Maths Vocabulary and Glossary

Number and Place value		Addition	
Key Stage 1	**Key Stage 2**	**Key Stage 1**	**Key Stage 2**
Cardinal number	Approximation	Addition	Columnar addition
Centi-	Compare	Addend	Complement
Compare	Estimate	Algebra	Formal written methods
Concrete objects	Exchange	Associative Commutative	Order of operation
Consecutive	Integer	Double	
Count	Interval	Equal	
Digit	Odd number	Inverse operations	
Even number	Place holder	Operation	
Hundred square	Positive number	Plus	
Inequality	Rational number	Repeated addition	
Infinite	Reciprocal	Sign	
Number bond	Representation	Sum	
Number line	Roman numerals	Total	
Number sentence	Round		
Number square			
Number track			
Numeral			
Ordinal number			
Partition			
Pattern			
Place value			
Second			
Sequence			
Symbol			
Zero			

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Maths Vocabulary and Glossary

Subtraction		Multiplication	
Key Stage 1	**Key Stage 2**	**Key Stage 1**	**Key Stage 2**
Difference Equal Inverse operations Minus Operation Repeated subtraction Sign Subtract Subtraction Subtrahend Take away	Columnar subtraction Exchange Formal written methods Negative integer Order of operation Subtraction by decomposition Subtraction by equal addition	Array Commutative Double Equal Inverse operations Multiple Multiplicand Multiplication Multiplication table Operation Multiply Product Repeated addition	Brackets Common factor Common multiple Cube number Factor Factorise Formal written methods Highest Common Factor (HCF) Long multiplication Multiplicative reasoning Order of operation Power (of ten) Prime factor Prime number Short multiplication Square number

Maths Vocabulary and Glossary

Division		Fractions/Decimals/Percentages	
Key Stage 1	**Key Stage 2**	**Key Stage 1**	**Key Stage 2**
Divide Dividend Division Inverse operations Operation Repeated subtraction Share (equally)	Divisibility Divisible (by) Divisor Formal written methods Long division Order of operation Quotient Remainder Short division	Common fraction Fraction Simple fraction Unit fraction	Decimal Decimal system Denominator Improper fraction Mixed fraction Mixed number Numerator Percentage Proper fraction Recurring decimal Simplify

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Maths Vocabulary and Glossary

Shape				Measure	
Key Stage 1		**Key Stage 2**		**Key Stage 1**	**Key Stage 2**
Angle	Position	Acute angle	Plot	Analogue Clock	Area
Anticlockwise	Prism	Angle at a point	Point	Anticlockwise	Convert
Axis of Symmetry	Property	Angle at a point	Polyhedron	Capacity	Cubic centimetre
Circle	Pyramid	on a line	Quadrant	Centilitre	Cubic metre
Circular	Quadrilateral	Axis	Rectilinear	Centimetre	Distance between
Cone	Quarter turn	Centre	Reflection	Chronological	Foot
Cube	Rectangle	Circumference	Reflective	Clockwise	Gallon
Cuboid	Rotation	Convert	symmetry	Denomination (currency)	Imperial unit
Cylinder	Side	Coordinate	Regular	Digital clock	Inch
2D/3D	Square	Cube	Rhombus	Direction	Kilo-
Edge	Surface	Curved surface	Right angle	Gram (g)	Kilogram
Face	Triangle	Degree	Sphere	Hour	Kilometre
Geometrical	Turn	Diameter	Symmetry	Length	Metre
Heptagon	Vertex	Dodecahedron	Tetrahedron	Litre	Metric unit
Hexagon	Vertical	Net	Translation	Mass	Mile
Kite		Octahedron	Trapezium	Measure	Milli-
Line		Parallel	Vertical opposite	Notation	Millilitre
Oblong		Parallelogram	angles	Pound sterling	Millimetre
Octagon		Perpendicular		Standard unit	Ounce
Pattern				Temperature	Perimeter
Pentagon				Time	Pint
Polygon				Unit	Pound (mass)
				Volume	Scale (noun)
				Weight	Square centimetre
					Square millimetre
					Yard

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Maths Vocabulary and Glossary

Statistics		Ratio and Proportion	
Key Stage 1	**Key Stage 2**	**Key Stage 1**	**Key Stage 2**
Bar Chart Block Graph Carroll diagram Column graph Continuous data Data Frequency Pictogram Set Table Tally	Average Bar line chart Column Graph Interpret Interval Mean Median Mode Pie chart		Proportion Proportional reasoning Ratio Ratio notation Scale (verb) Scale factor

Maths Vocabulary and Glossary

Glossary of Terms – Number and Place Value	
Approximation	A number or result that is not exact. In a practical situation an approximation is sufficiently close to the actual number for it to be useful. Verb: approximate. Adverb: approximately. When two values are approximately equal, the sign ≈ is used.
Cardinal number	A cardinal number denotes quantity, as opposed to an ordinal number which denotes position within a series. 1, 2, 5, 23 are examples of cardinal numbers First (1st), second (2nd), third (3rd) etc denote position in a series, and are ordinals.
Centi-	Prefix meaning one-hundredth (of)
Compare	In mathematics when two entities (objects, shapes, curves, equations etc.) are compared one is looking for points of similarity and points of difference as far as mathematical properties are concerned. Example: compare y = x with y = x2. Each equation represents a curve, with the first a straight line and the second a quadratic curve. Each passes through the origin, but on the straight line the values of y always increase from a negative to positive values as x increases, but on the quadratic curve the y-axis is an axis of symmetry and y ≥ 0 for all values of x. The quadratic has a lowest point at the origin; the straight line has no lowest point
Concrete objects	Objects that can be handled and manipulated to support understanding of the structure of a mathematical concept. Materials such as Dienes (Base 10 materials), Cuisenaire, Numicon, pattern blocks are all examples of concrete objects.
Consecutive	Following in order. Consecutive numbers are adjacent in a count. Examples: 5, 6, 7 are consecutive numbers. 25, 30, 35 are consecutive multiples of 5 multiples of 5. In a polygon, consecutive sides share a common vertex and consecutive angles share a common sides
Count	The act of assigning one number name to each of a set of objects (or sounds or movements) in order to determine how many objects there are. In order to count reliably children need to be able to: • Understand that the number words come in a fixed order • Say the numbers in the correct sequence; • Organise their counting (e.g. say one number for each object and keep track of which things they have counted); • Understand that the final word in the count gives the total • Understand that the last number of the count remains unchanged irrespective of the order (conservation of number)
Digit	One of the symbols of a number system most commonly the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Examples: the number 29 is a 2-digit number; there are three digits in 2.95. The position or place of a digit in a number conveys its value.
Estimate	1. Verb: To arrive at a rough or approximate answer by calculating with suitable approximations for terms or, in measurement, by using previous experience.

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Maths Vocabulary and Glossary

	2. Noun: A rough or approximate answer.
Even number	An integer that is divisible by 2.
Exchange	Change a number or expression for another of equal value. The process of exchange is used in some standard compact methods of calculation. Examples: 'carrying figures' in addition, multiplication or division; and 'decomposition' in subtraction.
Hundred square	A 10 by 10 square grid numbered 1 to 100. A similar grid could be numbered as a 0 – 99 grid.
Inequality	When one number, or quantity, is not equal to another. Statements such as a ≠ b, a b or a≥b are inequalities. The inequality signs in use are: ≠ means 'not equal to'; A ≠ B means 'A is not equal to B" < means 'less than'; A < B means 'A is less than B' > means 'greater than'; A > B means 'A is greater than B' ≤ means 'less than or equal to'; A ≤ B means 'A is less than or equal to B' ≥ means 'greater than or equal to'; A ≥ B means 'A is greater than or equal to B'
Infinite	Of a number, always bigger than any (finite) number that can be thought of. Of a sequence or set, going on forever. The set of integers is an infinite set.
Integer	Any of the positive or negative whole numbers and zero. Example: …-2, -1, 0, +1, +2 … The integers form an infinite set; there is no greatest or least integer.
Interval	All possible points in the closed continuous interval between 0 and 1 on the real number line, including the end points zero and 1.
Number bond	A pair of numbers with a particular total e.g. number bonds for ten are all pairs of whole numbers with the total 10.
Number line	A line where numbers are represented by points upon it.
Number sentence	A mathematical sentence involving numbers. Examples: 3 + 6 = 9 and 9 > 3
Number square	A square grid in which cells are numbered in order.
Number track	A numbered track along which counters might be moved. The number in a region represents the number of single moves from the start.
Numeral	A symbol used to denote a number. The Roman numerals I, V, X, L, C, D and M represent the numbers one, five, ten, fifty, one hundred, five hundred and one thousand. The Arabic numerals 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 are used in the Hindu-Arabic system giving numbers in the form that is widely used today.

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Odd number	An integer that has a remainder of 1 when divided by 2.
Ordinal number	A term that describes a position within an ordered set. Example: first, second, third, fourth … twentieth etc.
Partition	1. To separate a set into subsets. 2. To split a number into component parts. Example: the two-digit number 38 can be partitioned into 30 + 8 or 19 + 19. 3. A model of division. Example: 21 ÷ 7 is treated as 'how many sevens in 21?'
Pattern	A systematic arrangement of numbers, shapes or other elements according to a rule.
Place holder	In decimal notation, the zero numeral is used as a place holder to denote the absence of a particular power of 10. Example: The number 105.07 is a shorthand for $1 \times 102 + 0 \times 101 + 5 \times 100 + 0 \times 10{-}1 + 7 \times 10{-}2$.
Place value	The value of a digit that relates to its position or place in a number. Example: in 1482 the digits represent 1 thousand, 4 hundreds, 8 tens and 2 ones respectively; in 12.34 the digits represent 1 ten, 2 ones, 3 tenths and 4 hundredths respectively.
Positive number	A number greater than zero. Where a point on a line is labelled 0 positive numbers are all those to the left of the zero and are read 'positive one, positive two, positive three' etc. See also directed number and negative number.
Rational number	A number that is an integer or that can be expressed as a fraction whose numerator and denominator are integers, and whose denominator is not zero. Examples: − 1, ⅓, 3 /5, 9, 235. Rational numbers, when expressed as decimals, are recurring decimals or finite (terminating) decimals. Numbers that are not rational are irrational. Irrational numbers include √5 and π which produce infinite, non-recurring decimals.
Reciprocal	The multiplicative inverse of any non-zero number. Any non-zero number multiplied by its reciprocal is equal to 1. In symbols $x \times 1/x = 1$, for all $x \neq 0$. Multiplying by 1/x is the same as dividing by x, and since division by zero is not defined zero has to be excluded from all other numbers that all have a reciprocal.
Representation	The word 'representation' is used in the curriculum to refer to a particular form in which the mathematics is presented, so for example a quadratic function could be expressed algebraically or presented as a graph; a quadratic expression could be shown as two linear factors multiplied together or the multiplication could be expanded out; a probability distribution could be presented in a table or represented as a histogram, and so on. Very often, the use of an alternative representation can shed new light on a problem.

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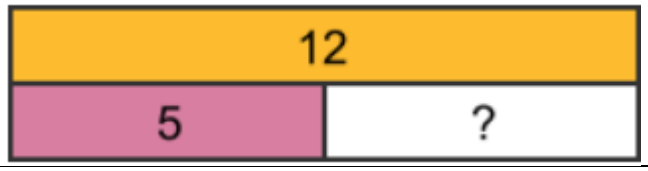
	An array is a useful representation for multiplication and division which helps to see the inverse relationship between the two. The Singapore Bar Model is a useful representation of for many numerical problems. e.g. Tom has 12 sweets and Dini has 5. How many more sweets does Tom have than Dini? 
Roman numerals	The Romans used the following capital letters to denote cardinal numbers: I for 1; V for 5; X for 10; L for 50; C for 100; D for 500; M for 1000. Multiples of one thousand are indicated by a bar over a letter, so for example V with a bar over it means 5000. Other numbers are constructed by forming the shortest sequence with this total, with the proviso that when a higher denomination follows a lower denomination the latter is subtracted from the former. Examples: III =3; IV = 4; XVII =17; XC = 90; CX =110; CD = 400; MCMLXXII = 1972. A particular feature of the Roman numeral system is its lack of a symbol for zero and, consequently, no place value structure. As such it is very cumbersome to perform calculations in this number system.
Round	In the context of a number, express to a required degree of accuracy. Example: 543 rounded to the nearest 10 is 540.
Second	1. A unit of time. One-sixtieth of a minute. 2. Ordinal number as in 'first, second, third, fourth …'.
Sequence	A succession of terms formed according to a rule. There is a definite relation between one term and the next and between each term and its position in the sequence. Example: 1, 4, 9, 16, 25 etc.
Symbol	A letter, numeral or other mark that represents a number, an operation or another mathematical idea. Example: L (Roman symbol for fifty), > (is greater than).
Zero	1. Nought or nothing; zero is the only number that is neither positive nor negative. 2. Zero is needed to complete the number system. In our system of numbers : $a - a = 0$ for any number a. $a + (-a) = 0$ for any number a; $a + 0 = 0 + a = a$ for any number a; $a - 0 = a$ for any number a; $a \times 0 = 0 \times a = 0$ for any number a; division by zero is not defined as it leads to inconsistency. 3. In a place value system, a place-holder. Example: 105. 4. The cardinal number of an empty set.

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Maths Vocabulary and Glossary

Glossary of Terms – Addition	
Addend	A number to be added to another
Addition	The binary operation of addition on the set of all real numbers that adds one number of the set to another in the set to form a third number which is also in the set. The result of the addition is called the sum or total. The operation is denoted by the + sign. When we write 5 + 3 we mean 'add 3 to 5'; we can also read this as '5 plus 3'. In practice the order of addition does not matter: The answer to 5 + 3 is the same as 3 + 5 and in both cases the sum is 8. This holds for all pairs of numbers and therefore the operation of addition is said to be commutative. To add three numbers together, first two of the numbers must be added and then the third is added to this intermediate sum. For example, (5 + 3) + 4 means 'add 3 to 5 and then add 4 to the result' to give an overall total of 12. Note that 5 + (3 + 4) means 'add the result of adding 4 to 3 to 5' and that the total is again 12. The brackets indicate a priority of sub-calculation, and it is always true that (a + b) + c gives the same result as a + (b + c) for any three numbers a, b and c. This is the associative property of addition. Addition is the inverse operation to subtraction, and vice versa. There are two models for addition: Augmentation is when one quantity or measure is increased by another quantity. i.e. "I had £3.50 and I was given £1, then I had £4.50". Aggregation is the combining of two quantities or measures to find the total. E.g. "I had £3.50 and my friend had £1, we had £4.50 altogether.
Algebra	The part of mathematics that deals with generalised arithmetic. Letters are used to denote variables and unknown numbers and to state general properties. Example: a(x + y) = ax + ay exemplifies a relationship that is true for any numbers a, x and y. Adjective: algebraic.
Associative	A binary operation $*$ on a set S is associative if $a * (b * c) = (a * b) * c$ for all a, b and c in the set S. Addition of real numbers is associative which means a + (b + c) = (a + b) + c for all real numbers a, b, c. It follows that, for example, 1 + (2 + 3) = (1 + 2) + 3. Similarly multiplication is associative. Subtraction and division are not associative because: 1 – (2 – 3) = 1 – (−1) = 2, whereas (1 – 2) – 3 = (−1) – 3 = −4 and 1 ÷ (2 ÷ 3) = 1 ÷ 2/3 = 3/2, whereas (1 ÷ 2) ÷ 3 = (1/2) ÷ 3 = 1/6.
Commutative	A binary operation $*$ on a set S is commutative if $a * b = b * a$ for all a and $b \in S$. Addition and multiplication of real numbers are commutative where a + b = b + a and a × b = b × a for all real numbers a and b. It

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	follows that, for example, 2 + 3 = 3 + 2 and 2 x 3 = 3 x 2. Subtraction and division are not commutative since, as counter examples, 2 – 3 ≠ 3 – 2 and 2 ÷ 3 ≠ 3 ÷ 2.
Columnar addition	A formal method of setting out an addition or a subtraction in ordered columns with each column representing a decimal place value and ordered from right to left in increasing powers of 10. With addition, more than two numbers can be added together using column addition, but this extension does not work for subtraction. 789 + 642 becomes 7 8 9 + 6 4 2 1 4 3 1 1 1 Answer: 1431 932 – 457 becomes 8 12 1 9 3 2 – 4 5 7 4 7 5 Answer: 475
Complement	In addition, a number and its complement have a given total. Example: When considering complements in 100, 67 has the complement 33, since 67 + 33 = 100
Double	1. To multiply by 2. Example: Double 13 is (13 × 2) = 26. 2. The number or quantity that is twice another. Example: 26 is double 13. In this context, a 'near double' is one away from a double. Example: 27 is a near double of 13 and of 14. (N.B. spotting near doubles can be a useful mental calculation strategy e.g. seeing 25 + 27 as 2 more than double 25.
Equal	Symbol: =, read as 'is equal to' or 'equals'. and meaning 'having the same value as'. Example: 7 – 2 = 4 + 1 since both expressions, 7 – 2 and 4 + 1 have the same value, 5.
Formal written methods	Setting out working in columnar form. In multiplication, the formal methods are called short or long multiplication depending on the size of the numbers involved. Similarly, in division the formal processes are called short or long division. See Mathematics Appendix 1 in the 2013 National Curriculum.
Inverse operations	Operations that, when they are combined, leave the entity on which they operate unchanged. Examples: addition and subtraction are inverse operations e.g. 5 + 6 – 6 = 5. Multiplication and division are inverse operations e.g. 6 × 10 ÷ 10 = 6. Squaring and taking the square root are inverse to each other: √x2 = (√x)2 = x; similarly with cube and cube root, and any integer power n and nth root. Some operations, such as reflection in the x-axis, or 'subtract from 10' are self-inverse i.e. they are inverses of themselves
Operation	A rule for combining two numbers in the set to produce a third also in the set.

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Order of operation	This refers to the order in which different mathematical operations are applied in a calculation. Without an agreed order an expression such as 2 + 3 × 4 could have two possible values: 5 × 4 = 20 (if the operation of addition is applied first) 2 + 12 = 14 (if the operation of multiplication is applied first) The agreed order of operations is that: • Powers or indices take precedent over multiplication or division – 2 × 32 = 18 not 25; • Multiplication or division takes precedent over addition and subtraction – 2 + 3 × 4 = 14 not 20 • If brackets are present, the operation contained therein always takes precedent over all others – (2 + 3) × 4 = 20 This convention is often encapsulated in the mnemonic BODMAS or BIDMAS: Brackets Orders / Indices (powers) Division & Multiplication Addition & Subtraction
Plus	A name for the symbol +, representing the operation of addition.
Repeated addition	The process of repeatedly adding the same number or amount. One model for multiplication. Example 5 + 5 + 5 + 5 = 5 x 4.
Sign	A symbol used to denote an operation. Examples: addition sign +, subtraction sign −, multiplication sign ×, division sign ÷, equals sign = etc. In the case of directed numbers, the positive + or negative − sign indicates the direction in which the number is located from the origin along the number line.
Sum	The result of one or more additions.
Total	1. The aggregate. Example: the total population - all in the population. 2. The sum found by adding.

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Maths Vocabulary and Glossary

Glossary of Terms – Subtraction	
Columnar subtraction	A formal method of setting out an addition or a subtraction in ordered columns with each column representing a decimal place value and ordered from right to left in increasing powers of 10. With addition, more than two numbers can be added together using column addition, but this extension does not work for subtraction. 789 + 642 becomes 7 8 9 + 6 4 2 1 4 3 1 1 1 Answer: 1431 932 – 457 becomes 8 12 1 9 3 2 – 4 5 7 4 7 5 Answer: 475
Difference	In mathematics (as distinct from its everyday meaning), difference means the numerical difference between two numbers or sets of objects and is found by comparing the quantity of one set of objects with another. e.g. the difference between 12 and 5 is 7; 12 is 5 more than 7 or 7 is 5 fewer than 12. Difference is one way of thinking about subtraction and can, in some circumstances, be a more helpful image for subtraction than 'take-away' – e.g. 102 - 98
Equal	Symbol: =, read as 'is equal to' or 'equals'. and meaning 'having the same value as'. Example: 7 – 2 = 4 + 1 since both expressions, 7 – 2 and 4 + 1 have the same value, 5.
Exchange	Change a number or expression for another of equal value. The process of exchange is used in some standard compact methods of calculation. Examples: 'carrying figures' in addition, multiplication or division; and 'decomposition' in subtraction.
Formal written methods	Setting out working in columnar form. In multiplication, the formal methods are called short or long multiplication depending on the size of the numbers involved. Similarly, in division the formal processes are called short or long division. See Mathematics Appendix 1 in the 2013 National Curriculum.
Inverse operations	Operations that, when they are combined, leave the entity on which they operate unchanged. Examples: addition and subtraction are inverse operations e.g. 5 + 6 – 6 = 5. Multiplication and division are

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	inverse operations e.g. 6 × 10 ÷ 10 = 6. Squaring and taking the square root are inverse to each other: √x2 = (√x)2 = x; similarly with cube and cube root, and any integer power n and nth root. Some operations, such as reflection in the x-axis, or 'subtract from 10' are self-inverse i.e. they are inverses of themselves
Minus	A name for the symbol −, representing the operation of subtraction.
Negative integer	An integer less than 0. Examples: -1, -2, -3 etc
Operation	A rule for combining two numbers in the set to produce a third also in the set.
Order of operation	This refers to the order in which different mathematical operations are applied in a calculation. Without an agreed order an expression such as 2 + 3 × 4 could have two possible values: 5 × 4 = 20 (if the operation of addition is applied first) 2 + 12 = 14 (if the operation of multiplication is applied first) The agreed order of operations is that: • Powers or indices take precedent over multiplication or division – 2 × 32 = 18 not 25; • Multiplication or division takes precedent over addition and subtraction – 2 + 3 × 4 = 14 not 20 • If brackets are present, the operation contained therein always takes precedent over all others – (2 + 3) × 4 = 20 This convention is often encapsulated in the mnemonic BODMAS or BIDMAS: Brackets Orders / Indices (powers) Division & Multiplication Addition & Subtraction
Repeated subtraction	The process of repeatedly subtracting the same number or amount. One model for division. Example 35 -5 - 5 - 5 - 5 - 5 - 5 - 5 = 0 so 35 ÷ 5 = 7 remainder 0.
Sign	A symbol used to denote an operation. Examples: addition sign +, subtraction sign −, multiplication sign ×, division sign ÷, equals sign = etc. In the case of directed numbers, the positive + or negative − sign indicates the direction in which the number is located from the origin along the number line.
Subtract	Carry out the process of subtraction
Subtraction	The inverse operation to addition. Finding the difference when comparing magnitude. Take away
Subtraction by decomposition	A method of calculation used in subtraction and particularly linked with one of the main columnar methods for subtraction. In this method the number to be subtracted from (the minuend) is repartitioned, if necessary, in order that each digit of the number to be subtracted (the subtrahend) is smaller than its corresponding digit in the minuend. e.g. in 739 – 297, only the digits in the hundreds and the ones columns are bigger in the minuend than the subtrahend.

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	By re-partitioning 739 into 6 hundreds, 13 tens and 9 ones each separate subtraction can be performed simply, i.e.: 9 – 7 13 (tens) – 9 (tens) and 6 (hundreds) – 2 (hundreds) $\begin{array}{r} {}^{6}\not{7}\,{}^{1}1\ 9 \\ -\ 2\ 9\ 7 \\ \hline 4\ 2\ 2 \end{array}$
Subtraction by equal addition	A method of calculation used in subtraction and particularly linked with one of the main columnar methods for subtraction. This method relies on the understanding that adding the same quantity to both the minuend and the subtrahend retains the same difference. This is a useful technique when a digit in the subtrahend is larger than its corresponding digit in the minuend. E.g. in the example below, 7 > 2, therefore 10 has been added to the 2 (in the ones place) of the minuend to make 12 (ones) and also added to the 5 (tens) of the subtrahend to make 60 (or 6 tens) before the first step of the calculation can be completed. Similarly 100 has been added to the 3 (tens) of the minuend to make 13 (tens) and also added to the 4 (hundreds) of the subtrahend to make 5 (hundred). 932-457 becomes $\begin{array}{r} \ {}^{1}9\ {}^{1}3\ 2 \\ -\ \not{4}\ \not{5}\ 7 \\ \ 5\ 6 \\ \hline 4\ 7\ 5 \end{array}$
Subtrahend	A number to be subtracted from another
Take away	1. Subtraction as reduction 2. Remove a number of items from a set.

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Maths Vocabulary and Glossary

Glossary of Terms – Multiplication	
Array	An ordered collection of counters, numbers etc. in rows and columns.
Brackets	Symbols used to group numbers in arithmetic or letters and numbers in algebra and indicating certain operations as having priority. Example: 2 x (3 + 4) = 2 x 7 = 14 whereas 2 x 3 + 4 = 6 + 4 = 10. Example: 3(x + 4) denotes the result of adding 4 to a number and then multiplying by 3; (x + 1)2 denotes the result of adding 1 to a number and then squaring the result
Common factor	A number which is a factor of two or more other numbers, for example 3 is a common factor of the numbers 9 and 30 This can be generalised for algebraic expressions: for example (x – 1) is a common factor of (x – 1)2 and (x – 1)(x + 3).
Common multiple	An integer which is a multiple of a given set of integers, e.g. 24 is a common multiple of 2, 3, 4, 6, 8 and 12.
Commutative	A binary operation $*$ on a set S is commutative if $a * b = b * a$ for all a and $b \in S$. Addition and multiplication of real numbers are commutative where a + b = b + a and a × b = b × a for all real numbers a and b. It follows that, for example, 2 + 3 = 3 + 2 and 2 x 3 = 3 x 2. Subtraction and division are not commutative since, as counter examples, 2 – 3 ≠ 3 – 2 and 2 ÷ 3 ≠ 3 ÷ 2.
Cube number	A number that can be expressed as the product of three equal integers. Example: 27 = 3 × 3 × 3. Consequently, 27 is a cube number; it . It is the cube of 3 or 3 cubed. This is written compactly as $27 = 3^3$, using index, or power, notation.
Double	1. To multiply by 2. Example: Double 13 is (13 × 2) = 26. 2. The number or quantity that is twice another. Example: 26 is double 13. In this context, a 'near double' is one away from a double. Example: 27 is a near double of 13 and of 14. (N.B. spotting near doubles can be a useful mental calculation strategy e.g. seeing 25 + 27 as 2 more than double 25.
Equal	Symbol: =, read as 'is equal to' or 'equals'. and meaning 'having the same value as'. Example: 7 – 2 = 4 + 1 since both expressions, 7 – 2 and 4 + 1 have the same value, 5.
Factor	When a number, or polynomial in algebra, can be expressed as the product of two numbers or polynomials, these are factors of the first. Examples: 1, 2, 3, 4, 6 and 12

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	are all factors of 12 because 12 = 1 × 12 = 2 × 6 = 3 × 4: (x – 1) and (x + 4) are factors of (x2 + 3x – 4) because (x – 1)(x + 4) = (x2 + 3x – 4)
Factorise	To express a number or a polynomial as the product of its factors. Examples: Factorising 12: 12 = 1 × 12 = 2 × 6 = 3 × 4 The factors of 12 are 1, 2, 3, 4, 6 and 12. 12 may be expressed as a product of its prime factors: 12 = 2 × 2 × 3
Formal written methods	Setting out working in columnar form. In multiplication, the formal methods are called short or long multiplication depending on the size of the numbers involved. Similarly, in division the formal processes are called short or long division. See Mathematics Appendix 1 in the 2013 National Curriculum.
Highest common factor (HCF)	The common factor of two or more numbers which has the highest value. Example: 16 has factors 1, 2, 4, 8, 16. 24 has factors 1, 2, 3, 4, 6, 8, 12, 24. 56 has factors 1, 2, 4, 7, 8, 14, 28, 56. The common factors of 16, 24 and 56 are 1, 2, 4 and 8. Their highest common factor is 8.
Inverse operations	Operations that, when they are combined, leave the entity on which they operate unchanged. Examples: addition and subtraction are inverse operations e.g. 5 + 6 – 6 = 5. Multiplication and division are inverse operations e.g. 6 × 10 ÷ 10 = 6. Squaring and taking the square root are inverse to each other: √x2 = (√x)2 = x; similarly with cube and cube root, and any integer power n and nth root. Some operations, such as reflection in the x-axis, or 'subtract from 10' are self-inverse i.e. they are inverses of themselves
Long multiplication	A columnar algorithm for performing multiplication by more than a single digit, again best illustrated by an example: 124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1
Multiple	For any integers a and b, a is a multiple of b if a third integer c exists so that a = bc Example: 14, 49 and 70 are all multiples of 7 because 14 = 7 x 2, 49 = 7 x 7 and 70 = 7 x 10.. -21 is also a multiple of 7 since -21 = 7 ×-3.
Multiplicand	A number to be multiplied by another. e.g. in 5 × 3, 5 is the multiplicand as it is the number to be multiplied by 3.

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Maths Vocabulary and Glossary

<table>
<tr><td>Multiplication</td><td>Multiplication (often denoted by the symbol "×") is the mathematical operation of scaling one number by another. It is one of the four binary operations in arithmetic (the others being addition, subtraction and division).
Because the result of scaling by whole numbers can be thought of as consisting of some number of copies of the original, wholenumber products greater than 1 can be computed by repeated addition; for example, 3 multiplied by 4 (often said as "3 times 4") can be calculated by adding 4 copies of 3 together:
3 x 4 = 3 + 3 + 3 + 3 = 12
Here 3 and 4 are the "factors" and 12 is the "product". Multiplication is the inverse operation of division, and it follows that 7 ÷ 5 × 5 = 7 Multiplication is commutative, associative and distributive over addition or subtraction.</td></tr>
<tr><td>Multiplication table Operation</td><td>An array setting out sets of numbers that multiply together to form the entries in the array, for example
<table>
<tr><td>Multipliers</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>1</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>2</td><td>2</td><td>4</td><td>6</td></tr>
<tr><td>3</td><td>3</td><td>6</td><td>9</td></tr>
<tr><td>4</td><td>4</td><td>8</td><td>12</td></tr>
<tr><td>5</td><td>5</td><td>10</td><td>15</td></tr>
<tr><td>6</td><td>6</td><td>12</td><td>18</td></tr>
<tr><td>7</td><td>7</td><td>14</td><td>21</td></tr>
</table></td></tr>
<tr><td>Multiplicative reasoning</td><td>Multiplicative thinking is indicated by a capacity to work flexibly with the concepts, strategies and representations of multiplication (and division) as they occur in a wide range of contexts.
For example, from this: 3 bags of sweets, 8 sweets in each bag. How many sweets?
To this and beyond:
Julie bought a dress in a sale for £49.95 after it was reduced by 30%. How much would she have paid before the sale?</td></tr>
<tr><td>Multiply</td><td>Carry out the process of multiplication</td></tr>
<tr><td>Order of operation</td><td>This refers to the order in which different mathematical operations are applied in a calculation.
Without an agreed order an expression such as 2 + 3 × 4 could have two possible values:
5 × 4 = 20 (if the operation of addition is applied first)
2 + 12 = 14 (if the operation of multiplication is applied first)
The agreed order of operations is that:
• Powers or indices take precedent over multiplication or division – 2 × 32 = 18 not 25;
• Multiplication or division takes precedent over addition and subtraction – 2 + 3 × 4 = 14 not 20
• If brackets are present, the operation contained therein always takes precedent over all others – (2 + 3) × 4 = 20
This convention is often encapsulated in the mnemonic BODMAS or BIDMAS:
Brackets
Orders / Indices (powers)
Division & Multiplication</td></tr>
</table>

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	Addition & Subtraction
Power (of ten)	1. 100 (i.e. 10^2 or 10 x 10) is the second power of 10, 1000 (i.e.10^3 or 10 x 10 x 10) is the third power of 10 etc. Powers of other numbers are defined in the same way. Example: 2 (2^1), 4 (2^2), 8 (2^3), 16 (2^4) etc are powers of 2. 2. A fractional power represents a root. Example: $x^{½} = \sqrt{x}$ 3. A negative power represents the reciprocal. Example: $x^{-1} = 1/x$ 4. By convention any number or variable to the power 0 equals 1. i.e. $x^0 = 1$
Prime factor	The factors of a number that are prime. Example: 2 and 3 are the prime factors of 12 (12 = 2 x 2 x 3).
Prime number	A whole number greater than 1 that has exactly two factors, itself and 1. Examples: 2 (factors 2, 1), 3 (factors 3, 1). 51 is not prime (factors 51, 17, 3, 1).
Product	The result of multiplying one number by another. Example: The product of 2 and 3 is 6 since 2 × 3 = 6.
Repeated addition	The process of repeatedly adding the same number or amount. One model for multiplication. Example 5 + 5 + 5 + 5 = 5 x 4.
Short multiplication	Essentially, simple multiplication by a one digit number, with the working set out in columns. 342 x 7 becomes
Square number	A number that can be expressed as the product of two equal numbers. Example 36 = 6 x 6 and so 36 is a square number or “6 squared”. A square number can be represented by dots in a square array.

Glossary of Terms – Multiplication	
Divide	To carry out the operation of division.
Dividend	In division, the number that is divided. E.g. in 15 ÷ 3, 15 is the dividend
Divisibility	The property of being divisible by a given number. Example: A test of divisibility by 9 checks if a number can be divided by 9 with no remainder.
Divisible (by)	A whole number is divisible by another if there is no remainder after division and the result is a whole number. Example: 63 is divisible by 7 because 63 ÷ 7 = 9 remainder 0. However, 63 is not divisible by 8 because 63 ÷ 8 = 7.875 or 7 remainder 7.

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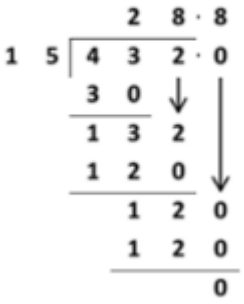
Maths Vocabulary and Glossary

Division	1. An operation on numbers interpreted in a number of ways. Division can be sharing – the number to be divided is shared equally into the stated number of parts; or grouping – the number of groups of a given size is found. Division is the inverse operation to multiplication. 2. On a scale, one part. Example: Each division on a ruler might represent a millimetre.
Formal written methods	To express a number or a polynomial as the product of its factors. Examples: Factorising 12: 12 = 1 × 12 = 2 × 6 = 3 × 4 The factors of 12 are 1, 2, 3, 4, 6 and 12. 12 may be expressed as a product of its prime factors: 12 = 2 × 2 × 3
Inverse operations Operation	Setting out working in columnar form. In multiplication, the formal methods are called short or long multiplication depending on the size of the numbers involved. Similarly, in division the formal processes are called short or long division. See Mathematics Appendix 1 in the 2013 National Curriculum.
Long division	A columnar algorithm for division by more than a single digit, most easily described with an example: 432 ÷ 15 becomes 
Order of operation	This refers to the order in which different mathematical operations are applied in a calculation. Without an agreed order an expression such as 2 + 3 × 4 could have two possible values: 5 × 4 = 20 (if the operation of addition is applied first) 2 + 12 = 14 (if the operation of multiplication is applied first) The agreed order of operations is that: • Powers or indices take precedent over multiplication or division – 2 × 32 = 18 not 25; • Multiplication or division takes precedent over addition and subtraction – 2 + 3 × 4 = 14 not 20

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	• If brackets are present, the operation contained therein always takes precedent over all others – (2 + 3) × 4 = 20 This convention is often encapsulated in the mnemonic BODMAS or BIDMAS: Brackets Orders / Indices (powers) Division & Multiplication Addition & Subtraction
Quotient	The result of a division. Example: 46 ÷ 3 = 15⅓ and 15⅓ is the quotient of 46 by 3. Where the operation of division is applied to the set of integers, and the result expressed in integers, for example 46 ÷ 3 = 15 remainder 1 then 15 is the quotient of 46 by 3 and 1 is the remainder.
Remainder	In the context of division requiring a whole number answer (quotient), the amount remaining after the operation. Example: 29 divided by 7 = 4 remainder 1.
Repeated subtraction	The process of repeatedly subtracting the same number or amount. One model for division. Example 35 -5 - 5 - 5 - 5 - 5 - 5 - 5 = 0 so 35 ÷ 5 = 7 remainder 0.
Share (equally)	Sections of this page that are currently empty will be filled over the coming weeks. One model for the process of division.
Short division	A compact written method of division. Example: 496 ÷ 11 becomes 4 5 r1 11 | 4 9 6 (5) Answer : 45 1 /11

Glossary of Terms – Fractions/Decimals/Percentages	
Common fraction	A fraction where the numerator and denominator are both integers. Also known as simple or vulgar fraction. Contrast with a compound or complex fraction where the numerator or denominator or both contain fractions.
Decimal	Relating to the base ten. Most commonly used synonymously with decimal fractions where the number of tenths, hundredth, thousandths, etc. are

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	represented as digits following a decimal point. The decimal point is placed at the right of the ones column. Each column after the decimal point is a decimal place. Example: The decimal fraction 0.275 is said to have three decimal places. The system of recording with a decimal point is decimal notation. Where a number is rounded to a required number of decimal places, to 2 decimal places for example, this may be recorded as 2 d.p.
Denominator	In the notation of common fractions, the number written below the line i.e. the divisor. Example: In the fraction ⅔ the denominator is 3.
Fraction	The result of dividing one integer by a second integer, which must be non-zero. The dividend is the numerator and the non-zero divisor is the denominator. See also common fraction, decimal fraction, equivalent fraction, improper fraction, proper fraction, simple fraction, unit fraction and vulgar fraction.
Improper fraction	An improper fraction has a numerator that is greater than its denominator. Example: 9 /4 is improper and could be expressed as the mixed number 2¼
Mixed fraction	A whole number and a fractional part expressed as a common fraction. Example: 1⅓ is a mixed fraction. Also known as a mixed number.
Mixed number	A whole number and a fractional part expressed as a common fraction. Example: 2 ¼ is a mixed number. Also known as a mixed fraction.
Numerator	In the notation of common fractions, the number written on the top – the dividend (the part that is divided). In the fraction ⅔, the numerator is 2.
Percentage	1. A fraction expressed as the number of parts per hundred and recorded using the notation %. Example: One half can be expressed as 50%; the whole can be expressed as 100% 2. Percentage can also be interpreted as the operator 'a number of hundredths of'. Example: 15% of Y means 15/100 × Y Frequently, it is necessary to calculate a percentage increase, or a percentage decrease. Sometimes, given the result of an increase or decrease the original whole has to calculated. Example 1: A salary of £24000 is increased by 5%; find the new salary. Calculation is £2400 × (1.05) = £25200 (note: 1.05 = 1 + 5/100) Example 2: The city population of 5 500 000 decreased by 13% over the last five years so that the present population is 5500000 × (0.87) = 4 785 000 (note: 1 – 13/100 = 0.87) Example 3: A sale item is on sale at £560 after a reduction of 20%, what was its original price? The calculation is: original price × 0.8 = £560. So, original price = £560/0.8 (since division is inverse to multiplication) = £700.
Proper fraction	A proper fraction has a numerator that is less than its denominator So ¾ is a proper fraction, whereas 4 /3 is an improper fraction (i.e. not proper).
Recurring decimal	A decimal fraction with an infinitely repeating digit or group of digits. Example: The fraction ⅓ is the decimal 0.33333 …, referred to as nought point three recurring and may be written as 0.3 (with a dot over the three).

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Maths Vocabulary and Glossary

	Where a block of numbers is repeated indefinitely, a dot is written over the first and last digit in the block e.g. 1 /7 = 0.˙142857
Simple fraction	A fraction where the numerator and denominator are both integers.
Simplify	Reduce a fraction to its simplest form.
Unit fraction	A fraction that has 1 as the numerator and whose denominator is a non-zero integer. Example: ½, ⅓

Glossary of Terms –

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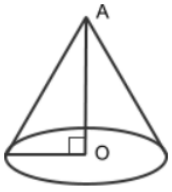
Shape	
2D/3D	Short for 2-dimensional and 3-dimensional. A figure is two-dimensional if it lies in a plane. A solid is three-dimensional and occupies space (in more than one plane). A plane is specified by ordered pairs of numbers called coordinates, typically (x,y). Points in 3-dimensional space are specified by an ordered triple of numbers, typically (x, y, z).
Acute angle	An angle between 0 o and 90 o .
Angle	An angle is a measure of rotation and is often shown as the amount of rotation required to to turn one line segment onto another where the two line segments meet at a point (insert diagram).
Angle at a point	The complete angle all the way around a point is 360°.
Angle at a point on a line	The sum of the angles at a point on a line is 180°.
Anticlockwise	In the opposite direction from the normal direction of travel of the hands of an analogue clock.
Axis	A fixed, reference line along which or from which distances or angles are taken.
Axis of Symmetry	A line about which a geometrical figure, or shape, is symmetrical or about which a geometrical shape or figure is reflected in order to produce a symmetrical shape or picture. Reflective symmetry exists when for every point on one side of the line there is another point (its image) on the other side of the line which is the same perpendicular distance from the line as the initial point. Example: a regular hexagon has six lines of symmetry; an equilateral triangle has three lines of symmetry.
Centre	The middle point for example of a line or a circle
Circle	The set of all points in a plane which are at a fixed distance (the radius) from a fixed point (the centre) also in the plane
Circular	1. In the form of a circle. 2. Related to the circle, as in circular function.
Circumference	The distance around a circle (its perimeter). If the radius of a circle is r units, and the diameter d units, then the circumference is $2\pi r$, or πd units.
Cone	A cone is a 3-dimensionsl shape consisting of a circular base, a vertex in a different plane, and line segments joining all the points on the circle to the vertex. 

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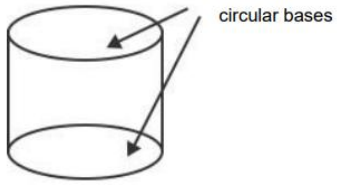
Coordinate	In geometry, a coordinate system is a system which uses one or more numbers, or coordinates, to uniquely determine the position of a point in space
Cube	In geometry, a three-dimensional figure with six identical, square faces. Adjoining edges and faces are at right angles.
Cuboid	A three-dimensional figure with six rectangular faces
Curved surface	The curved boundary of a 3-D solid, for example; the curved surface of a cylinder between the two circular ends, or the curved surface of a cone between its circular base and its vertex, or the surface of a sphere.
Cylinder	A three-dimensional object whose uniform cross-section is a circle. A right cylinder can be defined as having circular bases with a curved surface joining them, this surface formed by line segments joining corresponding points on the circles. The centre of one base lies over the centre of the second.  Right cylinder
Degree	The most common unit of measurement for angle. One whole turn is equal to 360 degrees, written 360^{o}
Diameter	Any of the chords of a circle or sphere that pass through the centre
Dodecahedron	A polyhedron with twelve faces. The faces of a regular dodecahedron are regular pentagons. A dodecahedron has 20 vertices and 30 edges.
Edge	A line segment, joining two vertices of a figure. A line segment formed by the intersection of two plane surfaces. Examples: a square has four edges; and a cuboid has twelve edges.
Face	One of the flat surfaces of a solid shape. Example: a cube has six faces; each face being a square
Geometrical	Relating to geometry, the aspect of mathematics concerned with the properties of space and figures or shapes in space.
Heptagon	A polygon with seven sides and seven edges.
Hexagon	A polygon with six sides and six edges. Adjective: hexagonal, having the form of a hexagon
Kite	A quadrilateral with two pairs of equal, adjacent sides whose diagonals consequently intersect at right angles.
Line	A set of adjacent points that has length but no width. A straight line is completely determined by two of its points, say A and B. The part of the line between any two of its points is a line segment.
Net	1. A plane figure composed of polygons which by folding and joining can form a polyhedron.

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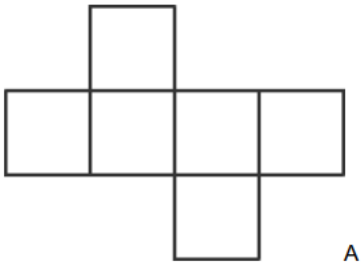
Maths Vocabulary and Glossary

	 A net of a cube 2. Remaining after deductions. Examples: The net profit is the profit after deducting all operating costs. The net weight is the weight after deducting the weight of all packaging.
Oblong	Sometimes used to describe a non-square rectangle – i.e. a rectangle where one dimension is greater than the other
Octagon	A polygon with eight sides. Adjective: octagonal, having the form of an octagon.
Octahedron	A polyhedron with eight faces. A regular octahedron has faces that are equilateral triangles.
Parallel	In Euclidean geometry, always equidistant. Parallel lines, curves and planes never meet however far they are produced or extended.
Parallelogram	A quadrilateral whose opposite sides are parallel and consequently equal in length.
Pattern	A systematic arrangement of numbers, shapes or other elements according to a rule.
Pentagon	A polygon with five sides and five interior angles. Adjective: pentagonal, having the form of a pentagon.
Perpendicular	A line or plane that is at right angles to another line or plane.
Plot	The process of marking points. Points are usually defined by coordinates and plotted with reference to a given coordinate system.
Point	An element, in geometry, that has position but no magnitude.
Polygon	A closed plane figure bounded by straight lines. The name derives from many angles. If all interior angles are less than 180° the polygon is convex. If any interior angle is greater than 180°, the polygon is concave. If the sides are all of equal length and the angles are all of equal size, then the polygon is regular; otherwise it is irregular. Adjective: polygonal.
Polyhedron	Plural: polyhedra. A closed solid figure bounded by surfaces (faces) that are polygonal. Its faces meet in line segments called its edges. Its edges meet at points called vertices. For a polyhedron to be convex, it must lie completely to one side of a plane containing any face. If it is not convex it is concave. A regular polyhedron has identical regular polygons forming its faces and equal angles formed by its surfaces and edges. The Platonic Solids are the five possible convex regular polyhedra: tetrahedron with four equilateral-triangular faces; cube with six square faces; octahedron with eight equilateral-triangular faces; dodecahedron with twelve regular- pentagonal faces; and icosahedron with twenty equilateral triangular faces.

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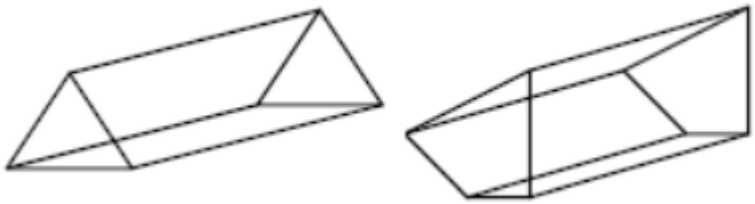
Position	Location as specified by a set of coordinates in a plane or in full 3-dimensional space. On the large scale, location on the earth is specified by latitude and longitude coordinates.
Prism	A solid bounded by two congruent polygons that are parallel (the bases) and parallelograms (lateral faces) formed by joining the corresponding vertices of the polygons. Prisms are named according to the base e.g. triangular prism, quadrangular prism, pentagonal prism etc. Examples: 
Property	Any attribute. Example: One property of a square is that all its sides are equal.
Pyramid	A solid with a polygon as the base and one other vertex, the apex, in another plane. Each vertex of the base is joined to the apex by an edge. Other faces are triangles that meet at the apex. Pyramids are named according to the base: a triangular pyramid (which is also called a tetrahedron, having four faces), a square pyramid, a pentagonal pyramid etc.
Quadrant	One of the four regions into which a plane is divided by the x and y axes in the Cartesian coordinate system.
Quadrilateral	A polygon with four sides.
Quarter turn	A rotation through 90º, usually anticlockwise unless stated otherwise.
Rectangle	A parallelogram with an interior angle of 90°. Opposite sides are equal. If adjacent sides are also equal the rectangle is a square. If adjacent sides are not equal, the rectangle is sometimes referred to as an oblong. A square is a (special type) of rectangle but a rectangle is not a square. The use of the word 'oblong' (favoured by some) resolves this issue. An oblong is a rectangle which is not square.
Rectilinear	Bounded by straight lines. A closed rectilinear shape is also a polygon. A rectilinear shape can be divided into rectangles and triangles for the purpose of calculating its area.
Reflection	In 2-D, a transformation of the whole plane involving a mirror line or axis of symmetry in the plane, such that the line segment joining a point to its image is perpendicular to the axis and has its midpoint on the axis. A 2-D reflection is specified by its mirror line.
Reflection symmetry	A 2-D shape has reflection symmetry about a line if an identical looking object in the same position is produced by reflection in that line. Example:

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	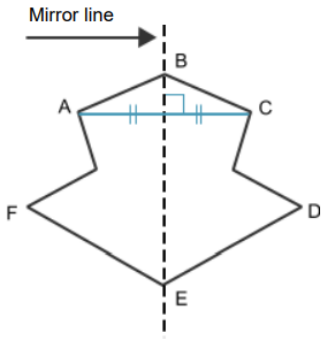
Regular	1. Describing a polygon, having all sides equal and all internal angles equal. 2. Describing a tessellation, using only one kind of regular polygon. Examples: squares, equilateral triangles and regular hexagons all produce regular tessellations.
Rhombus	A parallelogram with all sides equal.
Right angle	One quarter of a complete turn. An angle of 90 degrees. An acute angle is less than one right angle. An obtuse angle is greater than one right angle but less than two. A reflex angle is greater than two right angles.
Rotation	In 2-D, a transformation of the whole plane which turns about a fixed point, the centre of rotation. A is specified by a centre and an (anticlockwise) angle.
Side	A line segment that forms part of the boundary of a figure. Also edge.
Sphere	A closed surface, in three-dimensional space, consisting of all the points that are a given distance from a fixed point, the centre. A hemi-sphere is a half-sphere. Adjective: spherical
Square	A quadrilateral with four equal sides and four right angles.
Surface	A set of points defining a space in two or three dimensions.
Symmetry	A plane figure has symmetry if it is invariant under a reflection or rotation i.e. if the effect of the reflection or rotation is to produce an identical-looking figure in the same position. See also reflection symmetry, rotation symmetry. Adjective: symmetrical.
Tetrahedron	A solid with four triangular faces. A regular tetrahedron has faces that are equilateral triangles. Plural: tetrahedra
Translation	A transformation in which every point of a body moves the same distance in the same direction. A transformation specified by a distance and direction (vector).
Trapezium	A quadrilateral with at least one pair of sides parallel.
Triangle	A polygon with three sides. Adjective: triangular, having the form of a triangle.
Turn	A rotation about a point: a quarter turn is a rotation of 90°. A half turn is a rotation of 180°, a whole turn is a rotation of 360°.
Vertex	The point at which two or more lines intersect. Plural: vertices.

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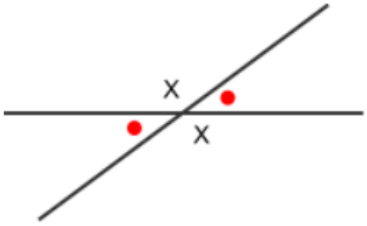
Vertical	At right angles to the horizontal plane. The up-down direction on a graph or map.
Vertical opposite angles	The pair of equal angles between two intersecting straight lines. There are two such pairs of vertically opposite angles 

Glossary of Terms – Measure	
Analogue Clock	A clock usually with 12 equal divisions labelled 'clockwise' from the top 12, 1, 2, 3 and so on up to 11 to represent hours. Commonly, each of the twelve divisions is further subdivided into five equal parts providing sixty minor divisions to represent minutes. The clock has two hands that rotate about the centre. The minute hand completes one revolution in one hour, whilst the hour hand completes one revolution in 12 hours. Sometimes the Roman numerals XII, I, II, III, IV, V1, VII, VIII, IX, X, XI are used instead of the standard numerals used today.
Anticlockwise	In the opposite direction from the normal direction of travel of the hands of an analogue clock.
Area	A measure of the size of any plane surface. Area is usually measured in square units e.g. square centimetres (cm2), square metres (m2).
Capacity	Capacity – the volume of a material (typically liquid or air) held in a vessel or container. Note: the term 'volume' is used as a general measure of 3- dimensional space and cannot always be used as synonymously with capacity. e.g. the volume of a cup is the space taken up by the actual material of the cup (a

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	metal cup melted down would have the same volume); whereas the capacity of the cup is the volume of the liquid or other substance that the cup can contain. A solid cube has a volume but no capacity. Units include litres, decilitres, millilitres; cubic centimetres (cm^3) and cubic metres (m^3). A litre is equivalent to 1000 cm^3.
Centilitre	Symbol: cl. A unit of capacity or volume equivalent to one hundredth of a litre.
Centimetre	Symbol: cm. A unit of linear measure equivalent to one hundredth of a metre.
Chronological	Relating to events that occur in a time ordered sequence.
Clockwise	In the direction in which the hands of an analogue clock travel. Anti-clockwise or counter-clockwise are terms used for the opposite direction.
Convert	Changing from one quantity or measurement to another. E.g. from litres to gallons or from centimetres to millimitres etc
Cubic centimetre	Symbol: cm^3 . A unit of volume. The three-dimensional space equivalent to a cube with edge length 1cm.
Cubic metre	Symbol: m^3 . A unit of volume. A three-dimensional space equivalent to a cube of edge length 1m.
Denomination (currency)	The face value of coins. In the smallest denomination of UK currency (known as Sterling) is 1p and the largest denomination of currency is a £50 note.
Digital clock	A clock that displays the time as hours and minutes passed, usually since midnight. Example: four thirty in the afternoon is displayed as 16:30.
Direction	The orientation of a line in space. e.g. north, south, east, west; up, down, right, left are directions.
Distance between	A measure of the separation of two points. Example: A is 5 miles from B
Foot	Symbol: ft. An imperial measure of length. 1 foot = 12 inches. 3 feet = 1 yard. 1 foot is approximately 30 cm.
Gallon	Symbol: gal. An imperial measure of volume or capacity, equal to the volume occupied by ten pounds of distilled water. In the imperial system, 1 gallon = 4 quarts = 8 pints. One gallon is just over 4.5 litres.
Gram (g)	Symbol: g. The unit of mass equal to one thousandth of a kilogram.
Horizontal	Parallel to the horizon.
Hour	A unit of time. One twenty-fourth of a day. 1 hour = 60 minutes = 3600 (60 x 60) seconds.
Imperial unit	A unit of measurement historically used in the United Kingdom and other English speaking countries. Units include inch, foot, yard, mile, acre, ounce, pound, stone, hundredweight, ton, pint, quart and gallon. Now largely replaced by metric units.

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Maths Vocabulary and Glossary

Inch	Symbol: in. An imperial unit of length. 12 inches = 1 foot. 36 inches = 1 yard. Unit of area is square inch, in^2 . Unit of volume is cubic inch, in^3 . 1 inch is approximately 2.54 cm.
Kilo-	Prefix denoting one thousand
Kilogram	Symbol: kg. 1kg. = 1000g.
Kilometre	Symbol: km. The base unit of length in the system is the metre. 1km. = 1000m.
Length	The extent of a line segment between two points. Length is independent of the orientation of the line segment
Litre	Symbol: l. A metric unit used for measuring volume or capacity. A litre is equivalent to 1000 cm3
Mass	A characteristic of a body, relating to the amount of matter within it. Mass differs from weight, the force with which a body is attracted towards the earth's centre. Whereas, under certain conditions, a body can become weightless, mass is constant. In a constant gravitational field weight is proportional to mass.
Measure	1. The size in terms of an agreed unit. See also compound measure. 2. Measure is also used as a verb, to find the size.
Metre	Symbol: m. 1m=100cm
Metric unit	Unit of measurement in the metric system. Metric units include metre, centimetre, millimetre, kilometre, gram, kilogram, litre and millilitre.
Mile	An imperial measure of length. 1 mile = 1760 yards. 5 miles is approximately 8 kilometres
Milli-	Prefix. One-thousandth.
Millilitre	Symbol: ml. One thousandth of a litre.
Millimetre	Symbol: mm. One thousandth of a metre.
Notation	A convention for recording mathematical ideas. Examples: Money is recorded using decimal notation e.g. £2.50
Ounce	Symbol: oz. An imperial unit of mass. In the imperial system, 16 ounces = 1 pound. 1 ounce is just over 28 grams.
Perimeter	The length of the boundary of a closed figure.
Pint	An imperial measure of volume applied to liquids or capacity. In the imperial system, 8 pints = 4 quarts = 1 gallon. 1 pint is just over 0.5 litres.
Pound (mass)	Symbol: lb. An imperial unit of mass. In the imperial system, 14 lb = 1 stone. 1 lb is approximately 455 grams. 1 kilogram is approximately 2.2 lb.
Pound sterling	Symbol £. A unit of money. £1.00 = 100 pence. £1 is commonly called a pound.
Scale (noun)	A measuring device usually consisting of points on a line with equal intervals.
Square centimetre	Symbol: cm^2 . A unit of area, a square measuring 1 cm by 1 cm. 10000 cm^2 = 1 m^2

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Square millimetre	Symbol: mm^2 . A unit of area, a square measuring 1 mm by 1 mm. One-hundredth part of a square centimetre and one-millionth part of a square metre.
Standard unit	Uniform units that are agreed throughout a community. Example: the metre is a standard unit of length. Units such as the handspan are not standard as they vary from person to person.
Temperature	A measure of the hotness of a body, measured by a thermometer or other form of heat sensor. Two common scales of temperature are the Fahrenheit scale (°F) and the Celsius (or centigrade scale) which measures in °C. These scales have reference points for the freezing point of water (0°C or 32°F) and the boiling point of water (100°C or 212°F). The relation between °F and °C is °F = 9/5(°C) + 32.
Time	1. Progress from past, to present and to future 2. Time of day, in hours, minutes and seconds; clocks and associated vocabulary 3. Duration and associated vocabulary 4. Calendar time in days, weeks, months, years 5. Associated vocabulary such as later, earlier, sooner, when, interval of time, clock today, yesterday, tomorrow, days of the week, the 12 months of a year, morning, a.m., afternoon, p.m., noon, etc.
Unit	A standard used in measuring e.g. the metre is a unit of length; the degree is a unit of turn/angle, etc.
Volume	A measure of three-dimensional space. Usually measured in cubic units; for example, cubic centimetres (cm^3) and cubic metres (m^3).
Weight	In everyday English weight is often confused with mass. In mathematics, and physics, the weight of a body is the force exerted on the body by the gravity of the earth, or any other gravitational body.
Yard	Symbol: yd. An imperial measure of length. In relation to other imperial units of length, 1 yard = 3 feet = 36 inches. 1760yd. = 1 mile One yard is approximately 0.9 metres.

Glossary of Terms – Statistics	
Average	Loosely an ordinary or typical value, however, a more precise mathematical definition is a measure of central tendency which represents and or summarises in some way a set of data. The term is often used synonymously with ‘arithmetic mean', even though there are other measures of average.

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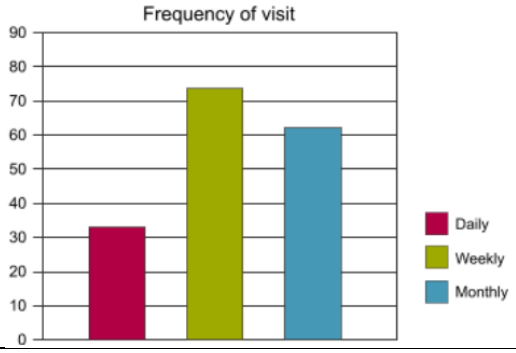
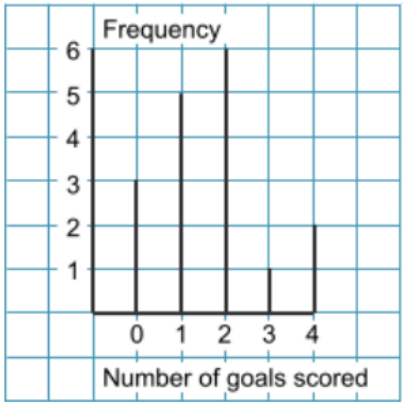
Bar Chart	A format for representing statistical information. Bars, of equal width, represent frequencies and the lengths of the bars are proportional to the frequencies (and often equal to the frequencies). Sometimes called bar graph. The bars may be vertical or horizontal depending on the orientation of the chart. 
Block Graph	Similar to a bar chart, but for categorical data, the width of bars is reduced so that they appear as lines. The lengths of the bar lines are proportional to the frequencies. Sometimes called bar line graph. 
Carroll diagram	A sorting diagram named after Lewis Carroll, author and mathematician, in which numbers (or objects) are classified as having a certain property or not having that property Example: Use the diagram below to classify all the integers from 1 to 33 <table><tr><td></td><td>Even</td><td>Not even</td></tr><tr><td>Multiple of three</td><td>6, 12, 18, 24, 30</td><td>3, 9, 15, 21, 27, 33</td></tr><tr><td>Not multiple of three</td><td>2, 4, 8, 10, 14, 16, 20, 22, 24, 26, 28, 32</td><td>1, 5, 7, 11, 13, 17, 19, 23, 25, 29, 31</td></tr></table>
Column	A vertical arrangement for example, in a table the cells arranged vertically.
Column graph	A bar graph where the bars are presented vertically.
Continuous data	Data arising from measurements taken on a continuous variable (examples: lengths of caterpillars; weight of crisp packets). Continuous data may be grouped into touching but

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Maths Vocabulary and Glossary

	non-overlapping categories. (Example height of pupils [x cm] can be grouped into 130 ≤ x < 140; 140 ≤ x
Data	Information of a quantitative nature consisting of counts or measurements. Initially data are nearly always counts or things like percentages derived from counts. When they refer to measurements that are separate and can be counted, the data are discrete. When they refer to quantities such as length or capacity that are measured, the data are continuous. Singular: datum.
Frequency	The number of times an event occurs; or the number of individuals (people, animals etc.) with some specific property.
Graph	A diagram showing a relationship between variables. Adjective: graphical.
Icosahedron	A polyhedron with 20 faces. In a regular Icosahedron all faces are equilateral triangles.
Interpret	Draw out the key mathematical features of a graph, or a chain of reasoning, or a mathematical model, or the solutions of an equation, etc.
Interval	All possible points in the closed continuous interval between 0 and 1 on the real number line, including the end points zero and 1.
Mean	Often used synonymously with average. The mean (sometimes referred to as the arithmetic mean) of a set of discrete data is the sum of quantities divided by the number of quantities. Example: The arithmetic mean of 5, 6, 14, 15 and 45 is (5 + 6 + 14 + 15 + 45) ÷ 5 i.e. 17. More correctly called the arithmetic mean, as there are also other means in mathematics.
Median	The middle number or value when all values in a set of data are arranged in ascending order. Example: The median of 5, 6, 14, 15 and 45 is 14. When there is an even number of values, the arithmetic mean of the two middle values is calculated. Example: The median of 5, 6, 7, 8, 14 and 45 is (7 + 8) ÷ 2 i.e. 7.5. The median is one example of an average.
Mode	The most commonly occurring value or class with the largest frequency. e.g. the mode of this set of data: 2, 3, 3, 3, 4, 4, 5, 5, 6, 7, 8 is 3 Some sets of data may have more than one mode.
Pictogram	A format for representing statistical information. Suitable pictures, symbols or icons are used to represent objects. For large numbers one symbol may represent a number of objects and a part symbol then represents a rough proportion of the number.
Pie chart	Also known as pie graph. A form of presentation of statistical information. Within a circle, sectors like 'slices of a pie' represent the quantities involved. The frequency or amount of each quantity is proportional to the angle at the centre of the circle.
Set	A well-defined collection of objects (called members or elements)
Table	1. An orderly arrangement of information, numbers or letters usually in rows and columns. 2. See multiplication table
Tally	Make marks to represent objects counted; usually by drawing vertical lines and crossing the fifth count with a horizontal or diagonal strike through. A Tally chart is a table representing a count using a Tally

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	Favourite Pets

Pet	Tally Marks	Number
Cat	𝍸 𝍸	10
Dog	𝍸	4
Rabbit	𝍸 I	6

Glossary of Terms – Ratio and Proportion	
Proportion	1. A part to whole comparison. Example: Where £20 is shared between two people in the ratio 3 : 5, the first receives £7.50 which is 3 /8 of the whole £20. This is his proportion of the whole. 2. If two variables x and y are related by an equation of the form y = kx, then y is directly proportional to x; it may also be said that y varies directly as x. When y is plotted against x this produces a straight line graph through the origin. 3. If two variables x and y are related by an equation of the form xy = k, or equivalently y = k/x, where k is a constant and x ≠ 0, y ≠ 0 they vary in inverse proportion to each other
Proportional reasoning	Using the mathematics and vocabulary of ratio, proportion and hence fractions and percentages to solve problems.

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Maths Vocabulary and Glossary

Ratio	A part to part comparison. The ratio of a to b is usually written a : b. Example: In a recipe for pastry fat and flour are mixed in the ratio 1 : 2 which means that the fat used has half the mass of the flour, that is amount of fat/amount of flour = ½. Thus ratios are equivalent to particular fractional parts.
Ratio notation	a : b can be changed into the unitary ratio 1 : b/a , or the unitary ratio a/b : 1. Any ratio is also unchanged if any common factors can be divided out.
Scale (verb)	To enlarge or reduce a number, quantity or measurement by a given amount (called a scale factor). e.g. to have 3 times the number of people in a room than before; to find a quarter of a length of ribbon; to find 75% of a sum of money.
Scale factor	For two similar geometric figures, the ratio of corresponding edge lengths.

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