

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (FOUNDATION)

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	Place Value	Introduction to Algebra	2D Shapes	Statistics	Fractions	Ratio and Proportion
Core Knowledge	<ul style="list-style-type: none"> • Multiply and divide numbers in the form TU x TU, HTU x U, HTU ÷ U • Understand and use decimal notation and place value • Round numbers to an appropriate degree of accuracy • Estimate answers to calculations involving more than two operations • Order decimals, as a list or using > < • Add and subtract decimals • Multiply or divide any number by 0.1 and 0.01 • Multiply and divide decimals • Use 4 operations with negative numbers • Know and use the order of operations (with and without brackets) • Find a percentage of an amount • Increase/decrease an amount by a given percentage 	<ul style="list-style-type: none"> • Write algebraic expressions e.g. five less than a number is $n - 5$ • Using all four operations to simplify algebraic expressions • Multiply a set of brackets by numbers, letters and both • Expand two sets of brackets then simplify • Factorise linear expressions • Recognise equations, expressions, identities and formulae • Substitute values into expressions or equations incl. the kinematic formulae • Find the input and output from a function machine • Use function machines to find an inverse function • Solve one step and two step equations including with a fraction • Solve equations including brackets • Solve equations with unknowns on both sides including where one is negative • Solve problems by forming and solving equations 	<ul style="list-style-type: none"> • Convert metric units including between lengths, areas, volumes, time and money. • Recognise the properties of 2D shapes • Calculate the area of triangles, parallelograms and trapeziums • Calculate the area of compound shapes • Calculate missing lengths given the area or perimeter • Calculate the area or perimeter using algebra, fractions or decimals • Solve worded problems including perimeter and area • Labelling parts of a circle • Calculate area and circumference of circles including in terms of pi • Find area and perimeter of half and quarter circles • Solve problems involving area and/or perimeter of circles or composite shapes 	<ul style="list-style-type: none"> • Identify the difference between discrete and continuous data • Find the mean, median, mode and range for discrete data sets • Find a set of values when given the mean, median, mode and range • Understanding how outliers can affect averages • Calculate the mean from a frequency table • Find the modal class • Reading timetables • Complete two way tables • Complete frequency tables (tally charts) • Drawing/interpreting time series graphs bar charts (clustered and composite) and pie charts • Conduct a statistical investigation that: <ul style="list-style-type: none"> • Specifies a problem and plan to investigate it • Collects data for an investigation • Displays data using: frequency tables, bar charts, pictograms and pie charts • Write a conclusion for an investigation 	<ul style="list-style-type: none"> • Cancel a fraction down to its simplest form • Identify equivalent fractions • Change an improper fraction to a mixed number • Find simple fractions of whole number quantities including multiplying a fraction by a whole number • Express one number as a fraction of another (incl. improper fractions) • Add and subtract fractions • Add and subtract mixed number fractions • Find the reciprocal of a number • Interpret division as a multiplying by a reciprocal • Multiply and divide fractions by an integer • Multiply and divide fractions by fractions including mixed numbers • Compare and order fractions by converting them to decimals or equivalent fractions • Converting between fractions, decimals and percentages • Compare and order a mixture of fractions, decimals and percentages • Write time in hours using decimals 	<ul style="list-style-type: none"> • Write a ratio from a worded statement/problem • Expressing a ratio in its simplest form • Scaling ratios up to find a missing value • Simplifying a ratio containing decimals • Simplifying a ratio expressed in different units to its simplest form • Converting a ratio into a unit ratio • Converting between fractions and ratios • Sharing a quantity in a ratio with 2 parts • Using ratios with three or more parts • Sharing a ratio A:B, where B gets £x more than A • Solving worded ratio problems • Solve problems involving direct proportion • Use multiplicative reasoning to solve a problem e.g. scaling recipes • Use the unitary method to solve simple word problems • Solve best buy / unit price problems • Use map scales to find the actual distance • Convert between currencies • Solve inverse proportion problems
	Tests			Progress Test 1		
All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)						
All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (FOUNDATION)

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
8	Types of Number	Probability	Sequences and Graphs	3D Shapes	Angles and Constructions	Transformations
Core Knowledge	<ul style="list-style-type: none"> Calculate squares, square roots, cubes and cube roots Know the square, cube and triangle numbers Calculating combinations of powers, roots and brackets - BIDMAS Use index laws ($2a^4 \times 3a^5$) including with negatives and multiple operations Find the reciprocal of a number Find the HCF/LCM of two/three numbers Write numbers as a product of their prime factors Use prime factor decomposition to find the HCF and LCM Round numbers to a set number of decimal places or significant figures Write the error interval of a number that has been rounded Estimate answers including to solve problems Order positive and negative numbers, including decimals Multiply large numbers and decimals with up to two decimal places Write large and small numbers in standard form Convert standard form to ordinary numbers Use calculations involving standard form including problem solving 	<ul style="list-style-type: none"> Describe the likeliness of an event happening Show probabilities on a number line using fractions, decimals and percentages Calculate the probabilities of single events including equally likely events Work out probabilities from sample space diagrams Present outcomes using a sample space diagram Find the number of possible combinations Use Venn diagrams to represent events and calculate probabilities. Use set notation (write numbers in sets) Understand mutually exclusive (independent events happening at the same time) and exhaustive outcomes Understand that mutually exclusive events sum to 1 Find the probability of events not happening List the possible outcomes for mutually exclusive events Compare theoretical and experimental probabilities (relative frequency) Complete and use two way tables Investigate with dice or coins the difference between theoretical and experimental probability Construct frequency trees. 	<ul style="list-style-type: none"> Substitute values into expressions and formulae Find missing terms in a sequence and the rule that it follows Compare geometric and arithmetic sequences Use Fibonacci style sequences Generating linear sequences given the nth term. Finding the nth term of linear sequences (increasing and decreasing) Plot graphs of $x = n$ and $y = n$, where n is an integer. Plot a linear function from a table of values including $y = mx + c$. Find the midpoint of a line or of two coordinates Calculate gradients of lines from a graph Identify the graph of a linear equation using $y = mx + c$ Use real-life graphs such as distance-time and velocity-time graphs 	<ul style="list-style-type: none"> Use and understand properties of 3D shapes (vertices, faces, edges) Use and understand properties of 3D shapes (vertices, faces, edges) Categorise 3D shapes into prisms, pyramids and spheres Calculate volumes of cuboids and prisms including cylinders Calculate the volume of a compound 3D shape Solve problems involving volume such as filling a shape with liquid Convert units of volume include litres to cm^3 Calculate surface area of cuboids and prisms Investigate nets – to find the number of faces, edges and vertices Draw plans and elevations of 3D shapes Find 3D coordinates of cuboids 	<ul style="list-style-type: none"> Calculate missing angles on a straight line Calculate missing angles about a point Calculate missing angles in triangles (including equilateral and isosceles) Calculate missing angles in quadrilaterals (including rhombus, parallelograms, etc.) Find missing angles using algebraic expressions and equations Find missing angles in parallel lines Accurately construct triangles Construct loci - equidistant from a point Construct loci - equidistant from two points (bisect a line) Construct loci - equidistant from a line Construct loci - equidistant from two lines (bisect an angle) Make and use accurate scale drawings 	<ul style="list-style-type: none"> Identify lines of symmetry and order of rotational symmetry Reflect a shape in the x and y axis and in lines in the form $y = n$ or $x = n$ Reflect a shape in $y = x$ and $y = -x$ Fully describe a reflection Describe and draw translations with words Describe and draw translations using vector notation Draw an enlargement with and without a centre of enlargement Fully describe an enlargement using scale factors, direction and centre of enlargement Draw and fully describe rotations (using a fraction of a turn and degrees) Draw and fully describe a combination of transformations Identify invariant points once a transformation has been performed Draw vectors Add and subtract vectors Scale up vectors
	Tests			Progress Test 3		
All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)						
All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (FOUNDATION)

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	Further Algebra	Fractions, Decimals and Percentages	Triangles	Further Statistics	Relationships	Graphs
Core Knowledge	<ul style="list-style-type: none"> Solve one and two step equations Solve equations involving brackets Solve linear equations with unknowns on both sides Change the subject of a linear equation Expand double brackets and simplify Factorise linear expressions Factorise quadratics in the form ax^2+bx+c where $a=1$ Solve quadratics by factorising Represent an inequality on a number line Solve linear inequalities that are one and two sided List integers that satisfy an inequality 	<ul style="list-style-type: none"> Fractions of amounts including improper fractions Four operations with fractions Convert between mixed numbers and improper fractions Use four operations with mixed numbers Four operations with decimals Convert between fractions, decimals and percentages Compare and order fractions Compare and order fractions, decimals and percentages Revision of percentage increase and decrease Reverse percentages Calculate the percentage change / percentage profit Simple and compound interest 	<ul style="list-style-type: none"> Identify whether shapes are similar or congruent Find scale factors and missing lengths in similar shapes Recognise why two triangles are congruent for example ASA, SAS, SSS or RHS Use Pythagoras' theorem to find the length of the hypotenuse of a triangle Use Pythagoras' theorem to find the length of a shorter side of a triangle Use Pythagoras' theorem to determine whether a triangle is right-angled Solve simple problems using Pythagoras' theorem such as finding diagonals of rectangles Use trigonometric ratios to find missing sides of a right-angled triangle Use trigonometric ratios to find missing angles in a right-angled triangle Know the exact values of $\sin \theta$, $\cos \theta$ and $\tan \theta$ for 0°, 30°, 45°, 60° and 90° 	<ul style="list-style-type: none"> calculate averages from a frequency table calculate averages from grouped data compare and describe populations using an average and measure of spread draw and interpret stem-and-leaf diagrams draw and interpret back to back stem-and-leaf diagrams draw frequency polygons draw pie charts interpret pie charts interpret time-series graphs commenting on trend draw and interpret scatter graphs describe correlation use interpolation and extrapolation with a line of best fit know the dangers of extrapolation 	<ul style="list-style-type: none"> Recognise sequences of triangle, square and cube numbers Complete sequences and describe the term-to-term rule Find and use the nth term of a linear sequence Complete Fibonacci style sequences involving numbers or algebra Solve problems involving ratio Combine ratios, e.g. given $a : b$ and $b : c$, find $a : b : c$ Relate ratios to fractions – express relationships as a fraction and/or ratio Use the unitary method to find the cost of multiple items Compare costs to decide the best value for money Solve problems involving direct proportion such as converting currency Solve problems involving indirect proportion such as how long a task takes depending on the number of workers 	<ul style="list-style-type: none"> Plot a linear function from a table of values including $y=mx+c$ and $ax+by=c$ Find the midpoint of a line from a graph Find the midpoint of two coordinates Calculate gradients of lines from a graph Find the equation of a line from a graph Identify the graph of a linear equation using $y=mx+c$ Plot quadratic, cubic and reciprocal graphs Identify roots, turning points and intercepts Interpret conversion graphs such as currency or phone bill rates Interpret real-life graphs such as distance-time and velocity-time
Tests			Progress Test 5			Progress Test 4
	All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)					
All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (FOUNDATION)

KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10	Powers	Additional Algebra	Space	Multiplicative Reasoning	Further Probability	Further Angles and Constructions
Core Knowledge	<ul style="list-style-type: none"> Calculate powers and roots Use the index laws Calculate negative powers Write a number as a product of its primes Find HCF or LCM and use them to solve problems Find the reciprocal of a number Convert between standard form and ordinary numbers Use the four operations with numbers in standard form with and without a calculator Round to significant figures and decimal places Estimate answers Truncate a number to a set degree of accuracy Write an error interval for a rounded or truncated number 	<ul style="list-style-type: none"> Know the difference between an equation, expression, formula and identity Write an expression or a formula Review solving equations including with brackets and with unknowns on both sides Form and solve equations Solve simultaneous linear equations Construct and solve simultaneous equations Solve simultaneous equations graphically Expand single and double brackets Factorise linear and quadratic expressions Rearrange formulae Solve inequalities and represent solutions on a number line 	<ul style="list-style-type: none"> Identify properties of 2D shapes including lines of symmetry and order of rotational symmetry Recognise parts of a circle Know and apply the formulae to calculate: <ul style="list-style-type: none"> area and perimeter of a triangle, parallelogram, trapezium or compound shape area of a circle, semi-circle or sector circumference of a circle or semi-circle Solve problems involving areas and perimeters of shapes and composite shapes Identify properties of 3D shapes including the number of edges, vertices and faces Know and apply the formulae to calculate: <ul style="list-style-type: none"> surface areas of 3D shapes including cuboids, prisms and cylinders volumes of 3D shapes including cuboids, prisms, cylinders and pyramids Solve problems involving surface area and volume of shapes and composite shapes Draw 2D representations (plans and elevations) of 3D objects Given 2D representations use isometric paper to draw the 3D shape 	<ul style="list-style-type: none"> Convert between metric units (length, mass, area, volume, time) Convert between cm^2 and m^2, cm^3 and m^3 Calculate speed, distance and time Calculate the average speed of a journey split into parts Convert between m/s and km/h Substitute into kinematic formulas Calculate density, mass and volume Calculate the density of a liquid made by mixing multiple liquids Calculate force, pressure and area Calculate a person wage using time and a half, double time etc. Revision of percentage increase or decrease Find the percentage change (percentage profit/increase/decrease) Reverse percentages Simple and compound interest 	<ul style="list-style-type: none"> Find the probability of events happening or not happening Use a probability scale List outcomes of multiple events Use sample space diagrams Understand what is meant by mutually exclusive events Calculate experimental probabilities (relative frequency) Calculate the expected number of outcomes Compare theoretical and experimental probabilities Complete and use frequency trees Complete and use two-way tables Understand what is meant by independent events Complete and use probability trees Complete and use Venn diagrams 	<ul style="list-style-type: none"> Measure and draw angles Solve angle problems involving parallel lines Solve angle problems involving types of triangles and quadrilaterals Solve angle problems involving polygons Draw and measure bearings Solve problems involving bearings Use transformations including reflecting, enlarging, rotating and translating Fully describe transformations Apply addition and subtraction of vectors and multiplication by a scalar Draw vectors Use standard ruler and compass constructions Solve loci problems using constructions
	Examination 1		Examination 2		Examination 3	
Tests	All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)					
	Exam board: Edexcel Course code: 1MA1 Course title: GCSE (9 - 1) in Mathematics					
	All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser					

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (FOUNDATION)

KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
11	Additional Graphs	Revision	Revision	Revision	Revision	Revision	
Core Knowledge	<ul style="list-style-type: none"> • Substitute values into formulas and expressions • Plot linear graphs including horizontal and vertical lines • Plot and identify linear graphs using $y = mx + c$ • Plot and use conversion graphs • Plot and interpret real life graphs such as distance-time • Plot inequalities in order to find a desired region • Plot quadratic, cubic and reciprocal graphs • Interpret quadratic graphs – identifying turning points, roots, intercepts • Recognise by shape linear, quadratic, cubic and reciprocal graphs • Plot and interpret scatter graphs, describing correlation • Use interpolation and extrapolation with a line of best fit 						
Tests		Mock Examinations		Mock Examinations	3 x GCSE examinations (details below)		
	The Additional Graphs unit has a mid-term assessment (30 minutes) and end of unit assessment (1 hour). It also has a booklet and Knowledge Organiser						
	Exam board: Edexcel Course code: 1MA1 Course title: GCSE (9 - 1) in Mathematics						
	3 x 1h30 exams, 1 non-calculator, 2 calculator, 3 x 80 marks = 240 marks						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (Higher)

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	Place Value	Introduction to Algebra	2D Shapes	Statistics	Fractions	Ratio and Proportion
Core Knowledge	<ul style="list-style-type: none"> • Multiply and divide numbers in the form TU x TU, HTU x U, HTU ÷ U • Understand and use decimal notation and place value • Round numbers to an appropriate degree of accuracy • Estimate answers to calculations involving more than two operations • Order decimals, as a list or using > < • Add and subtract decimals • Multiply or divide any number by 0.1 and 0.01 • Multiply and divide decimals • Use 4 operations with negative numbers • Know and use the order of operations (with and without brackets) • Find a percentage of an amount • Increase/decrease an amount by a given percentage 	<ul style="list-style-type: none"> • Write algebraic expressions e.g. five less than a number is $n - 5$ • Using all four operations to simplify algebraic expressions • Multiply a set of brackets by numbers, letters and both • Expand two sets of brackets then simplify • Factorise linear expressions • Expand double brackets • Recognise equations, expressions, identities and formulae • Substitute values into expressions or equations incl. the kinematic formulae • Find the input and output from a function machine • Use function machines to find an inverse function • Solve one step and two step equations including with a fraction • Solve equations including brackets • Solve equations with unknowns on both sides including where one is negative • Solve problems by forming and solving equations 	<ul style="list-style-type: none"> • Convert metric units including between lengths, areas, volumes, time and money. • Recognise the properties of 2D shapes • Calculate the area of triangles, parallelograms and trapeziums • Calculate the area of compound shapes • Calculate missing lengths given the area or perimeter • Calculate the area or perimeter using algebra, fractions or decimals • Solve worded problems including perimeter and area • Labelling parts of a circle • Calculate area and circumference of circles including in terms of pi • Find area and perimeter of half and quarter circles • Solve problems involving area and/or perimeter of circles or composite shapes 	<ul style="list-style-type: none"> • Identify the difference between discrete and continuous data • Find the mean, median, mode and range for discrete data sets • Find a set of values when given the mean, median, mode and range • Understanding how outliers can affect averages • Calculate the mean from a frequency table • Find the modal class • Complete two way tables • Drawing/interpreting time series graphs bar charts (clustered and composite) and pie charts • Conduct a statistical investigation that: <ul style="list-style-type: none"> • Specifies a problem and plan to investigate it • Collects data for an investigation • Displays data using: frequency tables, bar charts, pictograms and pie charts • Write a conclusion for an investigation 	<ul style="list-style-type: none"> • Cancel a fraction down to its simplest form • Identify equivalent fractions • Change an improper fraction to a mixed number • Find simple fractions of whole number quantities including multiplying a fraction by a whole number • Express one number as a fraction of another (incl. improper fractions) • Add and subtract fractions • Add and subtract mixed number fractions • Find the reciprocal of a number • Interpret division as a multiplying by a reciprocal • Multiply and divide fractions by an integer • Multiply and divide fractions by fractions including mixed numbers • Compare and order fractions by converting them to decimals or equivalent fractions • Converting between fractions, decimals and percentages • Compare and order a mixture of fractions, decimals and percentages • Write time in hours using decimals 	<ul style="list-style-type: none"> • Write a ratio from a worded statement/problem • Expressing a ratio in its simplest form • Scaling ratios up to find a missing value • Simplifying a ratio containing decimals • Simplifying a ratio expressed in different units to its simplest form • Converting a ratio into a unit ratio • Converting between fractions and ratios • Sharing a quantity in a ratio with 2 parts • Using ratios with three or more parts • Sharing a ratio A:B, where B gets £x more than A • Solving worded ratio problems • Solve problems involving direct proportion • Use multiplicative reasoning to solve a problem e.g. scaling recipes • Use the unitary method to solve simple word problems • Solve best buy / unit price problems • Use map scales to find the actual distance • Convert between currencies • Solve inverse proportion problems
	Tests			Progress Test 1		
All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)						
All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (Higher)

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
8	Types of Number	Probability	Sequences and Graphs	3D Shapes	Angles and Constructions	Transformations
Core Knowledge	<ul style="list-style-type: none"> Calculate squares, square roots, cubes and cube roots Use the order of operations - BIDMAS Use index laws ($2a^4 \times 3a^5$) including with negatives and multiple operations Find the reciprocal of a number Find fractional and negative powers of an integer and fraction Find the HCF/LCM of two/three numbers Write numbers as a product of their prime factors Use prime factor decomposition to find the HCF and LCM Round numbers to a set number of decimal places or significant figures Write the error interval of a number that has been rounded Estimate answers including to solve problems Order positive and negative numbers, including decimals Multiply large numbers and decimals with up to two decimal places Write large and small numbers in standard form Convert standard form to ordinary numbers Use calculations involving standard form including problem solving 	<ul style="list-style-type: none"> Describe the likelihood of an event happening Show probabilities on a number line using fractions, decimals and percentages Calculate the probabilities of single events including equally likely events Work out probabilities from sample space diagrams Present outcomes using a sample space diagram Find the number of possible combinations Use Venn diagrams to represent events and calculate probabilities. Use set notation (write numbers in sets) Understand mutually exclusive (independent events happening at the same time) and exhaustive outcomes Understand that mutually exclusive events sum to 1 Find the probability of events not happening List the possible outcomes for mutually exclusive events Compare theoretical and experimental probabilities (relative frequency) Complete and use two way tables Investigate with dice or coins the difference between theoretical and experimental probability Construct frequency trees. 	<ul style="list-style-type: none"> Substitute values into expressions and formulae Find missing terms in a sequence and the rule that it follows Compare geometric and arithmetic sequences Use Fibonacci style sequences Generating linear sequences given the nth term. Finding the nth term of linear sequences (increasing and decreasing) Plot graphs of $x = n$ and $y = n$, where n is an integer. Plot a linear function from a table of values including $y = mx + c$. Find the midpoint of a line or of two coordinates Calculate gradients of lines from a graph and from two coordinates Identify the graph of a linear equation using $y = mx + c$ Use real-life graphs such as distance-time and velocity-time graphs Draw inequalities on a number line Solve inequalities Write integers that satisfy inequalities 	<ul style="list-style-type: none"> Use and understand properties of 3D shapes (vertices, faces, edges) Use and understand properties of 3D shapes (vertices, faces, edges) Categorise 3D shapes into prisms, pyramids and spheres Calculate volumes of cuboids and prisms including cylinders Calculate the volume of a compound 3D shape Solve problems involving volume such as filling a shape with liquid Convert units of volume include litres to cm^3 Calculate surface area of cuboids and prisms Investigate nets – to find the number of faces, edges and vertices Draw plans and elevations of 3D shapes Find 3D coordinates of cuboids Find the volume and surface area of pyramids and spheres, using a given formula 	<ul style="list-style-type: none"> Calculate missing angles on a straight line Calculate missing angles about a point Calculate missing angles in triangles (including equilateral and isosceles) Calculate missing angles in quadrilaterals (including rhombus, parallelograms, etc.) Calculate missing angles in polygons (including regular shapes) Find exterior and interior angles of polygons Find missing angles using algebraic expressions and equations Find missing angles in parallel lines Accurately construct triangles Construct loci - equidistant from a point Construct loci - equidistant from two points (bisect a line) Construct loci - equidistant from a line Construct loci - equidistant from two lines (bisect an angle) Make and use accurate scale drawings 	<ul style="list-style-type: none"> Identify lines of symmetry and order of rotational symmetry Reflect a shape in the x and y axis, in lines in the form $y = n$ or $x = n$ and $y = x$ or $y = -x$ Fully describe a reflection Describe and draw translations with words and using vector notation Draw an enlargement with and without a centre of enlargement Fully describe an enlargement using scale factors, direction and centre of enlargement Draw and fully describe rotations (using a fraction of a turn and degrees) Draw and fully describe a combination of transformations Identify invariant points once a transformation has been performed Draw vectors Add and subtract vectors Scale up vectors Use Pythagoras' theorem to find the length of the hypotenuse of a triangle or the length of a shorter side of a triangle Solve problems using Pythagoras' theorem including diagonals of rectangles, length of ladders, perimeters of compound shapes, etc
	Tests			Progress Test 3		
All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)						
All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (Higher)

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	Further Algebra	Fractions, Decimals and Percentages	Triangles	Further Statistics	Relationships	Graphs
Core Knowledge	<ul style="list-style-type: none"> Solve linear equations with unknowns on both sides including with brackets Change the subject of a linear equation Change the subject when the variable appears twice Expand double and triple brackets and simplify Factorise quadratics in the form ax^2+bx+c where $a=1$ Factorise quadratics in the form ax^2+bx+c where $a>0$ Solve quadratics by factorising Solve quadratics using the quadratic equation Solve quadratics by completing the square Rearrange quadratic equations and then solve Represent an inequality on a number line Solve linear inequalities that are one and two sided List integers that satisfy an inequality Solve quadratic inequalities 	<ul style="list-style-type: none"> Use four operations with mixed numbers Multiply decimals Convert between fractions, decimals and percentages Compare and order fractions, decimals and percentages Understand that irrational numbers cannot be written as fractions Understand the difference between terminating and recurring decimals Convert fractions to decimals using division Convert recurring decimals to fractions Reverse percentages Calculate the percentage change / percentage profit Simple and compound interest Simplify algebraic fractions Use four operations with algebraic fractions 	<ul style="list-style-type: none"> Identify whether shapes are similar or congruent Find missing lengths in similar shapes using scale factors Prove that two triangles are congruent using ASA, SAS, SSS or RHS Use Pythagoras' theorem to find the length of the hypotenuse of a triangle Use Pythagoras' theorem to find the length of a shorter side of a triangle Use Pythagoras' theorem to determine whether a triangle is right-angled Solve problems using Pythagoras' theorem Use trigonometric ratios to find missing sides and angles of a right-angled triangle Know the exact values of $\sin \theta$, $\cos \theta$ and $\tan \theta$ for 0°, 30°, 45°, 60° and 90° Find missing sides and angles using Pythagoras and Trigonometry in 3 dimensions Know and apply the sine and cosine rules to find a missing lengths and angles Find the area of a triangle using $A=1/2absinC$ 	<ul style="list-style-type: none"> Compare and describe populations using an average and measure of spread Calculate averages from tables Calculate median, lower quartile, upper quartile and IQR from a list of values Draw and interpret cumulative frequency Draw and interpret box plots Compare and describe populations using an average and measure of spread Draw and interpret back to back stem-and-leaf diagrams Draw frequency polygons Draw and interpret pie charts Interpret time-series graphs commenting on trend Draw and interpret scatter graphs Use interpolation and extrapolation with a line of best fit Draw and interpret histograms 	<ul style="list-style-type: none"> Find and use the nth term of a linear sequence Find and use the nth term of a quadratic sequence Use simple geometric sequences Complete Fibonacci style sequences involving numbers or algebra Solve problems involving ratio Write relationships as a unit ratio Combine ratios, e.g. given $a : b$ and $b : c$, find $a : b : c$ Relate ratios to fractions Compare costs to decide the best value for money – best buy Solve problems involving direct proportion such as converting currency Solve problems involving indirect proportion such as how long a task takes depending on the number of workers Construct and solve equations involving direct proportion and indirect proportion 	<ul style="list-style-type: none"> Plot a linear function from a table of values including $y=mx+c$ and $ax+by=c$ Find the midpoint of a line from a graph or from two coordinates Calculate gradients of a line from a graph or from two coordinates Find the equation of a line from a graph Find the equation of a line from two coordinates Find the equation of a line given the gradient and one coordinate Identify the graph of a linear equation using $y=mx+c$ Plot quadratic, cubic and reciprocal graphs Identify roots, turning points and intercepts Use factorising to find the roots of a quadratic graph Use completing the square to find the turning point of a quadratic graph Calculate gradient and area under a real-life graph Interpret real-life graphs such as distance-time and velocity-time
Tests	Progress Test 5		Progress Test 5		Progress Test 4	
All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)						
All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser						

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (Higher)

KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10	Powers	Additional Algebra	Space	Multiplicative Reasoning	Further Probability	Further Angles and Constructions
Core Knowledge	<ul style="list-style-type: none"> Use the index laws Calculate fractional and negative powers Convert between standard form and ordinary numbers Use the four operations with numbers in standard form with and without a calculator Find the total number of outcomes or ways of picking – Permutations Simplify surds Use the four operations with surds Rationalise denominators Round to significant figures and decimal places Truncate a number to a set degree of accuracy Write an error interval for a rounded or truncated number 	<ul style="list-style-type: none"> Know the difference between an equation, expression, formula and identity Argue mathematically to show two expressions are equivalent Use algebra to support and construct arguments and proofs Solve simultaneous linear equations Construct and solve simultaneous equations Solve a linear and quadratic simultaneous equation Solve simultaneous equations graphically Substitute into functions Interpret and create composite functions Interpret and create inverse functions Find approximate solutions to equations using iteration 	<ul style="list-style-type: none"> Know and apply the formulae to calculate: <ul style="list-style-type: none"> area of a triangle, parallelogram and trapezium area of a circle, semi-circle and sectors circumference of a circle or sector arc lengths and angles of sectors Solve problems involving areas and perimeters Find the maximum or minimum possible area given rounded values - bounds Identify properties of 3D shapes including the number of edges, vertices and faces Know and apply the formulae to calculate: <ul style="list-style-type: none"> surface areas of 3D shapes including prisms, pyramids, spheres and frustums volumes of 3D shapes including prisms, pyramids, spheres and frustums Solve problems involving surface areas and volumes Use bounds Use similar lengths, areas and volume to find and use scale factors of enlargement Draw 2D representations (plans and elevations) of 3D objects 	<ul style="list-style-type: none"> Convert between metric units (length, mass, area, volume, time) Convert between cm^2 and m^2, cm^3 and m^3 Calculate speed, distance and time Calculate the average speed of a journey split into parts Convert between m/s and km/h Substitute into kinematic formulas Calculate density, mass and volume Calculate the density of a liquid made by mixing multiple liquids Calculate force, pressure and area Calculate a person wage using time and a half, double time etc. Revision of percentage increase or decrease Find the percentage change (percentage profit/increase/decrease) Reverse percentages Simple and compound interest 	<ul style="list-style-type: none"> Calculate the number of possible combinations Use sample space diagrams Understand what is meant by mutually exclusive events Calculate experimental probabilities (relative frequency) Calculate the expected number of outcomes Compare theoretical and experimental probabilities Complete and use frequency trees Complete and use two-way tables Understand what is meant by independent events Complete and use probability trees Solve probability problems involving ratio Solve conditional probability questions including with unknown probabilities Use set notation Complete and use Venn diagrams 	<ul style="list-style-type: none"> Solve angle problems involving parallel lines Solve angle problems involving types of triangles and quadrilaterals Solve angle problems involving polygons Draw and measure bearings Solve problems involving bearings Apply and prove circle theorems Use transformations including reflecting, enlarging, rotating and translating Fully describe transformations Find invariant points following transformations Apply addition and subtraction of vectors and multiplication by a scalar Use vectors to construct geometric arguments and proof Use standard ruler and compass constructions Prove two triangles are congruent using either ASA, SAS, SSS or RHS Solve loci problems using constructions
Tests	Examination 1		Examination 2		Examination 3	
	All units have a mid-term assessment (30 minutes) and end of unit assessment (1 hour)					
	Exam board: Edexcel Course code: 1MA1 Course title: GCSE (9 - 1) in Mathematics					
	All units have a booklet that is followed in lessons where examples can be copied into and a Knowledge Organiser					

St Edmund Campion Catholic School 5 Year Curriculum Summary: MATHS (Higher)

KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
11	Additional Graphs	Revision	Revision	Revision	Revision	Revision
Core Knowledge	<ul style="list-style-type: none"> Plot and identify linear graphs using $y = mx + c$ Find the equation of parallel and perpendicular lines that go through a given point Plot inequalities in order to find a desired region Plot quadratic, cubic and reciprocal graphs Interpret quadratic graphs – find turning points, roots, intercepts Plot exponential and circle graphs Find the equation of a tangent to a circle at a given point Estimate the area underneath a graph by splitting it into a given number of strips and interpret the result Estimate the gradient of a graph by drawing a tangent and interpret the result Solve simultaneous equations graphically Plot trigonometric functions Transform functions by reflection or translation Understand the effect on a function when transformed 					
Tests		Mock Examinations		Mock Examinations	3 x GCSE examinations (details below)	
	The Additional Graphs unit has a mid-term assessment (30 minutes) and end of unit assessment (1 hour). It also has a booklet and Knowledge Organiser					
	Exam board: Edexcel Course code: 1MA1 Course title: GCSE (9 - 1) in Mathematics					
	3 x 1h30 exams, 1 non-calculator, 2 calculator, 3 x 80 marks = 240 marks					