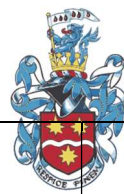


1st form – Key Stage 3 Mathematics MOSAIC

	Learning intentions			Pre-requisite knowledge	Key vocabulary		
MICHAELMAS TERM A	Unit 1: Place Value	Place value in integers - understand the place value of digits in integers - write integers as words and numerals and use positive powers of 10 in place-value tables Place value in decimals - understand the place value of integers in decimals - write decimals as words and numerals and use positive powers of 10 in place-value tables - multiply and divide by positive powers of 10 - multiply and divide by negative powers of 10	Ordering and comparing numbers - place positive numbers on a number line - compare positive numbers using $<$, $>$, and $=$ - order positive integers and decimals Measures - recognise and convert between units of measure - compare positive numbers using $<$, $>$, and $=$	You should know ... - how to round whole numbers - that thousandths come from dividing one into a thousand equal parts - how to use place value to help you multiply - how to divide numbers by 10 or 100 - how to estimate the position of a whole number on a number line - the common units of length, mass, and volume	<i>digit</i> <i>integer</i> <i>power</i> <i>leading zero</i> <i>power of 10</i> <i>index form</i> <i>trailing zero</i> <i>ascending</i> <i>descending</i> <i>metric system</i> <i>prefix</i>		Baseline
	Unit 2: Properties of number: factors, multiples, squares and cubes	Multiples - understand and list multiples of a number - identify whether a number is a multiple of another number Powers and roots - understand and calculate square numbers - understand and calculate cube numbers - understand and calculate square roots - understand and calculate cube numbers - understand and calculate powers of numbers - recognise powers of 2, 3, 4 and 5	Factors and prime factorisation - understand and identify factors of a number - identify whether a number is prime - write a number as a product of its prime factors - use prime factorisation to identify features of a number - find the HCF of two or more numbers - find the LCM of two or more numbers	You should know ... - times tables up to 12×12 - how to solve a multiplication involving an array - how square numbers are represented as arrays - how to round decimals - division facts from times tables	<i>multiple</i> <i>square number</i> <i>index notation</i> <i>exponent</i> <i>base</i> <i>squared</i> <i>power</i> <i>cube number</i> <i>cubed</i> <i>square root</i>	<i>cube root</i> <i>factor pair</i> <i>prime</i> <i>composite</i> <i>prime factor</i> <i>prime factorisation</i> <i>HCF</i> <i>LCM</i>	Diagnostic task 2
MICHAELMAS TERM B	Unit 3: Arithmetic procedures with integers and decimals	Addition and subtraction with negative integers - order and compare positive and negative integers - know that there are infinitely many integers Multiplication and division with negative integers - multiply positive and negative integers - divide positive and negative integers Addition and subtraction with decimals - add and subtract positive and negative decimals - order and compare positive and negative decimals - know that given two numbers, you can always find a number between them	Multiplication and division with decimals - multiply and divide efficiently using powers of 10 - multiply and divide positive and negative decimals Efficient calculations - know and use the commutative, associative, and distributive laws - calculate using the priority of operations - use a calculator fluently	You should know ... - how to place positive numbers on a number line - how to compare and order positive numbers - how to solve a multiplication or division involving an array - what the multiples of a number are - how to partition numbers in different ways - how to divide positive numbers using short division - how to use place value to help you multiply and divide - how to multiply and divide numbers by positive powers of 10 - how to multiply and divide numbers by negative powers of 10 - how to calculate powers of numbers on a calculator - how to work out square roots and cube roots on a calculator	<i>negative number</i> <i>positive number</i> <i>sum</i> <i>additive invers</i> <i>zero pair</i> <i>minuend</i> <i>subtrahend</i> <i>partitioning</i> <i>absolute value</i> <i>even</i> <i>odd</i> <i>dividend</i>	<i>quotient</i> <i>commutative law</i> <i>associative law</i> <i>factorise</i> <i>distributive law</i>	Diagnostic task 3
	Unit 4: Expressions and equations	Introduction to algebra - understand how to use a letter to represent a number - identify terms, products, and expressions - understand how to use an algebraic statement or formula to represent a relationship - understand and use algebraic notation - substitute numbers into an algebraic expression Formulae and equations - substitute numbers into function machines - identify and substitute numbers into an algebraic formula - use a simple formula written in words and write a formula from given information - identify equations and inequalities - write linear equations and determine whether a value satisfies an equation	Simplifying expressions - identify constants and coefficients - identify like terms - simplify expressions by collecting like terms Using the distributive law - expand brackets by multiplying an expression by a term - expand and simplify brackets - identify algebraic factors and find the HCF of algebraic terms - factorise expressions	You should know ... - how to multiply numbers using commutativity and associativity - a fraction represents a division - square numbers come from squaring an integer - how to add and subtract with negative numbers - how to multiply and divide negative numbers - the order of operations - how to solve missing number problems - how to find HCFs of numbers - how to use the distributive law	<i>variable expression</i> <i>term</i> <i>product</i> <i>generalise</i> <i>substitute</i> <i>function</i> <i>machine</i> <i>formula</i> <i>equation</i> <i>solution</i> <i>inequality</i> <i>constant</i> <i>coefficient</i> <i>simplify</i> <i>like terms</i>	<i>collect like terms</i> <i>identify</i> <i>expand brackets</i> <i>HCF</i> <i>factorise</i> <i>fully factorise</i>	Diagnostic task 4
LENT TERM A	Unit 5: Plotting coordinates	Plotting coordinates - describe and plot coordinates - solve problems involving points on coordinate grids - solve problems involving shapes on coordinate grids	Coordinates, formulae and graphs - understand that in a horizontal and vertical line either x or y is constant - understand that a graph shows all the points (within a range) that satisfy a relationship - plot points and draw a graph of an algebraic relationship	You should know ... - properties of quadrilaterals - how to write the coordinates of plotted points - how to work out pairs of values which satisfy an equation with two variables	<i>coordinate grid</i> <i>x-axis</i> <i>y-axis</i> <i>quadrant</i> <i>coordinate pair</i> <i>origin</i> <i>midpoint</i>	<i>reflection</i> <i>vertex</i> <i>vertices</i> <i>graphically</i> <i>algebraically</i>	Diagnostic task 5
	Unit 6: Perimeter and area	Properties of quadrilaterals and triangles - know and use the properties of different quadrilaterals - know and use the properties of different triangles Perimeter - work out perimeters using properties of polygons - solve problems involving perimeters of polygons	Area - work out areas of polygons on squared paper - work out areas of composite polygons made of rectangles - work out the area of triangles - work out the area of different quadrilateral - solve problems involving areas of polygons	You should know ... - that the sum of the angles in a triangle is 180° - common units of length - how many sides polygons have and properties of regular polygons - how to draw polygons on coordinate grids - how to use an algebraic statement or formula to represent a relationship - how to find the area of a rectangle - how to substitute variables into a formula	<i>quadrilateral</i> <i>polygon</i> <i>length</i> <i>parallel</i> <i>angle</i> <i>diagonal</i> <i>square</i> <i>rectangle</i> <i>parallelogram</i> <i>rhombus</i> <i>kite</i> <i>trapezium</i> <i>regular</i> <i>irregular</i> <i>triangle</i>	<i>equilateral</i> <i>isosceles</i> <i>scalene</i> <i>right-angles</i> <i>obtuse-angled</i> <i>perimeter</i> <i>edge</i> <i>rectilinear</i> <i>width</i> <i>height</i> <i>area</i> <i>composite</i> <i>base length</i> <i>perpendicular</i> <i>height</i>	Diagnostic task 6
LENT TERM B	Unit 7: Fractions and decimals (positive and negative)	Working with fractions and decimals - understand that 1 can be written in the form $\frac{a}{a}$ - convert between improper fractions and mixed numbers - write a fraction as a decimal - write a decimal as a fraction - write a fraction in its simplest form - convert between fractions and decimals using a calculator Comparing and ordering fractions - compare and order fractions by converting to decimals - compare and order fractions using common denominators - order positive and negative fractions and decimals	Adding and subtracting fractions - add and subtract fractions with common denominators - add and subtract mixed numbers with different denominators Multiplying and dividing fractions - multiply fractions - multiply mixed numbers - rewrite division as a multiplication by the reciprocal - divide a fraction by a whole number - divide a whole number by a fraction - divide a fraction by a fraction	You should know ... - how to add and subtract fractions with the same denominator - how to divide integers and decimals using short division - how to identify the place value of decimal digits - how to find the LCM of two numbers - how to compare and order decimal numbers - how to compare and order positive and negative numbers - how to use the distributive law of multiplication over addition	<i>fraction</i> <i>denominator</i> <i>numerator</i> <i>proper fraction</i> <i>improper fraction</i> <i>fraction</i> <i>mixed number</i> <i>terminating decimal</i> <i>recurring decimal</i>	<i>equivalent fractions</i> <i>simplest form</i> <i>common denominator</i> <i>unit fraction</i> <i>reciprocal</i>	Diagnostic task 7
TRINITY TERM A	Unit 8: Multiplicative relationships: ratio, fractions and decimals	Multiplicative relationships - understand that two numbers can be connected by addition/subtraction or multiplication/division - show a multiplicative relationship using a ratio, fraction, or diagram - find the multiplier between two numbers - find different pairs of numbers that satisfy the same multiplicative relationship Representing multiplicative relationships - use a ratio table to represent a multiplicative relationship - use a ratio table to simplify a ratio - use a double number line to represent a multiplicative relationship and connect it to other representations	Fractions in context - find a fraction of a given amount - find the original amount given a fraction of an amount and the fraction Applying ratio - write one number as a fraction of another - share an amount into a ratio - find the whole, given one part of a whole and the ratio - find one part of a whole, given another part and the ratio - use ratios to describe rates	You should know ... - how to complete a table of pairs of values that satisfy the same relationship - common units of length, mass, capacity, money, and area - how to simplify fractions - how to estimate the position of a decimal on a number line - how to plot and read points on a graph	<i>multiplicative relationship</i> <i>fraction</i> <i>ratio</i> <i>additive relationship</i> <i>multiplier</i> <i>double number line</i> <i>rate</i> <i>per</i> <i>conversion rate</i>		Diagnostic task 8
	Unit 9: Transformations	Translations - recognise a translation and know which features of an object are affected by translation - describe a translation - translate an object Rotations - recognise a rotation and know which features of an object are affected by rotation - rotate an object - describe a rotation Reflections - recognise a reflection and know which features of an object are affected by reflection - draw a mirror line for a reflection - reflect an object in a given line	Scale diagrams - know how distances on a scale diagram represent distance in real life - interpret a scale diagram - draw a scale diagram Enlargements - recognise an enlargement and know which features of an object are affected by enlargement - enlarge an object - describe an enlargement	You should know ... - how to draw shapes on coordinate grids - angles can measure turns in a clockwise or anticlockwise direction - how to reflect points in axes - how to find the midpoint of points on a coordinate grid using their coordinates - how to use ratio tables to work out quantities that are multiplicatively related - how to convert between units of length - how to work out one part, given the other part and the ratio - how to calculate the multiplier for any two numbers	<i>congruent</i> <i>orientation</i> <i>position</i> <i>transformation</i> <i>object</i> <i>image</i> <i>translation</i> <i>column vector</i> <i>rotation</i> <i>centre of rotation</i> <i>reflection</i> <i>mirror line</i> <i>scale diagram</i> <i>to scale</i> <i>similar</i>	<i>enlargement</i> <i>scale factor</i> <i>centre of enlargement</i>	Diagnostic task 9

2nd form – Key Stage 3 Mathematics MOSAIC

	Learning intentions			Pre-requisite knowledge	Key vocabulary		
MICHAELMAS TERM A	Unit 1: Estimation and rounding	Rounding to decimal places - round integers to the nearest 10, 100, or 1000 - round numbers to any number of decimal places Rounding to significant figures - understand significant figures - round integers using significant figures - round decimals using significant figures	Estimation - understand what is meant by a sensible degree of accuracy - estimate calculations - work out if a rounded calculation is an underestimate or overestimate - understand the impact of rounding errors - show rounding errors using inequality notation	You should know ... - the place value of digits in integers - the place value of decimal digits - conversions for common units of length - how to use the priority of operations when doing calculations - how to order fractions	<i>approximate</i> <i>rounding</i> <i>rounded</i> <i>degree of accuracy</i> <i>decimal place</i> <i>significant figure</i>	<i>overestimate</i> <i>underestimate</i> <i>lower bound</i> <i>upper bound</i> <i>error interval</i>	Baseline
	Unit 2: Solving linear equations	Solutions to linear equations - recognise linear equations - understand what a solution to an equation is - understand that a family of linear equations can all have the same solution One step linear equations - solve a linear equation with a single additive step - solve a linear equation with a single multiplicative step Two step linear equations - solve a two step linear equation with a single unknown - solve equations with unknown on both sides - know that there are multiple ways of solving equations with additive and multiplicative steps	Linear equations with brackets and fractions - solve equations involving brackets with the variable on one side - solve equations involving brackets with the variable on both sides - solve linear equations with fractions - solve linear equations with fractions when the unknown is in the denominator	You should know ... - how to write an equation from a given situation - how to substitute variables into an expression - how to collect like terms in an expression - how to expand brackets	<i>linear equation</i> <i>expression</i> <i>identity</i> <i>linear inequality</i> <i>equality</i> <i>solution</i> <i>isolate</i> <i>coefficient</i>		Diagnostic task 2
MICHAELMAS TERM B	Unit 3: Sequences	Features of sequences - describe and continue sequences - generate, describe, and continue sequences using a term-to-term rule - generate, describe, and continue sequences using a position-to-term rule	Arithmetic sequences - understand and identify arithmetic sequences - work out the nth term of an arithmetic sequence - use the nth term of an arithmetic sequence to calculate terms - determine whether a number is a term of an arithmetic sequence	You should know ... - how to predict the next shape or pattern in a sequence - sequences of multiples of numbers - how to substitute for the variables in an expression and evaluate - how to create expressions using symbols - how to solve linear equations	<i>sequence</i> <i>consecutive</i> <i>term-to-term rule</i> <i>nth term</i> <i>rule</i> <i>term</i> <i>Fibonacci-style sequence</i>	<i>position-to-term rule</i> <i>nth term</i> <i>arithmetic sequence</i> <i>common difference</i>	Diagnostic task 3
	Unit 4: Graphical representations of linear graphs	Connect coordinates, equations, and graphs - understand when it is sensible to join points as a linear graph - know that coordinates can be represented algebraically and graphically	Linear relationships - find the gradient of a straight line - identify and use the gradient and y-intercept of a straight line - identify and use the gradient and y-intercept of a straight line from its equation in the form $y = mx + c$ - solve problems involving linear relationships in context	You should know ... - how to use the nth term of an arithmetic sequence to calculate terms - how to plot points on a coordinate grid - how to find pairs of numbers that satisfy an equation with two unknowns - how to substitute variables into an expression and evaluate - how to rearrange an equation to isolate a variable - how to write the equation of a vertical or horizontal line or draw a horizontal line from the equation - how to plot and interpret graphs that describe rates	<i>linear graph</i> <i>linear relationship</i> <i>algebraically</i> <i>graphically</i> <i>x-axis</i> <i>y-axis</i> <i>x-coordinate</i> <i>y-coordinate</i> <i>origin</i> <i>table of values</i>	<i>rate of change</i> <i>gradient</i> <i>y-intercept</i> <i>draw a graph</i> <i>sketch a graph</i> <i>gradient-intercept form</i>	Diagnostic task 4
CAT 1							
LENT TERM A	Unit 5: Multiplicative relationships: percentages and proportionality	Percentages - write percentages as fractions and decimals - describe on number as a percentage of another - compare two proportions using percentages - find the percentage of an amount from another percentage - find a percentage of an amount using a multiplier - write percentage changes as fractions and decimals - calculate percentage changes - calculate the original amount, given an amount after a percentage change - find a percentage change given original and final amounts	Proportionality - use a graph to represent a multiplicative relationship - understand and recognise direct proportion in the form $y = kx$ - identify a ratio from a graph showing direct proportion - solve problems involving direct proportion - understand and recognise inverse proportion in different forms	You should know ... - how to convert any number of tenths and hundredths into decimals - how to convert fractions to decimals using short division - how to compare and order numbers - how to round decimals to one decimal place - how to use ratio tables - how to use double number lines - how to draw a linear graph by plotting points - how to find the equation of a straight line graph using the gradient and intercept	<i>percentage</i> <i>fraction</i> <i>decimal</i> <i>per cent</i> <i>double number line</i> <i>ratio table</i> <i>decimal multiplier</i> <i>increase</i> <i>decrease</i> <i>reduction</i>	<i>percentage</i> <i>change</i> <i>ratio</i> <i>multiplicative relationship</i> <i>linear graph</i> <i>direct proportion</i> <i>constant of proportionality</i> <i>inverse proportion</i>	Diagnostic task 5
	Unit 6: Graphical representations of data	Representing data - construct and interpret grouped and ungrouped frequency tables - know how data is collected and recorded and choose what data needs to be analysed to explore a statistical problem - construct and interpret bar charts - construct and interpret pictograms - construct and interpret scatter graphs Angles and pie charts - draw and measure angles - know what fraction of a full turn an angle represents - construct and interpret pie charts	Measures of average and spread of data - work out the mean, median, mode and range from ungrouped data and know what they are measuring - work out the modal group, median group, estimated mean and maximum range from grouped data Analysing and comparing data - understand how the mean, median, and mode summarise data - identify outliers in data and know how they affect the range - understand how the mean, median, mode, and range change as data changes - compare different sets of data using mean, median, mode, and range - use charts and graphs to compare data sets, including considering outliers - choose appropriate representations (table, graphs/charts) and measures (averages, range) to analyse statistical problems	You should know ... - how to construct and read a tally chart - how to use inequality notation to represent intervals - how to plot and read coordinates in the first quadrant - what the radius of a circle is - that there are 360° in a full circle and a full turn - how to calculate fractions of an amount - how to calculate percentages of amounts - how to complete ratio tables - how to order integers and decimals	<i>qualitative</i> <i>quantitative</i> <i>discrete data</i> <i>ungrouped</i> <i>frequency table</i> <i>frequency</i> <i>grouped</i> <i>frequency table</i> <i>continuous data</i> <i>bar chart</i> <i>key</i> <i>pictogram</i> <i>scatter graph</i> <i>angle</i> <i>degrees</i>	<i>vertex</i> <i>acute</i> <i>obtuse</i> <i>reflex</i> <i>protractor</i> <i>sector</i> <i>radius</i> <i>pie chart</i> <i>mean</i> <i>median</i> <i>mode</i> <i>range</i> <i>modal group</i> <i>midpoint</i> <i>outlier</i>	Diagnostic task 6
LENT TERM B	Unit 7: Perimeter, area, and volume	Perimeter - calculate the circumference of a circle - calculate and use the perimeter of shapes involving semicircles and quarter circles Area - calculate the area of a circle - calculate the radius or diameter of a circle given the area - calculate the area of shapes involving semicircles and quarter circles	Surface area - identify faces, surfaces, edges, and vertices of 3D shapes - draw and recognise nets of 3D shapes - calculate the surface area of 3D shapes made up of cubes and cuboids - calculate the surface area of prisms - calculate the surface area of cylinders Volume - calculate volumes of cubes and cuboids - calculate volumes of prisms and cylinders	You should know ... - how to substitute numbers into an algebraic expression and find the value - how to calculate perimeters of polygons - how to calculate the areas of polygons - the properties of cubes and cuboids - how to recognise standard units of volume	<i>circumference</i> <i>radius</i> <i>diameter</i> <i>sector</i> <i>cross section</i>	<i>base</i> <i>right prism</i> <i>surface area</i> <i>volume</i>	Diagnostic task 7
TRINITY TERM A	Unit 8: Geometrical properties: polygons	Symmetry - describe, sketch, and draw polygons - recognise line symmetry in polygons - recognise rotational symmetry in polygons Angle properties - understand and use angles at a point, angles on a straight line, and vertically opposite angles - understand and use corresponding and alternate angles	Angle properties of polygons - know and use proofs that in a triangle, the sum of interior angles is 180° - use proofs for finding the interior and exterior angle of a regular polygon Problem solving with angles - solve problems to find missing angles using angle facts	You should know ... - how to draw two lines at an angle using a protractor - how to use equal angle and length marking on shapes - the properties of different types of triangle - how to recognise a reflection - how to recognise a rotation - how to use standard notation to mark parallel lines - how to solve linear equations	<i>triangle</i> <i>quadrilateral</i> <i>pentagon</i> <i>hexagon</i> <i>heptagon</i> <i>octagon</i> <i>nonagon</i> <i>decagon</i> <i>regular polygon</i> <i>tessellate</i> <i>line of symmetry</i> <i>rotational symmetry</i>	<i>order of rotational symmetry</i> <i>parallel</i> <i>transversal</i> <i>corresponding angles</i> <i>alternate angles</i> <i>interior angle</i> <i>exterior angle</i>	Diagnostic task 8
							CAT 2
TRINITY TERM B	Unit 9: Constructions	Constructions using circles - draw a circle using a pair of compasses - construct a triangle using a ruler and a pair of compasses - construct a rhombus using a ruler and a pair of compasses	Constructions using rhombuses - know that the diagonals of a rhombus bisect each other at right angles and they bisect the angles - construct a perpendicular bisector of a line segment using a ruler and pair of compasses - construct a perpendicular to a given line through a given point using a ruler and a pair of compasses - construct an angle bisector using a ruler and a pair of compasses	You should know ... - how to identify the radius and diameter of a circle and know how they are related - the properties of a rhombus - properties of triangles - how to draw two lines at an angle using a protractor	<i>construction</i> <i>equidistant</i> <i>locus</i> <i>regular polygon</i> <i>tessellate</i> <i>line of symmetry</i> <i>rotational symmetry</i>	<i>isosceles triangle</i> <i>diameter</i> <i>bisector</i> <i>bisect</i> <i>altitude</i>	Diagnostic task 9



3rd form – Key Stage 3 Mathematics MOSAIC

	Learning intentions			Pre-requisite knowledge		Key vocabulary		
MICHAELMAS TERM A	Unit 1: Similarity and congruence	Notation and naming - label sides and angles of triangles and other polygons - know terms and notation for right-angled triangles with equal angles Similarity - identify similar shapes - find missing angles in similar shapes - find missing lengths in similar shapes	Congruence - identify congruent shapes - know congruence tests for triangles	You should know ... - how to describe and compare polygons by their properties - what changes and what does not change in translations, reflections, rotations, and enlargements - how to find pairs of numbers that satisfy the same multiplicative relationships - that the angles in a triangle sum to 180° and the angles in a quadrilateral sum to 360°		<i>point</i> <i>line segment</i> <i>polygon</i> <i>hypotenuse</i> <i>similarity</i> <i>similar</i> <i>congruent</i> <i>congruent test</i>		Baseline
	Unit 2: Pythagoras' theorem	Introduction to Pythagoras' theorem - know the formula for Pythagoras' theorem - know and recognise Pythagorean triples Finding the length of a hypotenuse - find the length of a hypotenuse using Pythagoras' theorem Finding the length of a diagonal in a rectangle using Pythagoras' theorem - solve problems to find missing lengths in 2D shapes using Pythagoras' theorem	Finding lengths in right-angled triangles - find a side length of a triangle using Pythagoras' theorem - find a missing length in a 2D shape using Pythagoras' theorem Reasoning with right-angled triangles - know what the converse of a theorem is and that it is not always true, and work out if a triangle is right-angled using the converse of Pythagoras' theorem - use Pythagoras' theorem to solve problems in context using right-angled triangles - use Pythagoras' theorem on a coordinate grid	You should know ... - the general way to label the sides and vertices of a triangle - how to substitute variables into an expression and evaluate - how to round a number to 2 decimal places - how to round a number to 3 significant figures - how to find the square root of a number using a calculator - how to calculate the perimeter of a polygon - how to calculate the area of a polygon - how to solve equations - how to plot and read points on a grid in all four quadrants		<i>Pythagoras' theorem</i> <i>hypotenuse</i> <i>mathematical proof</i> <i>Pythagorean triple</i> <i>exact answer</i> <i>converse</i>		Diagnostic task 2
MICHAELMAS TERM B	Unit 3: Probability	Likelihood and randomness - understand that some outcomes are equally likely and some are not - place events on a likelihood scale Probability - understand how a probability of a single event can be assigned a numerical value - understand and use the fact that the probabilities of all possible outcomes sum to 1 - calculate and use probabilities for single events - understand how the probability of an outcome can be estimated using experiments	Combined events - systematically list possible outcomes for two or more events - construct sample space diagrams to systematically find all the possible outcomes for two or more events - work out probabilities for combined events using sample space diagrams showing the possible outcomes - complete two-way frequency tables and use them to work out probabilities for combined events - work out probabilities for combined events using Venn diagrams	You should know ... - how to add positive decimals and subtract them from 1 - how to substitute values into a formula - how to write a fraction to represent a diagram - how to write fractions as decimals - how to write decimals as fractions - how to simplify fractions - how to estimate the position of decimals and fractions on a number line from 0 to 1 - how to add fractions and subtract them from 1 - how to convert between fractions and ratios - how to convert between percentages and fractions or decimals - how to construct and interpret frequency tables		<i>probability outcomes</i> <i>event</i> <i>random</i> <i>mutually exclusive</i> <i>experimental probability</i> <i>theoretical probability</i> <i>sample space diagram</i> <i>two-way frequency table</i> <i>Venn diagram</i>		Diagnostic task 3
	Unit 4: Non-linear sequences	Non-linear sequences - describe and continue special number sequences - describe and continue quadratic sequences Geometric sequences - describe and work out terms in geometric sequences - understand and use the nth term of simple geometric sequences	Other types of sequences identify Fibonacci-style sequences and other sequences	You should know ... - how to find the next term in a sequence of diagrams - how to find the next term in a sequence of numbers - how to find the square and the cube of an integer - how to substitute the variables in an expression and evaluate - sequences of multiples of numbers - how to find higher powers of integers - how to create expressions using variables		<i>arithmetic sequence</i> <i>common difference</i> <i>term</i> <i>term-to-term rule</i> <i>nth term</i> <i>position-to-term rule</i> <i>square numbers</i> <i>cube numbers</i> <i>triangular numbers</i>	<i>non-linear sequence</i> <i>quadratic sequence</i> <i>geometric sequence</i> <i>common ratio</i> <i>Fibonacci sequence</i> <i>Fibonacci-style sequence</i> <i>Factorial numbers</i> <i>Narayana's cow</i>	Diagnostic task 4
LENT TERM A	Unit 5: Expressions and formulae	The distributive law - expand a pair of binomial brackets - find areas of shapes using the product of binomial brackets - find missing terms in the product of binomial brackets The difference of two squares - recognise and expand the difference of two squares - use the difference of two squares in number and area calculations	Inverse operations - use algebraic manipulation to write additive relationships in different ways - use algebraic manipulation to write multiplicative relationships in different ways Changing the subject - change the subject of a formula	You should know ... - how to collect like terms in an expression - how to use the distributive law to expand brackets - how to calculate the areas of polygons - the first 12 square numbers - how to calculate other square numbers and square roots - how to factorise expressions - how to solve linear equations - how to substitute variables into a formula		<i>expand brackets</i> <i>term</i> <i>binomial coefficient</i> <i>area</i> <i>zero-sum pair</i> <i>difference of two squares</i> <i>factorise</i>	<i>additive relationship</i> <i>inverse operation</i> <i>equation</i> <i>multiplicative relationship</i> <i>formula</i> <i>subject</i>	Diagnostic task 5
	Unit 6: Trigonometry	A different kind of proportionality - use properties of similar right-angled triangles - recognise the right-angled triangle within a unit circle A different kind of measure - understand how sine is derived from measurements within a unit circle - understand how cosine is derived from measurements within a unit circle - understand how tangent is derived from measurements within a unit circle	Using trigonometric ratios to find sides - use trigonometric ratios to find a missing side in a right-angled triangle Using trigonometric ratios to find angles - use trigonometric ratios to find a missing angle in a right-angled triangle	You should know ... - how to recognise a right-angled triangle - where the hypotenuse is on a right-angled triangle - what similar and congruent triangles are - how to use scale factors to find missing lengths in similar shapes - what acute and obtuse angles are - how to substitute variables into a formula - how to change the subject of a formula		<i>right-angled triangle</i> <i>trigonometry</i> <i>unit circle</i> <i>hypotenuse</i> <i>sine</i> <i>cosine</i>	<i>complementary tangent</i> <i>opposite</i> <i>adjacent</i> <i>trigonometric ratios</i>	Diagnostic task 6
LENT TERM B	Unit 7: Standard form	Multiplying by powers of 10 - rewrite numbers with products of different powers of 10 (not in index form) - compare numbers written using powers of 10 Index notation - write positive powers of 10 in index notation - write negative powers of 10 in index form Large numbers in standard form - recognise when a number is written in standard form - convert between numbers written in ordinary form and standard form - order very large numbers written in standard form	Small numbers in standard form - recognise very small numbers written in standard form, and convert between numbers written in ordinary form and standard form - order very small numbers written in standard form	You should know ... - how to multiply and divide numbers by 10, 100, and other positive powers of 10 - how to multiply and divide numbers by 0.1, 0.01, and other negative powers of 10 - how to compare and order numbers with any number of decimal places - how to order and compare positive and negative integers		<i>power of 10</i> <i>index notation</i> <i>exponent</i> <i>standard form</i> <i>ordinary form</i>		Diagnostic task 7
TRINITY TERM A	Unit 8: Graphical representations	Multiplicative relationships - draw linear graphs from their equations - calculate and interpret gradients and intercepts - use linear graphs to find solutions to equations and inequalities - use linear graphs to find solutions to simultaneous equations Modelling real-life situations graphically - read and interpret linear graphs in context - use graphs to solve problems involving simultaneous equations - read and interpret distance-time graphs - model a journey on a distance-time graph	Non-linear graphs - use a table of values to draw a quadratic graph - recognise quadratic graphs - solve problems with non-linear graphs Direct and inverse proportion - solve problems involving direct proportion graphically - solve problems involving inverse proportion graphically	You should know ... - whether a value satisfies an inequality - how to identify the gradient and y-intercept of a linear relationship - how to recognise a quadratic equation - how to plot a graph from a table of given values		<i>linear graph</i> <i>gradient</i> <i>y-intercept</i> <i>curve</i> <i>non-linear graph</i> <i>parallel</i> <i>simultaneous equations</i> <i>intersection</i> <i>distance-time graph</i> <i>speed</i> <i>quadratic graph</i>	<i>parabola</i>	Diagnostic task 8
	GCSE Induction	Expanding brackets - expanding the product of two binomials - expanding the product of two binomials and a third factor - squaring a binomial Factorising quadratics - factorising quadratic equations where $a = 1$ - factorising quadratic equations where $a > 1$ - factorising quadratics using the difference of two squares Manipulating indices - evaluating expressions with negative, zero and fractional indices - simplifying expressions using the laws of indices	Surds - simplify surds - collecting like terms written as surds - multiplying surds Simultaneous equations - solving simultaneous equations using the elimination method - solving simultaneous equations using substitution	You should know ... - how to multiply algebraic terms - how to expand a pair of binomial brackets - how to recognise and expand the difference of two squares - how to factorise linear expressions - how to write positive and negative powers of 10 in index form				Diagnostic task 9



	1 st form		2 nd form		3 rd form	
MICHAELMAS TERM A	Unit 1: Place Value Place value in integers Place value in decimals Ordering and comparing numbers Measures <i>Career link:</i> A financial analyst uses place value to understand large financial figures.	Baseline	Unit 1: Estimation and rounding Rounding to decimal places Rounding to significant figures Estimation <i>Career link:</i> A financial advisor uses estimation to quickly assess potential investment returns.	Baseline	Unit 1: Similarity and congruence Notation and naming Similarity Congruence <i>Career link:</i> An architect uses similarity to create scaled models and drawings of buildings.	Baseline
	Unit 2: Properties of number: factors, multiples, squares and cubes Multiples Powers and roots Factors and prime factorisation <i>Book recommendation:</i> The Boy Who Loved Math: The Improbable Life of Paul Erdos by Deborah Helligman <i>Career link:</i> A software developer uses properties of number to write efficient code and algorithms.	Diagnostic task 1	Unit 2: Solving linear equations Solutions to linear equations One-step linear equations Two-step linear equations Linear equations with brackets and fractions <i>Career link:</i> An economist uses linear equations to model economic trends and predict outcomes.	Diagnostic task 1	Unit 2: Pythagoras' theorem Introduction to Pythagoras' theorem Finding the length of a hypotenuse Finding lengths in right-angled triangles Reasoning with right-angled triangles <i>Career link:</i> A carpenter or builder uses Pythagoras' theorem to ensure walls are perfectly square.	Diagnostic task 1
MICHAELMAS TERM B	Unit 3: Arithmetic procedures with integers and decimals Addition and subtraction with negative integers Multiplication and division with negative integers Addition and subtraction with decimals Multiplication and division with decimals Efficient calculation <i>Career link:</i> A business owner uses arithmetic to manage budgets and expenses.	Diagnostic task 2	Unit 3: Sequences Features of sequences Arithmetic sequences <i>Career link:</i> A computer programmer uses sequences to create patterns and loops in code.	Diagnostic task 2	Unit 3: Probability Likelihood and randomness Probability Combined events <i>Career link:</i> A data scientist uses probability to predict outcomes based on data analysis.	Diagnostic task 2
	Unit 4: Expressions and equations Introduction to algebra Formulae and equations Simplifying expressions Using the distributive law <i>Career link:</i> An engineer uses equations to model and solve complex problems.	Diagnostic task 3	Unit 4: Graphical representations of linear equations Connect coordinates, equations, and graphs Linear relationships <i>Career link:</i> A data scientist uses linear graphs to show relationships between different variables.	Diagnostic task 3	Unit 4: Non-linear sequences Non-linear sequences Geometric sequences Other types of sequences <i>Career link:</i> A financial advisor uses non-linear sequences to model investment growth.	Diagnostic task 3
LENT TERM A	Unit 5: Plotting coordinates Plotting coordinates Coordinates, formulae and graphs <i>Career link:</i> A pilot uses coordinates to navigate flight paths.	Diagnostic task 4	Unit 5: Multiplicative relationships: percentages and proportionality Percentages Proportionality <i>Career link:</i> A business manager uses percentages and proportionality to calculate sales and commissions.	Diagnostic task 4	Unit 5: Expressions and formulae The distributive law The difference of two squares Inverse operations Changing the subject <i>Career link:</i> A civil engineer uses expressions and formulae to calculate forces on structures.	Diagnostic task 4
	Unit 6: Perimeter and area Properties of quadrilaterals and triangles Perimeter Area <i>Career link:</i> An architect uses perimeter and area to design and plan buildings.	CAT 1	Unit 6: Graphical representations of data Representing data Angles and pie charts Measures of average and spread of data Analysing and comparing data <i>Career link:</i> A market analyst uses data graphs to present key market research findings.	CAT 1	Unit 6: Trigonometry A different kind of proportionality A different kind of measure Using trigonometric ratios to find sides Using trigonometric ratios to find angles <i>Career link:</i> A surveyor uses trigonometry to measure distances and angles of land.	CAT 1
LENT TERM B	Unit 7: Fractions and decimals (positive and negative) Working with fractions and decimals Comparing and ordering fractions Adding and subtracting fractions Multiplying and dividing fractions <i>Career link:</i> A chef uses fractions and decimals to adjust recipes.	Diagnostic task 5	Unit 7: Perimeter, area and volume Perimeter Area Surface area Volume <i>Career link:</i> An architect uses perimeter, area, and volume to design a building's space and materials.	Diagnostic task 5	Unit 7: Standard form Multiplying by powers of 10 Index notation Large numbers in standard form Small numbers in standard form <i>Career link:</i> An astronomer uses standard form to work with immense distances in space.	Diagnostic task 5
	Unit 8: Multiplicative relationships: ratio, fractions and decimals Multiplicative relationships Representing multiplicative relationships Fractions in context Applying ratio <i>Career link:</i> A graphic designer uses ratio to scale and resize images.	Diagnostic task 6	Unit 8: Geometrical properties: polygons Symmetry Angle properties Angle properties of polygons Problem-solving with angles <i>Career link:</i> A civil engineer uses geometrical properties to ensure buildings and bridges are structurally sound.	Diagnostic task 6	Unit 8: Graphical representations Interpreting linear graphs Modelling real-life situations graphically Non-linear graphs Direct and indirect proportion <i>Career link:</i> A financial analyst uses graphs to interpret and model stock market trends.	Diagnostic task 6
TRINITY TERM A	Unit 9: Transformations Translations Rotations Reflections Scale diagrams Enlargements <i>Career link:</i> An animator uses transformations to move and resize objects on screen.	Diagnostic task 7	Unit 9: Constructions Constructions using circles Constructions using rhombuses <i>Career link:</i> A mechanical engineer uses constructions to design accurate parts for machinery.	Diagnostic task 7	GCSE Induction Expanding brackets Factorising expressions Working with indices <i>Career link:</i> A programmer uses indices and algebraic expressions to write and optimise code.	Diagnostic task 7
	Unit 10: Probability Probability Compound probability Expected frequency <i>Career link:</i> A sports scientist uses probability to predict outcomes of events.	CAT 2	Unit 10: Graphical representations of data Scatter graphs Line graphs Histograms Box plots <i>Career link:</i> A data analyst uses graphical representations to identify trends and outliers in data.	CAT 2	Unit 10: Probability Probability Compound probability Expected frequency <i>Career link:</i> A sports scientist uses probability to predict outcomes of events.	CAT 2
TRINITY TERM B	Unit 11: Functions Functions Graphs of functions Graphical solution <i>Career link:</i> A financial analyst uses functions to model and predict financial trends.	Diagnostic task 8	Unit 11: Functions Functions Graphs of functions Graphical solution <i>Career link:</i> A financial analyst uses functions to model and predict financial trends.	Diagnostic task 8	Unit 11: Functions Functions Graphs of functions Graphical solution <i>Career link:</i> A financial analyst uses functions to model and predict financial trends.	Diagnostic task 8



	4 th form – Edexcel GCSE			5 th form – Edexcel GCSE		
	Higher	Foundation		Higher	Foundation	
MICHAELMAS TERM A	Unit 1: Number Multiplying and dividing decimals Rounding and estimation HCF and LCM with Prime factorisation Laws of indices and Standard form calculations Surds <i>Career link:</i> A financial analyst uses number theory and calculations for stock market models.	Unit 1: Number Negatives Order of operations Rounding and estimation Indices and roots Factors, multiples and primes <i>Career link:</i> A data analyst uses number to manage datasets and calculate statistics.	Baseline	Unit 11: Multiplicative reasoning Multipliers Growth and decay Kinematics Density and pressure Direct and indirect algebraic proportion <i>Career link:</i> A physicist uses multiplicative reasoning to calculate density and pressure.	Unit 12: Right-angled triangles Pythagoras' Theorem Trigonometry Sine, Cosine and Tangent ratios <i>Career link:</i> A surveyor uses trigonometry to measure distances and heights.	Baseline
	Unit 2: Algebra Operations with algebraic terms Expanding and factorising expressions Solving linear equations Substitution Changing the subject Expanding and factorising quadratics Sequences and the nth term <i>Career link:</i> A software developer uses algebra to write code and solve programming problems.	Unit 2: Algebra Expressions Simplifying expressions Expanding and factorising brackets Solving Equations Substitution <i>Career link:</i> A civil engineer uses algebra to model and solve structural problems. Book recommendation: The Number Devil by Hans Magnus Enzensberger	Diagnostic task 1	Unit 12: Similarity and congruence Congruent triangles Similar shapes Linear, area and volumetric scale factors <i>Career link:</i> A civil engineer uses similarity to scale drawings for large projects. Book recommendation: Flatterland: Like Flatland, Only More So by Ian Stewart	Unit 13: Probability Calculating simple probabilities Two Events Experimental probability Venn diagrams and set notation Tree diagrams <i>Career link:</i> A meteorologist uses probability to predict weather patterns.	Diagnostic task 11
MICHAELMAS TERM B	Unit 3: Interpreting and representing data Two way tables Venn diagrams Averages Bar charts Pie charts Time series Scatter graphs <i>Career link:</i> A sports analyst uses data representation to evaluate team performance. Book recommendation: The Cartoon Introduction to Statistics by Grady Klein and Alan Dabney	Unit 3: Graphs, tables and charts Frequency Table Two-way Tables Representation Time Series Pie Charts Scatter Graphs <i>Career link:</i> A market researcher uses graphs and charts to analyse and present consumer data.	Diagnostic task 3	Unit 13: Further trigonometry Bounds Trigonometric graphs Sine rule and Cosine rule Area of a triangle and segments Bearing 3d problems <i>Career link:</i> A navigator uses trigonometry to calculate bearings and distances.	Unit 14: Multiplicative reasoning Percentage change Growth and decay percentages Compound measures Speed, distance and time Direct proportion <i>Career link:</i> A physicist uses multiplicative reasoning to calculate speed, distance, and time.	Diagnostic task 13
	Unit 4: Fractions, ratio and percentages Calculations with fractions Converting FDP Percentage change Ratio problems Exchange rates and map scales <i>Career link:</i> A retail manager uses percentages and ratios to calculate sales and discounts.	Unit 4: Fractions and percentages Compare fractions + - x ÷ with fractions Mixed/Improper FDP Conversion % of Amounts Inc/Dec by a % <i>Career link:</i> A retail manager uses percentages to calculate sales and discounts.	GAT 1	Unit 14: Further statistics Sampling Cumulative frequency Box plots Histograms <i>Career link:</i> A market researcher uses statistics to analyse and present key findings.	Unit 15: Constructions, bearing and loci Plans and elevations Scales and maps Constructions Loci and regions Bearing <i>Career link:</i> A pilot uses bearings to navigate an aircraft. Book recommendation: The Simpsons and Their Mathematical Secrets by Simon Singh	Diagnostic task 14
LENT TERM A	Unit 5: Angles and trigonometry Properties of shapes Angles in parallel lines Angles with algebra Angles in polygons Pythagoras' Theorem with coordinates Pythagoras' Theorem with surds Right angled trigonometry <i>Career link:</i> A surveyor uses trigonometry to measure distances and angles of land.	Unit 5: Equations, inequalities and sequences Solving equations Forming and solving equations Inequalities Error Intervals Generating sequences nth term <i>Career link:</i> A computer programmer uses sequences to create patterns and loops in code.	Diagnostic task 5	Unit 15: Equations and graphs Non-linear simultaneous equations (including graphically) Inequalities and regions Quadratic inequalities Expanding 3 brackets Cubic equations and graphs Iteration <i>Career link:</i> A data analyst uses equations and graphs to find solutions in data modelling.	Unit 16: Quadratic equations and graphs Expanding brackets Factorising brackets Quadratic graphs Using graphs to solve equations Solving equation <i>Career link:</i> An engineer uses quadratic graphs to model the trajectory of objects.	Diagnostic task 15
	Unit 6: Graphical representations Real-life graphs Distance-time graphs Velocity-time graphs Straight line graphs and sketching Parallel and perpendicular lines Plotting non-linear graphs Sketching quadratic, cubic, reciprocal and exponential graphs Graphical solutions to equations <i>Career link:</i> An economist uses graphs to analyse economic trends. Book recommendation: Alex's Adventures in Numberland by Alex Bellos	Unit 6: Angles Properties of quadrilaterals and triangles Parallel Lines and transversals Triangles Exterior and interior angles Multi-stage problems <i>Career link:</i> A construction worker uses angles to ensure walls and roofs are stable.	Diagnostic task 6	Unit 16: Circle theorems Radii, Chords, Tangents Angles in circles Circle graphs Equation of tangents <i>Career link:</i> A mechanical engineer uses circle theorems to design circular machine parts.	Unit 17: Further Algebra Simplifying expressions Solving equations Simultaneous equations <i>Career link:</i> A research scientist uses algebra to solve complex scientific equations.	Diagnostic task 16
LENT TERM B	Unit 7: Area and volume Perimeter and area Prisms Circles, arcs and sectors Cylinders, spheres, pyramids and cones <i>Career link:</i> An architect uses area and volume to design a building's space and materials. Book recommendation: Alex's Adventures in Numberland by Alex Bellos	Unit 7: Averages and range Mean and Range Mode and Median Types of averages Estimating the mean from a table Sampling <i>Career link:</i> A sports analyst uses averages to evaluate player performance.	Diagnostic task 7	Unit 17: Further Algebra Surds – rationalising the denominator Algebraic fractions Proof and Functions <i>Career link:</i> A mathematician uses algebraic proofs to verify new theorems. Book recommendation: The Millennium Problems by Keith Devlin	Unit 18: Further multiplicative reasoning Ratio problems <i>Career link:</i> A financial advisor uses ratio to analyse and compare financial data.	Diagnostic task 17
	Unit 8: Transformation Reflection and rotation Enlargement Combining transformations Bearing and scale Construction <i>Career link:</i> An animator uses transformations to move and resize objects on screen.	Unit 8: Graphical representation Coordinate grids and Linear graphs Gradients y=mx+c Real-life graphs Distance graphs <i>Career link:</i> An economist uses graphs to model and interpret economic trends.	GAT 2	Unit 18: Further multiplicative relationships Ratio problems <i>Career link:</i> A financial advisor uses ratio to analyse and compare financial data.		
TRINITY TERM A	Unit 9: Equations and inequalities Solving quadratics Simultaneous equations Linear inequalities <i>Career link:</i> An engineer uses equations and inequalities to solve engineering problems.	Unit 9: Transformations Translation, Reflection, Rotation, Enlargement Describing transformations <i>Career link:</i> A graphic designer uses transformations to scale and position images.	Diagnostic task 9			
	Unit 10: Probability Combined events Mutual exclusivity Relative frequency Tree diagrams Venn diagrams <i>Career link:</i> A data scientist uses probability to predict outcomes based on data analysis.	Unit 11: Ratio and proportion Writing ratios Using ratios Ratios and measures Comparing ratios Proportional relationships Proportion graphs <i>Career link:</i> A chef uses ratio to adjust recipes for different quantities.	Diagnostic task 10			
TRINITY TERM B						



Level 2 – Extended Mathematics Certificate

Unit

MICHAELMAS TERM A	1 Number 1.1 Laws of indices 1.2 Surds 1.3 Rationalising denominators	Further study: These are the foundations for algebra and calculus at A-level and beyond, leading to more complex algebraic manipulation in further maths. Careers: Essential for careers in physics and computer science where understanding numerical properties is key.	Diagnostic task
	2 Algebraic manipulation 2.1 Algebraic indices 2.2 Expanding brackets 2.3 Factorising 2.4 Completing the square 2.5 Algebraic fractions	Further study: These are fundamental skills for nearly all pure mathematics topics, from solving equations to advanced calculus and polynomials. Careers: Crucial for software engineering, quantitative analysis, and financial modelling.	Diagnostic task
MICHAELMAS TERM B	3 Graphs 3.1 Linear Graphs 3.2 Quadratic graphs 3.3 Cubic and quartic graphs 3.4 Trigonometric graphs	Further study: This forms the basis for graphical analysis in further maths, including interpreting and sketching complex functions and their properties. Careers: Highly relevant for data science, economics, and physics where data visualisation is key.	Diagnostic task
	4 Translating and reflecting graphs 4.1 Translating and reflecting 4.2 Stretching 4.3 Circles 4.4 Exponential and reciprocal 4.5 Non-linear	Further study: Leads to understanding complex function transformations, which are central to graphical solutions and calculus. Careers: Applied in computer graphics, game development, and physics.	Diagnostic task
LENT TERM A	5 Functions 5.1 Functions 5.2 Composite functions 5.3 Inverse functions 5.4 Transforming functions	Further study: These concepts are central to advanced calculus, group theory, and abstract algebra in a further maths degree. Careers: Crucial for computer science, cryptography, and systems analysis.	Diagnostic task
	6 Equations and inequalities 6.1 Solve equations 6.2 Solve quadratic equations 6.3 Solve simultaneous equations 6.4 Inequalities	Further study: This underpins almost all of further maths, from solving polynomial equations to solving problems in mechanics and statistics. Careers: Essential for actuarial science, engineering, and financial analysis.	Diagnostic task
LENT TERM B	7 Pythagoras and trigonometry 7.1 Pythag and trig 7.2 Sine, cosine and area rules	Further study: This leads directly to advanced trigonometry (radians and identities) and its use with 3D vectors and mechanics. Careers: Critical for surveying, civil engineering, and navigation.	Diagnostic task
	8 Probability 8.1 The language of probability 8.2 Probability problems	Further study: This is the foundation for all statistical analysis in A-level and further maths, including probability distributions and hypothesis testing. Careers: Core to actuarial science, epidemiology, and quantitative research.	Diagnostic task
	9 Proof 9.1 Deduction 9.2 Exhaustion and disproof by counter example 9.3 Geometric proof	Further study: This is a fundamental skill in further pure mathematics, where rigorous proof is required for understanding and developing theorems. Careers: A key skill for academia, software verification, and the legal profession.	Diagnostic task
TRINITY TERM A	10 Vectors 10.1 Position vectors 10.2 Solving geometric problems	Further study: This expands into 3D vectors with the dot and cross product, which are essential for further mechanics and geometry. Careers: Fundamental to aerospace engineering, robotics, and computer graphics.	Diagnostic task
TRINITY TERM B			