Year 7 Autumn Half Term 1 – Arithmetic Procedures

This unit builds on your knowledge of the four operations from KS2 and then extends to include calculations involving negative numbers and decimals as well as giving the opportunity for more complex problem solving

Topic	What do I need to know?	How will I be assessed?
Addition and Subtraction	❑ Be able to add and subtract positive and negative integers ❑ Be able to use column addition with integers and decimals ❑ Be able to use column subtraction with integers and decimals	❑ Teacher marked task ❑ End of unit test
Multiplication and Division	❑ Be able to multiply and divide positive and negative numbers ❑ Be able to use written multiplication strategies with integers and decimals ❑ Be able to use written division strategies with integers and decimals	❑ Teacher marked task ❑ End of unit test
Laws of Arithmetic	❑ Know which operations are commutative ❑ Know which operations are associative ❑ Know the distributive law of multiplication and be able to use it to simplify calculations ❑ Know the order of operations and be able to apply it to calculations ❑ Be able to use a calculator efficiently	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Integer	A whole number
Negative	A number less than 0
Add	To find the total of a set of numbers
Subtract	To find the difference between two number
Multiply	To times two or more number together
Divide	To split a number to a set amount of groups
Commutative	The order of the numbers does not change the calculation e.g. 2 + 3 = 3 + 2
Associative	The order you perform the calculations in does not matter e.g. (2 + 3) + 5 = 2 + (3 + 5)
Distributive Law	Multiplying the sum of two numbers is the same as multiplying each one first and then adding them e.g. 5 x (2 + 3) = 5 x 2 + 5 x 3

Year 7 Autumn Half Term 2 – Introduction to Algebra

This unit builds on work you may have done in year 6 where you use symbols and letter to represent unknown numbers. It will introduce you to formula algebraic notation and develop your understanding to be able to manipulate, simplify and interpret algebraic expressions and equations.

Topic	What do I need to know?	How will I be assessed?
Algebraic Expressions and Equations	❑ Know the meaning of and identify: term, coefficient, factor, product, expression, formula and equation ❑ Know and use correct algebraic notation e.g. 3 x a = 3a ❑ Know that a letter can represent a generalised number, a variable that can take any value or a specific unknown ❑ Be able to write generalised forms of numbers e.g. write an odd number as $2n + 1$ ❑ Be able to substitute numbers into expressions	❑ Teacher marked task ❑ End of unit test
Simplifying Expressions	❑ Be able to identify like terms in an expression ❑ Be able to simplify expressions by collecting like terms	❑ Teacher marked task ❑ End of unit test
Expanding and Factorising	❑ Be able to expand brackets by multiplying an expression by a given term ❑ Be able to factorise expressions by finding common factors ❑ Be able to expand and collect like terms to simplify more complex expressions e.g. $3(x + 2) - 5(2x - 6)$ ❑ Be able to form and simplify expressions	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Term	A single number or variable, or numbers and variables multiplied together
Coefficient	A number used to multiply a variable
Factors	the numbers or variables we can multiply together to get a given term
Factorise	Splitting an expression into a multiplication of simpler expressions using brackets by finding common factors of each term
Expression	A group of a minimum of two numbers or variables and at least one math operation
Formula	A fact or rule that uses mathematical symbols e.g. +, -, ÷, x and =
Equation	An equation says that two things are equal e.g. $3x + 2 = x - 4$
Product	The result when two or more numbers, variables or terms are multiplied together
Like Term	terms whose variables (and their powers) are the same
Expand	When we multiply to remove the brackets in an expression

Year 7 Autumn Half Term 1 – Properties of Number

This unit builds on your knowledge of place value, decimals, integers, factors, multiples and primes from KS2 and then extends to include real-world applications and new ways of solving problems involving factors and multiples.

Topic	What do I need to know?	How will I be assessed?
Place Value	❑ Understand place value in integers ❑ Understand place value in decimals ❑ Apply your understanding of place value to measures ❑ Be able to order and compare numbers using <, > and =	❑ Teacher marked task ❑ End of unit test
Multiples	❑ Know what a multiple is ❑ Be able to list multiples of numbers ❑ Be able to identify where a number is a multiple of another or not	❑ Teacher marked task ❑ End of unit test
Exponents and Roots	❑ Be able to square and cube a number ❑ Be able to find the square and cube root of a number ❑ Use correct notation for positive exponents e.g. $2 \times 2 \times 2 \times 2 \times 2 = 2^5$ ❑ Use a calculator to find powers and roots of numbers	❑ Teacher marked task ❑ End of unit test
Factors and Primes	❑ Know what a factor is ❑ Be able to list factors of numbers ❑ Know what a prime number is and be able to list them ❑ Be able to write a number as a product of its prime factors ❑ Be able to find the HCF of two numbers using prime factor decomposition ❑ Be able to find the LCM of two numbers using prime factor decomposition ❑ Be able to solve problems involving HCF and LCM	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Integer	A whole number
Multiple	The result of multiplying a number by an integer
Factor	A number that divides into another with no remainder
Prime	A number that is only divisible by one and itself
Square	Multiply a number by itself e.g. 3 x 3
Cube	Multiply a number by itself twice e.g. 3 x 3 x 3
Power/Exponent	How many times to use the number in a multiplication e.g. $3^3 = 3 \times 3 \times 3$
Root	The inverse of applying a power e.g. square root is the inverse of squaring

Year 8 Autumn Half Term 1 – Arithmetic Sequences

This unit builds on your knowledge of sequences and patterns from both KS1 and KS2 and extends your knowledge introducing the concept of nth terms for arithmetic sequences

Topic	What do I need to know?	How will I be assessed?
Understanding Sequences	❑ Be able to find and use term-to-term rules for linear and non-linear sequences ❑ Know what a position-to-term rule is and identify the position-to-term rule for some sequences	❑ Teacher marked task ❑ End of unit test
Arithmetic Sequences	❑ Be able to recognise arithmetic sequences by finding the common difference ❑ Be able to find the nth term of arithmetic sequences ❑ Be able to calculate any term in an arithmetic sequence given the nth term ❑ Be able to determine whether a number is a term of a given arithmetic sequence ❑ Be able to find and the use the nth term for sequences of patterns and shapes.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Arithmetic Sequence	A sequence with a common difference between terms
Term	The position of a number in a sequence e.g. the 5th number is the 5th term
nth Term	A rule used to find a term in a sequence given its position
Increasing	A sequence is increasing if the terms get bigger (positive difference)
Decreasing	A sequence is decreasing if the terms get smaller (negative difference)

Year 8 Autumn Half Term 2 – Linear Graphs

This unit builds on your knowledge of coordinates from both KS2 and year 7, it also extends the work completed in year 7 where you saw that a set of coordinates forming a line can be connected using an equation. In this unit, you will continue to explore linear relationships and their representation as straight line graphs including new concepts like gradients and y-intercepts.

Topic	What do I need to know?	How will I be assessed?
Coordinates, equations and graphs	❏ Know that we can represent linear equations both algebraically and graphically. ❏ Understand that a linear graph shows all of the points (within a range) that satisfy a linear equation. ❏ Be able to represent a linear equation graphically by first generating a set of coordinates.	❏ Teacher marked task ❏ End of unit test
Linear Graphs	❏ Understand that there are two key elements to any linear relationship: gradient and y-intercept and know what these are. ❏ Be able to find the gradient and y-intercept from both algebraic and graphical representations. ❏ Be able to find the equation of a linear graph. ❏ Know the general form of a linear equation and rearrange to this form to help identify the gradient and y-intercept. ❏ Be able to solve problems involving algebraic and graphical representations of linear equations.	❏ Teacher marked task ❏ End of unit test

Key Words	Definition
Coordinate	A pair of numbers, in brackets, that describe a given position.
Equation	A rule that describes the relationship between two things.
Linear	To form a straight line when plotted on a cartesian graph
Gradient	The gradient of a line is how steep it is. Calculate by dividing the change in height by the change in horizontal distance.
Y-intercept	The point where a linear graph crosses the y-axis

Year 8 Autumn Half Term 2 – Solving Linear Equations

This unit builds on your introduction to algebra in year 7. You will you use skills developed from previous algebra units including collecting like terms and expanding brackets to learn how to find the value of unknown numbers in equations by solving. This will then be used later in KS3 and KS4 to solve problems including real life examples.

Topic	What do I need to know?	How will I be assessed?
What is a solution?	❑ Know that there are different types of equations including linear equations. ❑ Understand that in an equation the two sides of the 'equals' sign balance (are the same). ❑ Understand that a solution is a value that makes the two sides of an equation the same and that two linear equations can have the same solution.	❑ Teacher marked task ❑ End of unit test
One step equations	❑ Be able to solve a one step linear equation involving adding or subtracting ❑ Be able to solve a one step linear equation involving multiplying or dividing	❑ Teacher marked task ❑ End of unit test
Multiple step equations	❑ Be able to collect like terms so that a linear equation can be solved. ❑ Be able to solve basic equations that require two steps e.g. $3x + 2 = 8$ ❑ Be able to solve equations with unknowns on both sides. ❑ Be able to solve harder linear equations that involve reciprocals.	❑ Teacher marked task ❑ End of unit test
Equations with brackets	❑ Be able to solve equations with brackets	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Equation	An equation says that two things are equal e.g. 3x + 2 = x − 4
Linear Equation	An equation with only one unknown that is not raised to a power
Solve	Find the value of the unknown by using inverse operations
Like Term	terms whose variables (and their powers) are the same
Expand	When we multiply to remove the brackets in an expression

Year 8 Autumn Half Term 1 – Rounding and Estimation

This unit builds on your knowledge of place value including rounding and estimation from both KS2 and year 7 and then extends to introduce new concepts like significant figures, degrees of accuracy and rounding errors.

Topic	What do I need to know?	How will I be assessed?
Rounding Decimals	❑ Be able to round numbers to any number of decimals places	❑ Teacher marked task ❑ End of unit test
Significant Figures	❑ Know what a significant figure is ❑ Be able to round integers to a given number of significant figures ❑ Be able to round decimals to a given number of significant figures	❑ Teacher marked task ❑ End of unit test
Estimation	❑ Know what it means when a question asks to give your answer to a sensible degree of accuracy ❑ Be able to estimate the answer to calculation ❑ Use estimation to check if answers to problems are correct ❑ Be able to say if an estimate is an overestimate or underestimate ❑ Know that rounding numbers in a problem can cause rounding errors ❑ Be able to give the error interval of a rounded number ❑ Solve real life problems involving estimation	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Integer	A whole number
Estimate	Use rounding to find a rough or approximate answer
Significant Figure	Any digit after the first non-zero digit
Error Interval	The range of numbers that we could have had before the number was rounded
Degree of accuracy	How close a number is to the actual answer

Year 9 Autumn Half Term 1 – Similarity and Pythagoras

This unit builds on the geometry work including knowledge of shapes, angles and transformation covered in KS2 as well as in Year 7 and 8. It introduces new concepts such as similarity and congruence and then moves on to look at Pythagoras' Theorem.

Topic	What do I need to know?	How will I be assessed?
Similarity	❑ Know what similarity is and be able to identify if two shapes are similar ❑ Be able to find the scale factor of similar shapes ❑ Be able to use similarity to find missing lengths	❑ Teacher marked task ❑ End of unit assessment
Congruence	❑ Know what congruence is and be able to identify congruent shapes ❑ Be able to use congruency to find missing lengths and angles ❑ Know and use congruency conditions for triangles ❑ Know what rotational symmetry is and be able to find the order of rotational symmetry	❑ Teacher marked task ❑ End of unit assessment
Pythagoras' Theorem	❑ Know and recall Pythagoras' Theorem ❑ Know how to use Pythagoras' Theorem to find the hypotenuse. ❑ Know how to use Pythagoras' Theorem to find the shorter sides of a right triangle. ❑ Use Pythagoras' Theorem to prove if a triangle is right-angled ❑ Know how to use Pythagoras' Theorem to solve range of problems	❑ Teacher marked task ❑ End of unit assessment

Key Words	Definition
Congruence	Two shapes are congruent if they are the exact same size. All corresponding sides and angles are equal.
Similar	Two shapes are similar is all sides are in proportion. One is an enlargement of the other.
Scale factor	How many times bigger one shape is compared to another.
Hypotenuse	The longest side of a right triangle that is opposite the right angle.
Rotational Symmetry	A shape has Rotational Symmetry when it still looks the same after some rotation.

Year 9 Autumn Half Term 2 – Probability

This unit will use your knowledge of probability in everyday life including football scores and weather reports to further explore probability including being able to work out numerical probability for both single and combined events. This provides a basis for further probability work in KS4.

Topic	What do I need to know?	How will I be assessed?
Describe Frequency of Outcomes	❑ Be able to use correct vocabulary to describe the likelihood of an event happening. ❑ Be able to order the likelihood of an event happening by placing them on a scale.	❑ Teacher marked task ❑ End of unit test
Calculate Probabilities	❑ Know that probability is a measure of the likelihood of an event happening and that it can be given a number between 0 and 1 ❑ Be able to calculate probabilities from single events. ❑ Know that probabilities of all possible outcomes add to 1 and use this to calculate probabilities. ❑ Be able to calculate probabilities from independent combined events. ❑ Be able to calculate experimental probabilities. ❑ Be able to calculate expected outcomes of an experiment.	❑ Teacher marked task ❑ End of unit test
Record Outcomes	❑ Be able to use sample space diagrams. ❑ Be able to use systematic listing to record outcomes. ❑ Be able to use two-way tables. ❑ Be able to use Venn diagrams.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Probability	Numerical descriptions of how likely an event is to occur.
Mutually Exclusive	Two events are mutually exclusive if they cannot occur at the same time.
Event	A set of outcomes of an experiment to which a probability is assigned.
Experimental Probabilities	Probabilities you calculate by actually carrying out an experiment.
Theoretical Probabilities	Theoretical probability is the number of favourable outcomes divided by the total number of possible outcomes.
Frequency	The number of times an event or a value occurs.

Year 10 Equations and Inequalities

This unit builds on the foundation knowledge of data covered in KS3 to allow you to be able to understand, use and apply equations, inequalities formulas and sequences

Topic	What do I need to know?	How will I be assessed?
Solving equations	❑ To solve one and two step equations. ❑ To solve linear equations involving brackets.	❑ Teacher marked task ❑ End of unit assessment
Inequalities	❑ To understand and use correct notation for inequalities. ❑ To solve simple linear inequalities. ❑ To write down whole numbers which satisfy an inequality. ❑ To represent inequalities on a number line	❑ Teacher marked task ❑ End of unit assessment
Using formulae	❑ To substitute values into a given formula. ❑ To change the subject of a formula.	❑ Teacher marked task ❑ End of unit assessment
Sequences	❑ To recognise and extend sequences. ❑ Use the nth term to generate terms of a sequence. ❑ Find the nth term of an arithmetic sequence.	❑ Teacher marked task ❑ End of unit assessment

Key Words	Definition
Equation	A mathematical statement containing a equals sign. It tells us two things are equal.
Inequality	A mathematical statement that compares two values.
Formula	A rule that links two or more variables
Subject	The letter on it's own on one side of the formula
Rearrange	Change the subject
Substitute	Replacing letters with a given value.
Arithmetic Sequence	A sequence made by adding the same value each time

Year 10 Foundation – Averages

Dame Elizabeth CADBURY

This unit builds on the averages work covered in KS3 to allow you to solve more complex problems involving mean, median, mode and range as well as increasing your knowledge of how estimating, sampling and bias is use in the real world.

Topic	What do I need to know?	How will I be assessed?
Mean, median, mode and range	❑ How to calculate the mean from a list and from a frequency table ❑ How to compare sets of data using the mean and range. ❑ How to find the mode, median and range from a stem and leaf diagram ❑ How to Identify outliers ❑ How to estimate the range from a grouped frequency table	❑ Teacher marked task ❑ End of unit test (KAO)
Types of averages and estimating the mean	❑ To recognise the advantages and disadvantages of each type of average ❑ How to find the modal class ❑ How to find the median from a frequency table ❑ How to Estimate the mean of grouped data	❑ Teacher marked task ❑ End of unit test (KAO)
Sampling	❑ To understand the need for sampling ❑ To understand how to avoid bias.	❑ Teacher marked task ❑ End of unit test (KAO)

Key Words	Definition
Mean	The mean is the average of a data set. Add up all the data and divide by how much data there is.
Mode	The mode is the most common number in a data set.
Median	The median is the middle of the set of numbers
Range	The range is the difference between the highest and lowest values within a set of numbers.
Estimate	a rough or approximate calculation.
Sampling	sampling is a process used in statistical analysis in which a predetermined number of observations are taken from a larger population

Year 10 Higher – Equations and Inequalities

This unit builds on the solving equations and factorising work covered in KS3 to allow you to solve more complex quadratic equations, simultaneous equations as well as applying your new knowledge to real life problems.

Topic	What do I need to know?	How will I be assessed?
Solving Quadratic Equations	❑ How to solve quadratic equations where the coefficient of x^2 is 1. ❑ How to solve quadratic equations where the coefficient of x^2 is greater then one 1. ❑ How to solve quadratic equations using the quadratic formula ❑ To understand what is meant by the roots of a quadratic equation.	❑ Teacher marked task ❑ End of unit test
Completing the square	❑ To factorise a quadratic expression by completing the square. ❑ To solve a quadratic equation by completing the square.	❑ Teacher marked task ❑ End of unit test
Linear Simultaneous Equations	❑ How to solve linear simultaneous equations ❑ How to solve real life problems by deriving and solving simultaneous equations.	❑ Teacher marked task ❑ End of unit test
Quadratic Simultaneous Equations	❑ How to solve simultaneous equations that contain at least one quadratic equations. ❑ How to solve real life problems by deriving and solving simultaneous equations. ❑ How to solve quadratic inequalities.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Roots	A solution to an equation/ where a graph crosses the x axis
Linear equation	An equation with only one solution
Quadratic equation	An equation with two solutions
Factorise	To put an expression into brackets
Coefficient	The number in front of a letter.
Simultaneous Equation	Two different equations with the same two unknown values in each.

Year 10 Higher – Probability

This unit builds on the probability work covered in KS3 to allow you to solve more complex probabilities, as well as applying your new knowledge to real life problems.

Dame Elizabeth CADBURY

Topic	What do I need to know?	How will I be assessed?
Combined and Mutually Exclusive Events	❑ How to use the Product Rule and Sample Space Diagrams to list the outcomes of events. ❑ How to identify and find the probabilities of mutually exclusive events. ❑ How to find the probability of an event not happening.	❑ Teacher marked task ❑ End of unit test (KAO)
Experimental Probability	❑ How to find the expected results for theoretical and experimental probabilities. ❑ How to decide if a game is fair by comparing experimental outcomes to theoretical ones.	❑ Teacher marked task ❑ End of unit test (KAO)
Independent Events and Tree Diagrams	❑ How to draw and use frequency and probability trees. ❑ How to calculate probabilities of repeated events. ❑ How to decide if two events are independent.	❑ Teacher marked task ❑ End of unit test (KAO)
Conditional Probability and Venn Diagrams	❑ How to draw and use tree diagrams, two-way tables, and Venn diagrams. ❑ How to calculate conditional probability. ❑ How to use set notation.	❑ Teacher marked task ❑ End of unit test (KAO)

Key Words	Definition
Probability	Numerical descriptions of how likely an event is to occur.
Mutually Exclusive	Two events are mutually exclusive if they cannot occur at the same time.
Event	A set of outcomes of an experiment to which a probability is assigned.
Experimental Probabilities	Probabilities you calculate by actually carrying out an experiment.
Theoretical Probabilities	Theoretical probability is the number of favourable outcomes divided by the total number of possible outcomes.
Frequency	The number of times an event or a value occurs.
Conditional Probability	The likelihood of an event or outcome occurring, based on the occurrence of a previous event or outcome.

Year 11 More Algebra

This unit build on the algebra work covered in both KS3 and KS4. We meet linear equations once again and extend the work to include simultaneous equations. Once the basics have been covered this unit moves on to look at how real-life problems can be solved using simultaneous equations and how the solutions can also be found graphically. This unit also explores more complex graphs such a cubic, reciprocal and inverse graphs. This builds on graph work previously covered and extends to looking at how graphs can be used to model real-life situations.

Topic	What do I need to know?	How will I be assessed?
Graphs	❑ Draw the graph of a cubic function ❑ Draw the graph a reciprocal function ❑ Recognise the graphs of cubic and reciprocal functions ❑ Recognise direct and indirect proportion graphs	❑ Teacher marked task ❑ End of unit test
Simultaneous Equations	❑ Solve linear equations using a graph ❑ Solve linear equations algebraically ❑ Derive simultaneous equations and use them to solve worded problems	❑ Teacher marked task ❑ End of unit test
Expression, equations, formulae and identities.	❑ Know the difference between an expression, equation, formula and identity ❑ Identify an expression, equation, formula and identity from a list	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Cubic function	An equation where the highest power of x is 3.
Reciprocal function	An equation that contains a fraction and will require a number to be divided by x.
Simultaneous equation	Two or more equations that have the same solutions.
Intersection	Where two lines on a graph intersect. The coordinates of the intersection will give you the solutions to simultaneous equations.
Expression	A set of algebraic terms and/or numbers. An expression does not contain an equals sign.
Equation	A statement containing an equals sign and stating that two expressions are equal.
Formula	A mathematical rule that uses letters to represent that amounts that can be changed.
Identity	A statement that is always true no matter what vales are substituted.

Year 11 Foundation Congruence, similarity and vectors

This unit builds on the work completed in year 9 and explores the idea of similarity in more depth and looks at how the skills can be applied to complex exam questions.

Topic	What do I need to know?	How will I be assessed?
Congruence	❑ Understand what it means when two shapes are congruent. ❑ Identify congruent shapes. ❑ Find missing angles and side lengths of congruent shapes. ❑ Solve problems involving congruent shapes.	❑ Teacher marked task ❑ End of unit test
Similarity	❑ Understand what makes two shapes similar. ❑ Understand that similar shapes have equal angles ❑ Find a scale factor ❑ Use a scale factor to find an unknown side ❑ Find unknown sides when shapes are in nested diagrams. ❑ Solve problems involving similar shapes	❑ Teacher marked task ❑ End of unit test
Vectors	❑ Use and understand column vector notation. ❑ Understand that column vectors can be labelled using a letter. ❑ Add, subtract, multiply vectors written as column vectors or written as a letter. ❑ Be able to represent vectors on a graph.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Congruent	Exactly the same size and shape
Similar	The same shape but different sizes. One shape is a certain number of times bigger than the other.
Corresponding	Matching sides or angles on two or more shapes
Scale Factor	The number of times bigger each side of a similar shape in relative to another shape. Scale factors can be integer or fractional.
Column Vector	Describes a movement listing in a column vertically.

Year 11 Foundation Fractions, indices and standard form

This unit recaps and builds on the fractions work covered in year 7. During this unit there will be more of an emphasis on solving problems involving fractions and the decision-making process that is involved.

This unit also explores different ways in which very small or very large numbers can be written. This will include using indices and standard form. This will lead to fluency in using index laws or standard form to perform calculations both with and without a calculator. Finally, the unit will explore how indices and standard form can be incorporated in problem solving and questions that relate to the real world.

Topic	What do I need to know?	How will I be assessed?
Fractions	❑ be able to add, subtract, multiply and divide fractions. ❑ be able to add, subtract, multiply and divide mixed numbers. ❑ be able to find the reciprocal of a number. ❑ Understand that the reciprocal is a multiplicative inverse. ❑ Solve problems involving fraction.	❑ Teacher marked task ❑ End of unit test
Indices	❑ Use index laws to simplify calculations. ❑ Solve problems involving index laws.	❑ Teacher marked task ❑ End of unit test
Standard form	❑ Be able to convert very small or very large numbers into standard form. ❑ Be able to convert numbers written in standard form to ordinary numbers. ❑ Perform calculations involving standard form. ❑ Use a calculator to perform calculations involving standard form. ❑ Solve problems involving standard form.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Fraction	Part of a whole number or quantity.
Numerator	The number above the line in a fraction.
Denominator	The number below the line in a fraction.
Reciprocal	1 divided by a number. For example ½ is the reciprocal of 2 because 1÷2=½
Indices	Number representing how many times a number has been multiplied by itself.
Standard form	A systems of writing very small or large number efficiently using powers of 10.

Year 11 Higher Vectors and Geometric Proof

This unit adds more complexity to idea of mathematical movement. This work will build on the work done in KS3 on translations and adds more detail by introducing the idea taking a path of known vectors to get from one point to another. This unit comes at the end of the GCSE programme due to the unpinning algebraic skills needs to manipulate and factorise expressions. This unit also builds on the knowledge of properties of 2D shapes taught in KS3. You can also go on to study vectors further at A-level where 2D vectors are covered in more depth in year 12 before being extended to 3D vectors in year 13.

Topic	What do I need to know?	How will I be assessed?
Vectors	❑ Use and understand column vector notation. ❑ Understand that column vectors can be labelled using a letter. ❑ Add, subtract, multiply vectors written as column vectors or written as a letter. ❑ Be able to represent column vectors on a graph ❑ Calculate the resultant of two vectors using letters ❑ Calculate the resultant of two vectors using letters where a fraction or ratio needs to be applied ❑ Understand the properties of parallel vectors ❑ Prove lines are parallel. ❑ Prove points are collinear. ❑ Solve geometric problems using vectors. ❑ Apply vector methods of simple geometric proof.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Vector	Object with both magnitude and direction.
Resultant vector	The result of adding two or more vectors.
Scalar	A number that a vector is multiplied by
Direction	Orientation of a vector
Parallel	Vectors that are side by side and constantly have the same distance between them
Collinear	Points that lie on the same straight line

Year 11 Higher More Algebra

This unit builds on most of the basic algebra skills taught in KS3 and uses them to perform more complex calculations. This unit also introduces the idea of using a formal method to prove mathematical statements. This unit covers most of ground work needed to be successful at A level Maths as many of the concept are covered in more depth in year 12 and 13.

Topic	What do I need to know?	How will I be assessed?
Changing the subject of a formula	❑ Changing the subject of a formula where the subject appears twice by collecting like terms. ❑ Changing the subject of a formula where the subject appears twice by factorising.	❑ Teacher marked task ❑ End of unit test
Algebraic fractions	❑ Simplify an algebraic fraction by cancelling down. ❑ Simplify and algebraic fraction by factorising then cancelling. ❑ Multiply algebraic fractions. ❑ Divide algebraic fractions. ❑ Use cross cancelling. ❑ Solve equations involving algebraic fractions.	❑ Teacher marked task ❑ End of unit test
Functions	❑ Understand function notation. ❑ Substitute an x value into a function. ❑ Find an x value given f(x) by solving equations. ❑ Find composite functions. ❑ Find inverse functions.	❑ Teacher marked task ❑ End of unit test
Surds	❑ Understand what a surd is ❑ Give examples and non-examples of surds. ❑ Simplify surds. ❑ Use the four operations with surds. ❑ Expand brackets containing surds. ❑ Rationalise the denominator. ❑ Use the conjugate to rationalise the denominator. ❑ Solve problems involving surds.	❑ Teacher marked task ❑ End of unit test
Proof	❑ Understand how consecutive, odd and even numbers can be represented using algebra. ❑ Prove a result using algebra.	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Algebraic fractions	Fractions that contain at least on variable.
Function	A rule that establishes a relationship between one variable and another.
Composite function	A function that involving applying one rule to a variable and then applying rule to the result.
Inverse function	The reverse of a particular function.
Surd	Number written in square root form for accuracy.
Rationalise	Eliminating a Surd
Consecutive	Numbers that follow each other one after the other.

Year 11 Higher More Graphs

This unit builds on the graph work covered in KS3 and year 10 and extends it to explore some more complex ideas relating to graphs. This units offers the perfect segue into A level Mathematics as many of the concepts explored in this unit are covered in more depth in year 12 and 13. Finally, this unit will give an insight into how graphs are used in real life.

Topic	What do I need to know?	How will I be assessed?
Reciprocal and exponential graphs	❑ Recognise the graphs of reciprocal and exponential functions. ❑ Complete a table of values and draw the graph of reciprocal and exponential functions. ❑ Understand why the y intercept of an exponential graph is always (0,a). ❑ Given two coordinates of an exponential function, find the equation and use it to find other coordinates.	❑ Teacher marked task ❑ End of unit test
Other graphs	❑ Calculate the gradient of a tangent to a point on a curve. ❑ Estimate the area under a curve. ❑ Understand what the area of a curve represents in a range of contexts. ❑ Find acceleration and distance using a velocity time graph.	❑ Teacher marked task ❑ End of unit test
Transformations of graphs	❑ Understand the notation for translation of functions ❑ Translate functions ❑ Understand the notation for reflections of functions ❑ Reflect functions	❑ Teacher marked task ❑ End of unit test

Key Words	Definition
Reciprocal function	An equation that contains a fraction and will require a number to be divided by x
Exponential function	A function where the variable x occurs as a power. For example $y = a^x$
Growth	Describes the rate at which a quantity is increasing over time
Decay	Describes the rate at which a quantity is decreasing over time
Tangent	A straight line that touches a curve at only one point.
Velocity	The rate at which an object is moving in a particular direction
Translation	A movement left, right up or down.
Reflection	A mirror image