

## Year 10 Edexcel Foundation Maths Course Outline

	Students have 8 lessons per fortnight Homework is set 4 times a fortnight mainly from student practice book to be found on Firefly				
	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)		
Autumn First Half Term	Perimeter area and volume 1	Students should be able to: Find the perimeter and area of rectangles and triangles; calculate the area of parallelograms; estimate lengths; calculate a missing length given the area; solve worded area and perimeter questions; calculate the area and perimeter of trapezia; convert between area measures; find the height of a trapezium given its length; calculate the perimeter and area of compound shapes made from triangles and rectangles; calculate areas in hectares and convert between hectares and m2; problem solving compound area problems; calculate the surface area of a prism; calculate the surface are of a cuboid; calculate the surface area of a prism; calculate the volume of a prism; solve problems involving surface area and volume; convert between measures of volume.	<ul> <li>Practice book chapter 8</li> <li>Areas</li> <li>Volumes</li> <li>Surface areas</li> <li>Exam questions (assessed)</li> </ul>		
	Graphs	Students should be able to: Co-ordinates in four quadrants; find the midpoint of a line segment; recognise, name and plot horizontal and vertical graphs; recognise, name and plot the graphs of $y = x$ and $y = -x$ ; draw graphs to represent relationships; substitute positives and negatives into expressions; plot a straight line graph from a table of values; understand terms parallel, gradient, intercept; find the gradient of a line (one across); identify and interpret the gradient from an equation; understand that parallel lines have the same gradient; calculate the gradient given 2 points; match equations of lines which are parallel; understand what m and c represent in $y = mx + c$ ; sketch graphs given the values of m and c; draw and interpret graphs from real data; comparing graphs using mathematical arguments; substitute into speed formula; use, draw and interpret distance time graphs to solve problems; interpret rate of change from distance time graphs; find the midpoint and gradient from a line segment recap; understand when predictions are reliable; Interpolation and extrapolation.	<ul> <li>Practice book chapter 9</li> <li>Midpoint</li> <li>Y = mx + c</li> <li>Gradient</li> <li>Draw and interpret distance time graphs</li> <li>Exam questions (assessed)</li> </ul>		
	Nature of Landmark Assessment	A 35 minute tests at the end of each topic will be averaged to give a grade for the half term.			

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
Autumn Second Half Term	Transformations	Students should be able to: Identify congruent shapes by eye; understand clockwise and anticlockwise; understand that rotations are specified by a centre, an angle and a direction of rotation; rotate a shape about the origin or any other point on a coordinate grid; find the centre of rotation, angle and direction of rotation and describe rotations; describe a rotation fully using the angle, direction of turn, and centre; understand that translations are specified by a distance and direction using a vector; translate a given shape by a vector; transform 2D shapes using single reflections (including those not on coordinate grids) with vertical, horizontal and diagonal mirror lines; identify the equation of a line of symmetry; describe reflections on a coordinate grid; understand that an enlargement is specified by a centre and a scale factor Enlarge a given shape using (0, 0) as the centre of enlargement, and enlarge shapes with a centre other than (0, 0); find the centre of enlargement by drawing. Students should be able to: Calculate simple probabilities from equally likely events; understand mutually exclusive and exhaustive outcomes; complete a sample space diagram for two events; work out probabilities from sample space diagrams and two way tables; solve worded probability problems where it is not obvious that a sample space diagram is required; find and interpret probabilities based on experimental data; make predictions from experimental data; use Venn diagrams to work out probabilities; introduce and, not and or notation; solve probability questions where the Venn diagram is not given; understand what independent events are; put information in a frequency tree; put information in a tree diagram; use tree diagrams to find probabilities of two events	<ul> <li>Practice book chapter 10 <ul> <li>Transformations</li> <li>Exam questions (assessed)</li> </ul> </li> <li>Practice book chapter 13 <ul> <li>Sample space diagrams</li> <li>Venn diagrams</li> <li>Tree diagrams</li> <li>Exam questions (assessed)</li> </ul> </li> </ul>
	Nature of Landmark Assessment	A 35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
Spring First Half Term	Multiplicative reasoning Midyear Test	Students should be able to: Calculating simple percentages; write one value as a fraction and percentage of another; calculate percentage profit or loss; express a given number as a percentage of another number in more complex situations; increase or decrease an amount by a given percentage; reverse percentages; percentage multipliers; find an amount after repeated percentage changes; calculate compound interest; solve growth and decay problems; solve problems involving Density, Mass and Volume; solve problems involving pressure, force and area; problem solving questions on compound measures; calculate average speed, distance and time; use formulae to calculate speed and acceleration; relate formula of acceleration to the gradient of a velocity time graph; conversion Graphs; write a ratio as a unit ratio; solve problems involving direction proportion; solve problems involving inverse proportion; proportion problems using "k", the constant of proportionality.	<ul> <li>Practice book chapter 14</li> <li>Percentages – increase, decrease, compound, reverse</li> <li>Conversions</li> <li>Speed</li> <li>Density</li> <li>Exam questions (assessed)</li> </ul>
	Nature of Landmark Assessment	A 35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to
cond Half Term	Construction Loci and Bearings	Students should be able to: Recall properties of quadrilaterals and other 2D shapes; sketch nets of 3D shapes; recognise 3D shapes and their properties; describe 3D shapes using the correct mathematical words; draw lines of symmetry; identify rotational symmetry; identify and sketch planes of symmetry in 3D shapes; draw plans and elevations of 3D shapes; sketch 3D shapes based on their plans and elevations; construct ASA, SAS, SSS and RHS triangles; identify congruent triangles; construct angles; draw diagrams to scale; use scales on maps and diagrams to work out lengths and distances; make accurate drawings of nets of common 3D shapes; constructing an isosceles trapezium; construct a regular hexagon; bisect angles and lines using a ruler and compass; use a ruler and compass to construct 60, 45, 30 degrees; draw loci for the path of points that follow a given rule; identify regions bounded by loci to solve practical problems; angles in parallel lines; find and use 3-figure bearings; use angles at parallel lines to calculate bearings.	Practice book chapter 7 • Scale drawings • Loci • Bearings • Exam questions (assessed)
Spring Se	Revision	Revision of key topic areas identified throughout the year by topic tests analysis. Past paper practice for both non calculator and calculator examinations.	1 Past examination paper per week.
	Nature of Landmark Assessment	A 35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
nmer First Half term	Quadratic Equations and Graphs	Students should be able to: Multiplying double brackets; recognising quadratic equations; square single brackets; plot graphs of quadratic functions; use quadratic graphs to solve problems; factorise quadratic expressions; solve quadratic functions algebraically.	<ul> <li>Practice book chapter 16</li> <li>Expanding</li> <li>Plotting quadratics</li> <li>Using and memorising the quadratic formula</li> <li>Factorising</li> <li>Exam questions (assessed)</li> </ul>
Sur	Nature of Landmark Assessment	A 35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
Summer Second Half term	Circle, Cylinders, Cones and Sphere Fractions, Indices and Standard From	Students should be able to: Round accurately to a given number of significant figures or decimal place; rearrange equations; calculate the circumference of a circle; solve problems involving the circumference of a circle; calculate the circumference and radius of a circle; work out percentage error intervals; evaluate squares and square roots; substitute into formulae and solve for the unknown; work out the area of a circle; work out the radius or diameter of a circle; solve problems involving the area of a circle; give answers in terms of $\pi$ ; simplify fractions; work out areas of semicircles and quarter circle and perimeters; solve problems involving sectors of circles; work out the volume and surface area of a cone; work out the length of the hypotenuse using Pythagoras' theorem; work out the volume, surface area of a sphere. Students should be able to: Converting between top heavy fractions and mixed numbers; multiply and divide mixed numbers and fraction; solve fractions questions in context; find reciprocals of decimals and mixed numbers; to know and use the laws of indices; write reciprocals in index form; use a calculator to find the values of number in index form; write large numbers in standard form; write small numbers in	<ul> <li>Practice book chapter 17 <ul> <li>Using area volume</li> <li>Surface area formulae</li> <li>Exam questions (assessed)</li> </ul> </li> <li>Practice book chapter 18 <ul> <li>Standard form</li> <li>Exam questions (assessed)</li> </ul> </li> </ul>
	Nature of Landmark Assessment	standard form. A set of 3 end of year examinations in line with expected GCSE papers	



## Year 10 Maths Course Outline

## Students have 8 lessons per fortnight Homework is set 4 times a fortnight mainly from student practice book to be found on Firefly.

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
Autumn First Half Term	Equations and inequalities Multiplicative Reasoning	Students should be able to: Expanding double brackets; to be able to factorise quadratics; to be able to find the roots of quadratic equations by factorising; non monic factorisation; completing the square of non- monic; connection with key points on the graph; problems that require students to set up and solve a pair of simultaneous equations in a real-life context; use simultaneous equations to find the equations of a straight line; solve quadratic equations; use a calculator to evaluate surds; to be able to use the quadratic formula to solve quadratic equations; be able to complete the square for a quadratic equation; to be able to solve a quadratic equation by completing the square; recap changing the subject of an equation; solve simultaneous equations and solve them; recap inequality notation; to be able to solve inequalities and show the solution on a number line. Students should be able to: Divide using a ratio; express a multiplicative relationship between two quantities as a ratio or a fraction; reason best financial product; product where interest rate changes after 1 or 2 years; solve proportion problems using the unitary method; work out which product offers best value and consider rates of pay; work out the multiplier for repeated proportional change as a single decimal number; represent repeated proportional change using a multiplier raised to a power, use this to solve problems involving compound interest and depreciation; convert between metric speed measures; convert between density measures; convert between pressure measures; use kinematics formulae from the formulae sheet to calculate speed, acceleration, etc; calculate an unknown quantity from quantities that vary in direct or inverse proportion; set up and use equations to solve word and other problems involving direct and inverse proportion; recognise when values are in direct and inverse proportion by reference to the graph form, and use a graph to find the value of k; relate algebraic solutions to graphical representation of the equatio	<ul> <li>Higher practice book Chapter 9</li> <li>Surds</li> <li>Factorising monic quadratics</li> <li>Solving sim equations</li> <li>Completing the square</li> <li>Using the quadratic formula</li> <li>Exam questions (assessed)</li> </ul> Higher practice book Chapter 11 <ul> <li>Repeated percentage change</li> <li>Direct and indirect proportion</li> <li>Problems involving compound measures</li> <li>Memorising conversions</li> <li>Exam questions (assessed)</li> </ul>
	Nature of Landmark Assessment	35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and	Key Learning Areas	Homework Options
	approximate		Students will be guided by the
	duration		class teacher as to which level
			to complete (according to
			target level)
Autumn Second Half Term	Similarity and congruence	Students should be able to: Find missing angles in parallel lines and triangles; explain that two triangles are congruent; and state the conditions of congruence; prove that shapes are congruent supporting each point with a mathematical justification and to state the condition used; use geometric properties to prove congruency and hence prove further properties such as bisecting diagonals or proving where a midpoint lies; enlarge shapes by scale factors including fractions and mixed numbers; identify corresponding sides; use the ratio of corresponding sides to work out scale factors; discuss why both methods are fundamentally the same; use similarity to find missing lengths; state conditions of similarity; use angles in parallel lines to prove similarity; use similar triangles to work out lengths in real life; find the area of 2 similar shapes; use the link between linear scale factor; use the link between scale factors for length, area and volume to solve problems.	<ul> <li>Higher practice book Chapter 12</li> <li>Memorising conditions of congruency and similarity and geometric properties of triangles and quadrilaterals</li> <li>Proving congruency and similarity</li> <li>Exam questions (assessed)</li> </ul>
	More Trigonometry	Students should be able to: Use SOH CAH TOA to find missing lengths and angles; to understand and use upper and lower bounds in calculations involving trigonometry; forming and solving equations using sine and cosine rules; consider transformations of functions to find exact values of $3\cos(x)$ , $-\cos(x)$ or $\sin(x/2)$ ; explain why $\sin(x) = \sin(180 - x)$ for all value of x; prove the cosine rule by dropping a perpendicular; to know the graph of the Sine function and use it to solve equations; recap exact values of $\sin(x)$ , $\sin(x) = \sin(180 - x)$ for all value of x; prove the cosine rule by dropping a perpendicular; to know the graph of the Sine function and use it to solve equations; recap exact values of $\sin(x)$ ,	<ul> <li>Higher practice book Chapter 13 <ul> <li>Learning the graphs</li> <li>of Sine Cosine and</li> <li>Tangent</li> <li>Use sine and cosine</li> <li>rules to find missing</li> <li>lengths and angles</li> <li>Learn</li> <li>transformations</li> </ul> </li> <li>Exam questions (assessed)</li> </ul>
	Nature of		
	Landmark	35 minute tests at the end of each topic will be averaged to give a grade for the half term.	
	Assessment		

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
Spring First Half Term	Cumulative frequency, boxplots and histograms Midyear Test	Students should be able to: Understand how different sample sizes may affect the reliability of conclusions drawn; understand what is meant by a sample and a population; specify the problem and plan, decide what data to collect and what analysis is needed; understand primary and secondary data sources; identify possible sources of bias and plan to minimise it, write questionnaire questions to eliminate bias, and on timing and location of survey to ensure sample is representative ; select and justify a sampling scheme and a method to investigate a population; know the definition of random sampling; use random numbers to get a sample; know the definition and state it in terms of proportion, fraction, percentage or ratio; construct and interpret cumulative frequency graphs/diagrams and from the graph: estimate frequency greater/less than a given value; find the median and quartile values and interquartile range; compare two cumulative frequency; compare the mean and range of two distributions, or median and from cumulative frequency and identify any outliers; construct and interpret histograms from class intervals with unequal width; use and understand frequency density; estimate the mean from a histogram; estimate the median from a histogram with unequal class widths.	<ul> <li>Higher practice book Chapter 14</li> <li>Learn key terms</li> <li>Represent data in cumulative frequency diagrams</li> <li>And histograms</li> <li>Exam questions (assessed)</li> </ul>
	Nature of Landmark Assessment	35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level
			to complete (according to target level)
g Second Half Term	Equations and graphs	Students should be able to: Solve quadratics by factorising; form and solve linear simultaneous equations; solve linear simultaneous equations graphically; recap graph of circle; recap plotting quadratics; solve simultaneous equations involving circles and parabolas graphically; represent inequalities on graphs; interpret graphs of inequalities; factorise and solve quadratics; use graphs to identify solutions to quadratic inequalities; sketch quadratics and use to solve quadratic inequalities; find the co-ordinates of a turning point by completing the square; use completed square form to identify and justify how many roots a quadratic equations; solve quadratic equations using an iterative process; expand triple brackets; identify positive and negative cubic functions; using x and y intercepts sketch the graphs of cubic functions expressed as a product of 3 linear expressions; identify how many solutions a cubic graph has by considering repeated roots; use an iterative process to find a root of a cubic equation to a given number of d.p's.	<ul> <li>Higher practice book Chapter 15</li> <li>Solving simultaneous equations</li> <li>Completing the square</li> <li>Expanding triple brackets</li> <li>Use the iterative process to find a root of a cubic</li> <li>Exam questions (assessed)</li> </ul>
Sprin	Revision	Revision of key topic areas identified throughout the year by topic tests analysis. Past paper practice for both non calculator and calculator examinations.	1 Past examination paper per week.
	Nature of Landmark Assessment	35 minute tests at the end of each topic will be averaged to give a grade for the half term.	

	Topic and approximate duration	Key Learning Areas	Homework Options Students will be guided by the class teacher as to which level to complete (according to target level)
mmer first Half Term	Circles	Students should be able to: Recall the definition of a circle and identify and draw parts of a circle, including sector, tangent, chord, segment; use the facts that the angle subtended by an arc at the centre of a circle is twice the angle subtended at any point on the circumference, the angle in a semicircle is a right angle, the perpendicular from the centre of a circle to a chord bisects the chord, angles in the same segment are equal, alternate segment theorem, opposite angles of a cyclic quadrilateral sum to 180°, the tangent at any point on a circle is perpendicular to the radius at that point, tangents from an external point are equal in length to find missing angles on a diagram; prove these facts; prove a line is a tangent ; recognise and construct the graph of a circle centred at the origin of coordinates; find the equation of a tangent to a circle at a given point, by finding the gradient of the radius that meets the circle at that point (circles all centre the origin).	<ul> <li>Higher practice book Chapter 16</li> <li>Learning theorems</li> <li>Mixed questions finding missing angles</li> <li>Recap y=mx+c</li> <li>Find the equation of a tangent to a circle at a point</li> <li>Exam questions (assessed)</li> </ul>
۱S	Nature of Landmark Assessment	35 minute tests at the end of each topic will be averaged to give a level for the half term.	

	Topic and	Key Learning Areas	Homework Options
	approximate		Students will be guided by the
	duration		class teacher as to which level
			to complete (according to
			target level)
	Formulae, Algebraic	Students should be able to: Multiply surds; multiply two expressions containing surds; rationalise expressions using the difference of two squares; simplify fractions containing one or more non monic	<ul><li>Higher practice book Chapter 17</li><li>Algebraic fractions</li></ul>
	fractions, Surds	quadratics; change the subject of a formula such as , where all variables are in the denominators; find the	<ul> <li>Solving quadratics</li> </ul>
alf Term	and Proof	inverse of complex functions; adding and subtracting surds; rationalise the denominator involving surds; simplify algebraic fractions including 2 monic quadratics; multiply and divide algebraic fractions; solve quadratic equations arising from algebraic fraction equations; change the subject of a formula, including cases where the subject occurs on both sides of the formula, or where a power of the subject appears; solve 'Show that' and proof questions using consecutive integers; use function notation; find the inverse of a linear function	<ul> <li>Simplifying and rationalising surds</li> <li>Finding composite and inverse functions</li> <li>Proof questions</li> <li>Exam questions (assessed)</li> </ul>
Summer Second H	Vectors and Geometric proof	Students should be able to: Understand and use vector notation, including column notation, and understand and interpret vectors as displacement in the plane with an associated direction; understand that 2a is parallel to a and twice its length, and that a is parallel to –a in the opposite direction; represent vectors, combinations of vectors and scalar multiples in the plane pictorially; calculate the sum of two vectors, the difference of two vectors and a scalar multiple of a vector using column vectors; multiplying vectors (including algebraic terms); produced geometrical proofs to prove points are collinear and vectors/lines are parallel; find the length of a vector using Pythagoras' Theorem; calculate the resultant of two vectors; solve geometric problems in 2D where vectors are divided in a given ratio.	<ul> <li>Higher practice book Chapter 18</li> <li>Calculating resultant vectors</li> <li>magnitudes of vectors</li> <li>Exam questions (assessed)</li> </ul>
	Nature of Landmark Assessment	A set of 3 end of year examinations in line with expected GCSE papers	