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Introduction

The precise and appropriate use of subject specific vocabulary is an essential communication skill for learners and teachers of any subject. If you wish to communicate in a language other than your mother tongue, it is necessary to acquire knowledge of the vocabulary associated with that language, alongside the correct spelling and grammatical rules. The same applies to mathematics and this glossary has been developed by the Hampshire Mathematics Team to provide teachers with a reference point for the technical and subject specific language associated with mathematics. Everyday language in a mathematical context is also included to provide ideas for teachers to use with the word-card resource that accompanies this glossary.

This document provides word lists linked to vocabulary that appears in the national curriculum for mathematics (2014) organised into Key Stage bands. Upper Key Stage 2 (years 5 & 6) words have been included for transition and continuity. In Key Stage 4 (KS4), words in bold refer to content that is suitable for higher attaining pupils and standard type is intended for all students. This is because the current GCSE has two tiers of entry, 'foundation' (for all) and 'higher' (for those higher attaining students). The Key Stage 3 (KS3) content is intended to be for all to access and forms the basis for the foundation tier of study in KS4.

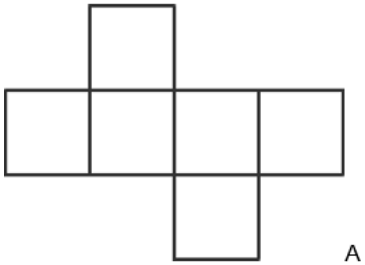
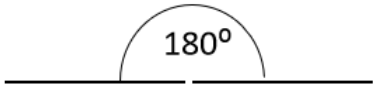
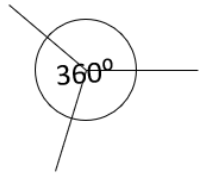
For each word, the year group and the national curriculum domain in which it first appears is identified. This is not to say that the word is not used in other areas of mathematics or in subsequent year groups. Mathematics is a subject where a 'spiral' curriculum is often advocated. Learners are expected to revisit concepts with ever increasing complexity, making connections across domains as they progress. The language associated with mathematics enables precise communication of ideas and concepts and provides one of the building blocks required by learners as they develop their understanding.

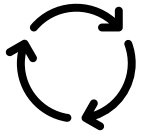
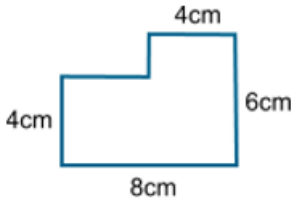
It is to be noted that not all the words in the glossary would be used in the classroom. This document provides a point of reference for teachers to ensure the language used is correct and precise and all concepts are taught with prior knowledge of meaning and definition.

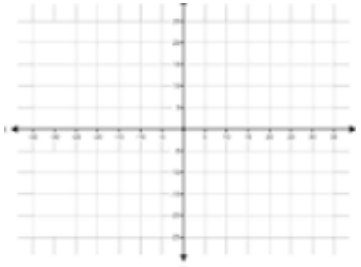
References

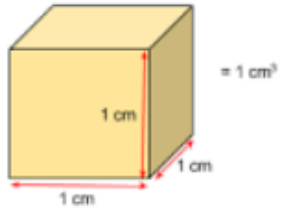
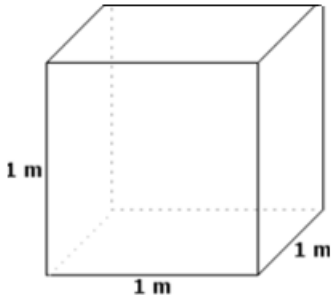
Mathematics glossary for teachers in key stages 1 to 4: Qualification and Curriculum Authority: May 2003
Mathematics programmes of study: key stages 1 to 4: National curriculum in England: DfE: Sept 2013
Mathematics glossary for teachers in key stages 1 to 3: National Centre for Excellence in the Teaching of Mathematics: Jan 2014
https://www.mathsisfun.com/definitions/
https://www.bbc.co.uk/bitesize/guides/

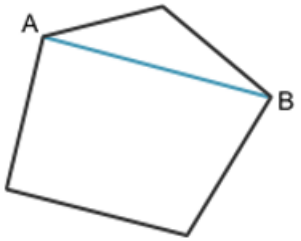
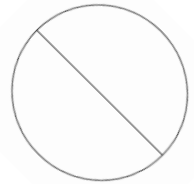
Upper Key Stage 2

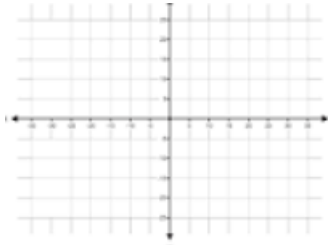
Word	Domain	Year	Meaning	Example
2-D representation	geometry-properties of shapes	5	Also called a 'net'. A plane figure composed of polygons which by folding and joining can form a polyhedron.	 A net of a cube
angles at a point (on a straight line)	geometry-properties of shapes	5	The sum of the angles at a point on a line is 180º.	
angles at a point (in a whole turn)	geometry-properties of shapes	5	The sum of the angles at a point for a complete turn is 360º.	
brackets	addition, subtraction, multiplication and division	6	Symbols used to group numbers in arithmetic or letters and numbers in algebra to indicate that certain operations have priority.	2 x (3 + 4) = 2 x 7 = 14 2 x 3 + 4 = 6 + 4 = 10 The **brackets** give priority to the addition over the multiplication.

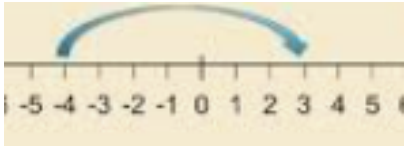
Word	Domain	Year	Meaning	Example
circumference	geometry- properties of shapes	6	The distance around a circle (its perimeter).	
common factor	multiplication and division	5	A number which is a factor of two or more other numbers.	3 is a **common factor** of the numbers 9 and 30.
common multiple	multiplication and division	6	An integer which is a multiple of two or more other integers.	24 is a **common multiple** of 2,3,4,6,8 and 12.
complement (of a number)	addition and subtraction fractions, decimals, and percentages.	5	Pairs of numbers that sum to another number (number bonds).	67 + 33 = 100 67 and 33 are **complements** in 100.
composite number	multiplication and division	5	A whole number that is the product of other whole numbers, excluding 1. This means that 1 and prime numbers are not composite. A composite number has more than two factors.	2 x 6 = 12 and 3 x 4 = 12 12 is a **composite number.**
composite shape	geometry- properties of shapes	5	A shape formed by combining two or more shapes.	

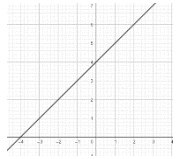
Word	Domain	Year	Meaning	Example
compound unit (speed)	measurement	6	A measure with two or more dimensions is a compound measure. Speed is calculated as distance ÷ time.	The car travelled at 50 km/h. The speed is given in kilometres per hour.
conjecture	reasoning fractions, decimals, and percentages	6	An educated guess (!) of a particular result, which is, as yet, unverified.	2, 4, 6, 8, 10…. **Conjecture**: The next number will be 12 because the sequence goes up in 2s.
coordinate plane	geometry - position and direction	6	Two axes at right angles to each other are used to define the position of a point in a plane. The Cartesian coordinate system uses (x,y) to define how far horizontally and vertically a point lies from the origin (0,0).	
cube number	multiplication and division	5	A number that can be expressed as the product of three equal integers.	27 = 3 x 3 x 3 $27 = 3^3$ 27 is a **cube number.**

Word	Domain	Year	Meaning	Example
cubic centimetre (cm^3)	measurement	6	A unit of volume. The three-dimensional space equivalent to a cube with edge length 1cm.	
cubic metre (m^3)	measurement	6	A unit of volume. The three-dimensional space equivalent to a cube with edge length 1m.	
decimal fraction	fractions, decimals and percentages	6	Tenths, hundredths, thousandths etc. represented by digits following a decimal point.	0.125 is a **decimal fraction.** It is equivalent to 1/10 + 2/100 + 5/1000 (or 1/8).
deduction	reasoning geometry-properties of shapes	5	Mathematical reasoning where the conclusion follows necessarily from a set of premises. If the premises are true then following deductive rules, the conclusion must also be true.	If 2x = 6, we can **deduce** that x = 3.

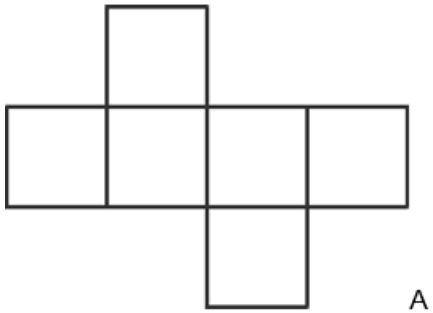
Word	Domain	Year	Meaning	Example
degree	geometry-properties of shapes	5	The most common unit of measurement for angle.	A complete turn is 360 **degrees** (360º).
diagonal (of a polygon)	geometry-properties of shapes	5	A line segment joining any two non-adjacent vertices of a polygon.	
diameter	geometry-properties of shapes	6	Any of the chords of a circle or sphere that pass through the centre.	
equation	algebra	6	A mathematical statement showing that two expressions are equal. The expressions are linked with the symbol '='.	7 - 2 = 4 + 1 5x = 15

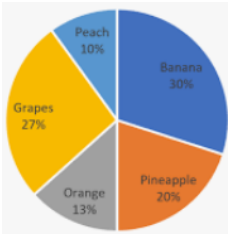
Word	Domain	Year	Meaning	Example
equivalence statement (or expression)	addition and subtraction multiplication and division	5	A numerical or algebraic expression which is the same as the original expression but is in a different form which might be more useful as a starting' point to solve a particular problem.	19 x 8 = (20 x 8) - (1 x 8)
formula (e)	algebra	6	An equation linking sets of physical variables.	To find the area of a circle, A, we use the **formula:** $A = \pi r^2$ Where 'r' is the radius of the circle.
four quadrants	geometry - position and direction	6	The four regions into which a plane is divided by the 'x' and 'y' axes in a (Cartesian) coordinate system.	
gallon	measurement	6	An imperial measure of capacity equal to the volume occupied by ten pounds of distilled water. 1 gallon = 4 quarts = 8 pints ≈ 4.5 litres.	The bucket held two **gallons** of water.
generalisation	algebra	6	To formulate a general statement or rule that applies correctly to all relevant cases.	'The sum of two odd whole numbers is always an even whole number' is a **general** statement. It is always true.

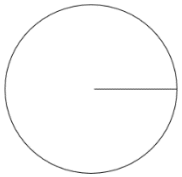
Word	Domain	Year	Meaning	Example
hundred thousand	number and place value	5	The sixth column to the left in relation to the decimal point. It is one hundred thousands, or 10^5	367, 500 This number reads as **three hundred** and sixty-seven **thousand** and five hundred.
imperial units	measurement	5	Units of measurement historically used in the United Kingdom and other English-speaking countries.	Inch, foot, yard, mile, acre, ounce, pound, stone, hundredweight, ton, pint, quart, gallon are all **imperial units** of measure.
improper fractions	fractions, decimals, and percentages	5	A fraction which has a numerator that is greater than its denominator, denoting a value greater than one.	$\frac{9}{4}$
inch (in or ")	measurement	5	An imperial unit of length.	My thumbnail is approximately one **inch** wide.
interval (across zero)	number and place value	6	The distance between a pair of numbers on a number line where one is positive and the other is negative.	
level of accuracy	number and place value addition and subtraction	5	Often in reference to the number of significant figures (or rounding) with which a numerical quantity is recorded. The degree of precision in the measurement of a quantity.	3.7 + 4.9 ≈ 4 + 5 4 + 5 = 9 3.7 + 4.9 ≈ 9 to the nearest whole number.
linear number sequence	number and place value algebra	6	A sequence of numbers that has a common difference (+/-).	3, 7, 11, 15, ….is a **linear number sequence** with a common difference of 4.

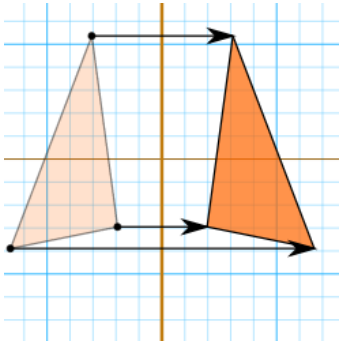
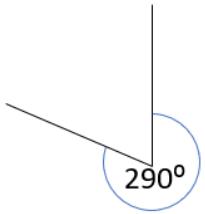
Word	Domain	Year	Meaning	Example
line graph	statistics	5	**A graph in which points representing values of a variable. for suitable values of an independent variable are connected by a straight line.**	
long division	multiplication and division	6	A columnar algorithm for division by more than a single digit.	432 ÷ 15 becomes 2 8 · 8 1 5 | 4 3 2 · 0 3 0 ↓ 1 3 2 1 2 0 ↓ 1 2 0 1 2 0 0 Answer: 28·8
long multiplication	multiplication and division	5	A columnar algorithm for multiplication by more than a single digit.	124 × 26 becomes 1 2 1 2 4 × 2 6 7 4 4 2 4 8 0 3 2 2 4 1 1 Answer: 3224

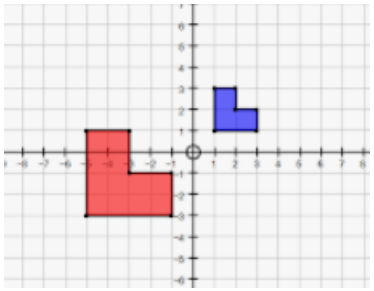
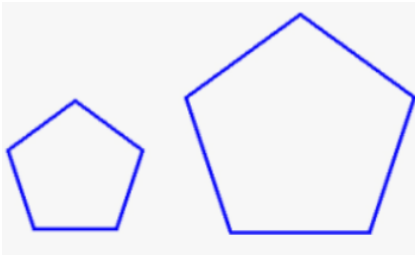
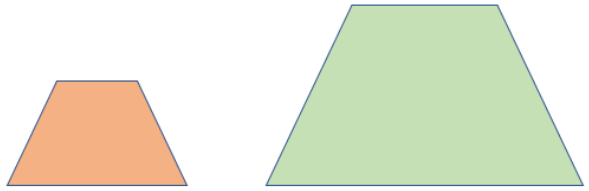
Word	Domain	Year	Meaning	Example
mean (average)	statistics	6	Sometimes called the arithmetic mean. The mean of a set of discrete data is the sum of the quantities divided by the number of quantities (or data points).	The **mean** average of 5, 6, 14, 15 and 45 is (5 + 6 + 14 + 15 + 45) ÷ 5 = 17 17 is the arithmetic **mean.**
mile	measurement	6	An imperial unit of length.	I live two **miles** away from my friend.
million	number and place value	5	The seventh column to the left in relation to the decimal point. It is one thousand thousands or 10^6	1, 367, 500 This number reads as **one million**, three hundred and sixty-seven thousand and five hundred.
mixed numbers	fractions, decimals, and percentages	5	A whole number and a fractional part expressed as a common fraction.	$4\frac{5}{8}$ = four and five eighths.
mixed operation	addition, subtraction, multiplication, and division	6	A calculation, or number sentence, involving more than one different operation.	3 + 7 x 8 = 59 is a calculation involving **mixed operations** (addition and multiplication on this occasion).
multi-digit number	number and place value	6	A number comprising at least two digits.	8974 is a **multi-digit** number.

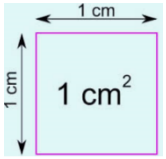
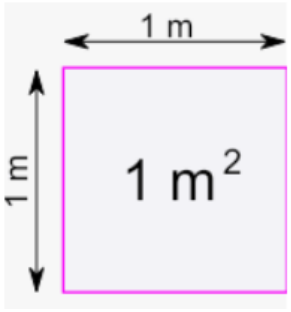
Word	Domain	Year	Meaning	Example
net (of a shape)	geometry- properties of shapes	6	A plane figure composed of polygons which by folding and joining can form a polyhedron.	 A net of a cube
order of magnitude	number and place value	6	The approximate size of a number, often given as power of ten.	$2.97 \times 1042 \approx 3 \times 1000 \approx 3 \times 10^3$ The **magnitude** of this product is thousands.
order of operations (BODMAS)	addition, subtraction, multiplication, and division	6	This refers to the order in which different mathematical operations are applied in a calculation. This is also known as BODMAS or BIDMAS, which stands for Brackets; Orders/Indices (powers); Division & Multiplication; Addition & Subtraction.	$2 + 3 \times 4 = 2 + 12$ (multiplication before addition) $2 + 12 = 14$
per cent %	fractions, decimals, and percentages	5	Out of 100.	From 100 counters, I choose 35. This is 35**%** of the whole.

Word	Domain	Year	Meaning	Example
percentage	fractions, decimals, and percentages	5	A fraction expressed as the number of parts per hundred and recorded using the notation %. The whole can be expressed as 100%.	35% = $\frac{35}{100}$ = 35 out of 100
pie chart	statistics	6	A form of presentation of statistical information. Within a circle, sectors like 'slices of a pie' represent the quantities involved. The frequency of each quantity is proportional to the angle at the centre of the circle.	
pint	measurement	5	An imperial measure of volume.	He drank a **pint** of lemonade. (1 pint is just over 0.5 litre)
pound (lb)	measurement	5	An imperial measure of mass.	She bought two **pounds** of potatoes. (**1lb** is approximately 455 grams)
powers of 10	number and place value	5	A way of recording multiplying by ten.	10^2 = 10 x 10 = 100 10^2 = **ten to the power** of 2
prime factor	multiplication and division	5	The factors of a number that are prime.	2 and 3 are the **prime factors** of 12 since 12 = 2 x 2 x 3.
prime number	multiplication and division	5	A whole number greater than 1 that has exactly two factors, itself and 1.	2 is a **prime number** (factors 2, 1) 41 is a **prime number** (factors 41, 1) 97 is a **prime number** (factors 97, 1)

Word	Domain	Year	Meaning	Example
proper fraction	fractions, decimals, and percentages	5	A fraction which has a numerator that is smaller than its denominator, denoting a value less than one.	$\frac{3}{4}$
proportional graph	measurement	6	A linear graph that converts one measure to another.	
proportionality	ratio and proportion	6	A part to whole comparison.	If £20 is shared in the ratio 3:5, the first person receives 3/8 of the whole. 3/8 is the **proportion.**
quotient	multiplication and division	6	The result of a division.	45 ÷ 3 = 15 15 is the **quotient.**
radius	geometry-properties of shapes	6	In relation to a circle, the distance from the centre to any point on the circumference. For a sphere, the distance from the centre to any point on the sphere.	
ratio (a:b notation)	ratio and proportion	6	A part-to-part comparison.	£20 is divided up in the **ratio** 3: 2. For every £3 one person gets, the other person gets £2.

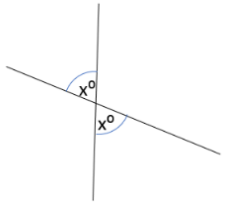
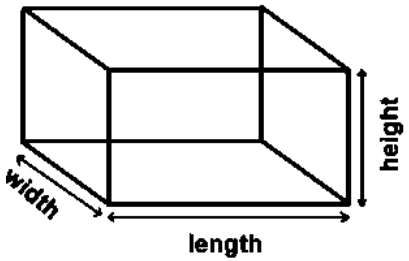
Word	Domain	Year	Meaning	Example
recurring decimal	fractions, decimals and percentages	6	A decimal fraction with an infinitely repeating digit or group of digits.	1/3 = 0.333333333……
reflection	geometry - properties of shapes	6	In 2-D, a transformation of the whole plane involving a mirror line or axis of symmetry in the plane. A 2-D reflection is specified by its mirror line.	
reflex angle	geometry – properties of shapes	5	An angle that is greater than 180º but less than 360º.	
relative size	ratio and proportion	6	A comparison of the size of number or shape.	10 is twice 5. 5 is half 10.
remainder	multiplication and division	5	In the context of division where the answer (quotient) is not a whole number, the amount remaining after the operation.	36 ÷ 5 = 7 r 1 The **remainder** is 1.

Word	Domain	Year	Meaning	Example
scale drawing	measurement	5	An accurate drawing of a physical object in which all lengths in the drawing are in the same ratio to the corresponding lengths in the actual object.	
scale factor	ratio and proportion	6	For two similar geometric figures, the ratio of the corresponding edge lengths.	 Enlargement **scale factor** 2. Each corresponding edge in the larger pentagon is twice the length of the smaller pentagon.
similar shape	ratio and proportion	6	Two shapes that have the same corresponding internal angles and sides or edges that are in proportion. One shape will be an 'enlargement' of the other.	

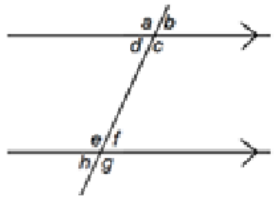
Word	Domain	Year	Meaning	Example
simple interest (simple rates)	ratio and proportion	6	In savings (or loans), banks apply an interest rate on the sum invested (or loaned). Simple interest is what is added to the savings (or loan) at the end of the specified period.	A saver invests £200 at a **simple rate** of 1% per year for one year. At the end of the year, the saver has 101% of £200, which is £202.
square centimetre (cm^2)	measurement	5	A unit of area, a square measuring 1cm by 1cm.	
square metre (m^2)	measurement	5	A unit of area, a square measuring 1m by 1m.	
square number	multiplication and division	5	A number that can be expressed as the product of two equal numbers.	36 = 6 x 6 $36 = 6^2$ 36 is six squared. 36 is a **square number.**

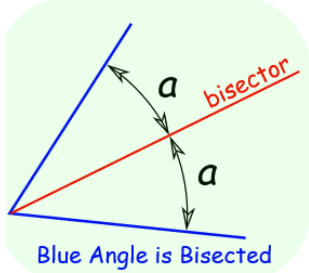
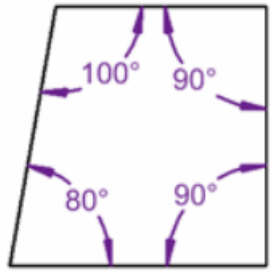
Word	Domain	Year	Meaning	Example
ten million	number and place value	6	The eighth column to the left relative to the decimal point. It is ten thousand thousands or 10^7	10, 500, 003 This number reads **ten million**, five hundred thousand and three.
ten thousand	number and place value	5	The fifth column to the left relative to the decimal point. It is ten thousands or $10^{4.}$	20, 503 This number reads **twenty thousand**, five hundred and three (2 lots of ten thousand).
term-to-term rule	algebra	6	An algebraic rule to generate successive terms of a sequence.	3, 7, 11, 15, …. The **term-to-term rule** is 'add 4'.
terminating decimal	fractions, decimals, and percentages	6	**A decimal fraction which can be expressed in a finite number of figures.**	$\frac{4}{5} = 0.8$ (this number **terminates** at the first decimal place).
thousandths	fractions, decimals, and percentages	5	The result of dividing by 1000. The third column to the left after the decimal point.	3.658 The eight is in the **thousandths** column.
timetable	statistics	6	A table of information showing when things will happen.	 This **timetable** shows when the trains arrive at each station.

STATIONS	TRAIN 1	TRAIN 2	TRAIN 3	TRAIN 4	TRAIN 5
CHURCH STREET	08:04	08:19	08:34	08:49	09:04
SANDYCOMBE CIRCLE	09:08	09:23	09:38	09:53	10:08
HENLEY HOSPITAL	10:05	10:20	10:35	10:50	11:05
HILLSIDE MALL	11:07	11:22	11:37	11:52	12:07
DULWICH PARK	12:04	12:19	12:34	12:49	13:04
GRAND CENTRAL	13:08	13:23	13:38	13:53	14:08
STATION PARADE	14:05	14:20	14:35	14:50	15:05
GOLDSTEAD	15:07	15:22	15:37	15:52	16:07
MONUMENT DISTRICT	16:05	16:20	16:35	16:50	17:05
LORDSHIP SQUARE	17:07	17:22	17:37	17:52	18:07

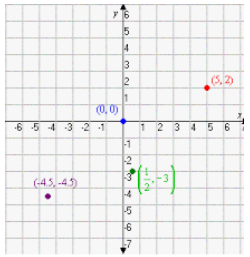
Word	Domain	Year	Meaning	Example
unequal sharing	ratio and proportion	6	The sharing of a quantity into parts that are not equal.	£20 is divided up in the ratio 3:2. For every £3 one person gets, the other person gets £2. This is **unequal sharing.**
unknown	algebra	6	In the context of calculation, the part that is to be worked out using the other known or given elements.	a + 4 = 10 a is **unknown.**
variable	algebra	6	A quantity that can take on a range of values, often denoted by a symbol or letter.	If x = 3, then x + 2 = 5 If x = 4, then x + 2 = 6 x is the **variable.**
vertically opposite (angles)	geometry-properties of shapes	6	The pair of equal angles between two intersecting lines. There are always two such pairs.	
volume	measurement	5	A measure of three-dimensional space, usually measured in cubic units such as cubic centimetres (cm^3).	

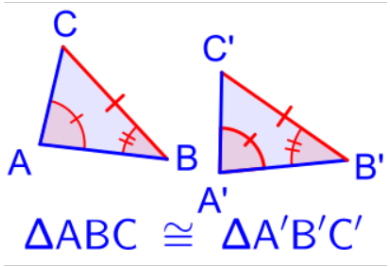
Key Stage 3

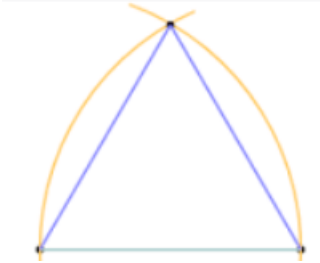
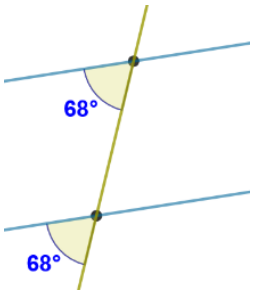
Word	Domain	Year	Meaning	Example
additive reasoning	develop fluency	7+	Reasoning about the operations of addition and subtraction. Understanding and using the part/whole relationship between sets of three or more numbers.	I know that 73 + 78 = 151 since it is a near double of 75 + 75 = 150 (using 5 + 5 = 10 and 3 + 8 = 11 and 70 + 70 = 140).
algebraic notation	algebra	7+	The use of letters and symbols to denote variables or unknowns.	a (x + y) where a, x and y are all numbers is an example of **algebraic notation.**
algebra	develop fluency	7+	The part of mathematics that deals with generalised arithmetic.	a + b = 10 I can find an infinite number of pairs of a and b to fit this general equation.
alternate angles	geometry and measures	7+	Two angles formed when a line crosses two other lines, that lie on opposite sides of the transversal line and on opposite relative sides of the other lines. If the two lines crossed are parallel, the alternate angles are equal.	 d and f are **alternate** and equal. There are other pairs of **alternate angle**s in this diagram.
analyse	develop fluency	7+	Examine (something) methodically and in detail, typically in order to explain and interpret it.	I can look at a scatter graph to **analyse** a trend in the data.

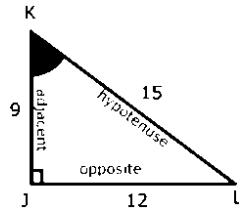
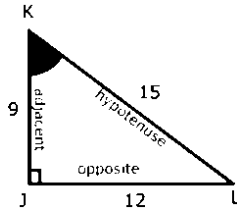
Word	Domain	Year	Meaning	Example
angle bisector	geometry and measures	7+	A line that divides an angle into two equal parts.	
angle sum (polygon)	geometry and measures	7+	The total number of degrees when all the internal angles of a polygon are added together.	 The angle sum of any quadrilateral is always 360º (100+90+80+90).
approximation	number	7+	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.	37 + 93.756 ≈ 40 + 90 40 + 90 = 130 130 is an **approximate** solution to 37 + 93.756

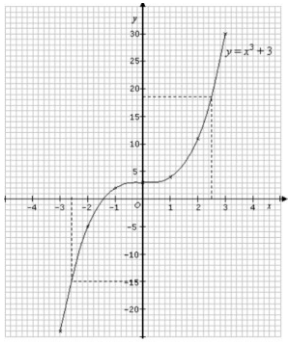
Word	Domain	Year	Meaning	Example
argument	reason mathematically	7+	A reason or set of reasons given in support of an idea, action, or theory.	All even numbers are of the form 2n, where n is a positive integer. 6 = 2 x 3 6 is an even number because it is a multiple of 2
arithmetic sequence	algebra	7+	A sequence of numbers in which successive terms are generated by adding or subtracting a constant amount to the preceding term. This constant is called the common difference. Also called arithmetic progression.	3, 7, 11, 15, 19 is an **arithmetic sequence** with a common difference of 4 between each term.
binomial	algebra	7+	A polynomial equation with two terms usually joined by a plus or minus sign is called a **binomial**. Binomials are used in algebra. (x + y)	3x + 7 This expression has two terms and so is a **binomial.**
bivariate data	statistics	7+	Data involving two random variables; used in statistics as a bivariate distribution.	Ice cream sales versus the temperature on that day. The two variables are Ice Cream Sales and Temperature.

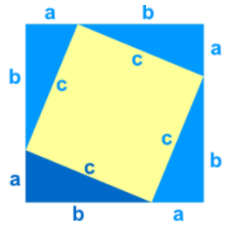
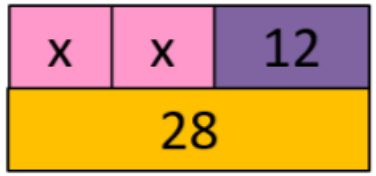
Word	Domain	Year	Meaning	Example
Cartesian plane	algebra	7+	A two-dimensional space used to define the position of a point. Two axes at right angles to each other are used to define this position. They are labelled the x-axis (horizontal) and the y-axis (vertical), with points described in terms of their relative position (x,y).	
coefficient	algebra	7+	Often used for the numerical coefficient. In these terms it describes the number (or multiplier) of a variable.	**3**x + 7 = 0 3 is the **coefficient of x**
combined events	probability	7+	A combined (or compound) event is an event that includes several outcomes.	If we flip a coin twice, we can find all the possible outcomes of the combined events. The first coin flip is one event, and the second coin flip is another event. They combine to produce outcomes, HH, HT, TH or TT
concave	geometry and measures	7+	Curving inwards. A concave polygon has at least one reflex internal angle.	 **Concave Octagon**

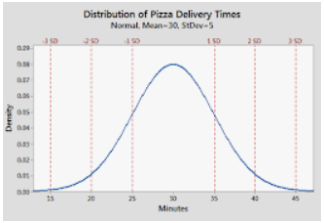
Word	Domain	Year	Meaning	Example
concept	solve problems	7+	The 'why' or 'big idea' in mathematics where the workings behind the answer are understood.	If I know that 3 + 7 = 10 leads to 30 + 70 = 100. I understand a **concept** associated with place value.
congruence	geometry and measures	7+	Two or more geometric figures are said to be congruent when they are the same in every way except their position in space.	
conjecture	develop fluency	7+	An educated guess (or otherwise) of a particular result, which is, as yet, unverified.	7, 14, 28, 56, ? **Conjecture**: The next number will be 392 because the sequence is generated by multiplying a term by 7 to get the next term. The nth term will be 7^n
constant	algebra	7+	A number or quantity that does not vary.	In the expression 3x + 7, 7 is the **constant.** (the value of 3x changes according to the value given to x m, x is the variable)

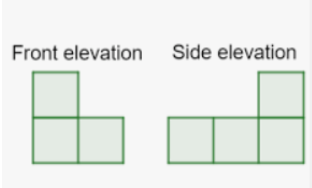
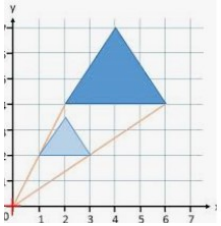
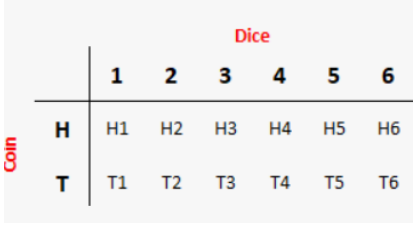
Word	Domain	Year	Meaning	Example
construction (ruler and compasses)	geometry and measures	7+	In geometry, the act of drawing shapes using only a pair of compasses and a straight edge. No measuring of lengths or angles is required.	
continuous data	statistics	7+	Data arising from measurements taken on a continuous variable.	I measure the height of sunflowers growing over time in centimetres. This is **continuous** data.
correlation	statistics	7+	A measure of the strength of the association between two variables.	The warmer the weather, the more ice-cream is sold. There is a **positive correlation** between average daily temperature and ice cream sales.
corresponding angles	geometry and measures	7+	The angles which occupy the same relative position at each intersection where a straight-line (a transversal) crosses two others. If the two lines are parallel, the corresponding angles are equal.	

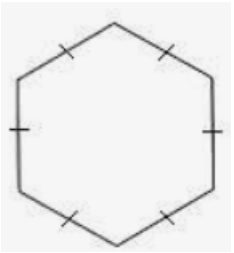
Word	Domain	Year	Meaning	Example
cosine	geometry and measures	7+	A function of an angle. It can also be described in terms of the ratio of two sides of a right-angled triangle containing the angle, where the cosine of the angle is defined as the side length adjacent to the angle divided by the length of the hypotenuse.	 Cos K = adjacent/ hypotenuse = 9/15
cosine^{-1}	geometry and measures	7+	The inverse of the cosine function.	Angle K = cos^{-1} (9/15) Angle K ≈ 53º 
counter-example	develop fluency	7+	Where a hypothesis or general statement is offered, an example clearly disproves it.	Statement: All prime numbers are odd **Counter-example**: 2 is prime and even
cubic	algebra	7+	A mathematical expression of degree 3; the highest total power that appears in the expression is power 3.	The general form of a **cubic** expression is $ax^3 + bx + cx + d$ where a, b, c and d are real numbers and a is not zero. An example is $3x^3 + 4$

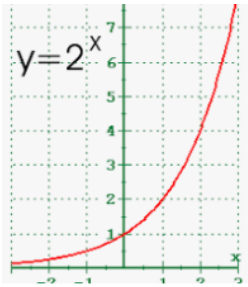
Word	Domain	Year	Meaning	Example
cubic curve	algebra	7+	A curve with an algebraic equation of degree three.	
deductive reasoning	develop fluency	7+	Mathematical reasoning where the conclusion follows necessarily from a set of premises. If the premises are true then following deductive rules, the conclusion must also be true.	Since all squares are rectangles and all rectangles have four sides; so all squares have four sides.
degree of accuracy	number	7+	A measure of the precision of a calculation, or the representation of a quantity. A number may be recorded as accurate to a given number of decimal places, or rounded, or to so many significant figures.	37 ÷ 7 = 52.8571429…… 37 ÷ 7 = 53 accurate to 2 significant figures.
density **(compound unit)**	ratio, proportion and rates of change	7+	A measure of mass per unit volume. Density = mass/volume	A rock with a volume of 15cm^3 and a mass of 45 g has **a density** of 45/15 = 3 cm^3 /g

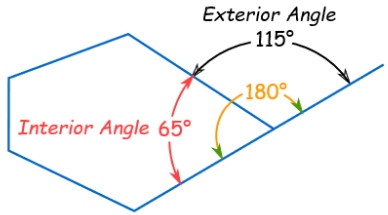
Word	Domain	Year	Meaning	Example
derive	geometry and measures	7+	To derive a formulae means to deduce, obtain, or prove the formula from a set of already known principles or observations.	 Using this diagram and the formulae for the area of a triangle (1/2base x height) and the area of a square, it is possible to **derive** Pythagoras' Theorem. $c^2 = a^2 + b^2$
diagrammatic	develop fluency	7+	A representation in picture, visual or geometric form.	This bar model is a **diagrammatic** form of the equation 2x + 12 = 28. 

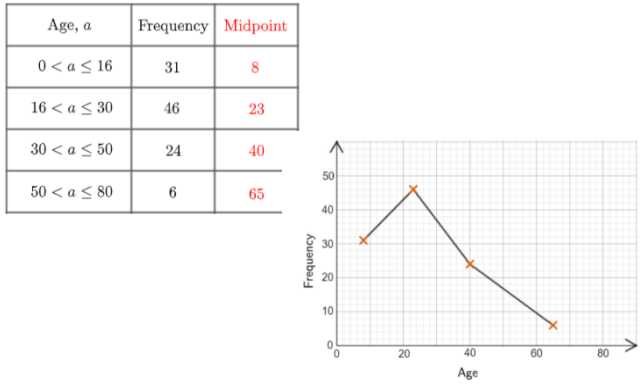
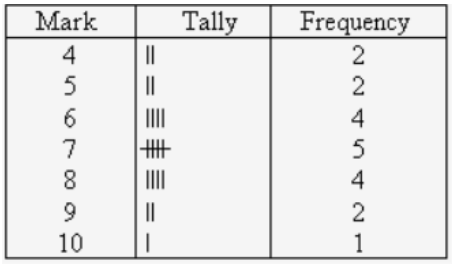
Word	Domain	Year	Meaning	Example
direct proportion	ratio, proportion, and rates of change	7+	Two variables x and y are in direct proportion if the algebraic relation between them is of the form y = kx, where k is a constant. The graphical representation of this is a straight line through the origin with k as the gradient of the line. The symbol used for direct proportion is α.	If T is proportional to S, we write T α S This means that T = k S, k is a constant (T and S are variables). Is T = 18 when S = 2, we can substitute to find k. 18 = 2k so k = 9 The equation of proportionality is T = 9S We can also plot T against S to obtain a straight- line graph with a gradient of 9.
discrete data	statistics	7+	Data resulting from situations involving discrete (countable) variables.	The number of people in a class. The number of goals scored. These are both examples of **discrete** data.
dividend	number	7+	The number that is divided.	**450** ÷ 45 = 10 450 is the dividend.
divisor	number	7+	The number by which another number is divided.	450 ÷ **45** = 10 45 is the **divisor.**
distribution	statistics	7+	For a set of data, the way in which values in the set are distributed between the minimum and maximum values.	

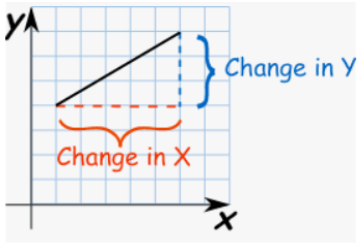
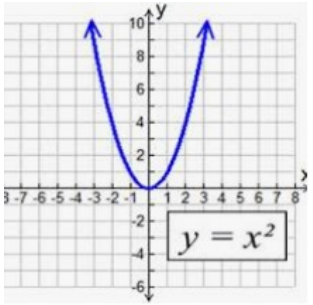
Word	Domain	Year	Meaning	Example
elevation	geometry and measures	7+	A 2-dimensional diagram of a 3-dimensional object, usually the view from the front or side.	
empty (null) set	probability	7+	The set with no members. Symbol is $\varnothing$	The set of all even numbers that are also odd is an **empty set**, since there are no members.
enlargement	geometry and measures	7+	A transformation of the place in which lengths are multiplied whilst directions and angles are preserved. A centre and scale factor are used to specify an enlargement.	
equally likely (outcomes)	probability	7+	In an experiment (trial in statistics) the result is the outcome. Two outcomes are equally likely if they have the same theoretical probability of occurrence.	 With a fair coin and dice, the probability of all 12 outcomes is 1/12. They are all **equally likely.**

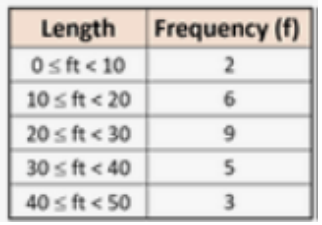
Word	Domain	Year	Meaning	Example
equation	algebra	7+	A mathematical statement showing that two expressions are equal.	4x + 7 = 95 is an **equation** It can be solved to give x = 22
equilateral	geometry and measures	7+	Of equal length.	This is an **equilateral** hexagon, (also a regular hexagon) 
error	number	7+	A mistake or the difference between an accurate calculation and an approximate calculation or estimate.	The length of a line, x, is 4cm to the nearest cm. The margin of **error** is: $3.5 \leq x < 4.5$ (also known as the level of accuracy)
evaluate (outcomes)	solve problems	7+	To find the value of a numerical or an algebraic expression.	3.7 - 0.3 can be **evaluated** as 3.4 3a + 2 can be **evaluated** when a = 6 3a + 2 = 3 x 6 + 2 = **20**
event	probability	7+	A possible outcome of a probability experiment or statistical trial.	Rolling a '3' on a 1-6 die is an **event.**
expand (products)	algebra	7+	Remove the brackets in an expression by multiplication.	$(3x + 2)(x - 7) = 3x^2 - 21x + 2x - 14$ $3x^2 - 19x - 14$ is the **expanded form.**

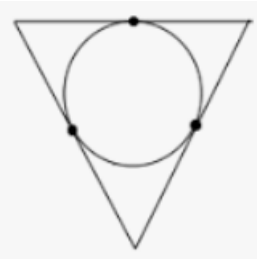
Word	Domain	Year	Meaning	Example
experimental probability	probability	7+	The ratio of the number of times an event occurs to the total number of trials or times the activity is performed.	If I roll a 1-6 die 100 times and achieve a '3' 18 times, then the **experimental p**robability of rolling a 3 is 18/100. (The theoretical probability would be 1/6) The more trials, the closer the experimental probability is to the theoretical.
exponent	algebra	7+	Also known as an index number, it is a number positioned above and to the right of another (the base), indicating repeated multiplication when the exponent is a positive integer. Negative integer exponents are the reciprocal of the corresponding positive integer exponent. Fractional, positive, exponents represent roots. When the exponent of a number is zero, the value is always one.	$3 \times 3 \times 3 \times 3 = 3^4$ '4' is the **exponent**
exponential (graph)	algebra	7+	The graph of a function that has variables expressed as exponents or powers.	

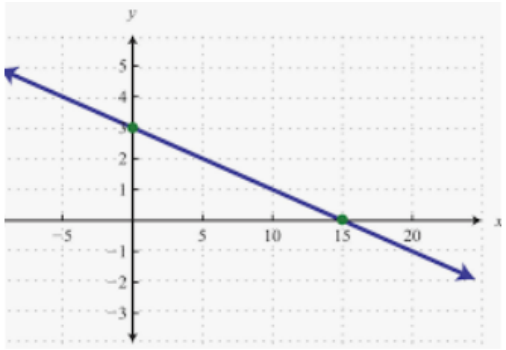
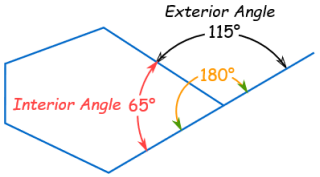
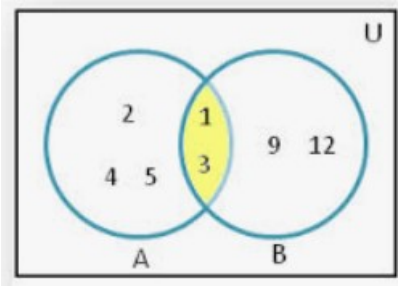
Word	Domain	Year	Meaning	Example
expression	algebra	7+	A mathematical form expressed symbolically.	37 - 18 x is an **expression** in x.
exterior angle	geometry and measures	7+	Of a polygon, the angle formed outside between one side and the adjacent side produced. This is the angle that has to be turned at the vertex if you are travelling around a shape. Each interior and its corresponding exterior angle sum to 180º. Exterior angles always sum to 360º, irrespective of the number of sides or the regularity of the polygon.	
factorise	algebra	7+	To resolve into factors. The opposite of 'expanding brackets'.	$x^2 + x - 12 = 0$ can be **factorised** into the form: $(x – 3)(x + 4) = 0$
fairness	probability	7+	Statistical parity. Keeping all variables constant except the one you are experimenting with.	A 1-6-sided die is **fair** if all numbers (1, 2, 3, 4, 5, 6) have an equal chance of occurring when the die is rolled. Also called unbiased.
financial mathematics	solve problems	7+	Mathematics relating to money.	I invest £300 for 2 years with 5% compound interest. How much money do I have at the end of 2 years? $300 \times 1.05^2 = £330.75$

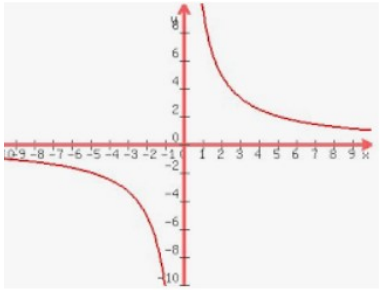
Word	Domain	Year	Meaning	Example
frequency	probability	7+	The number of times an event occurs.	Out of 20 maths tests, 1 person scored 10 marks. The **frequency** of a paper scoring 10 marks is 1.
frequency polygon	statistics	7+	A graph to display grouped data.	
frequency table	statistics	7+	A table that lists items and shows the number of times the items occur.	
generalise	develop fluency	7+	To formulate a general statement or rule that applies correctly to all relevant cases.	3 + 4 = 4 + 3 and 7 +11 = 11 + 7 **In general,** a + b = b + a (for any pair of numbers, a and b)

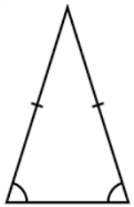
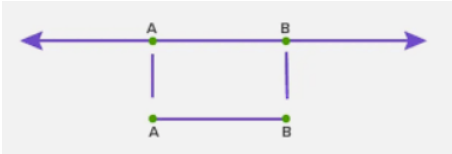
Word	Domain	Year	Meaning	Example
geometric sequence	algebra	7+	A series of terms in which each term is a constant multiple of the previous term (known as the common ratio). Sometimes called a geometric progression.	5, 25, 125, 625 This is a **geometric sequence** with a common ratio of 5. Each term is 5 multiplied by the previous term. The nth term is 5^n
gradient	algebra	7+	A measure of the slope of a line.	
graphical	develop fluency	7+	A diagrammatic representation of a mathematical relationship between two variables.	
greater than or equal to ≥	number	7+	A symbol to compare two or more quantities where one number can be larger than, but also the same as another.	3x + 6 ≥ 27 This means that x must **be greater than or equal** to 7.

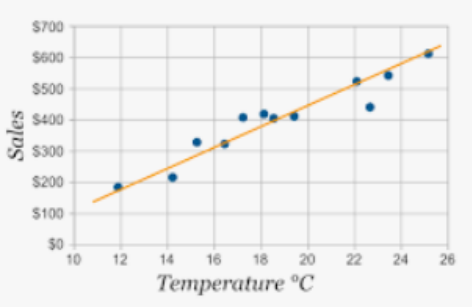
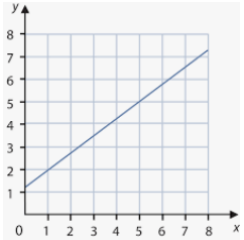
Word	Domain	Year	Meaning	Example
grouped data	statistics	7+	Observed data arising from counts and grouped into non-overlapping intervals.	
highest common factor	number	7+	The common factor of two or more numbers which has the highest value.	12, 20 and 24 have two common factors, 2 and 4. 4 is the **highest common factor.**
identity	algebra	7+	An equation that holds for all values of the variables. The symbol ≡ is used.	$a^2 - b^2 \equiv (a + b)(a - b)$
index laws	algebra	7+	Where index notation is used and numbers raised to powers are multiplied or divided, the rules for manipulating index numbers. $a^n \times a^m = a^{n+m}$ $a^n \div a^m = a^{n-m}$ $(a^n)^m = a^{nm}$	$a^3 \times a^5 = a^8$ demonstrates one of the laws of indices since $a^3 \times a^5 = a \times a \times a \times a \times a \times a \times a \times a = a^8$
index notation	algebra	7+	The notation in which a product such as: a x a x a x a is recorded as a^4	a x a x a x a = a^4 The '4' is the **index** (pl. indices) and the 'a' is the base.

Word	Domain	Year	Meaning	Example
Inequality	algebra	7+	When one number or quantity is not equal to another. Symbols used include ≠, ≥, ≤, <, >	73 < 93 < 106 93 is less than 106 and greater than 73.
infinite	number	7+	Of a sequence or set, going on forever. The set of integers is an infinite set. Symbol is ∞	1, 2, 3, 4, 5……105…….1,000,005……∞ There is always one more integer. The set is **infinite.**
inscribed	geometry and measures	7+	Describing a figure enclosed by another.	 The circle is **inscribed** in a triangle.
integer	number	7+	A whole number. A number that can be written without a fractional component.	3, 6, -10 are all **integers**

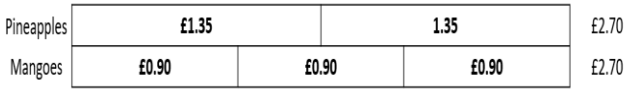
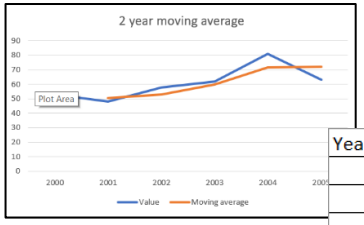
Word	Domain	Year	Meaning	Example
intercept	algebra	7+	To cut a line, curve or surface with another. On a graph, the value of the non-zero coordinate of the point where a line cuts an axis.	 The **intercepts** with the axes are at (0,3) and (15,0)
interior angle	geometry and measures	7+	The angle at a vertex inside a polygon	
intersection (set)	probability	7+	The elements that are common to two or more sets. Symbol is ∩	 A ∩ B = {1,3}

Word	Domain	Year	Meaning	Example
inverse proportion	ratio, proportion and rates of change	7+	Two variables x and y are in inversely proportional if the algebraic relation between them is of the form xy = k, where k is a constant.	If T is inversely proportional to S, we write T α 1/S This means that T = k/ S , k is a constant (T and S are variables) If T = 2 when S = 20, we can substitute to find k 2 = 20/k so k = 9 The equation of proportionality is T = 10 / S or TS = 10
inversely proportional graph	ratio, proportion and rates of change	7+	Two variables x and y are in inversely proportional if the algebraic relation between them is of the form xy = k, where k is a constant.	 The graph of xy = 10
irrational number	number	7+	A number that is not an integer and cannot be expressed as a common fraction with a non-zero denominator. Real irrational numbers, when expressed as decimals are infinite, non-recurring decimals.	√**17 is irrational** because its decimal form is 4.123105626……. The decimal form does not terminate or recur.

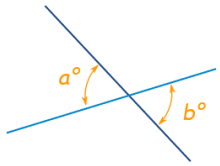
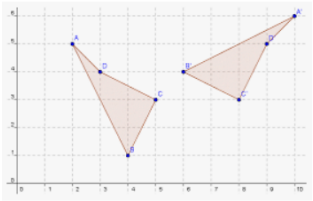
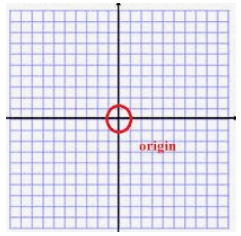
Word	Domain	Year	Meaning	Example
Isosceles (triangle)	geometry and measures	7+	A triangle in which two sides have the same length and consequently two angles are equal.	
Least (lowest) common multiple (LCM)	number	7+	The common multiple of two or more numbers, which has the least value.	The LCM of 12 and 15 is 60 Multiples of 12: 12, 24, 36, 48, **60**, 72, 84 Multiples of 15: 15, 30, 45, **60,** 75, 90
less than or equal to ≤	number	7+	A symbol to compare two or more quantities where one number can be less than, but also the same as another.	$3x + 6 \leq 27$ This means that x must **be less than or equal** to 7.
like terms	algebra	7+	Terms whose variables and exponents are the same	$2x^2 + 3x + 5x - y$ The **like terms** are in 'x' The expression simplifies to $2x^2 + 8x - y$
line segment	geometry and measures	7+	A straight line is defined as a set of adjacent points that has length but no width. The part of the line between any two of these points is a line segment.	 The **line segment** is AB

Word	Domain	Year	Meaning	Example
line of best fit	statistics	7+	A line drawn on a scatter graph to represent the best estimate of an underlying linear relationship between the variables.	
linear function	algebra	7+	Describes an expression or equation of degree one. All linear equations can be represented as straight line graphs.	The linear function y = x + 1 can be plotted as straight line. 
mean	statistics	7+	Sometimes called the arithmetic mean. The mean of a set of discrete data is the sum of the quantities divided by the number of quantities (or data points).	The **mean** of 6, 11, 16 is 11 (6 + 11 + 16) ÷ 3 = 11

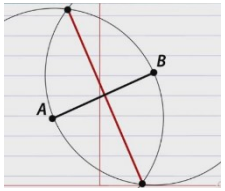
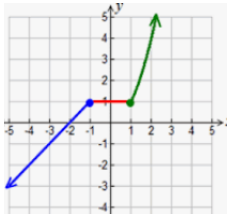
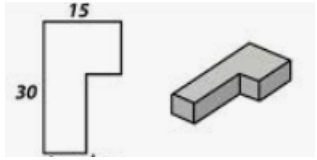
Word	Domain	Year	Meaning	Example
measure of central tendency	statistics	7+	A measure of how the values of a particular variable are located in terms of the values collected for a particular sample. Measures of central tendency include the arithmetic mean, the median and the mode. These are all statistical averages.	The mean average of 6, 11, 16, 12, 10 is a **measure of central tendency.** On average, values in this data set tend to 11.
measure of spread	statistics	7+	Measures of spread describe how similar or varied the set of observed values are for a particular variable (data item). Measures of spread include the range, quartiles and the interquartile range, variance, and standard deviation.	The range of 6, 10, 11, 12, 16 is a **measure of spread**. The difference between the maximum and minimum values (the range) is 10.
median	statistics	7+	The middle number or value when all values in a set of data are arranged in ascending order.	The **median** of 12, 6, 3, 5, 8 is 6 3, 5, **6**, 8, 12
mode	statistics	7+	The most commonly occurring value or class with the largest frequency. Some sets of data may have more than one mode.	The mode of 8, 5, 6, 8, 9, 8 is 8 5, 6**, 8, 8, 8**, 9

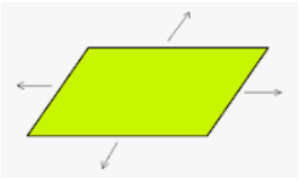
Word	Domain	Year	Meaning	Example
model (situations)	solve problems	7+	A mathematical model is a description of a system using mathematical concepts and language. Mathematical modelling uses mathematical approaches such as diagrams to understand and make decisions about real-life phenomena or situations.	The cost of three mangoes is the same as the cost of two pineapples. One pineapple costs £1.35. What is the cost of one mango?  This problem is modelled with a bar-model.
moving average	statistics	7+	The mean of a set of adjacent observations of fixed size is taken. The mean is calculated for successive sets of the same size to give the moving average. This is useful for predicting trends over time.	To find a two-year moving average for a data set from 2000 to 2005 find the mean averages for the subsets 2000/2001, 2001/2002 and 2002/2003 and so on. These can then be plotted to see, and predict, a trend over time.  Year / Value / Moving average 2000 / 53 / 2001 / 48 / 50.5 2002 / 58 / 53 2003 / 62 / 60 2004 / 81 / 71.5 2005 / 63 / 72

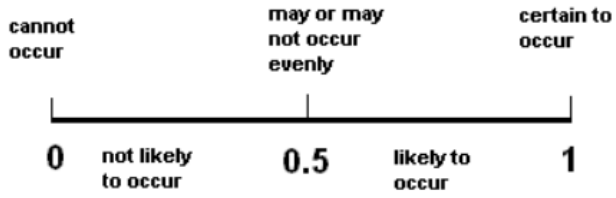
Word	Domain	Year	Meaning	Example
multiplicative reasoning	develop fluency	7+	Multiplicative reasoning refers to the mathematical understanding and capability to solve problems arising from proportional situations often involving an understanding and application of fractions as well as decimals, percentages, ratio and proportions.	In order to calculate 17 x 5, I can **reason** that: 17 x 5 is half of 17 x 10 (since 5 is half of 10) 17 x 10 = 170 170 ÷ 2 = 85 17 x 5 = 85
mutually exclusive (outcomes)	probability	7+	Events that cannot both occur in one experiment. When the mutually exclusive events cover all possible outcomes the sum of their probabilities is 1.	From a pack of cards, choose a card at random: • picking a red card and picking a black card are mutually exclusive • the probability of picking a heart or a diamond is 26/52 • the probability of picking a club or a spade is 26/52 • together the probabilities sum to 52/52 = 1
not equal to ≠	number	7+	Symbol used to denote two quantities or expressions that are not the same.	792 ≠ 54
nth term (of a sequence)	algebra	7+	The name for the term that is in the nth position in a sequence, starting the count of terms from the first term (n = 1). The nth term is sometimes represented by the symbol U_n.	16, 19, 22, 25, 28 … The nth term of this sequence is 3n + 13. $U_n = 3n + 13$ n = 1, $U_1 = 3(1) + 13 = 16$ n = 2, $U_2 = 3(2) + 13 = 19$ n = 3, $U_3 = 3(3) + 13 = 22$

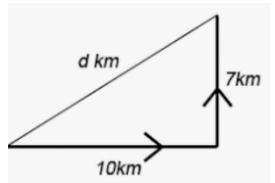
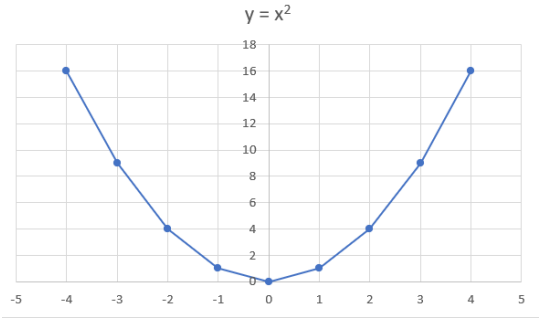
Word	Domain	Year	Meaning	Example
opposite angles	geometry and measures	7+	Angles formed where a pair of line segments intersect. Opposite angles are equal. Sometimes called vertically opposite angles, referring to the vertex at which the lines cross.	a and b are equal 
orientation	geometry and measures	7+	How a line segment or other geometric shape is positioned in respect to a coordinate grid.	
origin	geometry and measures	7+	A fixed point from which measurements are taken. Defined by the coordinates (0,0) in the Cartesian system.	
original value	ratio, proportion and rates of change	7+	Given a value defined as a proportion of another value, the original value is the one from which the proportion is taken.	After a 25% increase, an item cost £750. Find the original amount. 25% increase is a multiplier of 1.25 750 ÷ 1.25 = 600 The **original amount (or value of the item)** was £600.

Word	Domain	Year	Meaning	Example
outcomes	probability	7+	The result of a statistical trial or probability experiment.	Roll a 1-6 die. The possible **outcomes** are 1, 2, 3, 4, 5 or 6.
outlier	statistics	7+	In statistical samples, an outlier is an exceptional trial result that lies beyond where most of the results are clustered.	In a maths test, the following marks were scored: 25, 29, **3**, 32, **85**, 33, 27, 28 Both 3 and 85 are outliers. They lie outside the main cluster of scores.
percentage change	ratio, proportion and rates of change	7+	The relative change between an old value and its new value, expressed as a percentage of the old value	A watch is bought at a car boot sale for £40. It is later sold in a shop for £50. What is the percentage profit? The watch has changed in value by £10. The **percentage change** is (difference/original) x 100 = 10/40 x 100 = 25% 25% profit has been made.
percentage decrease	ratio, proportion and rates of change	7+	The relative decrease between an old value and its new value, expressed as a percentage of the old value.	A watch is bought at a car boot sale for £50. It is later sold in a shop for £25. What is the percentage loss? The watch has decreased by £25. The **percentage decrease** is (difference/original) x 100 = 25/50 x 100 = 50% A 50% loss has been made.

Word	Domain	Year	Meaning	Example
percentage increase	ratio, proportion and rates of change	7+	The relative increase between an old value and its new value, expressed as a percentage of the old value	A watch is bought at a car boot sale for £40. It is later sold in a shop for £50. What is the percentage profit? The watch has increased by £10. The **percentage increase** is (difference / original) x 100 = 10/40 x 100 = 25% 25% profit has been made.
perpendicular bisector	geometry and measures	7+	A line which cuts a line segment into two equal parts at 90°.	AB is bisected by the red line. 
piece-wise linear (graph)	algebra	7+	A function that consists of a number of straight-line functions that have discontinuities (breaks) at certain points.	
plan (view)	geometry and measures	7+	A 2-dimensional diagram of a 3-dimensional object, usually the view from directly above.	

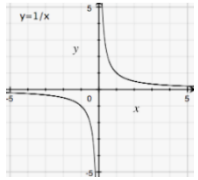
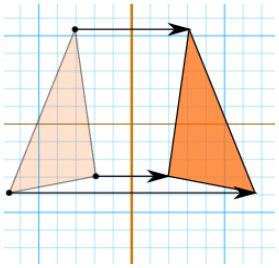
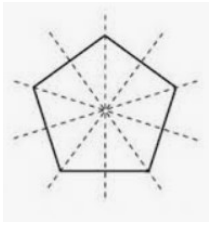
Word	Domain	Year	Meaning	Example
plane	geometry and measures	7+	A flat surface	
plane figure	geometry and measures	7+	A 2-dimensional figure or shape	
position-to-term rule	algebra	7+	In a sequence, a rule that defines the value of each term with respect to its position. Also called the nth term.	16, 19, 22, 25, 28 … The nth term of this sequence is 3n + 13. $U_n = 3n + 13$ n=1, $U_1 = 3(1) + 13 = 16$ n=2, $U_2 = 3(2) + 13 = 19$ n=3, $U_3 = 3(3) + 13 = 22$
power	number	7+	Another term for an index number or exponent.	$3 \times 3 \times 3 \times 3 = 3^4$ ‘4’ is the ‘**power’** and ‘3’ is the base.
probability	probability	7+	The likelihood of an event happening.	If I roll a 1-6 fair die, there is a **probability** of 1/6 that I will roll a ‘4’.

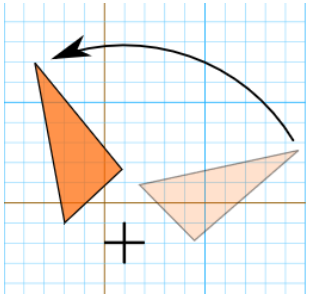
Word	Domain	Year	Meaning	Example
probability experiment	probability	7+	An experiment where a number of trials are carried out under fair conditions to establish the likelihood of each possible outcome occurring.	Drawing a card from a pack of playing cards is a **probability experiment**. The probability (or likelihood) of drawing a king is 4/52. Drawing a king is an outcome of the **probability experiment**.
probability scale (0-1)	probability	7+	A scale between zero and 1, with zero representing the impossibility of an event and 1 representing the fact that an event must happen.	
proof	develop fluency	7+	A chain of reasoning that establishes in conclusion the truth of the proposition. Proof indicates that a result is true beyond any shadow of a doubt.	Prove that whenever two even numbers are added, the total is also an even number. **Proof** An even number is defined as some multiple of 2. Let one even number be 2n and the other be 2m (n and m are positive integers). Added together gives 2n + 2m. Factorise to give 2(m + n), which is also a multiple of 2 and therefore even.

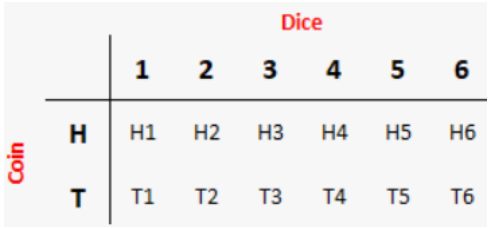
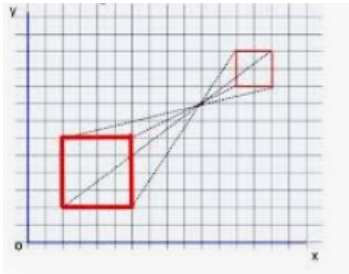
Word	Domain	Year	Meaning	Example
proportional reasoning	develop fluency	7+	Using the mathematics and vocabulary of ratio, proportion and hence fractions and percentages to solve problems.	If a cocktail recipe for 6 people requires 24 oranges, how many oranges are needed to make the cocktail for 9 people. **Proportionally**, there are 1.5 times as many people, so I can **reason** that 24 x 1.5 = 36 oranges are needed.
Pythagoras' Theorem	geometry and measures	7+	In a right-angled triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other sides.	To calculate the length of d using **Pythagoras' Theorem:** $d^2 = 10^2 + 7^2$ $d^2 = 149$ $d = \sqrt{149}$ $d \approx 12.2$km 
quadratic (function)	algebra	7+	Describing a function or expression of the form $ax^2 + bx + c$, where a, b and c are real numbers. The graph of the function $y = ax^2 + bx + c$ is a quadratic function and is a parabola.	 $y = x^2$ is a quadratic function (in this case a = 1, b = 0 and c = 0)

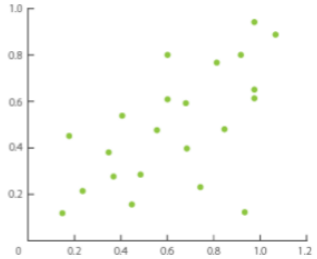
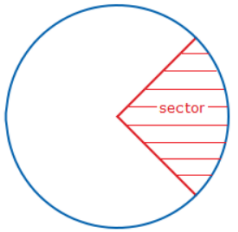
Word	Domain	Year	Meaning	Example
quotient	number	7+	The result of dividing a dividend by a divisor	450 ÷ 45 = **10** 10 is the **quotient.**
random sample	statistics	7+	A selection from a population where each sample of this size has an equal chance of being selected.	If I want to select a random sample of 10% of a population of 100 people, I can assign each a number and then use a random number generator to select 10 numbers. Equally, I could put all the numbers in a box and select without looking. The national lottery uses the process of a **random sample.**
random variable	probability	7+	A discrete or continuous quantity which can take on a range of values each of which has a certain probability of occurrence.	A discrete **random variable** could be the number of marbles in a jar, found by counting. A continuous **random variable** could be the number of seconds taken to complete a race.
range	statistics	7+	A measure of spread. The difference between the greatest and the least value in a set of numerical data.	In the data set: 2, 5, 5, 8, 9, 17, 24. The greatest value is 24 and the least value is 2. The **range** is the difference between 24 and 2. The **range** is 22.

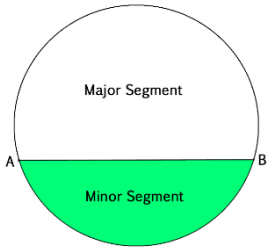
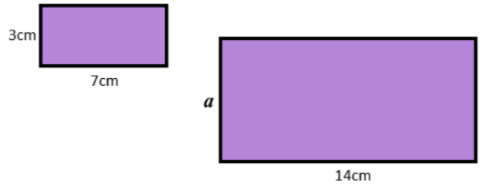
Word	Domain	Year	Meaning	Example
ratio notation	ratio, proportion and rates of change.	7+	a:b can be changed into the unitary ratio 1: b/a, or the unitary ratio a/b:1. Any ratio is unchanged is any common factors can be divided out.	In a box of counters, there are 3 red counters for every 5 blue counters. This can be recorded in **ratio notation** as: R : B 3 : 5
rational numbers	number	7+	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. Rational numbers, when expressed as decimals, are recurring decimals or finite (terminating) decimals.	-7, 17, 0.876, ¾ are all **rational numbers.**
raw data	statistics	7+	Data as they are collected, unprocessed.	The marks (out of 25) obtained by 20 students in a maths test are collected. This is **raw data** until it is ordered and analysed. 18, 16, 12, 10, 5, 5, 4, 19, 20, 10, 12, 12, 15, 15, 15, 8, 8, 8, 8, 16.
real numbers	number	7+	A number that is rational or irrational	-7, 17, 0.876, ¾ are all rational numbers. $\sqrt{3}$, $\sqrt{19}$, π are all irrational numbers. Together they are all **real numbers.**
reciprocal	number	7+	The multiplicative inverse of any non-zero number. Any non-zero number multiplied by its reciprocal is equal to 1.	2 and $\frac{1}{2}$ are **reciprocals** of each other. $-\frac{9}{7}$ and $-\frac{7}{9}$ are **reciprocals** of each other.

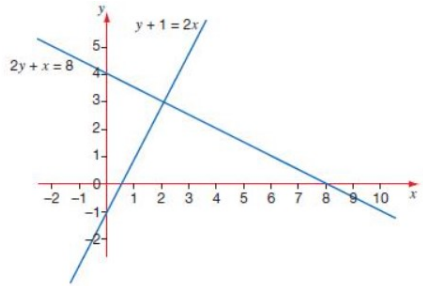
Word	Domain	Year	Meaning	Example
reciprocal (graph)	algebra	7+	The graph of y = 1/x x≠0, y≠0	
reduce (to simplest form)	algebra and number	7+	To resolve by division until no components have a common factor.	$\frac{6}{16} = \frac{3}{8}$ since $\frac{6}{16} = \frac{2\,x\,3}{2\,x\,8}$. The numerator and the denominator of $\frac{6}{16}$ are both divisible by 2. Once this is done $\frac{3}{8}$ has no common factors and the fraction has been **reduced to its simplest form.**
reflection	geometry and measures	7+	In 2-D, a transformation of the whole plane involving a mirror line or axis of symmetry in the plane. A 2-D reflection is specified by its mirror line.	
reflectively symmetric	geometry and measures	7+	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.	

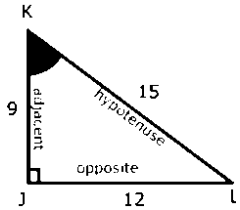
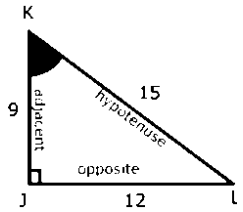
Word	Domain	Year	Meaning	Example
root	number	7+	The root of a number x is another number, which when multiplied by itself a given number of times, equals x.	The square **root** of 36 is 6 (6 x 6 = 36). The cube **root** of 216 is 6 (6 x 6 x 6= 216).
rotation	geometry and measures	7+	in 2-D, a transformation of the whole plane which turns about a fixed point, the centre of rotation. A rotation is specified by its centre and the angle and direction (clockwise or anti-cw) of rotation.	
rotationally symmetric	geometry and measures	7+	A 2-D shape has rotational symmetry about a point if an identical-looking shape in the same position is produced by a rotation through some angle greater than 0º and less than 360º about that point.	This shape has **rotational symmetry** or order 4. It can be rotated 90º around its centre point and map onto an identical shape. 

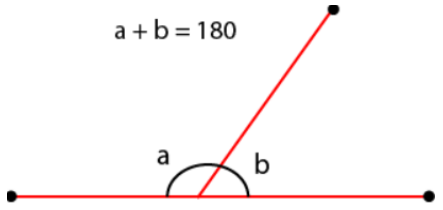
Word	Domain	Year	Meaning	Example
sample	statistics	7+	A subset of a population. A sample of observations may be made from which to draw inferences about a larger population	If you want to find out how many siblings the students in your year group have, you can take a small sample that represents the whole year group (the population). You could ask every tenth person in alphabetical order, for example.
sample space	probability	7+	The set of all possible outcomes of a trial. The sum of all the probabilities for all events in a sample space is 1.	
scale factor	geometry and measures	7+	The ratio of the distance of any transformed point from the centre to its distance from the centre prior to the transformation	This is an enlargement, **scale factor -2.** The image is twice the size of the object and is transformed to the opposite side of the centre of enlargement. 

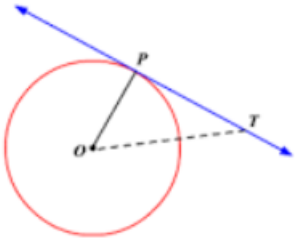
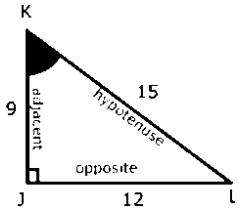
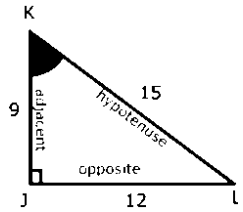
Word	Domain	Year	Meaning	Example
scale drawing (or model)	geometry and measures	7+	An accurate drawing or model of a representation of a physical object in which all the lengths in the drawing are in the same ratio to corresponding lengths in the actual object.	
scatter graph	statistics	7+	A graph on which paired observations are plotted and which may indicate a relationship between the variables.	
sector	geometry and measures	7+	The region within a circle bounded by two radii and one of the arcs they cut off.	

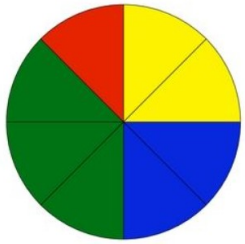
Word	Domain	Year	Meaning	Example
segment (circle)	geometry and measures	7+	The region bounded by an arc and the chord joining its two end points.	
set	probability	7+	A well-defined collection of objects called members or elements.	The elements of **set** A are all the odd numbers from 1 to 13. A = {1, 3, 5, 7, 9, 11, 13}
significant figure	number	7+	The run of digits in a number that are needed to specify the number to a required degree of accuracy. Additional zero digits may be needed to indicate the number's magnitude	271.258 is 271, correct to 3 **significant figures.** 2.71258 is 2.71, correct to 3 **significant figures.** 3789 is 4000, correct to 1 **significant figure.**
similar shape	geometry and measures	7+	When two figures are similar, the ratios of the lengths of their corresponding sides are equal and the corresponding internal angles are the same.	These rectangles are similar. Their sides are in the ratio 1:2 (simplified from 7:14) Therefore a = 6cm 

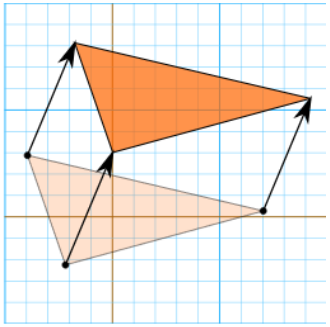
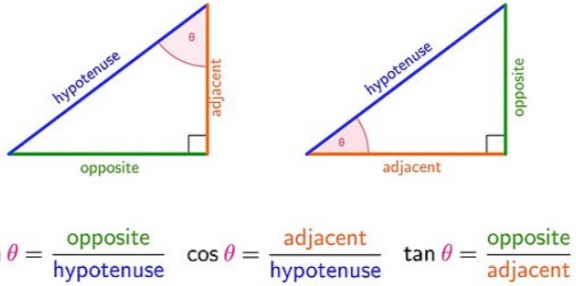
Word	Domain	Year	Meaning	Example
simple interest	ratio, proportion and rates of change	7+	In savings (or loans) , banks apply an interest rate on the sum invested (or loaned). Simple interest is what is added to the savings (or loan) at the end of the specified period.	A saver invests £200 at a **simple rate** of 1% per year for one year. At the end of the year, the saver has 101% of £200, which is £202.
simplest form	ratio, proportion and rates of change	7+	A fraction is in simplest form when the numerator and denominator cannot be any smaller, while still being whole numbers. For a ratio, the simplest form is when the elements of the ratio cannot be any smaller, while still being whole numbers. Reducing to simplest form is by multiplication or division.	$\frac{10}{30}$ simplifies to $\frac{1}{3}$ 10 : 20 simplifies to 1:2
simultaneous (linear equations)	algebra	7+	Two linear equations that apply simultaneously to given variables. The solution to the simultaneous equations is the pair of values for the variables that satisfies both equations.	 The two equations form two straight lines that cross at the point (2,3) x=2 and y=3 are solutions to the **simultaneous linear equations** 2x+y = 8 and y=1=2x.

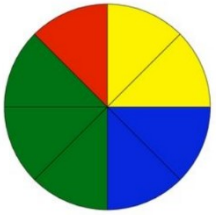
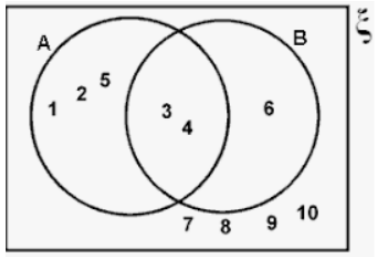
Word	Domain	Year	Meaning	Example
sine	geometry and measures	7+	A function of an angle. It can also be described in terms of the ratio of two sides of a right-angled triangle containing the angle, where the sine of the angle is defined as the side length opposite to the angle divided by the length of the hypotenuse.	 Sin K = opposite / adjacent = 12/15
sine^{-1}	geometry and measures	7+	The inverse of the sine function	Angle K = $\sin^{-1}(12/15)$ Angle K ≈ 53º 
single event	probability	7+	Single-event probability is used to find the probability for a single event that occurs for an experiment.	The probability of getting a 'Head' when tossing a coin is a **single-event** probability.
speed (compound unit)	ratio, proportion, and rates of change	7+	A measure of how the distance travelled by a moving object changes with time. The units of speed are length/time.	A car travelled a distance of 120 miles. The journey took the car 2 hours. **Speed** = distance ÷ time **Speed** = 120 ÷ 2 **Speed** = 60 mph (miles per hour)

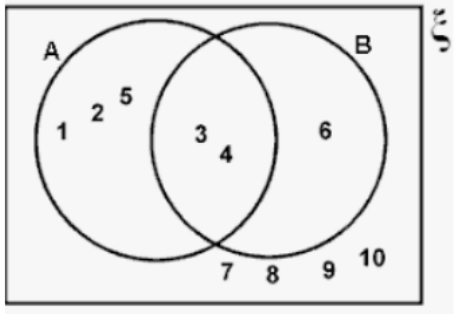
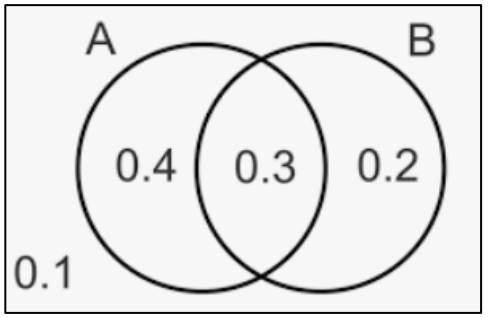
Word	Domain	Year	Meaning	Example
standard (index) form	number	7+	A form in which numbers are recorded as a number between 1 and 10 (including 1 and up to but not including 10), multiplied by a power of ten. This form is used as a succinct notation for very large and very small numbers.	3659.4 written in **standard form** is 3.6594×10^3 0.000758 written in **standard form** is 7.58×10^{-4}
subject of a formula	algebra	7+	A formula relates different physical variables in a mathematical way. The subject of the formula is the unknown element that is presented alone on one side of the formula, with the related variables on the other.	The formula to find the volume of a cone of radius r and perpendicular height h is $V = \frac{1}{3} \pi r^2 h$ V is the **subject of the formula.**
substitute	develop fluency	7+	Numbers can be substituted into an algebraic expression to get a value for that expression.	Evaluate 7x - 10 when x = 12 **Substitute** x into the expression to give 7 (12) - 10 = 74
supplementary angles	geometry and measures	7+	Two neighbouring angles whose sum is 180º. When lines interest each other, the resulting adjacent angles are supplementary	 a and b are supplementary angles and always sum to 180º

Word	Domain	Year	Meaning	Example
surd	algebra	7+	An irrational number expressed as the root of a natural number	√3 is a **surd.** The decimal equivalent of √3 is a non-terminating, non-repeating decimal and so is irrational.
tangent (circles)	geometry and measures	7+	A line is a tangent to a curve when it meets the curve in one and only one point.	
tangent (trigonometry)	geometry and measures	7+	A function of an angle. It can also be described in terms of the ratio of two sides of a right-angled triangle containing the angle, where the tangent of the angle is defined as the side length opposite to the angle divided by the side length adjacent to the angle.	 Tan K = opposite / adjacent = 12/9
tangent^{-1}	geometry and measures	7+	The inverse of the tangent function	 Angle K = $\tan^{-1}$ (12/9) Angle K ≈ 53º

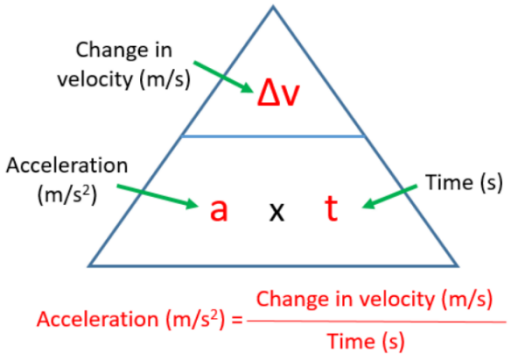
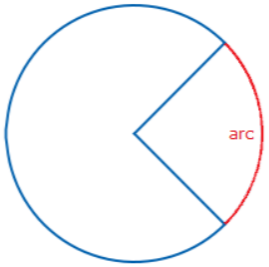
Word	Domain	Year	Meaning	Example
terminating decimal	number	7+	A decimal fraction that has a finite number of digits.	$\frac{3}{4}$ = 0.75
term-to-term rule	algebra	7+	A rule to generate successive terms of a sequence, in terms of the immediately preceding term or terms.	9, 13, 17, 21….. **The term-to-term rule** is 'add 4'.
theoretical probability	probability	7+	The probability of the result of a trial calculated from a model based on theoretical considerations rather than real-life frequencies of occurrence.	The **theoretical probability** of spinning a yellow is 2/8 (In practice, this may not always be true) 
transformation	geometry and measures	7+	A change that is, or is equivalent to, a change in position or direction of the coordinate axes.	Reflections, rotations, translations, and enlargements are **transformations**

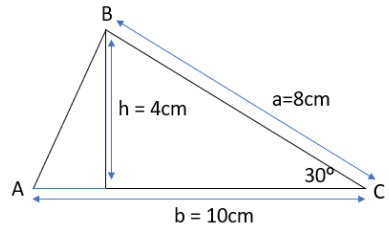
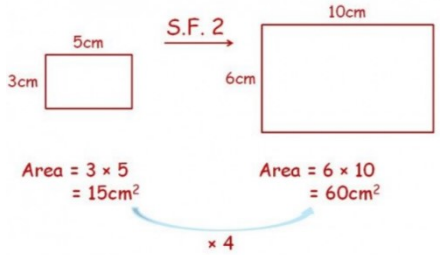
Word	Domain	Year	Meaning	Example
translation	geometry and measures	7+	A transformation in which every point of a body moves the same distance in the same direction.	
trapezium	geometry and measures	7+	A quadrilateral with exactly one pair of parallel sides.	
trigonometric ratios and trigonometry	geometry and measures	7+	Trigonometric functions are commonly defined as ratios of two sides of a right-angles triangle. Functions of angle. The most familiar functions being sine, cosine and tangent. Also called circular functions.	 Sine, Cosine and Tangent are **trigonometric** ratios.

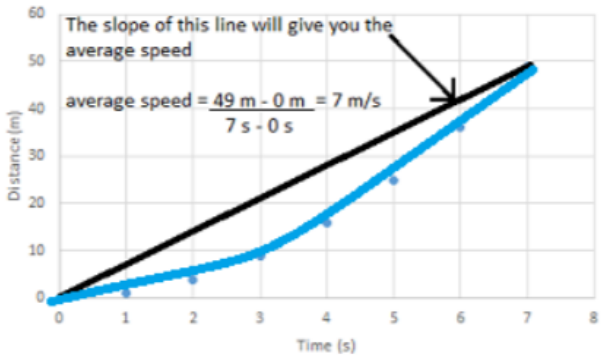
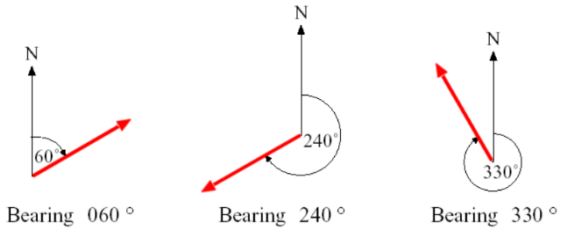
Word	Domain	Year	Meaning	Example
unequally likely (outcomes)	probability	7+	Outcomes of a probability experiment where the probabilities are not the same.	The probability of spinning red is 1/8 The probability of spinning green is 3/8 The outcomes do not have the same probability of occurring and so are **unequally likely.** 
union (set)	probability	7+	The set of elements that belong to either, or both, of a given pair of sets. The union of two sets A and B is written A U B.	 A U B is {1,2,3,4,5,6}
unique factorisation property	number	7+	Every integer greater than 1 either is a prime number itself or can be represented as the product of prime numbers and that, moreover, this representation is unique, up to (except for) the order of the factors.	24 = 2 x 2 x 2 x 3 24 = 2^3x 3 This is the **unique factorisation** of 24 since no other product of primes can be found for 24.

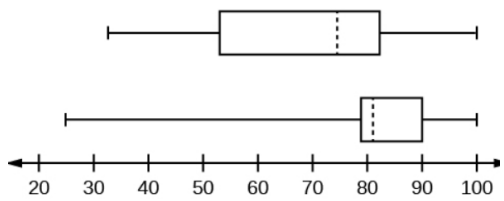
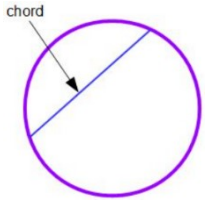
Word	Domain	Year	Meaning	Example
unit pricing (compound unit)	ratio, proportion, and rates of change	7+	The unit price tells you the cost per litre, per kilogram, per pound, etc, of what you want to buy.	If 5kg of flour costs £1.25. The **unit price** per kilogram is 125÷5 = 25. 1kg of flour costs 25p.
universal (set)	probability	7+	The set that contains all the items. The union of any set and its complement (all those elements not in the former set) form the universal set. Symbol ξ	 The **universal set, ξ**, is {1,2,3,4,5,6,7,8,9,10}
variable	algebra	7+	A quantity that can take on a range of values	9x – 7 x is the **variable.**
Venn diagram	probability	7+	A visual diagram to describe the relationships between two sets. The sets are represented by a circular region. The intersection of two sets is represented by an overlap of circles. The boundary of the Venn diagram represents the universal set.	

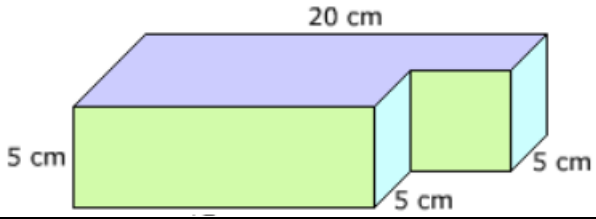
Key Stage 4

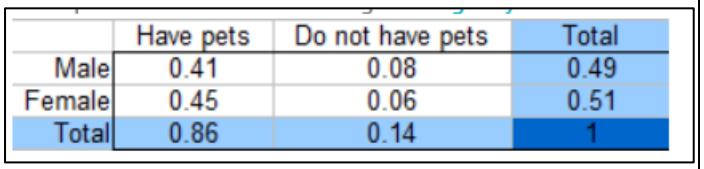
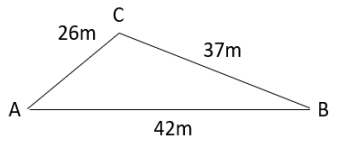
Word	Domain	Year	Meaning	Example
acceleration	algebra	9+	The rate at which velocity (speed) is changing. If an object is moving with a constant velocity, then its acceleration is zero since the velocity never changes.	
algebraic fractions	algebra	9+	A fraction whose numerator and/or denominator are algebraic expressions.	$\frac{3x-4}{9+7x}$
arc	geometry and measures	9+	A portion of a curve or circle circumference.	

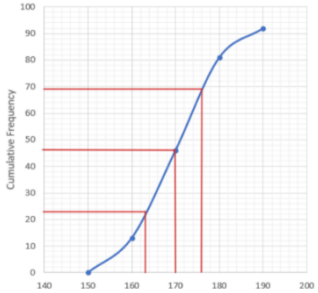
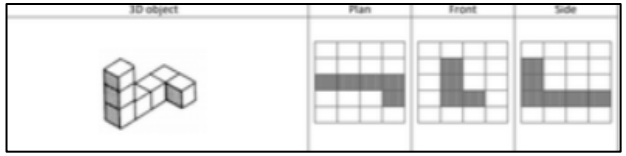
Word	Domain	Year	Meaning	Example
area (of a general triangle)	geometry and measures	9+	Calculated as [half of the base x vertical height] or [1/2 ab sinC], where a and b are side lengths enclosing a vertex of angle size C°	 The area of the triangle is ½ x b x h = ½ x 10 x 4 The area of the triangle = 20 cm² The area of the triangle is ½ absin C = ½ x 8 x 10 x sin 30 The area of the triangle is 20 cm²
area (scale factor)	geometry and measures	9+	When the linear scale factor of enlargement is 1:x, the corresponding area scale factor is $1^2 : x^2$.	 The area scale factor is x4
arithmetic progression	algebra	9+	A sequence of numbers in which successive terms are generated by adding or subtracting a constant amount to the preceding term. This constant is called the common difference. Also called arithmetic sequence.	3, 7, 11, 15, 19 is an **arithmetic progression** with a common difference of 4 between each term.

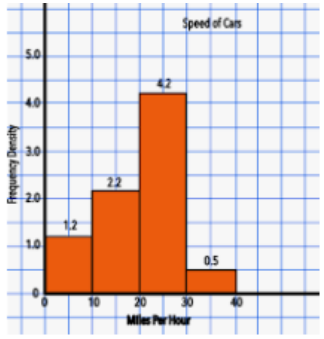
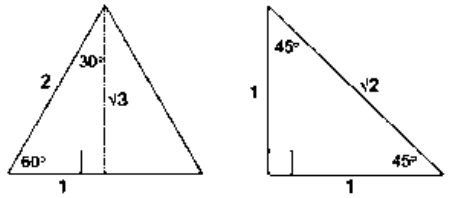
Word	Domain	Year	Meaning	Example
average (rate of change)	ratio, proportion and rates of change	9+	The change in the value of a quantity divided by the elapsed time. This is the same as the slope of the graph over a given time interval	
bearings	geometry and measures	9+	A **bearing** is the angle in degrees measured clockwise from north. **Bearings** are usually given as a three-figure **bearing**. For example, 30° clockwise from north is usually written as 030°.	
biased (unbiased)	probability	9+	In probability, biased means that the possible outcomes are not equally likely. In statistics, the **bias** of an estimator is the difference between this estimator's expected value and the true value of the parameter being estimated. An estimator or decision rule with zero **bias** is called unbiased.	A loaded die is **biased** because one outcome is more likely than another. A sample may be **biased** if a sub-group within the population is not represented in the sample. For example, if you want to find out the average shoe size of students in a year group but your sample includes no girls.

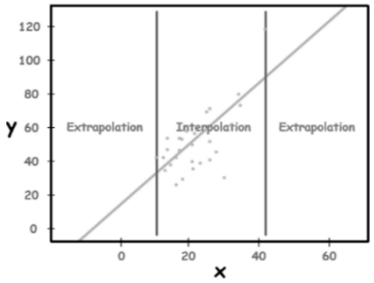
Word	Domain	Year	Meaning	Example
box plot	statistics	9+	A box and whisker plot—also called a box plot—displays the five-number summary of a set of data. The five-number summary is the minimum, first (lower) quartile, median, third (upper) quartile, and maximum. In a box plot, we draw a box from the first quartile to the third quartile. A vertical line goes through the box at the median.	 The horizontal lines forming the 'whiskers' go from the minimum value to the maximum value.
causation	statistics	9+	Causation indicates a relationship between two events where one event is affected by the other. In statistics, when the value of one event, or variable, increases or decreases as a result of other events, it is said there is causation.	We might observe that an increase in sunny days **causes** an increase in ice-cream sales.
chord	geometry and measures	9+	A straight-line segment joining two points on a circle or other curve.	
completing the square	algebra	9+	A method used to solve a quadratic equation by changing the form of the equation so that the left side is a perfect square trinomial.	$x^2 + 6x + 7 = (x + 3)^2 - 9 + 7$ $= (x + 3)^2 - 2$

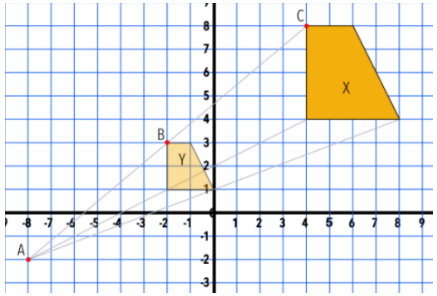
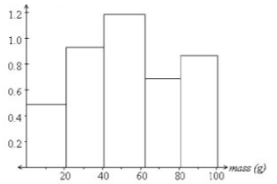
Word	Domain	Year	Meaning	Example
composite function fg (x)	algebra	9+	A function whose values are found from two given functions by applying one function to an independent variable and then applying the second function to the result and whose domain consists of those values of the independent variable for which the result yielded by the first function lies in the domain of the second.	Given f(x) = 3x + 2 and g(x) = x + 5 f(g(x)) = f(x + 5) = 3(x + 5) + 2 = 3x + 15 + 2 = 3x + 17
composite solid	geometry and measures	9+	A solid shape formed by combining two or more solid shapes.	
compound interest	ratio, proportion, and rates of change	9+	In savings (or loans), banks apply an interest rate on the sum invested (or loaned). Compound interest is when the interest is added to the savings (or loan) at the end of a specified period within the life of the savings or loan. Interest is then earned on the amount invested plus interest earned during the next period.	If you deposit £250 in a bank account which is paying 5% interest per year. How much money will you have if the bank pays compound interest over 5 years? $250 \times 1.05^5 = £319.07$

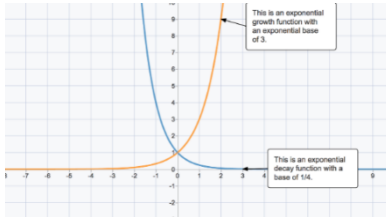
Word	Domain	Year	Meaning	Example
compound units	ratio, proportion, and rates of change	9+	Units that require two different types of measurement such as speed, which is defined using distance and time.	Calculate the density of aluminium if 20 cm^3 has a mass of 54g. Density = mass ÷ volume = 54 ÷ 20 = 2.7 g / cm^3 (grams per cubic centimetre). Density is measured using **compound units.**
conditional probability	probability	9+	Conditional probability refers to the chances that some outcome occurs given that another event has also occurred. It is often stated as the probability of "A given B" and written as P(A|B), where the probability of A depends on that of B happening.	 What is the (**conditional)** probability that a randomly selected person is male, given that they have a pet? P(male and have a pet) = 0.41 P(Have a pet) = 0.86 P(male | have a pet) = 0.41 / 0.86 = 0.477
cosine rule	geometry and measures	9+	A trigonometric formula for calculating missing side lengths and angles in non-right triangles. Cos A = $(b^2 + c^2 - a^2) / 2bc$.	 Find the value of angle A Cos A = $\frac{26^2 + 42^2 - 37^2}{2 \times 26 \times 42}$ = $\frac{1071}{2184}$ = 0.4904 A = $\cos^{-1}(0.4904)$ A = 60.63^o

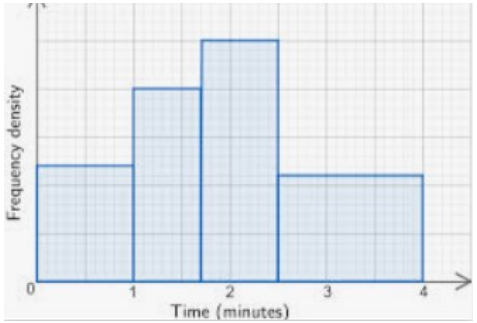
Word	Domain	Year	Meaning	Example
cumulative frequency (graph)	statistics	9+	A graph for displaying cumulative frequency. At a given point on the horizontal axis the sum of the frequencies of all the values up to that point is represented by a point whose vertical coordinate is proportional to the sum.	**Cumulative frequency graph** to show the heights of students in cm. 
dependent event	probability	9+	Two events are dependent if the outcome or occurrence of the first affects the outcome or occurrence of the second so that the probability is changed.	A card is chosen at random from a standard deck of 52 playing cards. Without replacing it, a second card is chosen. What is the probability that the first card chosen is a queen and the second card chosen is a jack? P(Queen) = 4 / 52 ; P(Jack) = 4 / 51 P(Queen and a Jack) = 4 / 52 x 4 / 51 = 16 / 2652 P(Queen and a Jack) = 4 / 663 The probability of the Jack is **dependent** on the probability of the Queen.
elevations (and plans)	geometry and measures	9+	The vertical height of a point above a base (line or plane). An elevation is also the view of a 3D shape when it is looked at from the side or from the front.	

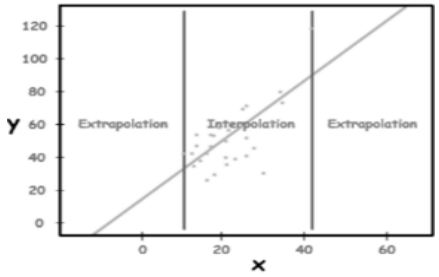
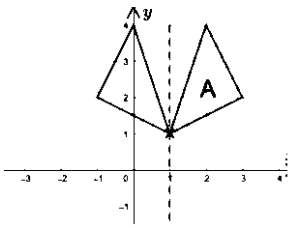
Word	Domain	Year	Meaning	Example
empirical	probability	9+	Knowledge derived from investigation, observation, experimentation, or experience, as opposed to theoretical knowledge based on logical or mathematical assumptions.	The theoretical probability of rolling a 6 on a fair 1-6-sided die is 1/6 We can carry out a number of trials to gather **empirical** data to test this.
equal class intervals (histogram)	statistics	9+	Used to organise grouped discrete data into classes with equal intervals.	The **class intervals**, or widths for this histogram are all equal (10): 0≤ x < 10 10≤ x < 20 20≤ x < 30 30≤ x < 40 
exact values (of a trig function)	algebra	9+	A value that is not rounded or estimated but is precise. With trig values, this is sometimes in surd form. Exact values for 45º can be found using an isosceles right-angled triangle of side lengths [1,1, √2]. Exact values for 30º and 60º can be found using an equilateral triangle of side lengths 2, leading to a perpendicular height of √3.	SOH CAH TOA Sin 30 = opposite/hypotenuse Sin 30 = 1/2 

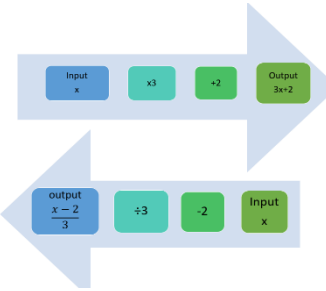
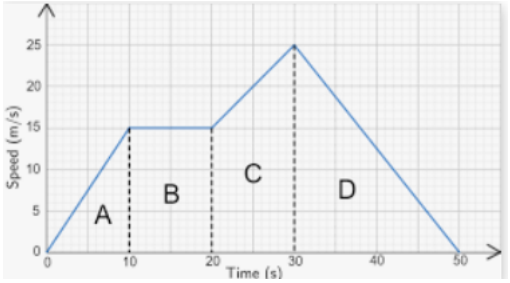
Word	Domain	Year	Meaning	Example
exhaustive (set)	probability	9+	A set of events is jointly or collectively exhaustive if at least one of the events must occur.	When rolling a six-sided die, the events 1, 2, 3, 4, 5, and 6 (each consisting of a single outcome) are collectively **exhaustive**, because they encompass the entire range of possible outcomes. The set {1,2,3,4,5,6} is **exhaustive.**
expected frequency	probability	9+	The number of times that we predict an event will occur based on a calculation using theoretical probabilities.	The **expected frequency** of heads is 500 out of 1,000 total coin-tosses. The **expected frequency** is based on our knowledge of probability - we have not actually done any coin tossing.
extrapolate	statistics	9+	An estimation of a value based on extending a known sequence of values or facts beyond the area that is certainly known.	
Fibonacci (sequence)	algebra	9+	A set of numbers that starts with a one or a zero, followed by a one, and proceeds based on the rule that each number (called a Fibonacci number) is equal to the sum of the preceding two numbers. (Other starting points produce different Fibonacci-like sequences).	F (0) = 0, 1, 1, 2, 3, 5, 8, 13, 21, 34 …

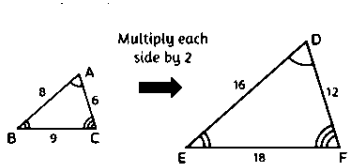
Word	Domain	Year	Meaning	Example
fractional (scale factor)	geometry and measures	9+	A scale factor of enlargement between zero and 1 that produces a smaller image from the original object, eg half the size. In cases where the fractional scale factor is an improper fraction (ie greater than 1), the enlargement will be larger than the object, eg 3/2 will give an image 1.5 times the size of the object.	 The small trapezium (Y) is an enlargement, scale factor ½, of the larger trapezium (X). Centre of enlargement (-8, -2).
fractional indices	number	9+	Fractional, positive, exponents (indices) represent roots.	$16^{1/2} = 4$ $(\sqrt{16} = 4)$
frequency density	statistics	9+	A scale on the y-axis of a histogram, usually with unequal class widths. It is the area of the bar that tells us the frequency in a histogram, not its height. Instead of plotting frequency on the y-axis, we plot the frequency density. To calculate this, you divide the frequency of a group by the width of it.	 Mass (g) / Interval width / Frequency / Frequency density = frequency / width 0-20 / 20 / 10 / 0.5 20-40 / 20 / 18 / 0.9 40-60 / 20 / 24 / 1.2 60-80 / 20 / 14 / 0.7 80-100 / 20 / 18 / 0.9 The **frequency density** is plotted on the y-axis.

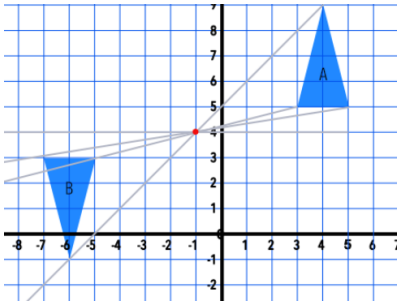
Word	Domain	Year	Meaning	Example
function f(x)	algebra	9+	A relation between a set of inputs and a set of permissible outputs with the property that each input is related to exactly one output.	f(x) = 3 x - 12
geometric progression	algebra	9+	A series of terms in which each term is a constant multiple of the previous term (known as the common ratio). Sometimes called a geometric sequence.	5, 25, 125, 625 …. This is a **geometric progression** with a common ratio of 5. Each term is 5x the previous term. The nth term is 5^n
growth and decay	ratio, proportion and rates of change	9+	An exponential function that describes how a function increases or decreases.	 $y=3^x$ (orange line) **exponential growth** $y=(1/4)^x$ (blue line) **exponential decay**

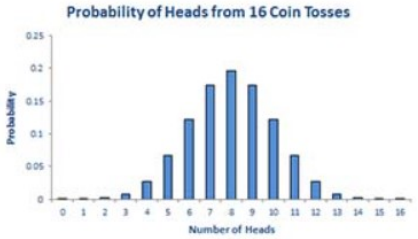
Word	Domain	Year	Meaning	Example
histogram	statistics	9+	A representation of grouped data. Segments along the x axis are proportional to the class interval. Rectangles are drawn with the line segments as bases. The area of the rectangle is proportional to the frequency of the class. Where class intervals are not equal, the height of each rectangle is called the frequency density of the class.	
independent event	probability	9+	Two events, A and B, are independent if the fact that A occurs does not affect the probability of B occurring.	Landing on heads after tossing a coin AND rolling a 5 on a single 6-sided die are examples of independent events.
instantaneous (rate of change)	ratio, proportion and rates of change	9+	The rate of change at a particular moment. Same as the value of the derivative at a particular point. For a function, the instantaneous rate of change at a point is the same as the slope of the tangent line. That is, it is the slope of a curve.	A car is accelerating such that, over time, the speed has changed from 0 mph to 50 mph. This tells us an average rate of change over time. Within that time, it may go slower or faster. The **instantaneous rate of change** tells us how the speed has changed at one moment in time (all the points in between 0mph and 50mph).

Word	Domain	Year	Meaning	Example
interpolate	statistics	9+	Interpolation is an estimation of a value within two known values in a sequence of values.	
inter-quartile range	statistics	9+	The difference between the upper and lower quartiles. A measure of spread.	Data: 1,2,3,4,5,6,7,8,9,10,11 Median: 1,2,3,4,5,**6**,7,8,9,10,11 To find the lower quartile, find the median of the lower half {1,2,3 | 4,5,6} = **3.5** To find the upper quartile, find the median of the upper half {6,7,8 | 9,10,11} = **8.5** **Inter-quartile range** = 8.5 – 3.5 = 5
invariance (transformations)	geometry and measures	9+	A property that does not change after certain transformations. Example: the side lengths of a triangle do not change when the triangle is rotated. So, we can say "triangle side lengths are invariant under rotation".	 The point (1,1) does not change in this reflection in the line x=1. The point (1,1) is **invariant**

Word	Domain	Year	Meaning	Example
inverse function $f^{-1}(x)$	algebra	9+	An inverse function (or anti-function) is a function that "reverses" another function: if the function f applied to an input x gives a result of y, then applying its inverse function g to y gives the result x, and vice versa, i.e., f(x) = y if and only if g(y) = x.	$f(x) = 3x + 2$ $f^{-1}(x) = (x-2)/3$ 
iteration	algebra	9+	The repeated application of a function or process in which the output of each step is used as the input for the next iteration.	$x_{n+1} = 4 - 3x_n$ Given $x_0 = 5$, calculate x_3 $x_1 = 4 - 3(5) = -11$ $x_2 = 4 - 3(-11) = 37$ $x_3 = 4 - 3(37) = -107$ The third **iteration** is equal to -107.
kinematic (problems)	algebra	9+	Kinematics is the study of motion, without reference to the forces that cause the motion. ... Kinematics has many equations associated with it, but sometimes it is easier to use graphs to understand motion. There are three main kinematics graphs: displacement-time graphs, velocity-time graphs, and acceleration-time graphs.	This velocity-time graph is a **kinematic** graph. 

Word	Domain	Year	Meaning	Example
length (scale factor)	geometry and measures	9+	In two similar geometric figures, the ratio of their corresponding sides is called the (length) scale factor	 The **length scale factor** is 2 All corresponding side lengths in DEF are twice as long as in ABC.
lower bound	number	9+	Any number that is less than or equal to all of the elements of a given set. The lower bound is the smallest value that would round up to the estimated value.	A mass (x) of 70 kg, rounded to the nearest 10 kg, has a **lower bound of 65 kg**, because 65 kg is the smallest mass that rounds to 70kg **65kg ≤ x < 75kg** (A quick way to calculate upper and lower bounds is to halve the degree of accuracy specified, then add this to the rounded value for the upper bound and subtract it from the rounded value for the lower bound).
lower quartile	statistics	9+	The lower quartile value is the median of the lower half of the data.	Data: 1,2,3,4,5,6,7,8,9,10,11 Median: 1,2,3,4,5,**6**,7,8,9,10,11 To find the **lower quartile**, find the median of the lower half {1,2,3 | 4,5,6} = **3.5**

Word	Domain	Year	Meaning	Example
modal class	statistics	9+	When you have a set of numbers/counts, and cluster them into groups - ie classes - the modal class is the class with the highest frequency, i.e. the one having most “members”.	<table><tr><th>Weight (Kg)</th><th>Frequency</th></tr><tr><td>60 up to 70</td><td>13</td></tr><tr><td>70 up to 75</td><td>2</td></tr><tr><td>75 up to 95</td><td>45</td></tr><tr><td>95 up to 100</td><td>7</td></tr></table> The **modal class** is 75 up to 95 since this is the class with the highest frequency (the most members).
negative (scale factor)	geometry and measures	9+	An enlargement using a negative scale factor will cause the enlargement to appear on the other side of the centre of enlargement; and will be inverted (upside down). The shape will also change size depending on the value of the enlargement.	 This is an enlargement, **scale factor -1,** centre of enlargement (-1,4)

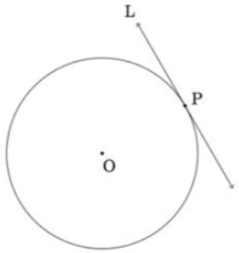
Word	Domain	Year	Meaning	Example
population	statistics	9+	A set of similar items or events which is of interest for some question or experiment. ... In statistical inference, a subset of the population (a statistical sample) is chosen to represent the population in a statistical analysis.	You ask 100 randomly chosen people at a football match what their main job is. Your **sample** is 100, but the **population** is all the people at that match. (The **population** is the whole group that is being studied)
pressure (compound unit)	ratio, proportion and rates of change	9+	The force per unit area. The pressure exerted by a solid object onto another solid surface is the weight of the object divided by the area of the object's surface. The formula is: pressure = force/ area If the unit of force is a Newton (N) and the unit of area is a square metre (m^2), then pressure is given as N/m^2	The surface area of a pair of skis is 0.25 m^2. The weight of a skier is 700N. How much pressure does the skier exert on the snow? Pressure is Newtons per square metre Pressure = weight ÷ area Pressure = 700 ÷ 0.25 **Pressure** ≈ 2800 N/m^2
probability distribution	probability	9+	A mathematical function that provides the probabilities of occurrence of different possible outcomes in an experiment. The normal distribution is a commonly encountered continuous probability distribution.	

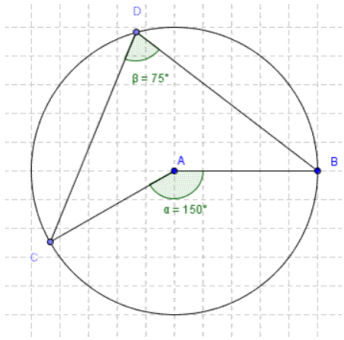
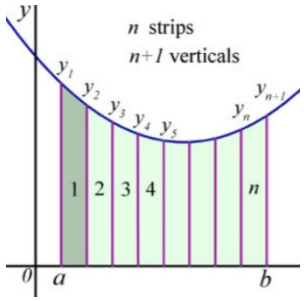
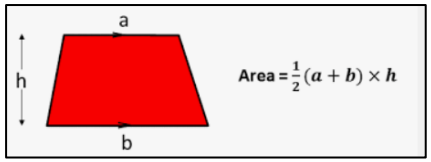
Word	Domain	Year	Meaning	Example
product rule (for counting)	number	9+	To find the total number of outcomes for two or more events, multiply the number of outcomes for each event together. This is called the product rule for counting because it involves multiplying to find a product.	Katie has 52 different playing cards. She gives one to Anna, one to Bill and one to Carol. How many different ways can she do this? A has 52 choices, B has 51 choices, C has 50 choices. Total number of different ways is: 52 x 51 x 50 = 132,600 ways

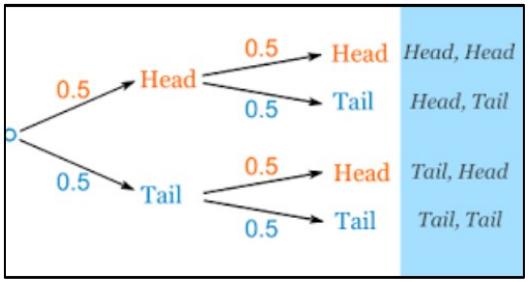
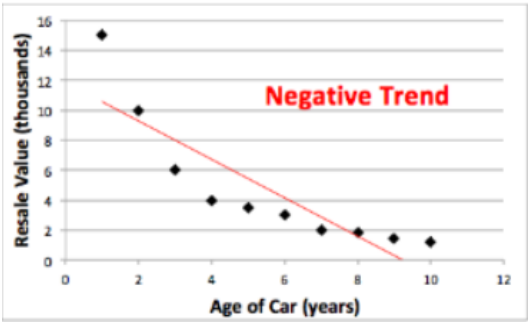
Word	Domain	Year	Meaning	Example
quadratic (sequence)	algebra	9+	A sequence of numbers in which the second differences between each consecutive term differ by the same amount, called a common second difference. A quadratic sequence has nth term = $an^2 + bn + c$	**-3, 8, 23, 42, 65**... is a **quadratic number sequence**. To find the nth term: **Step 1**: Confirm the sequence is quadratic. This is done by finding the second difference. Sequence = -3, 8, 23, 42, 65 1st difference = 11,15,19,23 2nd difference = 4,4,4,4 **Step 2**: If you divide the second difference by 2, you will get the value of a. 4 ÷ 2 = 2 So the first term of the nth term is **$2n^2$** **Step 3**: Next, substitute the number 1 to 5 into $2n^2$. n = 1,2,3,4,5 $2n^2$ = 2,8,18,32,50 **Step 4**: Now, take these values ($2n^2$) from the numbers in the original number sequence and work out the nth term of these numbers that form a linear sequence. n = 1,2,3,4,5 $2n^2$ = 2,8,18,32,50 Differences = -5,0,5,10,15 Now the nth term of these differences (-5,0,5,10,15) is **5n -10.** So b = 5 and c = -10. **Step 5**: Write down your final answer in the form $an^2 + bn + c$. **$2n^2 + 5n - 10$**

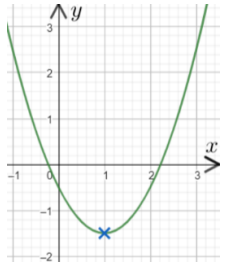
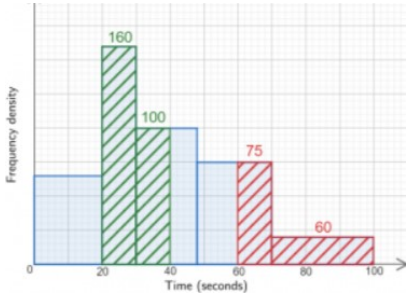
Word	Domain	Year	Meaning	Example
quadratic formula	algebra	9+	A formula that provides the solution to a quadratic equation of the form $ax^2 + bx + c = 0$. The formula is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ when $ax^2 + bx + c = 0$ a, b, c = constants, where $a \neq 0$ x = the unknown This formula is used when factorisation by inspection is not possible.	$2x^2 + 5x - 1 = 0$ a = 2; b = 5; c = -1 Substitute these values into the **quadratic formula.** $x = \frac{-5 \pm \sqrt{5^2 - 4x2x1}}{4}$ x = {-5 +/- √33}/4 x = 0.186 or x = -2.686 (to three decimal places).
rationalise (denominator)	number	9+	For a fraction with a surd (irrational number) as the denominator, we can multiply the fraction by one in the form √a/√a. This produces a denominator of a (rational number) since √a x √a = a (laws of indices and surds). We now have a rational denominator.	$\frac{7}{\sqrt{3}}$ has an irrational denominator. To rationalise the denominator: $\frac{7}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{7\sqrt{3}}{3}$

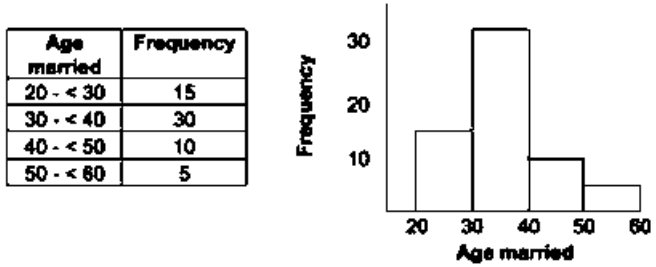
Word	Domain	Year	Meaning	Example
root (of a quadratic function)	algebra	9+	Roots are also called x-intercepts or zeros. ... The roots of a function are the x-intercepts. By definition, the y-coordinate of points lying on the x-axis is zero. Therefore, to find the roots of a quadratic function, we set f(x) = 0, and solve the equation, $ax^2 + bx + c = 0$.	To find the roots of $y = 2x^2 - 5x - 3$, we want to know where the graph cuts the x-axis (ie when y = 0) If $2x^2 - 5x - 3 = 0$, we can factorise this to $(2x + 1)(x - 3) = 0$ If $x - 3 = 0$, then $x = 3$ If $2x + 1 = 0$, then $x = -1/2$ **The roots are x = 3 and x = -1/2** This curve (parabola) will cut the x-axis at (3, 0) and (-1/2, 0)
scalar (quantity)	geometry and measures	9+	Any real number, or any quantity that can be measured using a single real number. A scalar is said to have magnitude but no direction.	Quantities with magnitude(size) but no direction include distance, speed, temperature, and mass. They are **scalar** quantities. {Compare with vectors: A vector has magnitude and direction. Vectors include acceleration, weight, momentum, and velocity}.

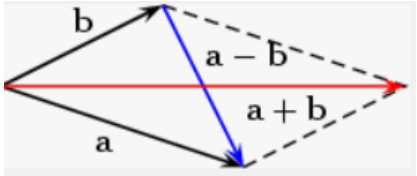
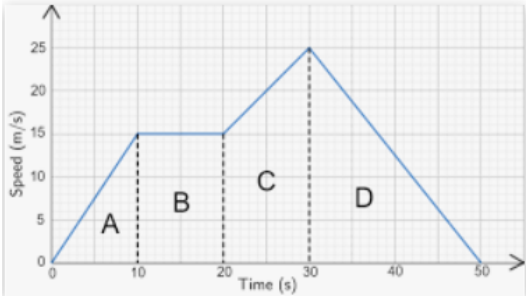
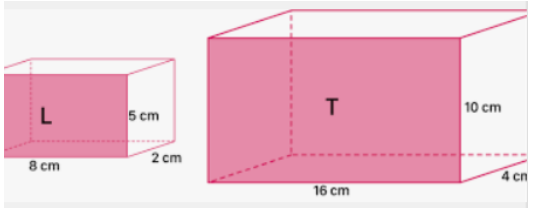
Word	Domain	Year	Meaning	Example
sine rule	geometry and measures	9+	A rule relating the sides and angles of any triangle (it doesn't have to be right-angled!): If a, b and c are the lengths of the sides opposite the angles A, B and C in a triangle, then: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{C}{\sin C}$ It can be used to find missing sides or angles with any two pairs of fractions. The ratio holds true with sides as the numerator or with angles as the numerator.	A = 60º , a = 10cm, b = 8cm Find angle B Use the form with the angles as the numerator (since one of these is unknown and you do not want unknowns as denominators!) Sin 60 / 10 = sin B / 8 (multiply both sides by 8) 8 sin 60/ 10 = sin B B = $\sin^{-1}$ (8sin60/10) B ≈ 44 º
surd	number	9+	An irrational number expressed as the root of a natural number	√4 is rational since the square root of 4 is 2 √3 is irrational since the square root of 3 is 1.7320508…. and is a non-recurring, non-terminating decimal. **√3 is a surd.**
tangent	geometry and measures	9+	A line is a tangent to a curve when it meets the curve at one and only one point.	 The **tangent** LP meets the circle at point P.

Word	Domain	Year	Meaning	Example
theorem (circle)	geometry and measures	9+	A set of 8 theorems that form chains of reasoning to find missing angles in circles (and sometimes outside but connected to a circle!) 1. angles at the centre and at the circumference. 2. angle in a semicircle. 3. angles in the same segment. 4. angles in a cyclic quadrilateral. 5. length of tangents. 6. angle between circle tangent and radius. 7. alternate segment theorem. 8. perpendicular from the centre bisects the chord.	 Theorem.1. The angle at the centre is twice the angle at the circumference.
trapezium rule	statistics	9+	To find the area under a curve, we have to split the space into very thin strips and look at them individually. Each strip is approximately the same shape as a trapezium, and we use the trapezium formula to estimate the area under the curve.	 

Word	Domain	Year	Meaning	Example
tree diagram	probability	9+	A tree diagram is a tool that we use in general mathematics, probability, and statistics that allows us to calculate the number of possible outcomes of an event, as well as list those possible outcomes in an organised manner.	
trend	statistics	9+	A consistent pattern of behaviour in a data set that enables conclusions about the population to be drawn. With bivariate data, a trend line (line of best fit) can be used to identify any trends. If the values of one set of data increases and the values of other set also increases then the two sets of related data shows a positive trend. If the values of one set of data increases and the values of other set decreases, then the two sets of related data shows a negative trend.	

Word	Domain	Year	Meaning	Example
triangular numbers (sequence)	algebra	9+	A sequence formed by creating a sequence of triangles with base 1,2,3…, leading to number of dots in each triangle generating the following sequence: 1,3,6,10,15…. The nth term for this sequence is $\frac{n(n+1)}{2}$	
turning point (of a graph)	algebra	9+	The turning point of a graph is the point at which the "turns around", ie it goes from having a downward slope to having an upward slope. On a positive quadratic graph (one with a positive coefficient for x^2), the turning point is also the minimum point.	This quadratic graph has a **turning point** at (1, -1.4).  The curve slopes in one direction on one side of the point and changes direction on the other side of the point.
unequal class intervals (histogram)	statistics	9+	Used to organise grouped discrete data into classes with unequal intervals. For histograms using unequal class intervals, the y-axis is the frequency density and the area of each rectangle represents the frequency of that class.	

Word	Domain	Year	Meaning	Example
univariate (distribution)	statistics	9+	A distribution of one variable There are several options for presenting univariate data such as bar charts, histograms, pie charts, frequency polygons and frequency distribution tables.	
upper bound	number	9+	The upper bound is the smallest value that would round up to the next estimated value.	A mass (x) of 70 kg, rounded to the nearest 10 kg, has an **upper bound of 75 kg**, because 75 kg is the smallest mass that rounds to the next multiple of 10 (80 kg) **65kg ≤ x < 75kg** (A quick way to calculate upper and lower bounds is to halve the degree of accuracy specified, then add this to the rounded value for the upper bound and subtract it from the rounded value for the lower bound).
upper quartile	statistics	9+	The upper quartile value is the median of the upper half of the data.	Data: 1,2,3,4,5,6,7,8,9,10,11 Median: 1,2,3,4,5,**6**,7,8,9,10,11 To find the upper quartile, find the median of the upper half {6,7,8 | 9,10,11} = **8.5**

Word	Domain	Year	Meaning	Example
vector	geometry and measures	9+	A quantity with both direction and magnitude, such as force or velocity.	
velocity-time graph	algebra	9+	A velocity-time graph has the velocity or speed of an object on the vertical axis and time on the horizontal axis. The distance travelled can be calculated by finding the area under a velocity-time graph. If the graph is curved, there are a number of ways of estimating the area (see trapezium rule).	
volume (scale factor)	geometry and measures	9+	When the linear scale factor of enlargement is 1:x, the corresponding volume scale factor is $1^3 : x^3$	 Volume of L= 8 x 5 x 2 = 80 cm^3 Length scale factor = 2 **Volume scale factor** = 2^3 = 8 Volume of T = 80 x 8 = 640 cm^3 Check: Volume of T = 16 x 10 x 4 = 640 cm^3

Glossary Index

Word	Domain	Section
2-D representation	Geometry - properties of shapes	UKS2
acceleration	Algebra	KS4
additive reasoning	Reason mathematically	KS3
algebraic notation	Algebra	KS3
algebra	Develop fluency	KS3
algebraic fractions	Algebra	KS4
alternate angles	Geometry and measures	KS3
analyse	Develop fluency	KS3
angle bisector	Geometry and measures	KS3
angle sum (polygon)	Geometry and measures	KS3
angles at a point (on a straight line)	Geometry - properties of shapes	UKS2
angles at a point (on a whole turn)	Geometry - properties of shapes	UKS2
approximation	Number	KS3
arc	Geometry and measures	KS4
area (of a general triangle)	Geometry and measures	KS4
area (scale factor)	Geometry and measures	KS4
argument	Reason mathematically	KS3
arithmetic progression	Algebra	KS4
arithmetic sequence	Algebra	KS3
average (rate of change)	Ratio, proportion, and rates of change	KS4

Word	Domain	Section
bearings	Geometry and measures	KS4
biased (unbiased)	Probability	KS4
binomial	Algebra	KS3
bivariate data	Statistics	KS3
box plot	Statistics	KS4
brackets	Addition, subtraction, multiplication, and division	UKS2
Cartesian plane	Algebra	KS3
causation	Statistics	KS4
chord	Geometry and measures	KS4
circumference	Geometry - properties of shapes	UKS2
coefficient	Algebra	KS3
combined events	Probability	KS3
common factor	Addition, subtraction, multiplication, and division	UKS2
common multiple	Addition, subtraction, multiplication, and division	UKS2
complement (of a number)	Fractions, decimals, and percentages	UKS2
completing the square	Algebra	KS4
composite function fg (x)	Algebra	KS4
composite number	Multiplication and division	UKS2
composite shape	Geometry - properties of shapes	UKS2
composite solid	Geometry and measures	KS4
compound interest	Ratio, proportion, and rates of change	KS4

Word	Domain	Section
compound unit (speed)	Measurement	UKS2
compound units	Ratio, proportion, and rates of change	KS4
concave	Geometry and measures	KS3
concept	Solve problems	KS3
conditional probability	Probability	KS4
congruence	Geometry and measures	KS3
conjecture	Fractions, decimals, and percentages	UKS2
conjecture	Reason mathematically	KS3
constant	Algebra	KS3
construction (ruler and compasses)	Geometry and measures	KS3
continuous data	Statistics	KS3
coordinate plane	Geometry - position and direction	UKS2
correlation	Statistics	KS3
corresponding angles	Geometry and measures	KS3
cosine	Geometry and measures	KS3
cosine rule	Geometry and measures	KS4
cosine^{-1}	Geometry and measures	KS3
counter-example	Reason mathematically	KS3
cube number	Multiplication and division	UKS2
cubic	Algebra	KS3
cubic centimetre (cm^3)	Measurement	UKS2

Word	Domain	Section
cubic curve	Algebra	KS3
cubic metre (m^3)	Measurement	UKS2
cumulative frequency	Statistics	KS4
decimal fraction	Fractions, decimals, and percentages	UKS2
deduction	Geometry - properties of shapes	UKS2
deductive reasoning	Reason mathematically	KS3
degree	Geometry - properties of shapes	UKS2
degree of accuracy	Number	KS3
density (compound unit)	Ratio, proportion, and rates of change	KS3
dependent event	Probability	KS4
derive	Geometry and measures	KS3
diagonal (of a polygon)	Geometry - properties of shapes	UKS2
diagrammatic	Develop fluency	KS3
diameter	Geometry - properties of shapes	UKS2
direct proportion	Ratio, proportion, and rates of change	KS3
discrete data	Statistics	KS3
dividend	Number	KS3
divisor	Number	KS3
distribution	Statistics	KS3
elevations (and plans)	Geometry and measures	KS3
empirical	Probability	KS4

Word	Domain	Section
empty set	Probability	KS3
enlargement	Geometry and measures	KS3
equal class intervals (histogram)	Statistics	KS4
equally likely (outcomes)	Probability	KS3
equation	Algebra	UKS2
equation	Algebra	KS3
equivalence statement	Multiplication and division	UKS2
error	Number	KS3
evaluate (outcomes)	Solve problems	KS3
event	Probability	KS3
exact values (of a trig function)	Geometry and measures	KS4
exhaustive (set)	Probability	KS4
expand (products)	Algebra	KS3
expected frequency	Probability	KS4
experimental probability	Probability	KS3
exponent	Algebra	KS3
exponential (graph)	Algebra	KS3
expression	Algebra	KS3
exterior angle	Geometry and measures	KS3
extrapolate	Statistics	KS4
factorise	Algebra	KS3

Word	Domain	Section
fairness	Probability	KS3
Fibonacci (sequence)	Algebra	KS4
financial mathematics	Solve problems	KS3
formula (e)	Algebra	UKS2
four quadrants	Geometry – position and direction	UKS2
fractional (scale factor)	Geometry and measures	KS4
fractional indices	Number	KS4
frequency	Probability	KS3
frequency density	Statistics	KS4
frequency table	Statistics	KS3
function f(x)	Algebra	KS4
gallon	Measurement	UKS2
generalisation	Algebra	UKS2
generalise	Develop fluency	KS3
geometric progression	Algebra	KS4
geometric sequence	Algebra	KS3
gradient	Algebra	KS3
graphical	Develop fluency	KS3
greater than or equal to ≥	Number	KS3
grouped data	Statistics	KS3
growth and decay	Ratio, proportion, and rates of change	KS4

Word	Domain	Section
highest common factor	Number	KS3
histogram	Statistics	KS4
identity	Algebra	KS3
imperial units	Measurement	UKS2
improper fractions	Fractions, decimals, and percentages	UKS2
inch	Measurement	UKS2
independent event	Probability	KS4
index laws	Algebra	KS4
index notation	Algebra	KS3
inequality	Algebra	KS3
infinite	Number	KS3
inscribed	Geometry and measures	KS3
instantaneous (rate of change)	Ratio, proportion, and rates of change	KS4
integer	Number	KS3
intercept	Algebra	KS3
interior angle	Geometry and measures	KS3
interpolate	Statistics	KS4
inter-quartile range	Statistics	KS4
intersection (set)	Probability	KS3
interval (across zero)	Number and place value	UKS2
invariance (transformations)	Geometry and measures	KS4

Word	Domain	Section
inverse function $f^{-1}(x)$	Algebra	KS4
inverse proportion	Ratio, proportion, and rates of change	KS3
inversely proportional graph	Ratio, proportion ,and rates of change	KS3
irrational number	Number	KS3
iteration	Algebra	KS4
kinematic (problems)	Algebra	KS4
length (scale factor)	Geometry and measures	KS4
less than or equal to ≤	Number	KS3
level of accuracy	Addition and subtraction	UKS2
like terms	Algebra	KS3
line of best fit	Statistics	KS3
line segment	Geometry and measures	KS3
linear function	Algebra	KS3
linear number sequence	Number and place value	UKS2
long division	Addition, subtraction, multiplication, and division	UKS2
long multiplication	Multiplication and division	UKS2
lower bound	Number	KS4
lower quartile	Statistics	KS4
lowest common multiple	Number	KS3
mean (arithmetic)	Statistics	KS3
mean (average)	Statistics	UKS2

Word	Domain	Section
measure of central tendency	Statistics	KS3
measure of spread	Statistics	KS3
median	Statistics	KS3
mile	Measurement	UKS2
million	Number and place value	UKS2
mixed numbers	Fractions, decimals, and percentages	UKS2
modal class	Statistics	KS4
mode	Statistics	KS3
model (situations)	Solve problems	KS3
moving average	Statistics	KS3
multi-digit number	Addition, subtraction, multiplication, and division	UKS2
multiplicative reasoning	Reason mathematically	KS3
mutually exclusive (outcomes)	Probability	KS3
negative (scale factor)	Geometry and measures	KS4
net (of a shape)	Geometry – properties of shapes	UKS2
not equal to ≠	Number	KS3
nth term (of a sequence)	Algebra	KS3
opposite angles	Geometry and measures	KS3
order of magnitude	Fractions, decimals, and percentages	UKS2
order of operations	Addition, subtraction, multiplication, and division	UKS2
origin	Algebra	KS3

Word	Domain	Section
original value	Ratio, proportion, and rates of change	KS3
outcomes	Probability	KS3
outlier	Statistics	KS3
per cent %	Fractions, decimals, and percentages	UKS2
percentage	Fractions, decimals, and percentages	UKS2
percentage change	Ratio, proportion, and rates of change	KS3
percentage decrease	Ratio, proportion, and rates of change	KS3
percentage increase	Ratio, proportion, and rates of change	KS3
perpendicular bisector	Geometry and measures	KS3
pie chart	Statistics	UKS2
piece-wise linear (graph)	Algebra	KS3
pint	Measurement	UKS2
plan view	Geometry and measures	KS3
plane figure	Geometry and measures	KS3
plane figure	Geometry and measures	KS3
population	Statistics	KS4
position-to-term rule	Algebra	KS3
pound (lb)	Measurement	UKS2
power	Number	KS3
powers of 10	Number and place value	UKS2
pressure (compound unit)	Ratio, proportion, and rates of change	KS4

Word	Domain	Section
prime factor	Multiplication and division	UKS2
prime number	Multiplication and division	UKS2
probability distribution	Probability	KS4
probability experiment	Probability	KS3
probability scale (0-1)	Probability	KS3
product rule (for counting)	Number	KS4
proof	Reason mathematically	KS3
proportional graph	Measurement	UKS2
proportional reasoning	Reason mathematically	KS3
proportionality	Ratio and proportion	UKS2
Pythagoras' Theorem	Geometry and measures	KS3
quadratic (sequence)	Algebra	KS4
quadratic formula	Algebra	KS4
quadratic function	Algebra	KS3
quotient	multiplication and division	UKS2
radius	Geometry- properties of shapes	UKS2
random sample	Statistics	KS3
random variable	Statistics	KS3
range	Statistics	KS3
ratio (a:b notation)	Ratio and proportion	UKS2
ratio notation	Ratio, proportion, and rates of change	KS3

Word	Domain	Section
rational number	Number	KS3
rationalise (denominator)	Number	KS4
raw data	Statistics	KS3
real number	Number	KS3
reciprocal	Number	KS3
reciprocal (graph)	Algebra	KS3
recurring decimal	Fractions, decimals, and percentages	UKS2
reduce to (simplest form)	Number	KS3
reflection	Geometry and measures	KS3
reflectively symmetric	Geometry and measures	KS3
reflex angle	Geometry- properties of shapes	UKS2
relative size	Ratio and proportion	UKS2
remainder	Multiplication and division	UKS2
root	Number	KS3
root (of a quadratic function)	Algebra	KS4
rotation	Geometry and measures	KS3
rotationally symmetric	Geometry and measures	KS3
sample	Probability	KS3
sample space	Probability	KS3
scalar (quantity)	Geometry and measures	KS4
scale drawing	Measurement	UKS2

Word	Domain	Section
scale factor	Ratio and proportion	UKS2
scatter graph	Statistics	KS3
sector	Geometry and measures	KS3
segment	Geometry and measures	KS3
set	Probability	KS3
significant figure	Number	KS3
similar shape	Ratio and proportion	UKS2
simple interest	Ratio, proportion, and rates of change	KS3
simple rates	Multiplication and division	UKS2
simplest form	Ratio, proportion, and rates of change	KS3
simultaneous (linear equations)	Algebra	KS3
sine	Geometry and measures	KS3
sine rule	Geometry and measures	KS4
$\sin^{-1}$	Geometry and measures	KS3
single event	Probability	KS3
speed (compound unit)	Ratio, proportion, and rates of change	KS3
square centimetre (cm^2)	Measurement	UKS2
square metre (m^2)	Measurement	UKS2
square number	Multiplication and division	UKS2
standard (index) form	Number	KS3
subject (of a formula)	Algebra	KS3

Word	Domain	Section
substitute	Develop fluency	KS3
supplementary angles	Geometry and measures	KS3
surd	Number	KS4
tangent (circles)	Geometry and measures	KS4
tangent (trigonometry)	Geometry and measures	KS3
tangent^{-1}	Geometry and measures	KS3
ten million	Number and place value	UKS2
terminating decimal	Number	KS3
term-to-term rule	Number and place value	UKS2
term-to-term rule	Algebra	KS3
theorem (circle)	Geometry and measures	KS4
theoretical probability	Probability	KS3
thousandths	Fractions, decimals, and percentages	UKS2
transformation	Geometry and measures	KS3
translation	Geometry and measures	KS3
trapezium (-a)	Geometry and measures	KS3
trapezium rule	Statistics	KS4
tree diagram	Probability	KS4
trend	Statistics	KS4
triangular numbers (sequence)	Algebra	KS4
trigonometric ratio	Geometry and measures	KS3

Word	Domain	Section
trigonometry	Geometry and measures	KS3
turning point (of a graph)	Algebra	KS4
unequal class intervals (histogram)	Statistics	KS4
unequal sharing	Ratio and proportion	UKS2
unequally likely (outcomes)	Probability	KS3
union (set)	Probability	KS3
unique factorisation property	Number	KS3
unit pricing (compound unit)	Ratio, proportion, and rates of change	KS3
univariate (distribution)	Statistics	KS4
universal set	Probability	KS3
unknown	Algebra	UKS2
upper bound	Number	KS4
upper quartile	Statistics	KS4
variable	Algebra	UKS2
variable	Algebra	KS3
vector	Geometry and measures	KS4
velocity-time graph	Algebra	KS4
Venn diagram	Probability	KS3
vertically opposite (angles)	Geometry- properties of shapes	UKS2
volume	Measurement	UKS2
volume (scale factor)	Geometry and measures	KS4

Word Cards Introduction KS3/KS4

How do we learn to communicate in the language of mathematics?

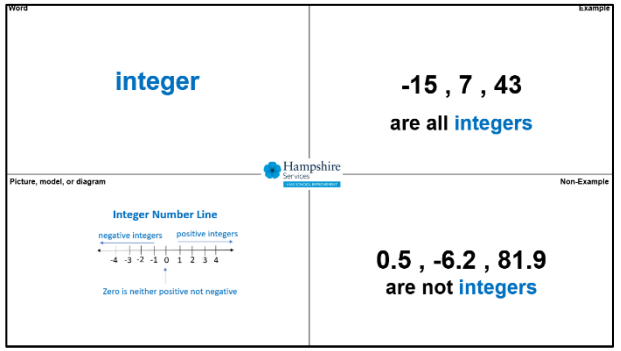
Sometimes the vocabulary is specific to the subject and not found elsewhere. Words such as geometry, square root and algebra may fall into this category. Sometimes the vocabulary has a different (or parallel) meaning in mathematics compared to everyday usage. Words such as product, square, average, sum, coordinate are examples of this.

Effective communication in mathematics can be likened to learning a foreign language. We need to be precise when we speak 'mathematics' and we need to interpret the meaning of the words in the context of the subject and of the problem.

This resource is designed to provide a flexible way of developing the use of accurate and precise mathematical vocabulary in the classroom. The HIAS Maths Team Glossary is intended to support teachers with ideas for definitions and examples for mathematical words and provides a reference point when creating cards that are bespoke to learners or particular topic areas.

The word cards are divided into four sections:

- the mathematical word
- an example of what the word is
- an example of what the word is not
- a model or image to represent the word visually or diagrammatically.



The word cards are linked to the units of work in the HIAS scheme of learning for mathematics for Year 1 to Year 9, which is available to subscribing schools.

https://maths.hias.hants.gov.uk/

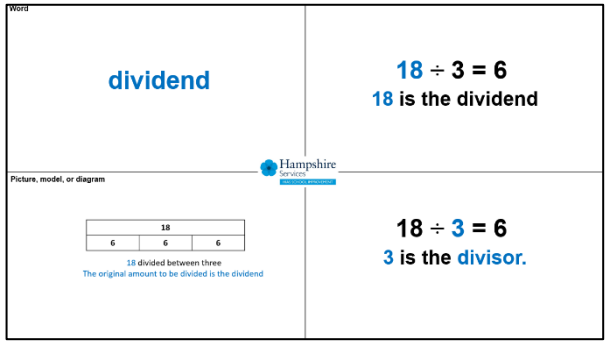
How can we support learners so that they use precise mathematical language correctly and accurately?

Consider the word ‘sum’. In everyday speak, we sometimes talk about ‘doing a sum’, to mean any calculation. We also use it in phrases such as ‘the sum of all fears’ to mean your worst nightmares all in one place and to talk about an amount of money such as, ‘that is a large sum of money’. In mathematics, the definition is the same, but we are more precise in our usage. The sum is the total amount resulting from the addition of two or more numbers, items, or quantities.

Equally, we can consider the word ‘difference’. In everyday speak, we use it to compare how people or things are dissimilar.
We also use it in phrases that describe impact such as, ‘This action will make a difference to the outcome’ and to describe an argument as in ‘Jack and Jill have had a difference of opinion’. In mathematics, the definition is the same, but we are more precise in our usage. The difference is the amount by which two quantities differ or the amount that is left after subtraction of one value from another.

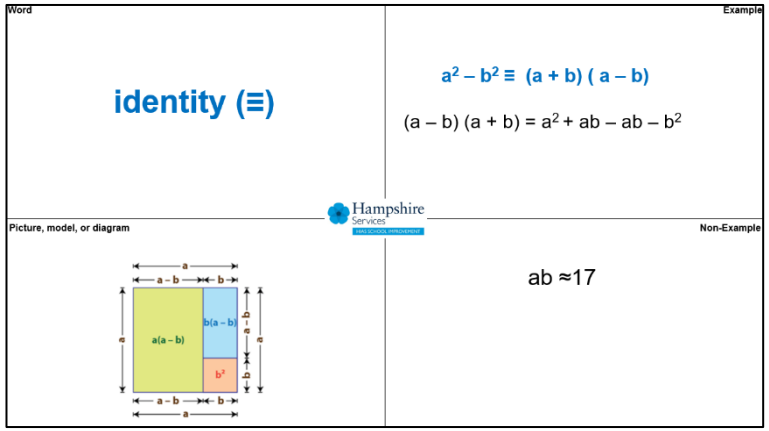
To ensure that learners use precise mathematical language, they need opportunities to explore what it is and what it is not, they also need to represent the word or phrase in different ways to build meaning.

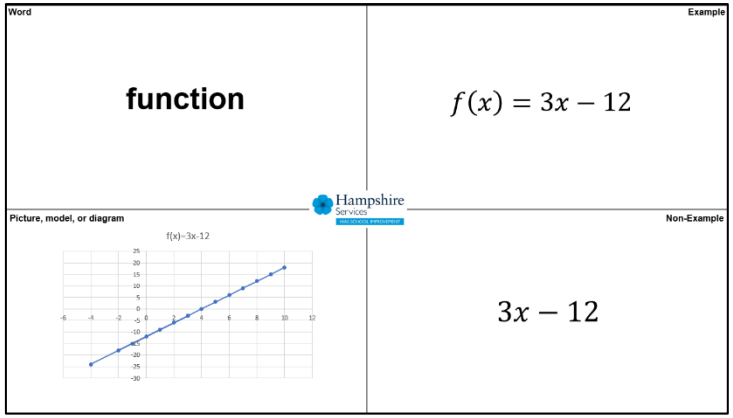
The cards can be used in a variety of ways. Teachers should utilise the resource in such a way that learners are able to collaborate and come to a common understanding as to the meaning and use of a particular mathematical word.



Ideas for how to use the cards with learners and with teachers

- Matching activities – cut the completed cards into four pieces, shuffle the card pieces, and ask learners to work collaboratively to put them back together again.
- Guess the word – complete three sections, leaving the 'word' box blank. Ask learners to independently decide which word is being described and then compare with other learners' ideas. Agree which words are possible and which are not, with reasons.
- Fill in the blanks – complete one or more sections on a card, leaving at least one section blank. Ask learners to collaborate to complete the blank sections and then compare with other groups' interpretations of the information given. Learners should discuss, agree, and justify choices in pairs and in larger groups.
- Word banks - use a small bank of maths words, taken from the topic you are teaching. Ask pupils to fill in the boxes for the same word and compare. Agree which is mathematically correct, discuss and justify choices.
- Teacher CPD – use the glossary and ask colleagues to complete blank cards for a particular word. Agree as a staff what is appropriate for different ages and stages. Develop a common understanding of progression in the use of mathematical vocabulary and an appreciation of different meanings or interpretations of the same word, such as 'sequence of events' and 'a number sequence' as well as different words with similar meanings, such as 'sum' and 'total'.





Word Card List KS3/KS4

Domain	KS3	KS4
Number	integer divisor dividend quotient lowest common multiple highest common factor square root cube root	product rule (for counting) index (-ices) surd rationalise (denominator) standard (index) form upper bound lower bound
Algebra	substitute inequality expand (brackets) factorise quadratic (function) nth term	algebraic fraction identity function inverse function composite function turning point iteration
Ratio, proportion, and rates of change	scale factor reduce (to simplest form) percentage increase percentage decrease compound (units)	proportional inversely proportional trigonometric ratio (trigonometry) exponential growth exponential decay
Geometry and measure	trapezium (-a) perpendicular bisector	sector segment

	congruent similar rotation Pythagoras' Theorem	arc chord bearing vector
Probability	frequency outcome random fair probability scale (0-1) Venn diagram sample space	exhaustive (set) empirical theoretical independent dependent conditional tree diagram
Statistics	grouped (data) mean mode median range outlier bivariate (data) scatter graphs	histogram sample population cumulative frequency box plots upper quartile lower quartile inter-quartile range