Thomas Telford School

Whole School

Numeracy Policy

September 2022

Thomas Telford School is committed to raising the standards of numeracy of all of its students, so that they develop the ability to use numeracy skills effectively in all areas of the curriculum and the skills necessary to cope confidently with the demands of further education, employment and adult life.

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Introduction:

The purposes of our whole-school numeracy policy:

- to develop, maintain and improve standards in numeracy across the school;
- to ensure consistency of practice including methods, vocabulary, notation, etc.;
- to indicate areas for collaboration between subjects;
- to assist the transfer of students' knowledge, skills and understanding between subjects.

A definition of numeracy:

Numeracy is a proficiency which is developed mainly in mathematics but also in other subjects. It is more than an ability to do basic arithmetic. It involves developing confidence and competence with numbers and measures. It requires understanding of the number system, a repertoire of mathematical techniques, and an inclination and ability to solve quantitative or spatial problems in a range of contexts. Numeracy also demands understanding of the ways in which data are gathered by counting and measuring, and presented in graphs, diagrams, charts and tables.

(Framework for Teaching Mathematics – yrs 7 to 9 – DfES)

In the appendices are more thorough descriptions of the numeracy skills appropriate to students at the end of Key Stages 2 and 3.

Practice at Thomas Telford School

1. Raising Standards

Raising Standards in Numeracy across our school cannot be solely judged in increased test percentages. There is a need to evaluate the students' ability to transfer mathematical skills into other subject areas, applying techniques to problem solving. Their confidence in attempting this is initially as important as achieving the correct solution.

The Senior Management Team has a commitment to the implementation and evaluation of this work. They are aware of the need to create time for liaison and sustain the cross curricular links forged between subject areas. The effectiveness of these links will reduce the replication of work by teachers and students.

2. Consistency of Practice

Teachers of mathematics should:

- be aware of the mathematical techniques used in other subjects and provide assistance and advice to other departments, so that a correct and consistent approach is used in all subjects.

- provide information when needed to other subject teachers and departments on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups.

- through liaison with other teachers, attempt to ensure that students have appropriate numeracy skills.

Teachers of subjects other than mathematics should:

- ensure that they are familiar with correct mathematical language, notation, conventions and techniques, relating to their own subject, and encourage students to use these correctly.

- be aware of appropriate expectations of students and difficulties that might be experienced with numeracy skills.

- provide information for mathematics teachers on the stage at which specific numeracy skills will be required for particular groups.

3. Our Areas of Collaboration:

Mental Arithmetic Techniques

All departments should give every encouragement to students using mental techniques but must also ensure that they are guided towards efficient methods and do not attempt convoluted mental techniques when a written or calculator method is required.

Written Calculations

Teachers should be aware of the use of "non-standard" methods, particularly for grid multiplication and division by chunking. The desire for students to progress to formal algorithms and the most efficient methods should not at the expense of having only a method rather than a cohesive and full understanding.

Whole school Policy on the use of calculators

The school expects all students to bring their own scientific calculator to lessons when required. In deciding when students use a calculator in lessons we should ensure that:

- students' first resort should be mental methods;
- students have sufficient understanding of the calculation to decide the most appropriate method: mental, pencil and paper or calculator;
- students have the technical skills required to use the basic facilities of a calculator constructively and efficiently, the order in which to use keys, how to enter numbers as money, measures, fractions, etc.;
- students understand the four arithmetical operations and recognise which to use to solve a particular problem;
- when using a calculator, students are aware of the processes required and are able to say whether their answer is reasonable;
- students can interpret the calculator display in context (e.g. 5.3 is £5.30 in money calculations);
- we help students, where necessary, to use the correct order of operations – especially in multi-step calculations, such as (3.2 - 1.65) x (15.6 - 5.77).

Vocabulary

The following are all important aspects of helping students with the technical vocabulary of Mathematics:

- Using a variety of words that have the same meaning e.g. add, plus, sum
- Encouraging students to be less dependent on simple words e.g. exposing them to the word multiply as a replacement for times

- Discussion about words that have different meanings in Mathematics from everyday life e.g. take away, volume, product etc
- Highlighting word sources e.g. quad means 4, lateral means side so that students can use them to help remember meanings. This applies to both prefixes and suffixes to words.

4. Transfer of Skills

It is vital that as the skills are taught, the applications are mentioned and as the applications are taught the skills are revisited.

The Mathematics team will deliver the Curriculum, knowledge, skills and understanding through the schemes of work, using direct interactive teaching. They will make references to the applications of Mathematics in other subject areas and give contexts to many topics. Other curriculum teams will build on this knowledge and help students to apply them in a variety of situations. Liaison between curriculum areas is vital to students being confident with this transfer of skills and the Maths team willingly offers support to achieve this.

Detailed below are some examples different ways maths may be encountered in other curriculum areas.

ART – Symmetry; use of paint mixing as a ratio context.

ENGLISH – comparison of 2 data sets on word and sentence length.

HOSPITALITY AND CATERING– recipes as a ratio context and calculating amounts for ingredients, reading scales

GEOGRAPHY – representing and interpreting data, use of Spreadsheets

HISTORY – timelines, sequencing events

ICT – representing data; considered use of graphs, using formulae in Spreadsheets

MFL – Dates, sequences and counting in other languages; use of basic graphs and surveys to practise foreign language vocabulary and reinforce interpretation of data.

MUSIC – fractions, use of timing

PHYSICAL EDUCATION – collection of real data for processing in Maths, presenting data, estimation, time and measurement

RELIGIOUS EDUCATION – interpretation and comparison of data gathered from secondary sources (internet) on e.g. developing and developed world

SCIENCE – calculating with formulae, graphing skills, representing and interpreting data

TECHNOLOGY – measuring skills, units of area and volume, scale, practical equipment, and proportion

BUSINESS STUDIES – calculating profit and loss, finding percentage change, calculating and interpreting averages, drawing/interpreting graphs and charts

Appendices

The National Strategy Framework for Maths states what students are expected to know at different ages. These are listed below.

1.1 Year 6 Students should :

- have a sense of the size of a number and where it fits in the number system
- know number bonds by heart e.g. tables, doubles and halves
- use what they know by heart to work out answers mentally
- calculate accurately & efficiently using a variety of strategies, both written & mental
- recognise when AND when not to use a calculator; using it efficiently if needs be
- make sense of number problems, including non-routine problems, and recognise the operations needed to solve them
- explain their methods and reasoning using correct mathematical terms
- judge whether their answers are reasonable, and have strategies for checking
- suggest suitable units for measuring
- make sensible estimates for measurements
- explain and interpret graphs, diagrams, charts and tables
- use the numbers in graphs, diagrams, charts and tables to predict.

1.2 Year 9 students should:

- have a sense of the size of a number and where it fits into the number system;
- recall mathematical facts confidently;
- calculate accurately and efficiently, both mentally and with pencil and paper, drawing on a range of calculation strategies;
- use proportional reasoning to simplify and solve problems;
- use calculators and other ICT resources appropriately and effectively to solve mathematical problems, and select from the display the number of figures appropriate to the context of a calculation;
- use simple formulae and substitute numbers in them;
- measure and estimate measurements, choosing suitable units and reading numbers correctly from a range of meters, dials and scales;

- calculate simple perimeters, areas and volumes, recognising the degree of accuracy that can be achieved;
- understand and use measures of time and speed, and rates such as £ per hour or miles per litre;
- draw plane figures to given specifications and appreciate the concept of scale in geometrical drawings and maps;
- understand the difference between the mean, median and mode and the purpose for which each is used;
- collect data, discrete and continuous, and draw, interpret and predict from graphs, diagrams, charts and tables;
- have some understanding of the measurement of probability and risk;
- explain their methods, reasoning and conclusions, using correct mathematical terms;
- judge the reasonableness of solutions and check them when necessary;
- give their results to a degree of accuracy appropriate to the context.

1.3 Further details - Areas of Collaboration.

Section 1 – Number

Reading and writing numbers

It is now common practice to use spaces rather than commas between each group of three figures. eg. 34 000 not 34,000 though the latter will still be found in many text books and cannot be considered incorrect.

In reading large figures students should know that the final three figures are read as they are written as ***hundreds, tens*** and ***units.*** Reading from the left, the next three figures are ***thousands*** and the next group of three are ***millions.***

eg. 3 027 251 is three million, twenty-seven thousand and fifty-one.

Order of Operations

It is important that students follow the correct order of operations for arithmetic calculations. Most will be familiar with the mnemonic: **BODMAS.**

Brackets, power **O**f, **D**ivision, **M**ultiplication, **A**ddition, **S**ubtraction

This shows the order in which calculations should be completed. eg

5 + 3 x 4 means		**NOT** 5 + 3 x 4 means 8 x 4	
5 + 12	= <u>17</u> ✓		= <u>32</u> **x**

The important facts to remember are that the **B**rackets are done first, then the **P**owers, **M**ultiplication and **D**ivision and finally, **A**ddition and **S**ubtraction

eg(i) (5 + 3) x 4
= 8 x 4
= <u>32</u>

eg (ii) $5 + 6^2 \div 3 - 4$
$= 5 + 36 \div 3 - 4$
$= 5 + 12 - 4$
$= 17 - 4$
$= \underline{13}$

Care must be taken with **S**ubtraction.

eg 5 + 12 – 4 **or** 5 + 12 – 4
= 17 – 4 = 5 + 8
= <u>13</u> ✓ **=** <u>13</u> **x**

eg 5 –12 + 4 **but** 5 –12 + 4 [1]
= -7 + 4 = 5 – 16
= <u>-3</u> ✓ **=** <u>-11</u> **x**

1 For this to be correct it would have to be written**:** 5 – **(**12 + 4**)** so that the bracket is worked out first.

Calculators

Some students are over-dependent on the use of calculators for simple calculations. Wherever possible students should be encouraged to use mental or written methods. It is however, necessary to consider the ability of the student and the objectives of the task in hand. In order to complete a task successfully it may be necessary for students to use a calculator for what you perceive to be a relatively simple calculation. This should be allowed if progress within the subject area is to be made. Before completing the calculation, students should be encouraged to make an estimate of the answer. Having completed the calculation on the calculator they should consider whether the answer is reasonable in the context of the question.

Mental Calculations

Most students should be able to carry out the following processes mentally though the speed with which they do it will vary considerably.

- recall addition and subtraction facts up to 20
- recall multiplication and division facts for tables up to 15 x 15.

Students should be encouraged to carry out other calculations mentally using a variety of strategies but there will be significant differences in their ability to do so. It is helpful if teachers discuss with students how they have made a calculation. Any method which produces the correct answer is acceptable.

eg $53 + 19 = 53 + 20 - 1$

$284 - 56 = 284 - 60 + 4$

$32 \times 8 = 32 \times 2 \times 2 \times 2$

$76 \div 4 = (76 \div 2) \div 2$

Written Calculations

Students often use the ‘ **=** ‘ sign incorrectly. When doing a series of operations, they sometimes write mathematical sentences which are untrue.

eg $5 \times 4 = 20 + 3 = 23 - 8 = 15$ since $5 \times 4 \neq 15$

It is important that all teachers encourage students to write such calculations correctly.

eg
$5 \times 4 = 20$
$20 + 3 = 23$
$23 - 8 = \underline{\underline{15}}$ ✓

The ‘ = ‘ sign should only be used when both sides of an operation have the same value. There is no problem with a calculation such as:

$43 + 57 = 40 + 3 + 50 + 7 = 90 + 10 = \underline{100}$ ✓

since each part of the calculation has the same value.

The '≈' (approximately equal to) sign should be used when estimating answers.

eg 2 378 – 412 ≈ 2 400 – 400

2 400 – 400 = 2 000 ✓

Pencil & Paper Calculations

All students should be able to use some pencil and paper methods involving simple addition, subtraction, multiplication and division. Some less able students will find difficulty in recalling multiplication facts to complete successfully such calculations. In these circumstances it may be more useful to use a calculator in your subject to complete the task.

Before completing any calculation, students should be encouraged to estimate a rough value for what they expect the answer to be. This should be done by rounding the numbers and mentally calculating the approximate answer.

After completing the calculation, they should be asked to consider whether or not their answer is reasonable in the context of the question.

There is no necessity to use a particular method for any of these calculations and any with which the student is familiar and confident should be used. Many families of schools are now discussing and beginning to agree common methods across schools.

The following methods are some with which students may be familiar.

Addition & Subtraction

Estimate

Addition 3 456 + 975 3 500 + 1 000 = 4 500

```
   3 456
+    975
   4 431
   1  11
```

Subtraction by 'counting on'

Estimate

eg 8 003 – 2 569 8 000 – 3 000 = 5 000

Start	**Add**
2 569	1
2 570	30
2 600	400
3 000	5 000
8 000	3
Total	5 434

Subtraction by decomposition

Estimate
8 000 – 3 000 = 5000

eg $$\begin{array}{r} {}^{7}\cancel{8}\;{}^{9}\cancel{0}\;{}^{9}\cancel{0}\;{}^{1}3 \\ -2\;5\;6\;9 \\ \hline 5\;4\;3\;4 \end{array}$$

Addition and subtraction of decimals is completed in the same way but reminders may be needed to maintain place value by keeping decimal points in line underneath each other.

Multiplication and Division by 10,100,1000…

When a number is multiplied by 10 its value has increased tenfold and each digit will move one place to the left so multiplying its value by 10. When multiplying by 100 each digit moves two places to the left, and so on… Any empty columns will be filled with zeros so that place value is maintained when the numbers are written without column headings.

eg. 46 x 100 = 4 600

Th	H	T	U
		4	6
4	6	0	0

The same method is used for decimals.

eg. 5.34 x 10 = 53.4

H	T	U	.	t	h
		5	.	3	4
	5	3	.	4	

Empty spaces after the decimal point are not filled with zeros. The place value of the numbers is unaffected by these spaces.

When dividing by 10 each digit is moved one place to the right so making it smaller.

eg. 350 ÷ 10 = 35

H	T	U	.	t	h
3	5	0	.		
	3	5	.		

eg. $53 \div 100 = 0.534$

H	T	U	.	t	h
	5	3			
		0	.	5	3

When the calculation results in a decimal the units column must be filled with a zero to maintain the place value of the numbers.

Multiplication

$$\begin{array}{rrl} & 3\,2\,7 & \\ \times & 5\,3 & \\ \hline & 9\;8_2 1 & \longleftarrow \quad 327 \times 3 \\ & 1\;6_1 3_3\,5\,0 & \longleftarrow \quad 327 \times 50 \\ \hline & 1\,7\,3\,3\,1 & \\ \hline \end{array}$$

Conventional multiplication as set out above may not suit all students and teachers should be aware that other methods may be employed by some students.

eg(i) 327 x 53 Estimate: 300 x 50 = 15 000

X	300	20	7	**Total**
50	15 000	1000	350	16 350
3	900	60	21	981
Total	15900	1060	371	**17331**

eg(ii) 456 X 24 Estimate: 450 x 20 = 9 000

$$\begin{array}{r} 456 \\ \underline{\times\ 20} \\ \underline{9120} \\ {\scriptstyle 1\,1} \end{array} \quad + \quad \begin{array}{r} 456 \\ \underline{\times\ \ 4} \\ \underline{1824} \\ {\scriptstyle 2\,2} \end{array} \qquad \begin{array}{r} 9120 \\ \underline{+\ 1824} \\ \underline{10\,924} \end{array}$$

Division

$$\begin{array}{rr} & 2\;7 \\ \cline{2-2} 1\;3 & \big)\,3\;5\;1 \\ - & 2\;6\;0 \\ \cline{2-2} & 9\;1 \\ - & 9\;1 \\ \cline{2-2} & 0 \end{array}$$

Chunking
is a method for Long Division with which some students will be familiar and is based on recall of multiplication of numbers by 5,10, 20 etc. followed by continuous subtraction.

eg 351 ÷ 13

			2	7		
1	3	3	5	1		
	-	1	3	0	1	0
		2	2	1		
	-	1	3	0	1	0
			9	1		
		-	5	2		4
			3	9		
		-	3	9		3
				0	2	7

Any remainders in this type of calculation should be written as a fraction by dividing the remainder by the number by which the calculation has been divided.

Multiplying Decimals

- As always, estimate the answer.
- Complete the calculation as if there were no decimal points.
- In the answer insert a decimal point so that there are the same number of decimal places in the answer as there were in the original question.
- Check to see if the answer is reasonable

eg (i) 1.2 x 0.3 $\approx$ 1 x 0.3 = 0.3

Ignoring the decimal points, this will be calculated as 12 x 3 = 36 and will now need two decimal places in the answer.

$\therefore$ 1.2 x 0.3 = 0.36

Similarly:
eg (ii) 43.14 x 3.5 $\approx$ 40 x 4 = 160

	4	3	.	1	4	(2 decimal places)
x		3	.	5	0	(1 decimal place)
	2	1	5	7	0	
1	2	9	4	2	0	
1	5	0.	9	9	0	(3 dp needed in the answer)

Percentages

Whilst students should be familiar with many operations involving percentages in mathematics lessons it is not proposed to elaborate on all of them in this booklet. The following is a sample of operations which students will be expected to use in other areas.

Calculating percentages of a quantity

Methods for calculating percentages of a quantity vary depending upon the percentage required. Students should be aware that fractions, decimals and percentages are different ways of representing part of a whole and know the simple equivalents

eg 10% = $^{1}/_{10}$ 12% = 0.12

Where percentages have simple fraction equivalents, fractions of the amount can be calculated.

eg.i) To find 50% of an amount, halve the amount.
ii)To find 75% of an amount, find a quarter by dividing by four and then multiply it by three.

Most other percentages can be found by finding 10%, by dividing by 10, and then finding multiples or fractions of that amount

eg. To find 30% of an amount first find 10% by dividing the amount by 10 and then multiply this by three.
30% = 3x10%

Similarly: 5% = half of 10% and 15% = 10% + 5%
Most other percentages can be calculated in this way.

When using the calculator it is usual to think of the percentage as a decimal. Students should be encouraged to convert the question to a sentence containing mathematical symbols. ('of' means X)

eg. Find 27% of £350 becomes

0.27 X £350 =

and this is how it should be entered into the calculator.

Calculating the amount as a percentage

In every case the amount should be expressed as a fraction of the original amount and then converted to a percentage in one of the following ways:

i) What is 15 as a percentage of 60?
(using simple fractions)

$$\frac{15}{60} = \frac{1}{4} = 25\%$$

ii) What is 27 out of 50 as a percentage?
(using equivalent fractions)

$$\frac{27 \times 2}{50 \times 2} = \frac{54}{100} = 54\%$$

iii) What is 39 as a percentage of 57?
(Using a calculator)

$$\frac{39}{57} = 39 \div 57 = 0.684 \text{ (to 3 d.p.)} = 68.4\%$$

Section 2 – Algebra

The most common use of algebra across the curriculum will be in the use of formulae.

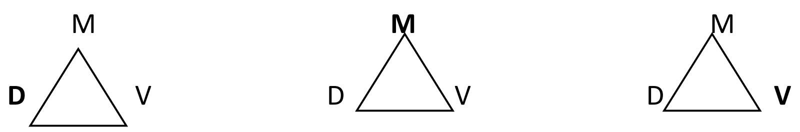
When transforming formulae students will be taught to use the 'balancing' method where they do the same to both sides of an equation.

eg (i) $A = lb$ Make b the subject of the formula

$[\div l]$ $\frac{A}{l} = b$

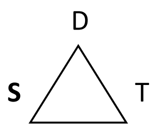
However , in some cases triangles can be useful for specific cases.

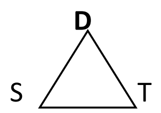
eg Density = $\frac{\text{Mass}}{\text{Volume}}$

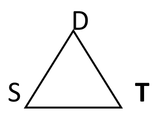


Density = $\frac{\text{Mass}}{\text{Volume}}$, **Mass** = Density x Volume, **Volume** = $\frac{\text{Mass}}{\text{Density}}$

Similarly with **Distance, Speed and Time**





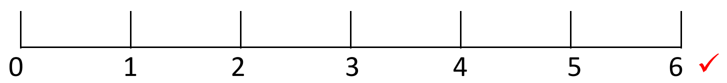


Speed = $\frac{\text{Distance}}{\text{Time}}$, **Distance** = Speed x Time, **Time** = $\frac{\text{Distance}}{\text{Speed}}$

Plotting Points

When drawing a diagram on which points have to be plotted some students will need to be reminded that the numbers written on the axes must be on the lines not in the spaces.

eg



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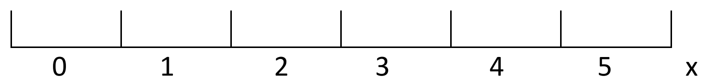


Axes

When drawing graphs to represent experimental data it is usual to use the horizontal axis for the variable which has a regular class interval.

eg In an experiment in which temperature is taken every 5 minutes the horizontal axis would be used for time and the vertical axis for temperature.

Having plotted points students can sometimes be confused as to whether or not they should join the points. If the results are from an experiment then a 'line of best fit' will usually be needed. Further details appear in the following section on Data Handling.

Section 3 – Data Handling

It is important that graphs and diagrams are drawn on the appropriate paper:

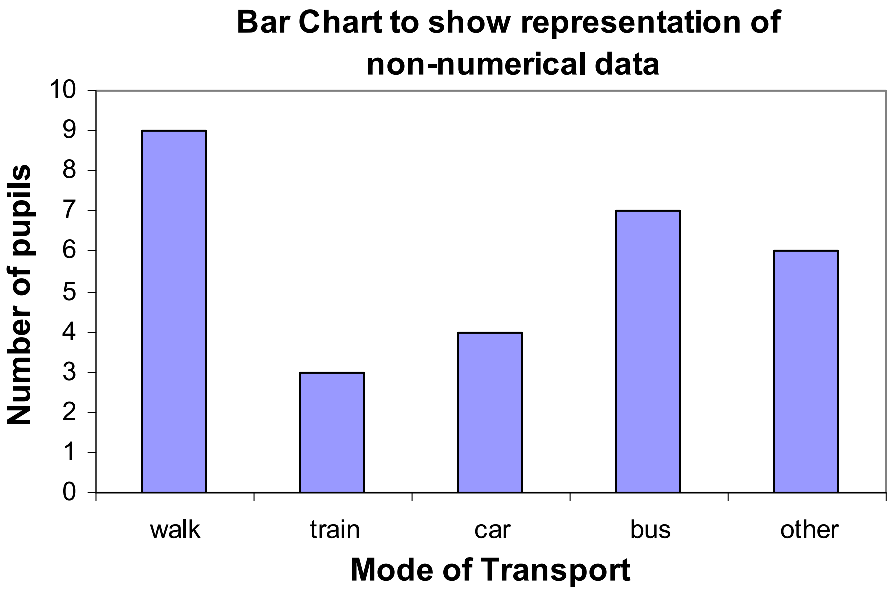
- bar charts and line graphs on squared or graph paper.
- pie charts on plain paper.

Bar Charts

These are the diagrams most frequently used in areas of the curriculum other than mathematics. The way in which the graph is drawn depends on the type of data to be processed.

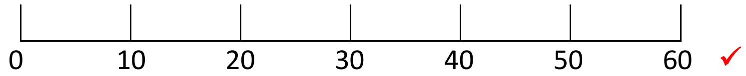
Graphs should be drawn with **gaps between the bars** if the data categories are not numerical (colours, makes of car, names of pop star, etc). There should also be gaps if the data is numeric but can only take a particular value (shoe size, KS3 level, etc). In cases where there are gaps in the graph the horizontal axis will be labelled beneath the columns.

The labels on the vertical axis should be on the lines.
eg.



Where the data are continuous, eg. lengths, the horizontal scale should be like the scale used for a graph on which points are plotted.

eg



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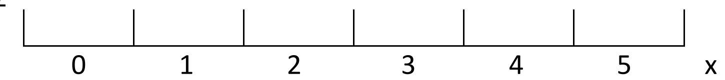
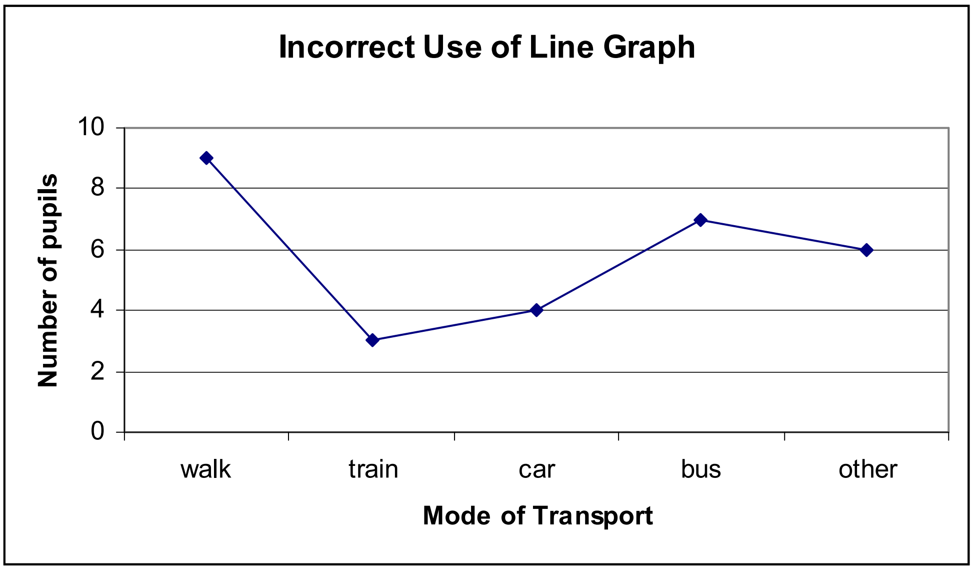


Line Graphs

Line graphs should only be used with data in which the order in which the categories are written is significant. Points are joined if the graph shows a trend or when the data values between the plotted points make sense to be included. For example, the measure of a patient's temperature at regular intervals shows a pattern but not a definitive value.



Computer Drawn Graphs & Diagrams

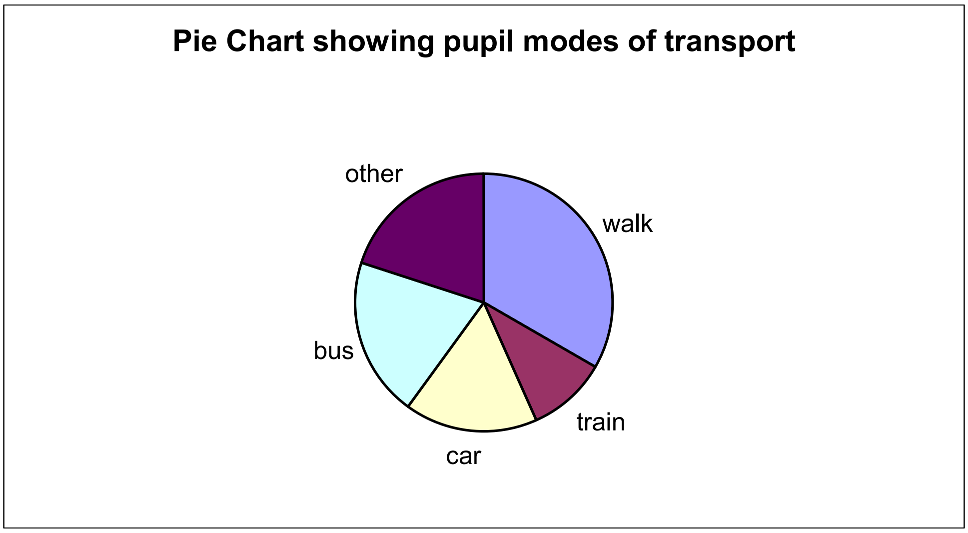
Students throughout the school should be able to use **Excel** or other spreadsheets to draw graphs to represent data. Because it is easy to produce a wide variety of graphs there is a tendency to produce diagrams that have little relevance. Students should always be encouraged to write a comment explaining their observations from the graph.

Pie Charts

The way in which students should be expected to work out angles for a pie chart will depend on the complexity of the question. If the numbers involved are simple it will be possible to calculate simple fractions of 360°.

eg. The following table shows the results of a survey of 30 students travelling to school. Show this information on a pie chart.

Mode of Transport	Frequency	Fraction	Angle
Walk	10	$\frac{1}{3}$	120º
Train	3	$\frac{1}{10}$	36º
Car	5	$\frac{1}{6}$	60º
Bus	6	$\frac{1}{5}$	72º
Other	6	$\frac{1}{5}$	72º
Total	**30**	**1**	**360º**



However, with more difficult numbers which do not readily convert to a simple fraction students should first work out the share of 360° to be allocated to **one** item and then multiply this by its frequency.

eg. 180 students were asked their favourite core subject.

Each students has $360 \div 180 = 2°$ of the pie chart.

Subject	Number of students	Pie Chart Angle
English	63	63 x 2 = 126º
Mathematics	75	75 x 2 = 150º
Science	42	42 x 2 = 84º
Total	180	360º

If the data is in percentage form each item will be represented by 3.6° on the pie. To calculate the angle students will need to multiply the frequency by 3.6.

eg. 43% will be represented by 43 X 3.6 = 154.8°
$\approx \underline{155°}$

Any calculations of angles should be rounded to the nearest degree only at the **final stage of the calculation.** If the number of items to be shown is 47 each item will need:

$360 \div 47 = 7.659574468°$

This complete number should be used when multiplying by the frequency and then rounded to the nearest degree.

Using Data

Range
The range of a set of data is the difference between the highest and the lowest data values. The range is a measure of spread and is a way of showing the consistency of a set of data.

eg. If in an examination the highest mark is 80% and the lowest mark is 45%, the range is 35% because 80% - 45% = 35%

The range is always a **single number**, so it is **NOT** 45% - 80%

Averages
Three different averages are commonly used:

Mean – is calculated by adding up all the values and dividing by the number of values**.**

Median – is the middle value when a set of values has been arranged in order.

Mode - is the most common value. It is sometimes called the **modal group.**

eg. for the following values: **3, 2, 5, 8, 4, 3, 6, 3, 2,**

Mean = $\frac{3 + 2 + 5 + 8 + 4 + 3 + 6 + 3 + 2}{9} = \frac{36}{9} = 4$

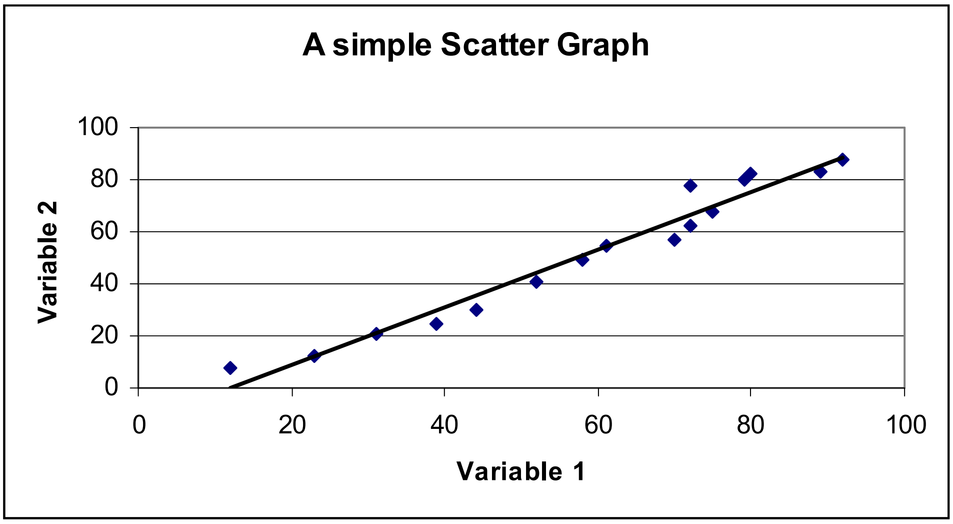
Median – is 3 because 3 is in the middle when the values are put in order.

2, 2, 3, 3, 3, 4, 5, 6, 8

Mode - is 3 because this is the value which occurs most often.

Scattergraphs

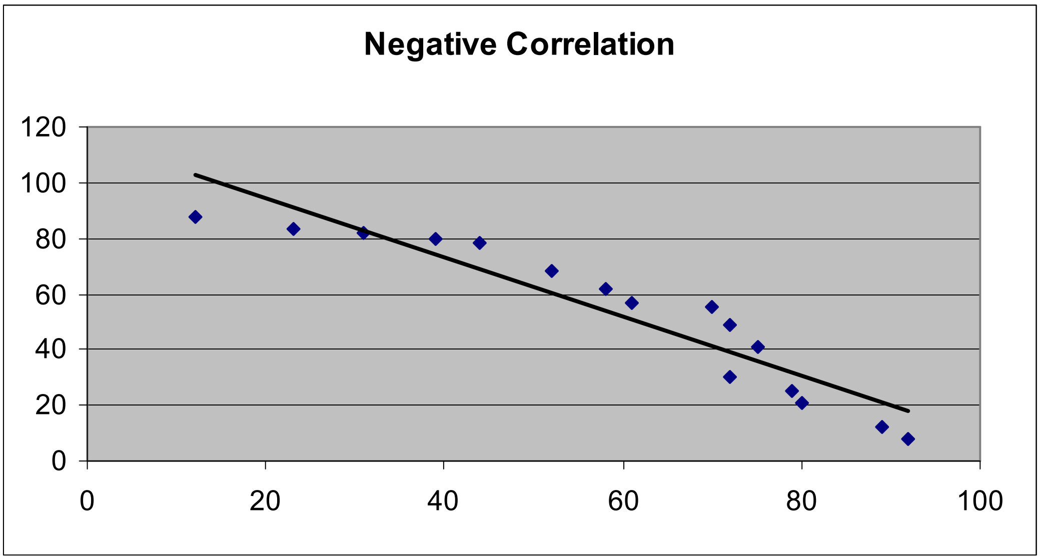
These are used to compare two sets of numerical data. The two values are plotted on two axes labelled as for continuous data. If possible a 'line of best fit' should be drawn.

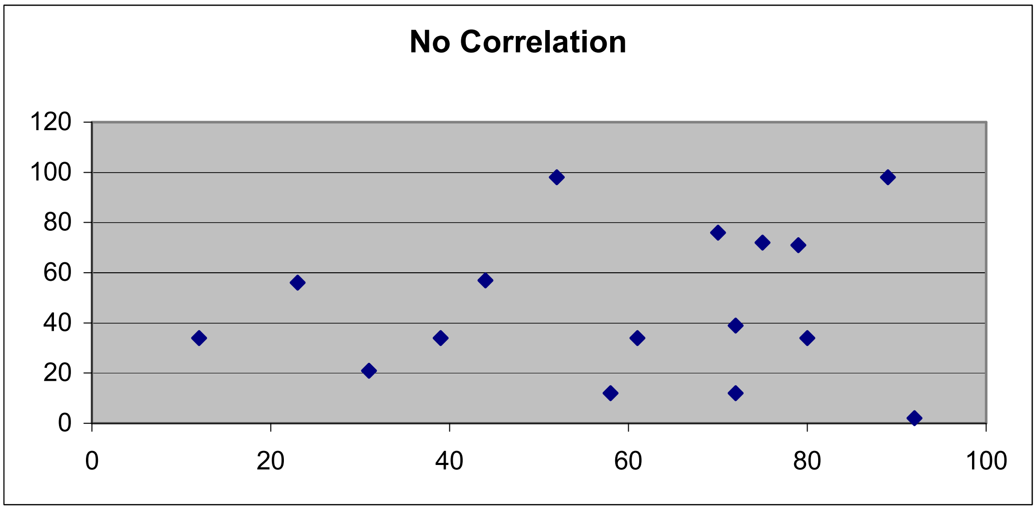


The degree of correlation between the two sets of data is determined by the proximity of the points to the 'line of best fit'

The above graph shows a positive correlation between the two variables. However, you need to ensure that there is a reasonable connection between the two, e.g. ice cream sales and temperature. Plotting use of mobile phones against cost of houses will give two increasing sets of data but are they connected?

Negative correlation depicts one variable increasing as the other decreases, no correlation comes from a random distribution of points. See diagrams below.


Negative Correlation
120
100
80
60
40
20
0
0
20
40
60
80
100


No Correlation
120
100
80
60
40
20
0
0
20
40
60
80
100