Numeracy Policy

Rationale

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 an understanding of the ways in which data are gathered by counting and measuring, and presented in graphs, diagrams, charts and tables.

Policy

Every subject makes a contribution to mathematics across the curriculum because they all use some aspects of mathematics. However, certain subjects use mathematics, on a day-to-day basis, more than others.

Teachers of mathematics should:

1. 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.

2. Provide information to other subject teachers on appropriate expectations of students and difficulties likely to be experienced in various age and ability groups.

3. Through liaison with other teachers, attempt to ensure that students have appropriate numeracy skills by the time they are needed for work in other subject areas.

4. Seek opportunities to use topics and examination questions from other subjects in mathematics lessons.

Teachers of subjects other than mathematics should:

1. 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.

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

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

4. Provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to other subjects in mathematics lessons.

5. Be aware of strategies and interventions being employed in the mathematics department to raise numeracy standards.

Monitoring, Evaluation and Review

The effectiveness of this policy, as a working document, must be evaluated annually.

Suitable success criteria might be:

1 More teachers are aware of developments in mathematics and numeracy across all key stages.

2 More teachers are confident about the use of mathematics in their own subject(s).

3 More teachers plan effectively for mathematics in their own subject(s).

4 A higher proportion of students are aware of the mathematics used in other subjects.

5 A higher proportion of students are aware of the usefulness of mathematics in other subjects.

6 Increased liaison between mathematics department and other departments about strategies for teaching mathematics, times when mathematical topics are taught and subject-specific examples for use in mathematics lessons.

Cross Curricular Numeracy

Opportunities to develop numeracy will be possible in all subjects. Below are some examples of possible activities to develop the focus on numeracy across the curriculum.

ENGLISH Frequency of words (e.g. Shakespeare vs. Bacon) Line Graphs - charting emotional response Algebraic aspects of poetry structure.	**SCIENCE** Various arithmetical calculations Golden ratio/Fibonacci sequence in nature. Graphs and charts of all kinds.	**ART** Tessellation and symmetry – Escher. Geometric shapes in art – Kandinsky, Mondrian. 2D, 3D, ratios and transformations.	**D & T** Measurements and converting units. Constructions, drawing and Trigonometry. Calculations used in electronics.
GEOGRAPHY Measures, co-ordinates and scales in maps. Ability to convert between units. Graphs and charts of all kinds.	**HISTORY** Timelines and dates. Interpreting statistics. Relevance of shape in iconography/propaganda. History of maths.	**ICT** Spread sheets, databases and flowcharts. Use of functions in spread sheets for various topics in mathematics. Dimensions of graphics.	**MFL** Money and time – design menus with costs. Arithmetic in different languages. Reading numerical signs and information.
MUSIC & DRAMA Time, rhythm and meter. Pythagoras, numerical scales and ratios. Golden ratio used by composers - Debussy. Maths in set design.	**PE** Distance, speed and time calculations. Angles – closing down. Ratios – power/weight. Shape – equipment. Counting in Dance.	**RS** Use of shape in iconography – pillars of Islam or Pentecost. Importance of numbers as factors and multiples in religions – e.g. 12. Dates and calendar.	**FOOD & TEXTILES** Ratios in recipes. Measurements and converting units. Time and money. Geometry in designs and patterns or prints.

Dissemination of the Policy

This policy is available on the school website, on request to parents, the LA and OFSTED through the Head Teacher.

Other policies that have relevance are:

Curriculum
Teaching and Learning

Date approved by governors	June 2017
Date for review	June 2020

Common Approaches

Areas for Collaboration

In this section, exemplar material is provided on topics which will most likely have cross curricular relevance. It is intended to ensure consistency of practice including methods, vocabulary and notation.

Section 1 Number

Reading and writing numbers

Students must be encouraged to write numbers simply and clearly. It is now common practice to use spaces rather than commas between each group of three figures, e.g. 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, e.g. 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: BIDMAS.

Brackets, Indices, Division, Multiplication, Addition, Subtraction

This shows the order in which calculations should be completed.

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

The important facts to remember are that the Brackets are done first, then the Powers, Multiplication and Division and finally, Addition and Subtraction.

(5 + 3) x 4	$5 + 6^2 \div 3 - 4$
= 8 x 4	= 5 + 36 ÷ 3 – 4
= <u>32</u> ✓	= 5 + 12 – 4
	= <u>13</u> ✓

Care must be taken with Subtraction.

5 – 12 + 4	**NOT**	5 – 12 + 4	**INSTEAD**	5 – (12 + 4)
= -7 + 4		= 5 – 16		= 5 – 16
= -3 ✓		= -11 ✗		= -11 ✓

Some students will be familiar with BODMAS. This mnemonic serves the same purpose but changes “Indices” for “powers Of” instead.

Calculators

Some students are over-dependent on the use of calculators for simple calculations. Wherever possible, students should use mental or pencil and paper methods. It is, however, necessary to give consideration to 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 and should be encouraged to write down their steps. 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. They should not be allowed to use their phone as a calculator.

Mental Calculations

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.

$53 + 19 = 53 + 20 - 1$ $\qquad$ $284 - 56 = 284 - 60 + 4$

$32 \times 8 = 32 \times 2 \times 2 \times 2$ $\qquad$ $76 \div 4 = (76 \div 2) \div 2$

Students who are unable to recall multiplication and division facts up to 10 x 10 may benefit from the support of a multiplication grid.

Written Calculations

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

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

It is important that all teachers encourage students to write such calculations correctly, showing all working and with only a single ‘ = ’ on each line.

$5 \times 4 = 20$

$20 + 3 = 23$

$23 - 8 = \underline{15}$ ✓

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

$$2\,378 - 412 \approx 2\,400 - 400$$

$$2\,400 - 400 = \underline{2\,000} \quad ✓$$

Pencil & Paper Calculations

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

Addition & Subtraction

Column Addition: 3 456 + 975

$$\begin{array}{r} 3\,456 \\ +\ \underline{\quad 975} \\ \underline{4\,431} \\ \scriptstyle 1\ 1\ 1 \end{array}$$

Subtraction by decomposition: 8 003 – 2 569

$$\begin{array}{r} {\scriptstyle 7\ \ 9\ \ 9\ \ 1} \\ \cancel{8}\ \cancel{0}\,\cancel{0}\ 3 \\ -\ \ \underline{2\ \ 5\ 6\ 9} \\ \underline{5\ \ 4\ 3\ 4} \end{array}$$

Subtraction by ‘counting on’: 8 003 – 2 569

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

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.

$46 \times 100 = 4\,600$ ✓ $\qquad$ $5.34 \times 10 = 53.4$ ✓

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.

$350 \div 10 = 35$ ✓ $\qquad$ $53.4 \div 100 = 0.534$ ✓

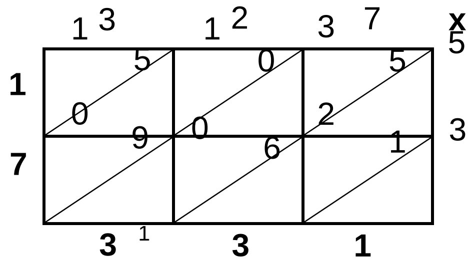
When the calculation results in a decimal, the units column must be filled with a zero to maintain the place value of the numbers.

Multiplication

Grid Multiplication: 53 x 327

X	300	20	7	Total
50	15 000	1000	350	16 350
3	900	60	21	981
				<u>17331</u>

Lattice Multiplication: 53 x 327



Repeated Multiplication: 24 x 456

10 x 456 = 4 560
10 x 456 = 4 560
2 x 456 = 1 824
2 x 456 = 1 824
Total = 10 924

Long Multiplication: 53 x 327

```
    327
 x   53
    981   (3 x 327)
 16 350   (50 x 327)
 17 331
```

Conventional long multiplication as set out above should be encouraged for the more able students.

Division

Short Division

$$4\overline{)6\;{}^{2}2\;{}^{2}4}\quad = 1\;5\;6 \qquad 5\overline{)3\;{}^{3}9\;{}^{4}6\,.\,{}^{1}0}\quad = 7\;9\,.\,2 \qquad 8\overline{)3\,.\,{}^{3}0\;{}^{6}0\;{}^{4}0}\quad = 0\,.\,3\;7\;5$$

This method is preferable but will only suit the most able students. Many of the less able students will be familiar with a method called "chunking", which is based on counting up in multiples of 5 or 10 followed by continuous subtraction. This method should be discouraged, especially of the more able students, as it only works successfully for numbers that divide equally. For the least able students, they should be encouraged to think of division as the inverse of multiplication. Instead of 60 ÷ 5 = □ ask 5 x □ = 60.

Multiplying Decimals

Complete the calculation as if there were no decimal points. In the answer, insert a decimal point, so that there is the same number of decimal places in the answer as there were in the original question.

1.25 x 0.3 (3 decimal places)	1.2 x 0.3
= 12 x 3	= 125 x 3 (1.25 x 100 = 125, 0.3 x 10 = 3)
= 375	= 375 (now must divide by 100 and 10)
= 0.375 (3 decimal places)	= 0.375

Students should be encouraged to recognise that by making the decimals whole numbers they are multiplying by 10, 100 or 1000, so they must divide their answer by the same 10, 100 or 1000, respectively.

Percentages

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 equivalents.

$$10\% = \frac{1}{10} = 0.1 \qquad 75\% = \frac{3}{4} = 0.75 \qquad 23\% = \frac{23}{100} = 0.23$$

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

50% of £140 = <u>£70</u> (halve the amount)   10% of 250g = <u>25g</u> (divide the amount by 10)

Most other percentages can be found by finding %'s and then finding multiples or fractions of that amount.

45% of £120	61% of 300g	16% of £90
25% = £30	50% = 150g	10% = £9
10% = £12	10% = 30g	5% = £4.50
<u>10% = £12</u>	<u>1% = 3g</u>	<u>1% = £0.90</u>
45% = <u>£54</u>	61% = <u>183g</u>	16% = <u>£14.40</u>

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 by replacing "of" with "x" (multiplied by).

27% of £350 becomes 0.27 x £350 = £94.50

Calculating the Quantity 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:

15 as a percentage of 60 (using simple fractions)

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

27 as a percentage of 50 (using equivalent fractions)

$$\frac{27}{50} = \frac{54}{100} = \underline{54\%}$$

39 as a percentage of 57 (using a calculator)

39 ÷ 57 = 0.684(3dp) = <u>68.4%</u>

Calculating Percentage Changes

These calculations can be done mentally or with a calculator, using and adapting the techniques above.

£48 increased by 35%
(without a calculator)
25% of £48 = £12.00
10% of £48 = £4.80
£48 + £12 + £4.80 = <u>£64.80</u>

£96 increased by 32%
(with a calculator)
£96 x (1 + 0.32)
£96 x 1.32 = <u>£126.72</u>

£134 decreased by 18%
(with a calculator)
£134 x (1 – 0.18)
£134 x 0.82 = <u>£109.88</u>

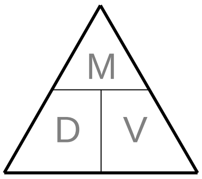
SECTION 2 – ALGEBRA

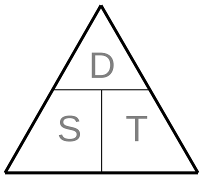
Use of Formulae

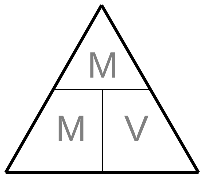
The most common use of algebra across the curriculum will be in the use of formulae. When transforming formulae students will be taught to use the ‘balancing’ method where they do the same to both sides of an equation. This will only be accessible to the more able students.

$v = u + at$ (make u the subject)	$F = ma$ (make m the subject)
$v - at = u$ [-at from both sides]	$\frac{F}{a} = m$ [÷ both sides by a]

In specific cases, triangles can be useful for students to remember the relationship between variables.



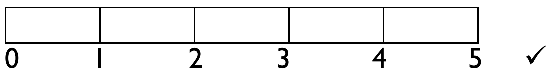


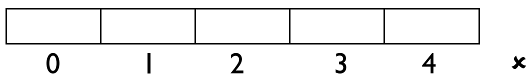


$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$	$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$	$\text{Mass} = \frac{\text{Momentum}}{\text{Velocity}}$
$\text{Volume} = \frac{\text{Mass}}{\text{Density}}$	$\text{Time} = \frac{\text{Distnace}}{\text{Speed}}$	$\text{Velocity} = \frac{\text{Momentum}}{\text{Mass}}$
Mass = Density x Volume	Distance = Speed x Time	Momentum = Mass x Velocity

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.





Axes

When drawing graphs to represent the results of an experiment, it is usual to use the horizontal axis for the variable which has a regular class interval. The horizontal axis (x) displays the independent variable and the vertical axis (y) displays the dependent variable.

For example, 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 as time does not depend on temperature, but the temperature is changing over time.

Having plotted points students can sometimes be confused as to whether or not they should join the points. This will depend on the type of graph or chart being drawn and the nature of the data. Further details appear in the following section on Data Handling.

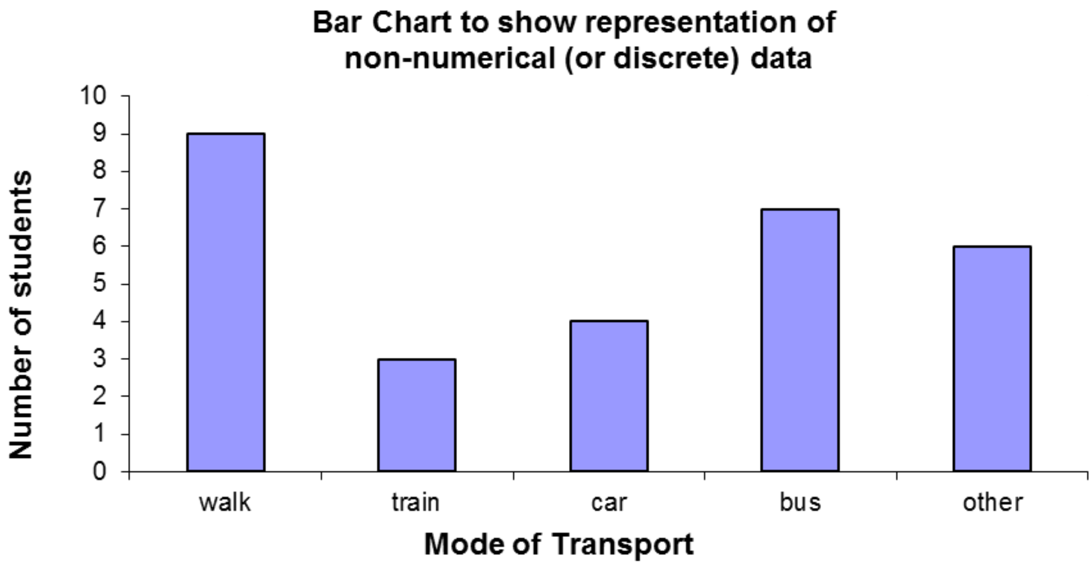
SECTION 3 – DATA HANDLING

Discrete and Continuous Data

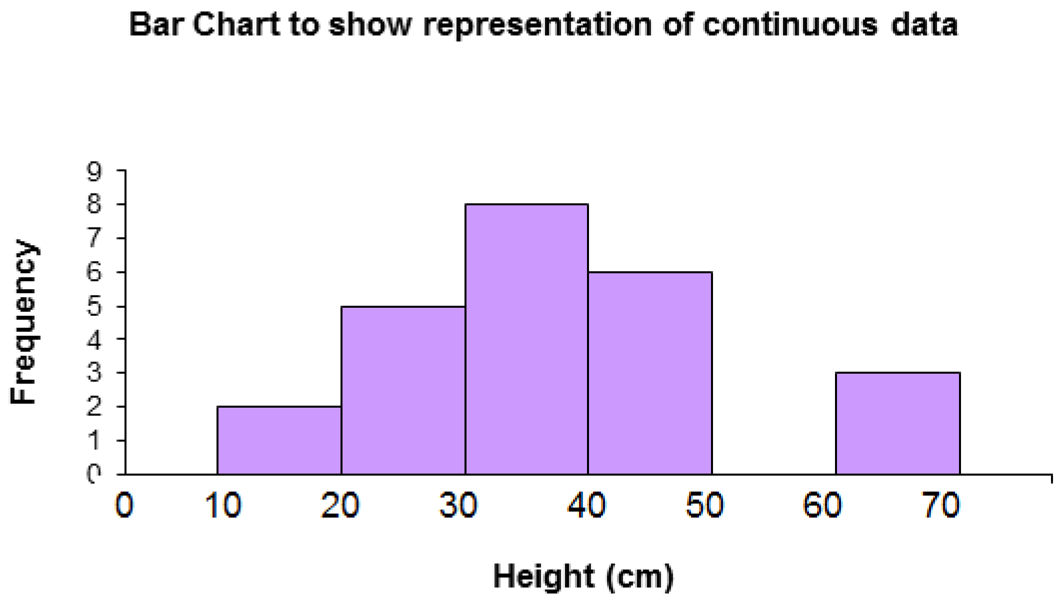
The way in which a graph or chart is drawn depends on the type of data to be processed. Discrete mean numerical values which can only take specific numbers, while continuous data can take any value. For example, the number of people is discrete because you can only have a whole number of people, but their height would be continuous because height can take any value.

Bar Charts

Graphs should be drawn with gaps between the bars if the data categories are not numerical (colours, makes of car, names). There should also be gaps if the data is discrete (shoe size, number of people, KS3 level). 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.

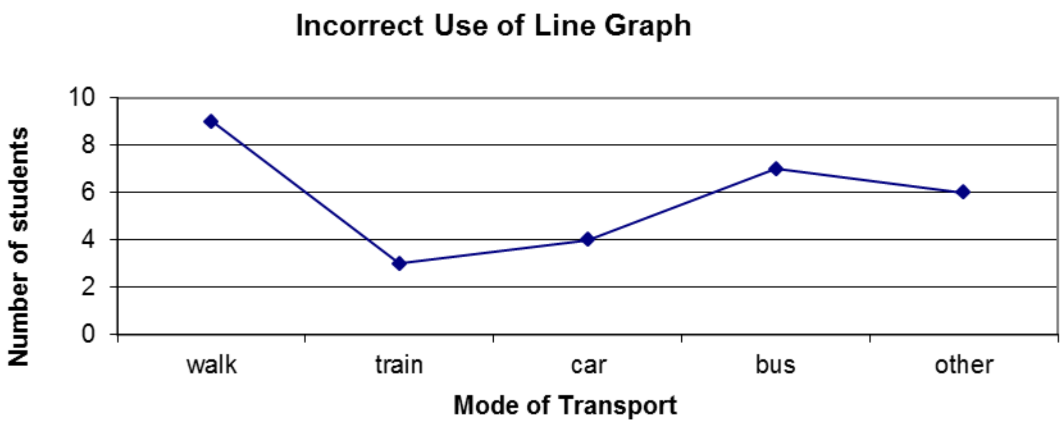


Where the data are continuous, the horizontal scale should be like the axis used for a graph.



Line Graphs

Line graphs should only be used with data which is connected. 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, a line graph would be appropriate for representing the change of temperature over time.

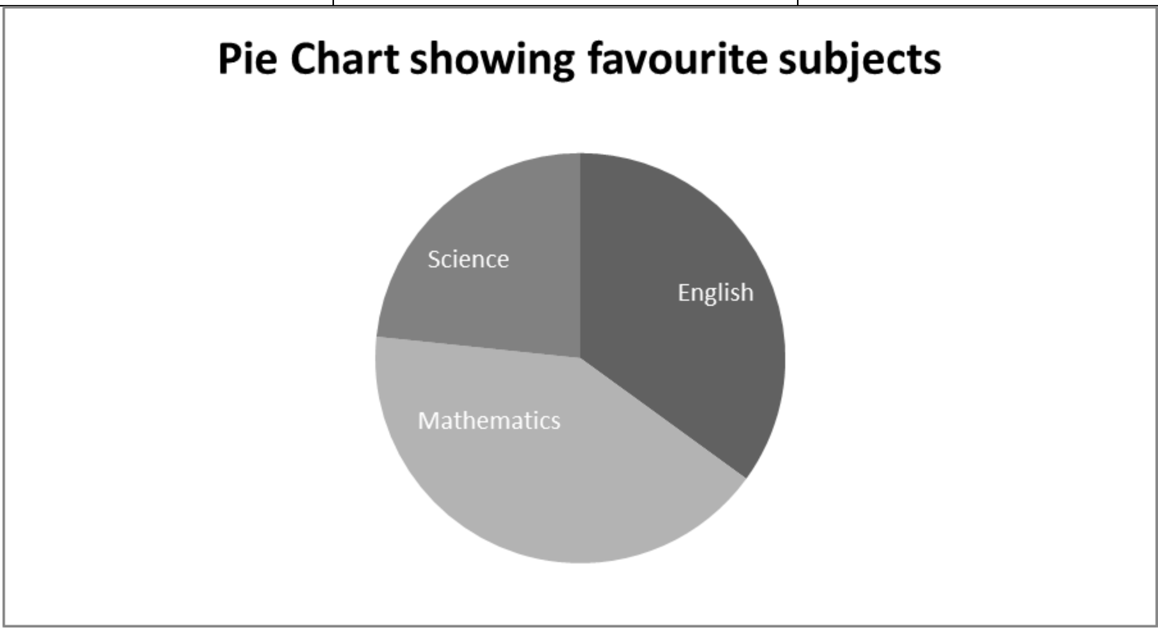


Pie Charts

To draw a pie chart, students should be encouraged to find the share of 360° to be allocated to **one** item and then multiply this number by each of the frequencies to find the angle on the pie chart.

180 students were asked their favourite subject: Each student represents $\frac{360°}{180} = 2°$ of the pie chart.

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



Students should not write the values of the angles on the pie chart.

Using Data

Range – The range of a set of data is the difference between the highest and the lowest data values. If in an examination the highest mark is 80 and the lowest mark is 45, the range is 35 because 80 – 45 = 35. It is always a single number. It is not an average, although students will commonly associate it with averages.

Averages

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.

For the following values: 3, 2, 5, 8, 4, 3, 6, 3, 2,

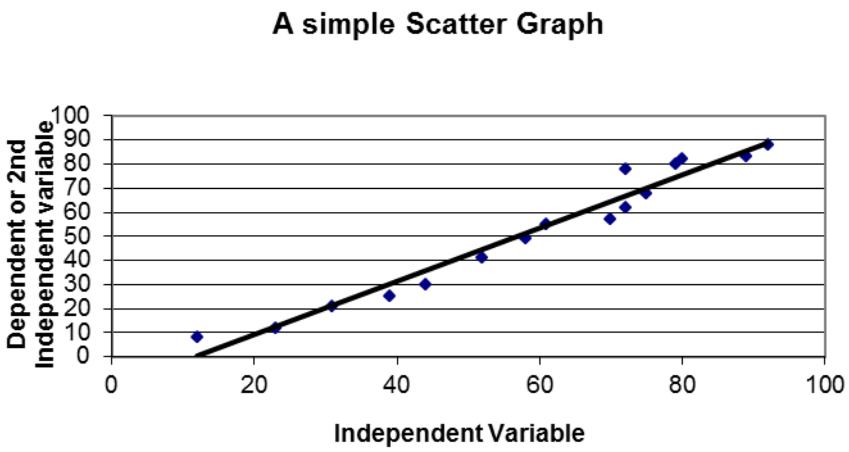
$$\text{Mean} = \frac{3+2+5+8+4+3+6+3+2}{9} = \frac{36}{9} = 4$$

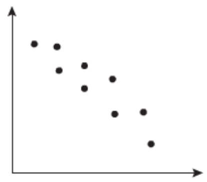
Median – Put in order and cross off ~~2~~, ~~2~~, ~~3~~, ~~3~~, 3, ~~4~~, ~~5~~, ~~6~~, ~~8~~ = 3

Mode = 3 because 3 is the value which occurs most often.

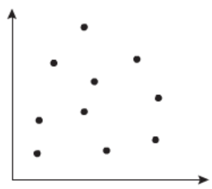
Scatter Graphs

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





Negative correlation



No correlation

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 line of best fit does not need to go through the origin. Students should be encouraged to use their line of best fit to make readings and make comments.

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, such as, ice cream sales and temperature. Plotting use of mobile phones against cost of houses will give two increasing sets of data but are unlikely to be connected.

Negative correlation depicts one variable increasing as the other decreases. No correlation comes from a random distribution of points (see above).

SECTION 4 – SHAPE, SPACE AND MEASURE

Measures

When measuring, students should be encouraged to know a variety of units and pick the appropriate units for each question. For example, the height of a room might be measured in metres while the width of a stamp might be measured in millimetres, neither will be measured in kilometres.

1m

100cm

1000mm

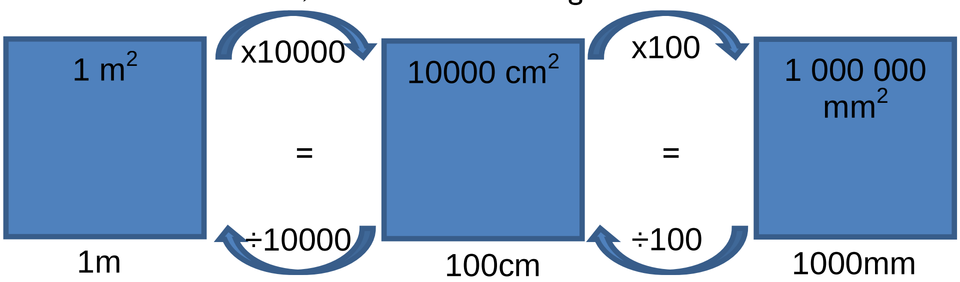
If converting between units, students should be encouraged to recognise the operation being used.

x1000 x100 x10

1km = 1 000m = 100 000cm = 1 000 000mm

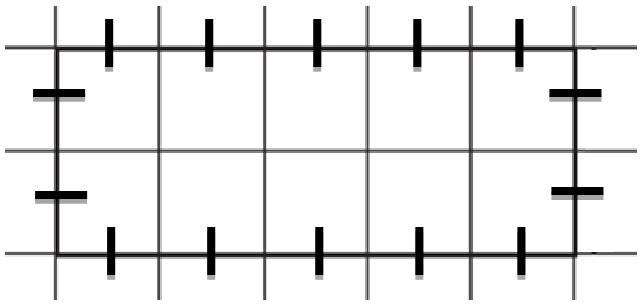
÷1000 ÷100 ÷10

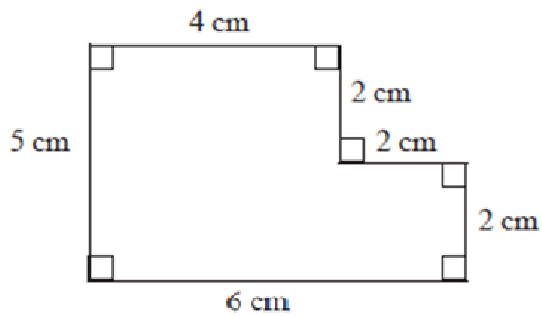
If converting between units^2 and units^3, students must recognise that the above conversions no longer hold.



Perimeter

The perimeter of a shape is found by finding the sum of each of the sides. For the less able students, the shape may be drawn on cm squared paper so that they can mark each cm and count the perimeter.





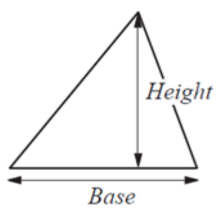
Perimeter = 14cm (count the marks)

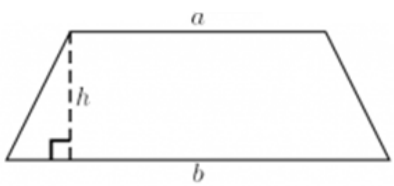
Perimeter = 6 + 5 + 4 + 2 + 2 + 2 = 21cm

Area

The area of a shape is found by counting the number of squares used to make the shape (cm²). For the less able students, the shape may be drawn on cm squared paper so that they can mark each square and count the area. The areas of different shapes are found by using different formulae (Examples below).

1	2	3	4	5
10	9	8	7	6





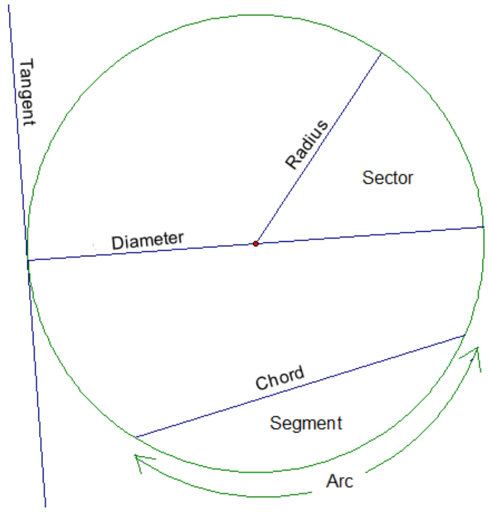
Area = 10 cm^2 (or 2 x 5 = 10cm^2)

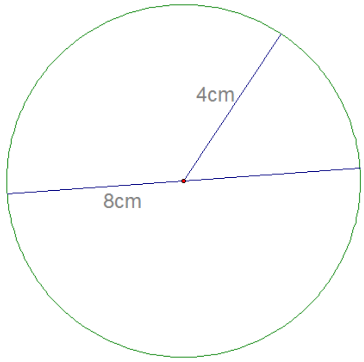
Triangle area = $\frac{1}{2}$ bh

Trapezium area = $\frac{1}{2}$(a + b)h

Circles

The perimeter and area of a circle are calculated using π. 3.14 is an acceptable approximation for π, otherwise the calculator value should be used. Key words relating to the parts of a circle are listed below.





Circumference = πd or 2πr

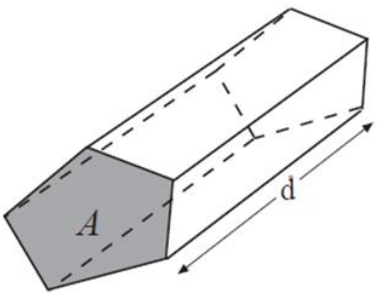
C = 3.14 x 8 = 25.12 cm

Area = πr^2

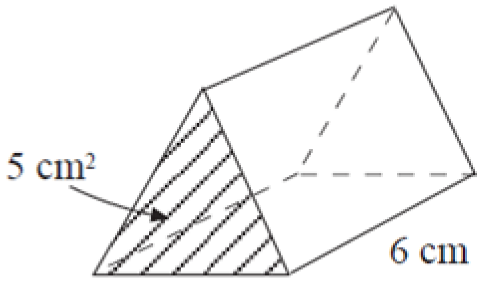
Area = 3.14 x 4 x 4 = 50.24 cm^2

Volume of Prisms

Volume of prisms is calculated by finding the area of the cross-section and multiplying it by the depth. The cross-section is the uniform face, while the depth is often referred to as the length of the object.



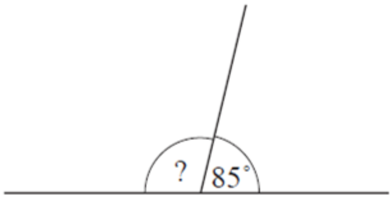
Volume = Area of Cross-Section x depth



Volume = 5 x 6 = 30 cm^3

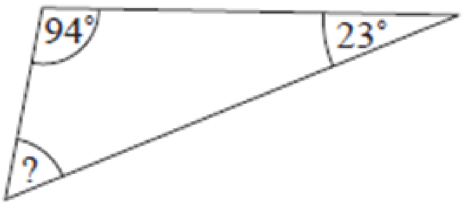
Angles

Some angle rules and can be used to calculate various other angles in shapes or on lines. For example the angles in any polygon can be found by splitting the shape into triangles. Students should be encouraged to give a reason to accompany their answer.



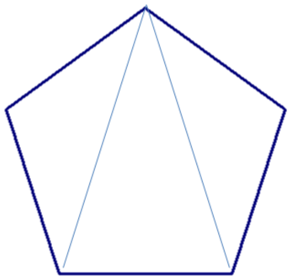
Angles on a straight line add up to 180°

180 – 85 = <u>95°</u>



Angles in a triangle add up to 180°

180 – 94 – 23 = <u>63°</u>



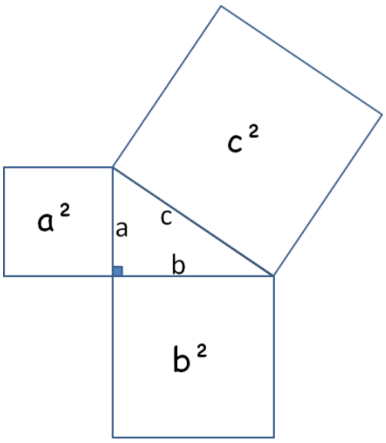
A pentagon can be split into 3 triangles

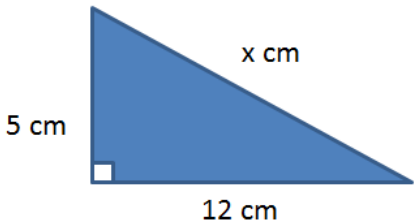
3 x 180 = 540°

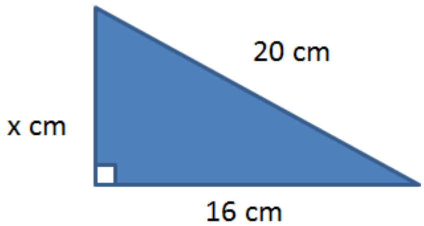
Interior angles of a pentagon add up to 540°

Pythagoras' Theorem

Pythagoras can only be applied to right angled triangles. It describes the relationship between the two shorter sides (a & b) and the hypotenuse (c). The sum of the squares of the two shorter sides equals the square of the longest side. Students will be more familiar with the formula: $a^2 + b^2 = c^2$. Students should be encouraged to label the triangle to ensure that they complete the question correctly.





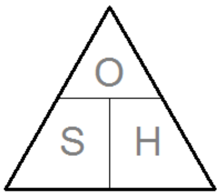


$a^2 + b^2 = c^2$
$5^2 + 12^2 = x^2$
$25 + 144 = x^2$
$169 = x^2 \quad (\sqrt{169})$
$x = \underline{13\text{ cm}}$

$a^2 = c^2 – b^2$
$x^2 = 20^2 – 16^2$
$x^2 = 400 – 256$
$x^2 = 144 \quad (\sqrt{144})$
$x = \underline{12\text{ cm}}$

Trigonometry

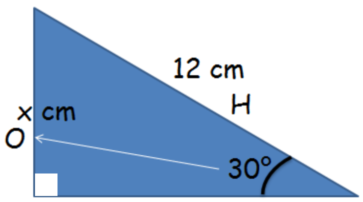
Trigonometry describes the relationship in triangles between the sides and angles. The sides are named in relation to the given angle as the opposite, adjacent and hypotenuse. Students should be encouraged to label the triangle to ensure that they complete the question correctly. Most will be familiar with the mnemonic: **SOHCAHTOA**. Sine = opposite/hypotenuse, Cosine = adjacent/hypotenuse, Tangent = opposite/adjacent. Triangles also can be useful for students to remember the relationship between each of the ratios.



$$\sin\theta = \frac{\text{Opposite}}{\text{Hypotneuse}}$$

$$\text{Hypotenuse} = \frac{\text{Opposite}}{\sin\theta}$$

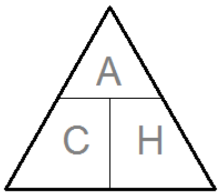
$$\text{Opposite} = \sin\theta \times \text{Hypotenuse}$$



$$\text{Opposite} = \sin\theta \times \text{Hypotenuse}$$

$$x = 12\sin 30°$$

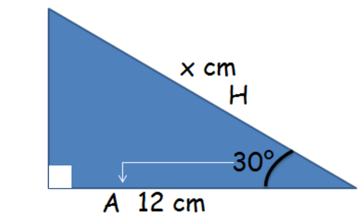
$$x = \underline{6\text{cm}}$$



$$\cos\theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\text{Hypotenuse} = \frac{\text{Adjacent}}{\cos\theta}$$

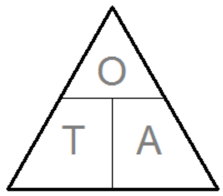
$$\text{Adjacent} = \cos\theta \times \text{Hypotenuse}$$



$$\text{Hypotenuse} = \frac{\text{Adjacent}}{\cos\theta}$$

$$x = \frac{12}{\cos 30°}$$

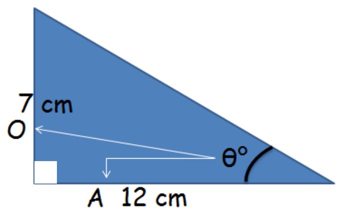
$$x = \underline{13.9\text{cm}}\ (1\text{dp})$$



$$\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$$

$$\text{Adjacent} = \frac{\text{Opposite}}{\tan\theta}$$

$$\text{Opposite} = \tan\theta \times \text{Adjacent}$$



$$\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$$

$$\theta = \tan^{-1}\frac{7}{12}$$

$$\theta = \underline{35.7°}\ (1\text{ dp})$$