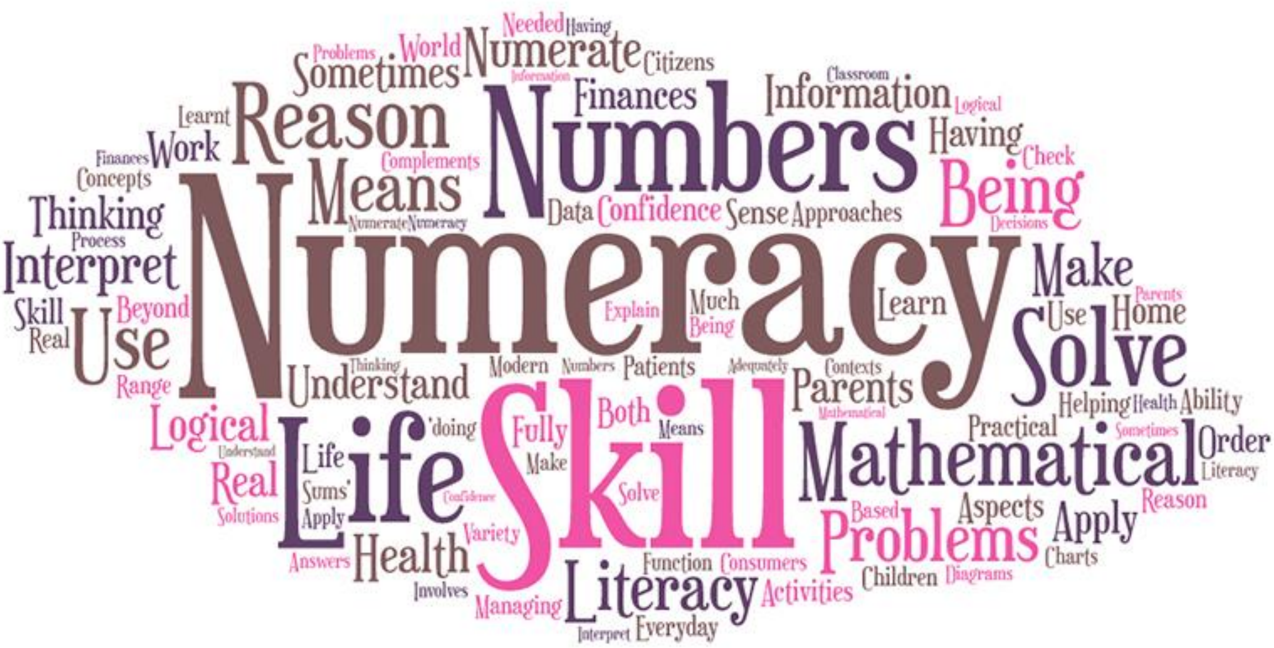
SKEGNESS ACADEMY

Numeracy Policy

Skegness Academy is committed to raising the standards of numeracy of all of its students across all key stages.

This will enable our students to develop their skills resulting in them being able to access the numeracy across the Academy curriculum, and also preparing them for the demands of further education, employment and adult life.

October 2020



SKILLS KNOWLEDGE AMBITION

Skegness Academy, together we achieve the extraordinary!

Contents

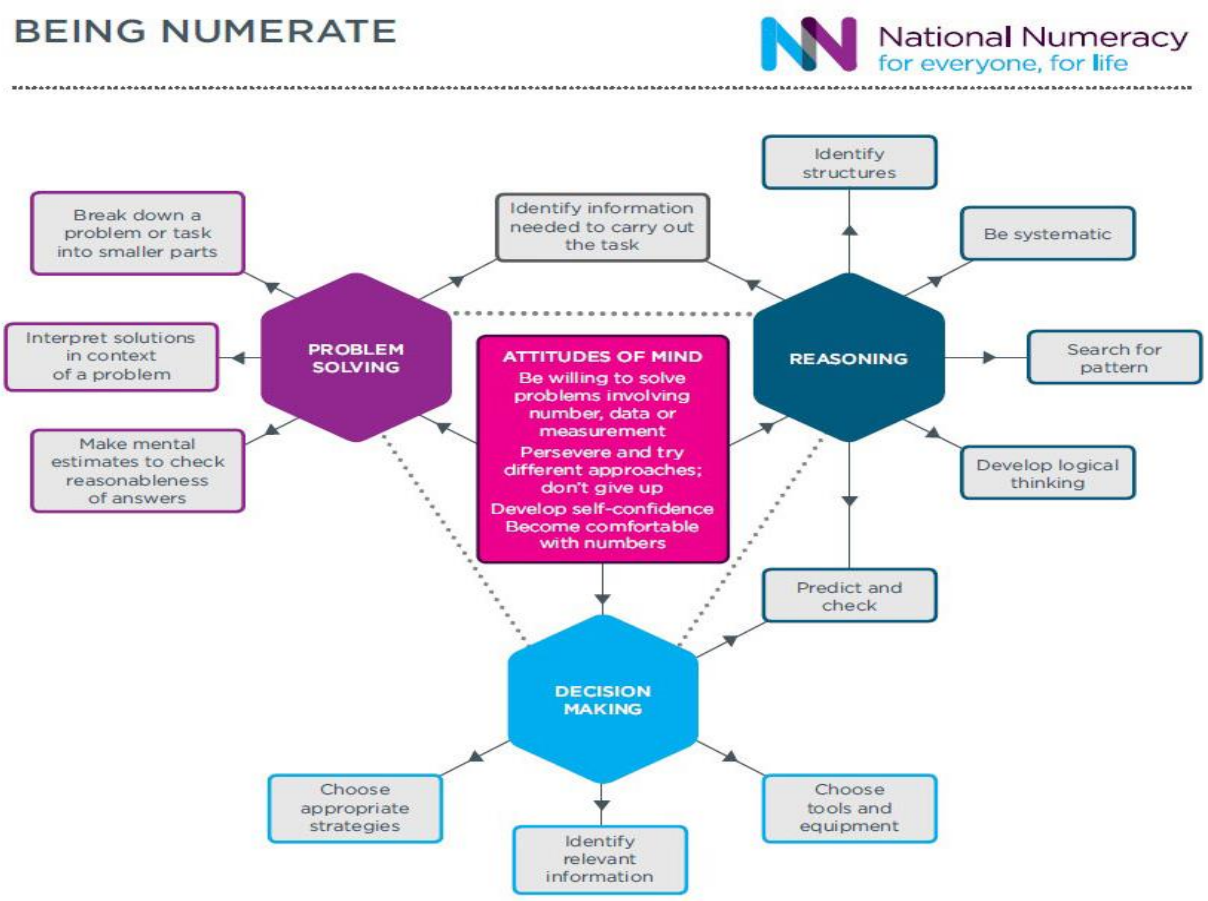
'Numeracy is not limited to the ability to use numbers, to add, subtract, multiply and divide. Numeracy encompasses the ability to use mathematical understanding and skills to solve problems and meet the demands of day-to-day living in complex social settings. To have this ability, a young person needs to be able to think and communicate quantitatively, to make sense of data, to have a spatial awareness, to understand patterns and sequences, and to recognise situations where mathematical reasoning can be applied to solve problems.' **(Ruairí Quinn)**

Our Aim

Our aim is to raise the achievement of all students by seeking to develop their numeracy skills by consistent and accurate application across the curriculum. Numeracy is a key skill in students' learning and all students are entitled to quality experiences in this area. The teaching of numeracy is the responsibility of all staff and the school's approach should be consistent as possible across the curriculum.

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 is gathered by counting and measuring, and presented it in graphs, diagrams, charts and tables.



(This should be displayed in every classroom)

Intent

The intent of our whole school Numeracy policy is to develop and improve numeracy standards across the Academy by:

- Improving the numeracy skills of the Academies students and develop their confidence in its application
- Raise the profile of mathematics and identify its importance in all curriculum areas
- Ensure consistency of practice across departments
- Encourage collaboration between faculties
- Provide all staff with the numeracy skills which will enable them to facilitate the improvement of numeracy in the Academy

The Numeracy Policy responsibility for all staff is to:

- Implement the numeracy policy consistently
- Identify the numeracy levels of their students through data (numeracy age testing in year 7 & 8)
- Demonstrate a level of competence with basic numeracy skills
- Provide the opportunities to address any numeracy needs in their lessons

Implementation

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 to other subject teachers 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 by the time they are needed for work in other subject areas
- Seek opportunities to use topics and examination questions from other subjects in mathematics lessons
- Display EZY maths posters of current topics in your classroom to support students

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
- Display EZY maths posters of current topics in your classroom to support students
- Provide information for mathematics teachers on the stage at which specific numeracy skills will be required for particular groups
- Provide resources for mathematics teachers to enable them to use examples of applications of numeracy relating to other subjects in mathematics lessons

Numeracy catch-up programme:

Instrumental in developing and improving the numeracy skills of the students at the Academy is the 'catch-up' programme which is managed by the SEND team and supported by LBi when required.

Any student that has not achieved a standardised score of 100 in their KS2 SATS numeracy test is eligible for numeracy 'catch up' funding and will therefore be entered into this programme as they are currently not reaching age related expectations. Any student in this programme will be tested separate to the numeracy age testing. The progress of students is closely monitored and the intervention will not terminate until the students proficiency has significantly improved and on retest an ARE score of 100 is reached.

Students that achieve a standardised score of 85+ in our testing will be monitored and can work on programmes at home as well as being invited to attend breakfast and lunch time numeracy clubs. All of these students have access to mathletics and TT Rockstars.

From the numeracy catch up testing any student that is scoring less than a standardised score of 85 is deemed significantly below age related expectations and will receive intervention. These students will work on a variety of programmes to boost their numeracy ability and will also receive an additional numeracy lesson.

Any specific barriers to learning which are found to impede a student's progress are communicated to teaching staff.

Numeracy Age Testing:

Numeracy Age testing is completed by every student in year 7 and 8 irrespective of their KS2 score. The Numeracy Age test converts the students score into an age that ranges from 5 years to 16+ (in years and months). Students that achieve a grade that is less than their chronological age will be given a intervention booklet as well as continued in class support with their numeracy skills. Numeracy Age testing occurs biannually and all results will be shared with all staff to inform their planning when numeracy skills are required within their subject.

Thinking Mathematically

We need to get away from numeracy being shoehorned into lessons just to tick a box, we need to support our students to 'think like a mathematician' and get away from:

- English: count the number of lines in a poem
- Art: calculate the amount of paint needed to cover your canvas
- History: Multiply the number of King Henrys by the number of King Georges
- PE: time yourself running 100m, take your pulse, draw a graph. . .

In order to start 'thinking like a mathematician' we need to break down the wall of 'I can't do maths' and as a united team of teachers make that phrase something that is socially unacceptable to say; both by staff and students.

These are some of the ways mathematical thinking might naturally occur across the curriculum:

- Identifying structures & relevant data
- Being systematic
- Searching for patterns
- Thinking logically
- Predicting & checking

- Breaking down problems into smaller parts
- Interpreting solutions in context of problem
- Estimating to check likelihood of answers

These ways of holding the world are not only essential for an understanding of mathematics but also enrich every area of life.

Transferable Skills

The transfer of skills is something that many pupils find difficult. It is essential to start from the basis that pupils realise it is the same skill that is being used; sometimes approaches in subjects differ so much that those basic connections are not made, hence the need for the consistency of practice mentioned above.

Some mathematical opportunities across the curriculum are listed below (this is not an exhausted list).

Subject	Ideas
Arts	• Use standard measures to find length • Form repeating patterns (tessellations), making use of reflection, rotation and translation. • Use of paint mixing as a ratio context. • Many patterns and constructions in our own and other cultures are based on spatial ideas and properties of shapes, including symmetry. • Calculating the golden ratio in pictures/drawings (Mona Lisa) • Perspective and scale • Drawing in 3 dimensions • Loci for movement in dance
Business Studies	• Estimation from spreadsheets • Use of mathematical vocabulary e.g. sum, profit • Sketching graphs to show change over time • Accurate graph drawing including labelling axes • Sampling and surveying in market research • Designing data collection sheets • Producing and interpreting averages and charts • Costings • Ratio • Formulae • Awareness of sensible answers – approximate calculation including percentages, fractions, multiplication, division etc.
Design Technology	• Use standard measures (metric and imperial) to find length, mass, time, force, temperature area or capacity. • Use mathematical symbols and notation, construct and interpret graphs and charts. • Use scale and ratio to produce drawings. • Using ruler, compass, protractor correctly • Using recipes as a ratio/proportion context • Estimation of quantities or of results of calculations • Sampling and surveying • Reading scales on equipment • Converting between units • Drawing in 2 dimension or 3 dimensions, including plans and elevations • Time planning including Gantt charts, timelines etc. • Pricing the cost of a meal/product

Subject	Ideas
English	• Comparison of 2 data sets on word and sentence length. • Graph sketching e,g, tension throughout an act of a play • Use of fractions and percentages in persuasive writing including misleading graphs • Reading and writing numbers, identifying centuries • Coding, secret codes • Grouping/categorising ideas/words
Geography	• Use mathematical symbols and notation, construct and interpret graphs and charts. • Use grids to identify position (links to co-ordinates and grid references). • Use negative numbers to interpret below sea level. • Use standard measures (metric and imperial) to find length, mass, time, force, temperature area or capacity, especially distance and area. • Discussing evidence in history or geography may involve measurement, estimation and approximation skills, and making inferences. • Pupils will make statistical enquiries, for example, in analysing population data to explore and compare lifestyles; they will also use a wide range of measurements and rates of change. • The study of maps includes the use of coordinates and ideas of angle, direction, position, scale and ratio.
History	• Use timelines and interpret negative numbers. (AD and BC) • Use fractions and percentages to express and compare proportions • Use scale to interpret maps and diagrams • Use mathematical symbols and notation, construct and interpret graphs and charts.
ICT	• Use mathematical symbols and notation (sigma for sum), construct and interpret graphs and charts. • Use formulae to calculate and to interpret data in spreadsheets. • In ICT lessons, pupils will collect and classify data, enter them into data-handling software, produce graphs and tables, and interpret and explain their results. Their work in control will include the measurement of distance and angle. • Spreadsheet skills, used in modelling and simulations, rely on the numeric, algebraic and graphical skills involved in constructing formulae and generating sequences, functions and graphs.
MFL	• Use dates, sequences and counting in other languages; • Use basic graphs and surveys to practise foreign language vocabulary and reinforce interpretation of data. • Use of and calculation with money • Conversion/exchange rates • Directions
Music	• Use addition of fractions in bar music • Use counting for beats • Use sound waves, frequency and oscillations • Use graph sketching to demonstrate change over time e.g. in dynamics over a piece

Subject	Ideas
PE	• Use time, height and distance in measurements. • Telling the time, timekeeping • Reading from scales using measuring equipment • Calculation of speed, acceleration, deceleration and graphing of these over time during an action/event • Use fractions to identify time. • Design data collection sheets. • Collect and record real data, find the averages, compare and draw conclusions. • Sequencing results (decimals, lengths etc) • Scoring • Athletic activities use measurement of height, distance and time, and data-logging devices to quantify, explore, and improve performance. • Ideas of counting, time, symmetry, movement, position and direction are used extensively in music, dance, gymnastics, athletics and competitive games. E.g. angles, rotation, planes, axes
Science	• Use formulae to calculate work, power, mass, density • Rearrange formulae • Use graphs to represent data, interpretation of graphs • Estimating quantities or results of calculations • Use standard measures to find length, mass, time, force, temperature, area or capacity; • Hypothesise before an experiment, consider limitations to findings afterwards • Manipulate numerical data from their experiments and do calculations including averages; • Record results in tables – choose appropriate form and design data collection sheets • Use mathematical symbols and notation, construct and interpret graphs and charts. • Constructing graphs, extrapolating, recognising patterns • Take readings from scales.

Appendix One

Examples of skills and facts used with the academy

Reading and writing numbers

Pupils must be encouraged to write numbers simply and clearly. The symbol for zero with a line through it (∅), ones which could be mistaken for 7 (1) and continental sevens (7) should be discouraged.
Most pupils are able to read, write and say numbers up to a thousand, but often have difficulty with larger 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 pupils 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. 3 027 451 is three million, twenty seven thousand, four hundred and fifty one.

Order of Operations

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

Brackets, **I**ndices, **D**ivision, **M**ultiplication, **A**ddition, **S**ubtraction

Not: Indices is another word for powers. It includes squares, cubes, roots, and other higher, fractional and negative powers.

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

5 + 3 x 4
means
5 + 12
= 17 ✓

NOT 5 + 3 x 4
means 8 x 4
= 32 **x**

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

eg(i) (5 + 3) x 4
= 8 x 4
= 32

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

= 13

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

eg 5 + 12 – 4 **or** 5 + 12 – 4
= 17 – 4 = 5 + 8
= 13 ✓ **=** 13 **x**

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

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

Calculators

Some pupils are over-dependent on the use of calculators for simple calculations. **Wherever possible pupils should be encouraged to use mental or pencil and paper methods**. It is, however, necessary to give consideration to the ability of the pupil and the objectives of the task in hand. In order to complete a task successfully it may be necessary for pupils 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 pupils 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 pupils 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 100
- recall multiplication and division facts for tables up to 12 x 12.

Pupils 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 pupils 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 x 8 = 32 x 2 x 2 x 2

76 ÷ 4 = (76 ÷ 2) ÷ 2

Written Calculations

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

eg 5 x 4 = 20 + 3 = 23 – 8 = 15 is not true since 5 x 4 ≠ 15

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

eg 5 x 4 = 20
20 + 3 = 23
23 – 8 = 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 = 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 ✓

All pupils should be able to use some pencil and paper methods involving simple addition, subtraction, multiplication and division. Some less able pupils 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, pupils should be encouraged to estimate a rough value for what they expect the answer to be. This should be done by rounding the numbers to one significant figure 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 pupil 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 pupils may be familiar.

Addition Estimate

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

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

Subtraction

Estimate

8 000 – 3 000 = 5000

eg
$$\begin{array}{r} {\scriptstyle 7\ 9\ 9\ 1} \\ 8\not{0}\not{0}3 \\ -2\,5\,6\,9 \\ \hline 5\,4\,3\,4 \end{array}$$

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.
The decimal point does not move - the numbers do.

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 ÷ 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

```
    3 2 7
x     5 3
-------------
    9 8 2 1   <-------  327 x  3
1 6 1 3 3 5 0 <-------  327 x 50
-------------
1 7 3 3 1
-------------
```

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

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

```
 456          456        9120
x 20         x  4       +1824
-----        -----      -----
9120    +    1824       10 924
-----        -----      -----
1 1               2 2
```

Division

```
          2  7
      ------------
1  3 | 3  5  1
     |
   - | 2  6  0
     ---------
```

```
    9 1
-   9 1
  -----
      0
```

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) $1.2 \times 0.3 \approx 1 \times 0.3 = 0.3$

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

$\therefore 1.2 \times 0.3 = 0.36$

Similarly:

eg (ii) $43.14 \times 3.5 \approx 40 \times 4 = 160$

```
      4  3  .  1  4   (2 decimal places)
x           3  .  5   (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 pupils 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 pupils will be expected to use in other areas. It is important to reiterate that "per cent" means "out of 100" (compare to century, Cents in a dollar etc).

Calculating percentages of a quantity

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

eg 10% = $^{1}/_{10}$ =0.1 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. Pupils 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)

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

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

$$\frac{39}{57} = 39 \div 57 = 0.684\ (3dp) = 68.4\%$$

Appendix Two

Maths Glossary

Acute angle – An angle measuring less than 90°
Add/addition – To join two or more quantities to get the sum or total
Adjacent – Next to
Algebra – An area of maths where unknown quantities are represented by letters
Alternate angles – Equal angles within parallel lines that are identified by a Z shape
Angle – The amount of turning between two lines meeting at the same point
Anti-clockwise – The opposite direction to which hands move round a clock
Approximate – To estimate a number, usually through rounding
Arc – A section of the circumference of a circle
Area – The size of the space a surface takes up, measured in units^2
Ascending – Going up
Average – A summary of a set of data, either mode, median and mean
Axis – Reference lines on a graph
Bar graph – A graph using bars to show quantities for easy comparison
Bisect – To divide into two equal sections
Box plot – A diagram that uses a number line to show the distribution of data through the minimum, lower quartile, median, upper quartile and maximum
Brackets – Symbols used to enclose an expression, ( )
Calculate – Work out, find the value of
Calculator – A device that performs mathematical operations
Capacity – The amount a container can hold
Centimetre – A metric unit for measuring length (10 millimetres)
Centre – The middle
Certain – Inevitable, will definitely happen
Chance – The likelihood that a particular outcome will occur
Circle – A 2D shape whose edge is always the same distance from the centre
Circumference – The perimeter of the circle
Chord – A straight line joining two points at the edge of the circle, not through the centre
Clockwise - The direction which hands move round a clock
Common denominator – A denominator which is a multiple of the other denominators
Compasses (pair of) – A mathematical instrument used to draw circles
Cone – A 3D shape with a circular base which tapers to a single vertex at the top
Congruent – Having the same shape and the same size
Continuous data – Data which could have an infinite number of values with a particular range
Coordinates – Pairs of numbers used to show a position of a graph with axes, eg (2,-4)
Corresponding angles– Equal angles within parallel lines that are identified by a F shape
Cross section – The face that results from slicing through a prism
Cube – A 3D shape with 6 square faces
Cuboid A 3D with 3 pairs of rectangular faces
Cube number – A number found by multiply a number by itself 3 times, eg $4^3 = 4 \times 4 \times 4 = 64$
Cylinder – A prism whose cross section is a circle
Data – A collection of information
Decagon – A 2D shape with 10 sides
Decimal – A part of a number or a whole, 0.4 or 3.279
Decrease – To make smaller
Degree – The unit with which angles are measured, eg 67°
Denominator – The bottom number of a fraction
Density - The degree of compactness of a substance, found by mass ÷ volume
Descending – Going down
Diagonal – A straight line joining two non-adjacent vertices
Diameter – A line going through a circle edge to edge that passes through the centre
Dice – A cube marked with dots or numbers
Digit – A symbol used to show a number, 1 2 3...
Discrete data - Data which has only a finite number of values

Divide/division – To share equally, ÷
Double – To multiply by 2
Edge – The part of a 3D shape where 2 faces meet
Equal to/equals – To have the same value, =
Equation - Two expressions that are equal to each other
Equilateral triangle – A triangle with 3 equal sides and 3 equal angles
Equivalent fractions – Two fractions representing the same proportion
Estimate – To find a close answer by rounding
Even number – A number in the 2x table
Even chance – An outcome shares the same probability of occurring with another
Expression (algebraic) – Made up of terms and operations (algebra)
Exterior angle – The angle formed outside a polygon when a side is extended
Face – The flat part of a 3D shape
Factor – A number that divides exactly into another
Formula – A mathematical rule to describe a relationship between quantities
Fraction – A part of a number or a whole, $\frac{3}{4}$
Frequency – The number of times a particular value appears in a set of data
Gradient – The slope of a line
Gram – A metric unit for measuring mass
Graph – A drawing or diagram used to record information
Half – To divide by 2
Hexagon – A 2D shape with 6 sides
Heptagon – A 2D shape with 7 sides
Highest common factor – The greatest of all the factors shared by a pair of numbers
Horizontal – A straight line parallel to the horizon
Hypotenuse – The longest side of a right-angled triangle
Impossible – Will not happen
Improper fraction – A fraction with a larger numerator than denominator
Increase – To make bigger
Index/indices – Numbers or letters raised to a power, 4^2 or a^6
Inequality – Two amounts not equal to each other, < ≤ ≥ >
Infinite/infinity – Unlimited, goes on forever
Integer – A whole number
Interior angle – An angle inside a polygon
Intersect – The point where two lines cross
Inverse operations – Opposite operations, + inverse to -, x inverse to ÷
Irregular (polygon) – A polygon with different sized sides and angles
Isometric (paper) – equal dimensions between dots
Isosceles triangle – A triangle with 2 equal sides and 2 equal angles
Kilogram – A metric unit for measuring mass (1000 grams)
Kilometre – A metric unit for measuring length (1000 metres)
Kite – A 2D shape with two pairs of equal sides and one pair of opposite angles that are equal
Line of symmetry – Divides a shape into two congruent sides
Linear – Has one dimension
Litre – A metric unit for measuring capacity (1000 millilitres)
Lowest common multiple - The smallest of all the multiples shared by a pair of numbers
Maximum – The greatest possible value
Mean – An average found by finding the sum of the data and dividing by the number of values
Median – An average found by locating the middle value of an ordered set of data
Metre – A metric unit for measuring length (100 centimetres, 1000 millimetres)
Midpoint – The middles point between 2 values or 2 coordinates
Millilitre – A metric unit for measuring capacity
Millimetre – A metric unit for measuring length
Minimum – The smallest possible value
Minus - Negative
Mixed number – A number comprised of an integer and a fraction
Mode – An average found by identifying the value with the highest frequency
Multiply/multiplication – A number is added to itself a number of times, x

Multiple – A number in another number's times table
Negative – Below/less than zero/0, -4
Net – A 2D shape that can be folded into a 3D shape
Nonagon – A 2D shape with 9 sides
Number line – A line marked with numbers
Numerator – The top number of a fraction
Obtuse angle - An angle measuring more than 90° but less than 180°
Octagon – A 2D shape with 8 sides
Odd number – A number not in the 2x table
Operations – Add, subtract, multiply, divide
Opposite angles – A pair of equal angles directly opposite each other formed by the intersection of 2 straight lines
Origin – Coordinate (0,0)
Outcome – One of the possible results of a probability experiment
Outlier – A value far away from the others in a set of data (also called anomaly)
Parallel – Lines that are the same distance apart
Parallelogram – A 2D shape with 2 pairs of parallel lines
Pentagon – A 2D shape with 5 sides
Percent/percentage – A part of a number or a whole. Per cent means out of 100, 46%
Perimeter – The distance around the edge of a 2D shape
Perpendicular – Two lines meeting at a right-angle
Pi – Ratio of the circumference to a circle's diameter, π, 3.141592...
Pictogram – A graph using pictures to represent frequency
Pie chart – A graph using a divided circle where each section represents a part of the total
Place value – The value of a digit depending on its place in the number
Plan – A diagram showing the view from directly above
Plane – A flat surface
Polygon – A 2D shape with straight sides
Population – Whole set from which a sample is taken
Positive – Above/greater than zero/0
Prime – a number with only two factors, 1 and itself
Prime factor – A number which is both a factor of something and a prime
Prism – A 3D shape with a constant cross section throughout
Probability – The chance that a particular outcome will occur
Product – The result of multiplying
Proportion – A part to whole comparison
Protractor – An instrument used to measure the size of angles
Pyramid - A 3D shape with a polygon base which tapers to a single vertex at the top
Pythagoras – In any right-angled triangle where c is the hypotenuse, $a^2 + b^2 = c^2$
Quadrant – Any quarter of a plane divided by an x- and y-axis
Quadrilateral – A 2D shape with 4 sides
Qualitative data – Non-numerical data
Quantitative data – Numerical data
Quantity – A number of something
Radius – The distance from the centre of a circle to its edge
Random – A chance pick from a number of items
Range – The smallest value subtracted from the greatest value
Ratio – Comparative value of 2 or more amounts
Reciprocal – One of two numbers whose product is 1, ½ and 2
Rectangle – A quadrilateral with two pairs of parallel sides with different lengths and all vertices are right-angles
Recurring decimal – A decimal which has repeating digits or a repeating pattern of digits
Reflection – A mirror view
Reflex angle – An angle measuring more than 180° and less than 360°
Regular polygon – A polygon with all sides and angles equal
Remainder – The remaining amount after dividing a quantity by a number that is not a factor
Rhombus – A parallelogram with all sides equal
Right-angle – An angle measuring exactly 90°
Right-angled triangle – A triangle with one right-angle
Rotation – To turn an object

Rotational symmetry – When a turning shape has the same outline as the original shape
Round/rounding – Change the number to a more convenient value
Sample – A part of the population to be used
Scale factor – The ratio of two corresponding edges on a scaled drawing
Scalene triangle – A triangle with all different sides and all different angles
Scatter diagram – A diagram with coordinates plotted to show the relationship between two variables
Sector – A section of a circle bounded by two radii and an arc
Segment – A section of a circle bounded by a chord and an arc
Semi-circle – Half a circle
Sequence – An ordered set of numbers or objects arranged according to a rule
Set (of data) – A collection of items
Similar - Having the same shape but a different size
Simplify (algebra) – To remove brackets, unnecessary terms and numbers
Simplify (fractions) – To reduce the numerator and denominator in a fraction to the smallest numbers possible
Solve/solution – To work out the answer
Sphere – A 3D shape that is perfectly round, a ball
Square – A 2D shape with all equal sides and all angles 90º
Square number – A number that results by multiplying another number by itself
Square root – The opposite of squaring a number
Subtract/subtraction – To take one quantity away from another, -
Sum – The result of adding
Surface area – The area of the surface of a 3D shape
Symmetry – An object is symmetrical when one half is a mirror image of the other
Tally – Use of sets of 5 marks to record a total, 𝍸
Term (n^{th}) – One of the numbers in a sequence
Tessellation – Patterns of shapes that fit together without any gaps
Tetrahedron – A 3D shape with four triangular faces, a triangular-based pyramid
Three-dimensional (3D) – Having three dimensions, length, width and height
Transformation – A change in position or size
Translation – To move an item in any direction without rotating it
Trapezium – A 2D shape with four sides, two of them being parallel
Tree diagram – A diagram used to display the probability of different outcomes with each branch representing one possible outcome
Triangle – A 2D shape with three sides
Triple/treble – To multiply by three
Two-dimensional (2D) - Having two dimensions, length and width
Unit - One
Unit of measure – Standard amount or quantity
Variable – Something that varies, represented by a letter in algebra
Venn diagram – A diagram using circles to show relationships between sets
Vertex/vertices – The point where two sides meet, or three or more faces
Vertical – Perpendicular to the horizon
Volume – The amount of space occupied by a 3D object
X-axis – The horizontal axis on a graph
Y-axis – The vertical axis on a graph
Y-intercept – Where a line intersects the y-axis