1$

$(4 + 63 = 67)$ leaves you with $67 - 1$

Subtraction 6th: $\mathbf{67 - 1}$

$(67 - 1 = 66)$ leaves you with 66

Answer = 66

Equations

Having discussed ways to express problems or statements using mathematical language, I can construct, and use appropriate methods to solve, a range of simple equations.
MTH 3-15a
I can create and evaluate a simple formula representing information contained in a diagram, problem or statement.
MTH 3-15b
Having discussed the benefits of using mathematics to model real-life situations, I can construct and solve inequalities and an extended range of equations.
MNU 4-15b

The development of solving equations progresses as follows:

- "Balancing"
- performing the same operation to each side of the equation
- doing "Undo" operations e.g
  undo + with -,
  undo – with +
  undo x with ÷,
  undo ÷ with x
- encouraging statements like:

  "add something to both sides"
  "multiply both sides by something"

- We prefer
  - the letter x to be written differently from a multiplication sign x
  - one equals sign per line
  - equals signs beneath each other
  - we discourage bad form such as 3 x 4 = 12 ÷ 2 = 6 x 3 = 18

WORKED EXAMPLES ON NEXT PAGE

Example 1

$2x + 3 = 9$ take away 3 from both sides

$2x = 6$ divide by 2 both sides

$x = 3$

Example 2

$3x + 6 = 2\,(x - 9)$

$3x + 6 = 2x - 18$ subtract 6 from both sides

$3x = 2x - 24$ subtract 2x from both sides

$x = -24$

We do not.......

"change the side, change the sign"

Using formulae

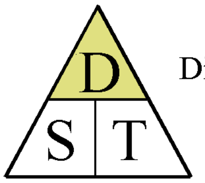
> Having discussed ways to express problems or statements using mathematical language, I can construct, and use appropriate methods to solve, a range of simple equations.
> MNU 3-15a
> I can create and evaluate a simple formula representing information contained in a diagram, problem or statement.
> MNU 3-15b

In maths, science and technology the triangle system is used:

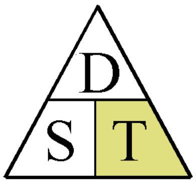
By covering up the variable that is required you can easily see how to find it.

Example 1

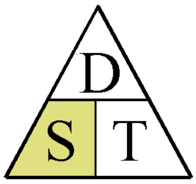
Speed, distance and time



Distance = Speed X Time



$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$



$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

A van travelled 360km in 8 hours. What is its average speed, in km/hr?

By covering *S* we see that

Speed = distance ÷ time

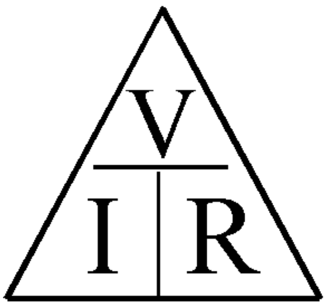
S = 360 ÷ 8
S = 45km/hr

Example 2

Ohms law

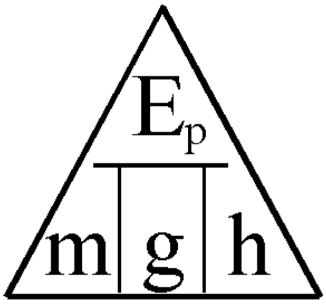
Given the voltage (V) = 10v and current (I) = 1mA, solve for the resistance R

Cover I and we see that R = V ÷ I
R = 10 ÷ 1
R = 10kΩ



The triangle system can also be used with formulae that have four variables.

Potential Energy



$E_p = m \times g \times h$

Where E_p = Potential Energy,
m = Mass of object
g = Acceleration of Gravity = 9.81 m/s^2
h = Height of object

Example 3

Potential Energy

A cat had climbed at the top of the tree. The tree is 20 metres high and the cat weighs 6kg. How much **Potential Energy** does the cat have?
m = 6 kg, h = 20 m, g = 9.8 m/s^2(Gravitational Acceleration of the earth)

By covering up the E_p you can see that **$E_p = m \times g \times h$.**

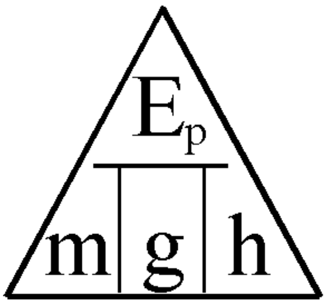
Substitute the values in the below potential energy formula:

$E_p = 6 \times 9.8 \times 20$

Answer: Potential Energy E_p = 1176 Joules

Example 4

Potential Energy



On a 3m ledge, a rock is laying at the potential energy of 120 J. What will be the **Mass** of the rock?
E_p = 120 J, h = 3m, g = 9.8 m/s^2(Gravitational Acceleration of the earth)

By covering up the m you can see that

$m = E_p \div (g \times h)$

Substitute the values in the below Velocity formula:

$m = 120 \div (9.8 \times 3)$

Answer : Mass m = 4.08kg

The triangle system is also used in mathematics in trigonometry and in technology and physics in pneumatic systems, energy and power, mechanical systems and in the study of electricity.

The length of a string S (mm) for the weight W (g) is given by the formula:

$$S = 16 + 3W$$

Example 5 **Find S when W = 3 g**

S = 16 + 3W (write formula)
S = 16 + 3 x 3 (replace letters by numbers)
S = 16 + 9 (solve the equation – by doing and undoing) S
= 25
Length of string is 25 mm (interpret result in context)

Example 6 **Find W when S = 20.5 mm**

S = 16 + 3 W (write formula)
20.5 = 16 + 3W (replace letters by numbers)
4.5 = 3W (solve the equation – by doing and undoing)
W = 1.5

The weight is 1.5 g (interpret result in context)

We do not .....

We do not rearrange the formula before substitution (too difficult). State the answer only – working & units must be shown

Scientific Notation or Standard Form

Having explored the notation and vocabulary associated with whole number powers and the advantages of writing numbers in this form, I can evaluate powers of whole numbers mentally or using technology.
MTH 3-06a

I have developed my understanding of the relationship between powers and roots and can carry out calculations mentally or using technology to evaluate whole number powers and roots, of any appropriate number.
MTH 4-06a

Within real-life contexts, I can use scientific notation to express large or small numbers in a more efficient way and can understand and work with numbers written in this form.
MTH 4-06b

In mathematics we introduce scientific notation for the more able in S2, and for others in early S3.

We teach that a number in scientific notation consists of a number between one and ten multiplied - or divided - by 10 a certain number of times

Other terms used may include :

- 'Kilo' meaning one thousand
- 'Milli' meaning one thousandth
- 'Centi' meaning one hundredth

More able should be able to use powers and square roots.

WORKED EXAMPLE

24,500,000 = 2.45×10^7 (2.45 multiplied by 10, 7 times)

0.000988 = 9.88×10^{-4} (9.88 divided by 10, 4 times)

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