MATHS CURRICULUM MAP
Year 7

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 1	The Grammar of Written Calculations	• What is a number? • What is the difference between measuring and counting? • Why is using place value helpful? • What is base 10? • What is the relationship between place value columns? • Describe what happens when you multiply by 10, 100 or 1000? • How does rounding help with estimating? • When might mental methods be more efficient than written methods? • What is multiplication? • What is division? • Is division commutative? • How are multiplication and division linked? • What happens if a number does not divide exactly? • What is commutativity, associativity & disributivity? • How do arrays and area models help you understand commutativity of multiplication? • How do arrays and area models help you understand associativity and distributivity?	• Recognise concrete representations and place value models of integers and decimals • Understand decimal notation and place values and identify the values of the digits in a decimal • Convert between decimal and fraction where the denominator is a factor of 10 or 100 • Use correctly the symbols <, > and the associated language • Multiply, and divide, any integer or decimal by 10, 100, 1000, or 10,000 • Mentally add and subtract sets of numbers including decimals • Use the commutativity and associativity of addition • Understand and use the formal written algorithms for addition and subtraction including decimals • Use commutativity, associativity and distributivity to solve calculations efficiently • Use column method to multiply integers • Use a formal algorithm for division • Multiply and divide whole numbers and decimals • Find factors and multiples. • Recognise and define: prime, square and cube numbers • Use the definitions of factors and multiples to find common factors and common multiples • Express an integer as a product of its factors
Module 2	Negatives and Introduction to Algebra	• Does the order of addition and subtraction matter? • Why might BIDMAS be misleading? • Does it make a difference if you multiply or divide first? Where else have we met this idea? • Why might you want to divide first? Why might you want to multiply first? • For worded problems, should we apply operations in the same order that they appear? • How are indices linked to multiplication? Can you think of any similar relationships? • What does equal priority mean? • How can the language of temperature help me work out calculations? • How can multiplying negative numbers help me in dividing negative numbers? • What links can I make between addition and multiplication of negative numbers? • How does multiplying and dividing by negatives affect the concept of multiplication as scaling? • If I am adding a negative number, does my number want to get more/less positive/negative? • If I am subtracting a negative number, does my number want to get more/less positive/negative? • Why do we need to use letters? • What can letters in maths represent? • What is the difference between the equal sign and the identity sign? • How can we use substitution to check answers? • What is the difference between 3x^2 and (3x)^2 ? • Is ab the same or different to ba? What about a/b and b/a? a+b and b+a? a-b or b-a?	• Define each element of BIDMAS • Understand the priority of operations, including equal priority • Form and identify equivalent calculations based on distributivity, commutativity and the order of operations • Interpret negative numbers in a variety of contexts • Compare and order positive and negative numbers • Use positive and negative numbers to express change and difference • Calculate using all four operations with positive and negative values • Use number lines to model calculations with negative numbers • Explore scaling with negative multipliers • Form and manipulate expressions involving negative numbers • Use number lines to model calculations with negative numbers • Develop understanding of algebraic notation • Collect like terms to simplify expressions and understand that this is a result of the distributive property • Substitute numerical values into expressions and evaluate • Expand and factorise single brackets • Develop understanding of the equality and inequality signs • Form equations or inequalities from abstract and real life contexts • Use different contexts, including sequences, to construct expressions, equations and inequalities

MATHS CURRICULUM MAP
Year 7

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 3	Classifying 2D Shapes	• How would you describe what an angle is? • What do they measure? • What is a degree? • How do you use protractors/angle measurers correctly? • What is a point of intersection? • How could you define a line of symmetry? • What are the possible orders of rotational symmetry for a triangle? • What is the difference between scalene, isosceles and equilateral triangles? • What is the difference the radius and the diameter of a circule? • How do you use a compass correctly?	• Draw and measure acute and obtuse angles to the nearest degree • Estimate the size of a given angle • Know and use the angle facts: angles at a point, angles at a point on a straight line, vertically opposite angles • Define parallel and perpendicular lines • Use angle facts around corresponding, alternate and cointerior angles to find missing angles Find unknown angles. • Form algebraic expressions and solve equations related to unknown angles • Define and identify the order of rotational symmetry • Identify and count the lines of symmetry • Describing the properties of scalene, isosceles and equilateral triangles • Know that the interior angles in a triangle sum to 180° • Solve problems involving unknown angles in triangles • Compare the symmetry, side length, number of parallel sides and angles in quadrilaterals • Name the basic features of circles. • Construct triangles using a pair of compasses and ruler given the length of the sides. • Construct triangles with the same interior angles using a protractor. • Construct triangles given two sides and an angle
Module 4	The Cartesian Plane	• Does the order of the numbers matter? • If you know the mid-point, can you find the line segment? • What shapes can be described as rectilinear? • What lengths are multiplied to find the area? • What is the difference between area and perimeter? • What is a vector? • How does moving the point of rotation effect the image? • What is a rotation? • Does an enlargement always make a shape bigger? • Describe the effect of a scale factor of enlargement.	• Reading and writing coordinates of points in all four quadrants. Including non-integer coordinates • Finding the mid-point of a line segment or two points • Using the midpoint and a point on the line to find the coordinates of another point on the line • Recognise and plot horizontal and vertical lines on a coordinate axis • Understanding equations of horizontal and vertical lines • Calculating the perimeter of polygons • Finding the area of rectilinear shapes • Finding the area of other 2-D shapes including triangles, and special quadrilaterals • Find the area & perimeter of compound shapes (inc finding missing sides) • Translate shapes and describe translations using column vectors • Rotate shapes about a point by multiples of 90 degrees, clockwise or anti-clockwise • Describe rotations accurately • Reflecting shapes by horizontal, vertical and diagonal lines • Enlarge a shape by a positive and/or unit fraction scale factor

MATHS CURRICULUM MAP
Year 7

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 5	Fractions	• What is a prime number? • What is the Lowest Common Multiple? (LCM) • What is the Highest Common Factor? (HCF) • What does it mean to prime factorise a number? • What is a numerator? What is a denominator? • What is a improper fraction? • What is a proper fraction? • What is the relationship between the division of fractions and the multiplication of them? • How do we add fractions with unlike denominators? • What does equivalent mean?	• Be able to 'build' numbers by considering products. • Use index notation • Find factors and multiples, square numbers, cube numbers, prime number, triangular numbers • Write a number as a product of primes • Find the common factor and common multiple using the prime factorisation • Find the highest common factor and lowest common multiple using the prime factorisation • Recognise and name equivalent fractions • Convert fractions to decimals • Convert terminating decimals to fractions in their simplest form • Convert between mixed numbers and improper fractions • Compare and order numbers (including like and unlike fractions) • Find a fraction of a set of objects or quantity • Find the whole given a fractional part • Multiply and divide fractions by a whole number or fraction • Add and subtract fractions with like denominators • Add and subtract fractions with unlike denominators • Add and subtract fractions mixed numbers and improper fractions • Convert between improper fractions and mixed numbers
Module 6	Ratios and Percentages	• What is a ratio? • Why do we use ratios to share? • What does a part of a ratio look like? • What is a percentage? • Why do we say percent? • What is a bar model? • What is simplifying? • How do decimals and percentages relate to each other? • How can you use a decimal to calculate a percentage of amount? • What does a percentage over 100 mean?	• Compare two or more quantities in a ratio. • Use bar models to represent percentage and ratio • Simplifying ratios • Understand percentages as a ratio of two quantities where one quantity is standardised to 100 • Interpret a percentage as a fraction and decimal • Find a percentage of an amount with and without a calculator • Increase and decrease a quantity by a given percentage • Compare two quantities using percentages • Find a quantity given a percentage of it • Solve ratio and proportion problems in a variety of contexts • Understand percentages as a fractional operator with a denominator of 100 • Understand and interpret percentages over 100.

MATHS CURRICULUM MAP

Year 8

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 1	Equivalence through Fractions and Percentages	• What is a prime number/multiple/factor? • What is the Lowest Common Multiple? (LCM) • What is the Highest Common Factor? (HCF) • What does it mean to prime factorise a number? • What does it mean to simplify? • What is an equivalent fraction? • What is a numerator? What is a denominator? • What is a improper fraction? • What is a proper fraction? • What is the relationship between the division of fractions and the multiplication of them? • How do we add fractions with unlike denominators? • What is a proportion? • What is the relationship between percent and 100?	• Be able to 'build' numbers by considering products. • Use index notation • Find factors and multiples, square numbers, cube numbers, prime number, triangular numbers • Write a number as a product of primes • Find the common factor and common multiple using the prime factorisation • Find the highest common factor and lowest common multiple using the prime factorisation • Recognise and name equivalent fractions • Convert fractions to decimals • Convert terminating decimals to fractions in their simplest form • Convert between mixed numbers and improper fractions • Compare and order numbers (including like and unlike fractions) • Find a fraction of a set of objects or quantity • Find the whole given a fractional part • Multiply and divide fractions by a whole number or fraction • Add and subtract fractions with like denominators • Add and subtract fractions with unlike denominators • Add and subtract fractions mixed numbers and improper fractions • Convert between improper fractions and mixed numbers
Module 2	Forming and Solving Equations and Inequalities	• What is a sequence? • What does it mean to generalise? • What is the nth term and how can I use it to solve problems? • What is the difference berween an equation, expression and inequality? • Does an equation always have a solution? • What does the word inverse mean? • Why do I need to perform the same operations to both sides of my equation? • How do I decide what order to perform the inverse operations in? • What do inequalities represent? • How do inequalities relate to equations? • Are the same methods for solving inequalities the same as equations?	• Identify and generate terms of a sequences • Finding a given term in a linear sequence • Developing a rule for finding a term in a linear sequence • Generalising the position to term rule for a linear sequence (nth term) • Form and solve equations including those with unknowns both sides and those involving algebraic fractions • Represent, form and solve inequalities • Use number lines and inequality symbols to represent and describe sets of numbers. • Use substitution to determine whether values satisfy given inequalities. • Solve linear inequalities with the unknown on one side. • Form inequalities in geometrical contexts • Use bar models to manipulate linear inequalities between two variables. • Compare manipulating linear equations and linear inequalities.
Module 3	Graphs and Proportions	• What is an object? • What is an image? • What other translations can be described with a vector? • How does moving the point of rotation effect the image? • What happens when I move the shapes vertices? • What happens to the image if I move the reflection line? • Can a combination of transformations be described by a single transformations? • What is the effect of a scale factor on the area of a shape? • What is the effect of a scale factor on the perimeter of a shape? • How does the word linear relate to general form of y=ax+c • What happens as the coefficient of x changes? • What happens as the coefficent of x becomes negative? • What happens as the y-intercept changes? • How do you know if two lines are parallel? "	• Translate shapes and describe translations using column vectors • Rotate shapes about a point by multiples of 90 degrees, clockwise or anti-clockwise • Describe rotations accurately • Reflecting shapes by horizontal, vertical and diagonal lines • Describing rotations by giving the vertical or horizontal equation of the line • Apply a combination of transformations to a shape • Describe the single transformation made by applying a combination of transformation • Enlarge a shape by a positive and/or unit fraction scale factor • Identify the equations of horizontal and vertical lines (from year 7) • Plot coordinates from a rule to generate a straight line • Recognise y = ax & equations of the form y= ax + c • Identify key features of a linear graph including the y-intercept and the gradient • Make links between the graphical and the algebraic representation of a linear graph • Recognise different algebraic representations of a linear graph • Identify parallel lines from algebraic representations

MATHS CURRICULUM MAP
Year 8

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 4	Proportional Reasoning	• What is a ratio? • Why do we use ratios to share? • What does a part of a ratio look like? • What is a coordinate? • What is a gradient? • What does parallel mean? • What is the Y-intercept? • What does it mean to be proportional? • What does it mean to be inversely proportional? • What do the graphical representations of proportion look like?	• Understand the concept of ratio and use ratio language and notation • Connect ratio with understanding of fractions • Compare two or more quantities in a ratio • Recognise and construct equivalent ratios • Express ratios involving rational numbers in their simplest form • Construct tables of values and use graphs as a representation for a given ratio • Compare ratios by finding a common total value • Explore ratios in different contexts including speed and other rates of change • Contrast ratio relationships involving discrete and continuous measures • Use speed and other rates of change to draw and interpret graphical representations • Explore density and concentration as other contexts for proportional relationships • Explore contexts involving proportional relationships • Represent proportional relationships using tables and graphs • Represent proportional relationships algebraically • Recognise graphs of proportional relationships • Solve proportion problems • Define inverse proportional relationships • Represent inverse proportion relationships algebraically
Module 5	Statistics - Types of Data, Averages and Interpretations	• What happens to the original mean when one of the numbers is removed? • When will the mean go up? When will it go down? Why? • How could you compare the two data sets? • When is the mean better to use? • When is the median better to use? • When is the mode better to use? • What is continuous data? • What is discrete data? • What is the difference between univariate data and bivariate data? • What is an outlier? • Why do we use scatter diagrams? • What does the line of best fit allow us to do? • What does interpolation mean? • What does extrapolation mean?	• Find the mean, median mode and range from raw datasets • Use the mean, median and mode to compare data sets • Use an average plus the range to compare datasets • Find the mode, median and mean from tables and graphical representations (not grouped) • Explore methods of data collection including surveys, questionnaires and the use of secondary data • Appreciate the difference between discrete and continuous data • Classify and tabulate data • Conduct statistical investigations using collected data • Construct scatter graphs • Recognise clusters and outliers • Analyse the shape, strength and direction to make conjectures for possible bivariate relationships • Plot a line of best fit • Use a line of best fit to interpolate and extrapolate inferences
Module 6	Circles; 3D Shapes - Surface Area and Volume	• What are the definitions of the circumference, radius, diameter, a chord, a sector and a segment? • Is the circumference proportional to the diameter? • What is pi? • What is an irrational number? • What approximation can used for pi? • How many decimal places of pi do you need to calculate the circumference of earth at the equator to accuracy of a hydrogen atom? • When did you convert between the units?	• Explore relationship between circumference and diameter/radius • Use the formula for circumference • Explore relationship between area and radius • Use the formula for area of a circle • Find the area and circumference of a semi-circle and other sectors • Find the area and perimeter of composite shapes involving sectors of circles • Name prisms, nets of prisms and using language associated with 3-D shapes • Finding the volume and surface area of cuboids • Finding the volume and surface area of other prisms including cylinders • Finding the volume and surface area of composite solids • Solving equations and rearranging formulae related to volumes • Convert between different units of area and volume

MATHS CURRICULUM MAP
Year 9

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 1	Graphs and Proportions	• What is a coordinate? • What is a gradient? • What does parallel mean? • What is the Y-intercept? • What does it mean to be proportional? • What does it mean to be inversely proportional? • What do the graphical representations of proportion look like? • What is standard form? • What is the purpose of standard form? • How do you know if a number is very large or small when written in standard form?	• Plot coordinates in all four quadrants • Find the midpoint of a line segment joining two points • Find an endpoint of a line segment, given the midpoint and one endpoint • Identify the equations of horizontal and vertical lines • Plot a straight line from a rule by generating coordinates • Find the gradient and y-intercept of a line (inc negative and fractional gradients) • Find the equation of a line • Identify parallel lines • Recognise when two quantities are directly proportional to each other • Solve direct proportion problems using the unitary method • Recognise when two quantities are inversely proportional to each other • Use standard form to express very large and small numbers • Convert between standard form and ordinary numbers • Order large and small numbers that are in standard form • Use standard form to solve addition and subtraction problems
Module 2	Algebra - Manipulating Variables	• Why do we round numbers? • What effect does rounding have in subsequent calculations? • What does it mean to generalise? (In the context of a sequence) • What is an expression? • What is an equation? • What is a formula? • What is a binomal or a polynomial? • What is the best method for expanding double/triple brackets	• Round numbers to powers of 10 • Round numbers to a required number of decimal places • Round numbers to a required number of significant figures • Find the nth term of a linear sequence • Recognise linear and quadratic expressions • Recognise arithmetic and geometric sequences • Generate and describe linear and non-linear sequences • Multiply a term over a single bracket • Expand products of two binomials • Factorise expressions into a single bracket • Expand products of three binomials • Define what an expression, equation and formula are • Manipulate familiar formulae such as known formulae for area and perimeter • Make a specific term the subject of the formula
Module 3	Circles; 3D Shapes - Surface Area & Volume	• What are the definitions of the circumference, radius, diameter, a chord, a sector and a segment? • Is the circumference proportional to the diameter? • What is pi? • What is an irrational number? • What approximation can used for pi? • How many decimal places of pi do you need to calculate the circumference of earth at the equator to accuracy of a hydrogen atom? • When did you convert between the units? • How do you use a compass correctly? • How do you use a protactor/angle measurer correctly?	• Explore relationship between circumference and diameter/radius • Use the formula for circumference • Explore relationship between area and radius • Use the formula for area of a circle • Find the area and circumference of a semi-circle and other sectors • Find the area and perimeter of composite shapes involving sectors of circles • Name prisms, nets of prisms and using language associated with 3-D shapes • Finding the volume and surface area of cuboids • Finding the volume and surface area of other prisms including cylinders • Finding the volume and surface area of composite solids • Solving equations and rearranging formulae related to volumes • Convert between different units of area and volume • Constructing triangles using a pair of compasses and ruler given the length of the sides. • Constructing triangles with the same interior angles using a protractor. • Constructing triangles given two sides and an angle

MATHS CURRICULUM MAP
Year 9

	Topic	Core declarative knowledge: what should students know?	Core procedural knowledge: what should students be able to do?
Module 4	Mensuration	• What are the properties of a right angled triangle? • What is the hypotenuse? • How can you identify the hypotenuse or the longest side of any triangle from its angles? • What is the Pythagoras Theorem? • What is the difference berween an equation, expression and inequality? • Does an equation always have a solution? • What does the word inverse mean? • Why do I need to perform the same operations to both sides of my equation? • How do I decide what order to perform the inverse operations in? • What do inequalities represent? • How do inequalities relate to equations? • Are the same methods for solving inequalities the same as equations?	• Identify the sides of a right angled triangle in relation to Pythagoras. • Identify the hypotenuse of a right angled triangle • Recognise the formula for the Pythagoras Theorem • Use the formula to find the length of the hypotenuse. • Use the formula to find the length of one of the shorter sides of a right angled triangle • Form and solve equations including those with unknowns both sides and those involving algebraic fractions • Represent, form and solve inequalities • Use number lines and inequality symbols to represent and describe sets of numbers. • Use substitution to determine whether values satisfy given inequalities. • Solve linear inequalities with the unknown on one side. • Form inequalities in geometrical contexts • Use bar models to manipulate linear inequalities between two variables. • Compare manipulating linear equations and linear inequalities.
Module 5	Equations, Inequalities and Probability	• Why is using a graph to find a solution sometimes an estimate? • What does using the graph to find a solution physically represent? • What are the characteristics of a linear, exponential and reciprocal graph? • What is probability? • What does it mean to be random? • What is the likelihood of winning the lottery? • What does the probabilities of all possible outcomes sum to? • What does 0 and 1 represent in probability? • Is anything certain? • What regions do the intersection and union represent on a venn diagram? • What does mutually exclusive mean? • What is the difference between experimental and theoretical probability?	• Use linear and quadratic graphs to estimate values of y or x for given values of x or y • Find approximate solutions of simultaneous linear equations • Find approximate solutions to contextual problems from given graphs of a variety of functions • Use linear, exponential and reciprocal graphs to find solutions (including in context) • Record, describe and analyse the frequency of outcomes of simple probability experiments • Define and use key language terms such as randomness, fairness, equally and unequally likely outcomes • Use the 0-1 probability scale • Understand that the probabilities of all possible outcomes sum to 1 • Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams • Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities.
Module 6	Handling Data	• What happens to the original mean when one of the numbers is removed? • When will the mean go up? When will it go down? Why? • How could you compare the two data sets? • When is the mean better to use? • When is the median better to use? • When is the mode better to use? • What is continuous data? • What is discrete data? • What is the difference between univariate data and bivariate data? • What is an outlier? • Why do we use scatter diagrams? • What does the line of best fit allow us to do? • What does interpolation mean? • What does extrapolation mean?	• Find the mean, median mode and range from raw datasets • Use the mean, median and mode to compare data sets • Use an average plus the range to compare datasets • Find the mode, median and mean from tables and graphical representations (not grouped) • Explore methods of data collection including surveys, questionnaires and the use of secondary data • Appreciate the difference between discrete and continuous data • Classify and tabulate data • Conduct statistical investigations using collected data • Construct scatter graphs • Recognise clusters and outliers • Analyse the shape, strength and direction to make conjectures for possible bivariate relationships • Plot a line of best fit • Use a line of best fit to interpolate and extrapolate inferences.