Maths IGCSE Higher Scheme of work.

It is assumed that students being prepared for the Higher tier will have knowledge of the Foundation tier content.

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGSCE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
1 Decimals	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H1.3A** convert recurring decimals into fractions **F1.8B** round to a given number of significant figures or decimal places **F1.8D** use estimation to evaluate approximations to numerical calculations **F1.11A** use a scientific electronic calculator to determine numerical results				
Extension Opportunities		Use of decimals within a problem. Show algebraically that $3.0\dot{1}$ can be written as $3\frac{1}{90}$ Links with other areas of mathematics can be made by using surds in Pythagoras' Theorem and when using trigonometric ratios.				
Additional Teacher Notes		The expectation for Higher tier is that much of this work will be reinforced throughout the course. Make sure students are absolutely clear about the difference between significant figures and decimal places.				

Maths Scheme of Work –IGCSE Higher Grade 5-9

<table>
<tr><th>Unit</th><th>Prior Knowledge
From GCSE Foundation</th><th>Learning Opportunities</th><th>Colour band</th><th>Edexcel Award</th><th>Functional skills</th><th>GCSE</th></tr>
<tr><td>2
Special numbers and powers</td><td>‘F’ prefixes in learning opportunities indicate learning from foundation tier.</td><td>
<table>
<tr><td>F1.4D</td><td>express integers as product of powers of prime factors</td></tr>
<tr><td>F1.4E</td><td>find highest common factors (HCF) and
lowest common multiples (LCM)</td></tr>
<tr><td>H1.4A</td><td>understand the meaning of surds</td></tr>
<tr><td>H1.4B</td><td>manipulate surds, including rationalising a denominator</td></tr>
<tr><td>H1.4C</td><td>use index laws to simplify and evaluate numerical expressions involving integer, fractional and negative powers</td></tr>
</table>
Teaching ideas and resources here
</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Extension Opportunities</td><td>Problems that use indices instead of integers will provide rich opportunities to apply the knowledge in this unit in other areas of mathematics.</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Additional Teacher Notes</td><td colspan="5">Students need to know how to enter negative numbers into their calculator.
Use negative number and not minus number to avoid confusion with calculations.
Students need to be encouraged to learn squares from 2 × 2 to 15 × 15 and cubes of 2, 3, 4, 5 and 10, and corresponding square and cube roots.</td></tr>
</table>

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
3 Fractions	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F1.2D** order fractions and calculate a given fraction of a given quantity **F1.2E** express a given number as a fraction of another number **F1.2G** convert a fraction to a decimal or percentage **F1.2F** use common denominators to add and subtract fractions and mixed numbers **F1.2H** understand and use fractions as multiplicative inverses **F1.2I** multiply and divide fractions and mixed numbers				
Extension Opportunities		Many of these topics provide opportunities for reasoning in real-life contexts, particularly percentages. Calculate original values and evaluate statements in relation to this value justifying which statement is correct.	**F1.2F**			
Additional Teacher Notes		Ensure that you include fractions where only one of the denominators needs to be changed, in addition to where both need to be changed for addition and subtraction. Include multiplying and dividing integers by fractions. Encourage use of the fraction button. .				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities		Colour band	Edexcel Award	Functional skills	GCSE
4 Percentages	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F1.6B**	express a given number as a percentage of another number				
		F1.6C	express a percentage as a fraction and as a decimal				
		F1.6D	understand the multiplicative nature of percentages as operators				
		F1.6E	solve simple percentage problems, including percentage increase and decrease				
		F1.6F	use reverse percentages				
		F1.6G	use compound interest and depreciation				
		H1.6A	use repeated percentage change				
		H1.6B	solve compound interest problems				
Extension Opportunities		Many of these topics provide opportunities for reasoning in real-life contexts, particularly percentages. Calculate original values and evaluate statements in relation to this value justifying which statement is correct.					
Additional Teacher Notes		Students should be reminded of basic percentages. Amounts of money should always be rounded to the nearest penny, except where successive calculations are done (i.e. compound interest, which is covered in a later unit). Emphasise the use of percentages in real-life situations.					

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
5 Ratio and Proportion	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F1.7A** use ratio notation, including reduction to its simplest form and its various links to fraction notation **F1.7B** divide a quantity in a given ratio or ratios **F1.7C** use the process of proportionality to evaluate unknown quantities **F1.7D** calculate an unknown quantity from quantities that vary in direct proportion **F1.7E** solve word problems about ratio and proportion **F1.10A** use and apply number in everyday personal, domestic or community life **F1.10B** carry out calculations using standard units of mass, length, area, volume and capacity **F1.10C** understand and carry out calculations using time, and carry out calculations using money, including converting between currencies Teaching ideas and resources here				
Extension Opportunities		Problems involving sharing in a ratio that include percentages rather than specific numbers such can provide links with other areas of mathematics. In a youth club the ratio of the number of boys to the number of girls is 3 : 2 . 30% of the boys are under the age of 14 and 60% of the girls are under the age of 14. What percentage of the youth club is under the age of 14?				
Additional Teacher Notes		Three-part ratios are usually difficult for students to understand. Also include using decimals to find quantities. Use a variety of measures in ratio and proportion problems.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
6 Indices and Standard Form	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F1.4C** use index notation and index laws for multiplication and division of positive and negative integer powers including zero **F1.9A** calculate with and interpret numbers in the form $a \times 10^n$ where n is an integer and $1 \leqslant a < 10$ **H1.9A** solve problems involving standard form Teaching ideas and resources here				
Extension Opportunities		Evaluate statements and justify which answer is correct by providing a counter-argument by way of a correct solution.				
Additional Teacher Notes		Standard form is used in science and there are lots of cross-curricular opportunities. Students need to be given plenty of practice in using standard form with calculators.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
7 Degrees of accuracy	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F1.8C** identify upper and lower bounds where values are given to a degree of accuracy **H1.8A** solve problems using upper and lower bounds where values are given to a degree of accuracy Teaching ideas and resources here				
Extension Opportunities		This unit provides many opportunities for students to evaluate their answers and provide counterarguments in mathematical and real-life contexts, in addition to requiring them to understand the implications of rounding their answers.				
Additional Teacher Notes		Students should use 'half a unit above' and 'half a unit below' to find upper and lower bounds. Encourage use of a number line when introducing the concept.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
8 Set language, notation and Venn diagrams	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F1.5A** understand the definition of a set **F1.5B** use the set notation $\cup$, $\cap$ and $\in$ and $\notin$ **F1.5C** understand the concept of the universal set and the empty set and the symbols for these sets **F1.5D** understand and use the complement of a set **F1.5E** use Venn diagrams to represent sets **F6.3D** find probabilities from a Venn diagram **H1.5A** understand sets defined in algebraic terms, and understand and use subsets **H1.5B** use Venn diagrams to represent sets and the number of elements in sets **H1.5C** use the notation n(A) for the number of elements in the set A **H1.5D** use sets in practical situations Teaching ideas and resources here				
Extension Opportunities		Given Universal set is {1, 2, 3, 4, 5, 6, 7, 8, 9, 10 A = {5, 7, 9} and B = {1, 3, 5, 7} Write down a possible set C so that $A \cap C$ = {7} and C has 4 members.				
Additional Teacher Notes		When drawing a Venn diagram it is a good idea to put members in the intersection first.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
9 Algebraic manipulation	. **'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H2.1A** use index notation involving fractional, negative and zero powers **F2.1D** use index laws in simple cases **F2.2B** collect like terms **F2.2C** multiply a single term over a bracket **F2.2D** take out common factors **H2.2A** expand the product of two or more linear expressions **H2.2B** understand the concept of a quadratic expression and be able to factorise such expressions **H2.2C** manipulate algebraic fractions where the numerator and/or the denominator can be numeric, linear or quadratic **H2.2D** complete the square for a given quadratic expression **H2.2E** use algebra to support and construct proofs Teaching ideas and resources here				
Extension Opportunities		Evaluate statements and justify which answer is correct by providing a counterargument by way of a correct solution.				
Additional Teacher Notes		Some of this will be a reminder from Key Stage 3 and could be introduced through investigative material such as handshake, frogs etc. Students will be asked to show 'algebraic working' when solving equations. Solutions with no working will score no marks. Students can leave their answer in fraction form where appropriate. Emphasise that fractions are more accurate in calculations than rounded percentage or decimal equivalents.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
10 Expressions, formulae and rearranging equations	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F2.3C** substitute positive and negative integers, decimals and fractions for words and letters in expressions and formulae **F2.3D** use formulae from mathematics and other real-life contexts expressed initially in words or diagrammatic form and convert to letters and symbols **F2.3E** derive a formula or expression **H2.3A** understand the process of manipulating formulae or equations to change the subject, to include cases where the subject may appear twice or a power of the subject occurs **H2.5A** set up problems involving direct or inverse proportion and relate algebraic solutions to graphical representation of the equations Teaching ideas and resources here				
Extension Opportunities		Justify and infer relationships in real-life scenarios to direct and inverse proportion such as ice cream sales and sunshine.				
Additional Teacher Notes		Students should be reminded to show all stages in their working. Consider using science contexts for problems involving inverse proportionality, e.g. volume of gas inversely proportional to the pressure or frequency is inversely proportional to wavelength.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
11 Linear equations and inequalities	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F2.4A** solve linear equations, with integer or fractional coefficients, in one unknown in which the unknown appears on either side or both sides of the equation **F2.4B** set up simple linear equations from given data **F2.8C** solve simple linear inequalities in one variable and represent the solution set on a number line Teaching ideas and resources here				
Extension Opportunities		Problems that require students to justify why certain values in a solution can be ignored. Set up and solve problems involving linear equations.				
Additional Teacher Notes		Emphasise the importance of leaving their answer as an inequality (and not changing it to =). Students can leave their answers in fractional form where appropriate. Ensure that correct language is used to avoid reinforcing misconceptions: for example, 0.15 should never be read as 'zero point fifteen', and 5 > 3 should be read as 'five is greater than 3', not '5 is bigger than 3'				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
12 Sequences	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H3.1A** understand and use common difference (d) and first term (a) in an arithmetic sequence **H3.1B** know and use nth term = $a + (n - 1)d$ **H3.1C** find the sum of the first n terms of an arithmetic series (S_n) Teaching ideas and resources here				
Extension Opportunities		Evaluate statements about whether or not specific numbers or patterns are in a sequence and justify the reasons.				
Additional Teacher Notes		Emphasise use of $3n$ meaning $3 \times n$. Students need to be clear on the description of the pattern in words, the difference between the terms and the algebraic description of the nth term.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
13 Real life graphs	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F3.3A** interpret information presented in a range of linear and non-linear graphs Teaching ideas and resources here				
Extension Opportunities		Speed/distance graphs can provide opportunities for interpreting non-mathematical problems as a sequence of mathematical processes, whilst also requiring students to justify their reasons why one vehicle is faster than another.				
Additional Teacher Notes		Careful annotation should be encouraged: it is good practice to label the axes and check that students understand the scales. Use various measures in the distance–time and velocity–time graphs, including miles, kilometres, seconds, and hours, and include large numbers in standard form. Ensure that you include axes with negative values to represent, for example, time before present time, temperature or depth below sea level.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
14 Linear Graphs	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F3.3E** determine the coordinates of the midpoint of a line segment, given the coordinates of the two end points **F3.3G** find the gradient of a straight line **F3.3H** recognise that equations of the form $y = mx + c$ are straight line graphs with gradient m and intercept on the y-axis at the point $(0, c)$ **F3.3I** recognise, generate points and plot graphs of linear functions **H3.3F** calculate the gradient of a straight line given the coordinates of two points **H3.3G** find the equation of a straight line parallel to a given line; find the equation of a straight line perpendicular to a given line **F2.8D** represent simple linear inequalities on rectangular Cartesian graphs **F2.8E** identify regions on rectangular Cartesian graphs defined by simple linear inequalities **H2.8B** identify harder examples of regions defined by linear inequalities Teaching ideas and resources here				
Extension Opportunities		Given an equation of a line, provide a counterargument as to whether or not another equation of a line is parallel or perpendicular to the first line.				

	Decide if lines are parallel or perpendicular without drawing them and provide reasons.				
Additional Teacher Notes	Encourage students to sketch what information they are given in a question – emphasise that it is a sketch. Careful annotation should be encouraged – it is good practice to label the axes and check that students understand the scales.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
15 Quadrative equation, inequalities and graphs	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H2.7A** solve quadratic equations by factorization **H2.7B** solve quadratic equations by using the quadratic formula or completing the square **H2.7C** form and solve quadratic equations from data given in a context **H2.8A** solve quadratic inequalities in one unknown and represent the solution set on a number line **F3.3I** recognise, generate points and plot graphs of quadratic functions Teaching ideas and resources here				
Extension Opportunities		Problems that require students to set up and solve a quadratic equation or inequality.				
Additional Teacher Notes		Remind students to use brackets for negative numbers when using a calculator, and remind them of the importance of knowing when to leave answers in surd form. Reinforce the fact that some problems may produce one inappropriate solution, which can be ignored. Clear presentation of working out is essential. Link with graphical representations.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
16 Harder graphs and transformations of graphs	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H3.3A** recognise, plot and draw graphs with equation: $y = Ax^3 + Bx^2 + Cx + D$ in which: (i)the constants are integers and some could be zero (ii)the letters *x* and *y* can be replaced with any other two letters or: $y = Ax^3 + Bx^2 + Cx + D + \frac{E}{x} + \frac{F}{x^2}$ in which: (i)the constants are numerical and at least three of them are zero (ii)the letters *x* and *y* can be replaced with any other two letters or: $y = \sin x, y = \cos x, y = \tan x$ for angles of any size (in degrees) **H3.3B** apply to the graph of $y = f(x)$ the transformations $y = f(x) + a$, $y = f(ax)$, $y = f(x + a)$, $y = af(x)$ for linear, quadratic, sine and cosine functions **H3.3C** interpret and analyse transformations of functions and write the functions algebraically **H3.3D** find the gradients of non-linear graphs **H3.3E** find the intersection points of two graphs, one linear (y_1) and one non-linear (y_2), and recognise that the solutions correspond to the solutions of $y_2 - y_1 = 0$ Teaching ideas and resources here				

Extension Opportunities	Match equations of quadratics, cubics, reciprocal, trig functions with their graphs by recognising the shape or by sketching.				
Additional Teacher Notes	Use lots of practical examples to help model the quadratic function, e.g. draw a graph to model the trajectory of a projectile and predict when/where it will land. Ensure axes are labelled and pencils used for drawing. Graphical calculations or appropriate ICT will allow students to see the impact of changing variables within a function.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
17 Simultaneous equations	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H2.6A** calculate the exact solution of two simultaneous equations in two unknowns **H2.6B** interpret the equations as lines and the common solution as the point of intersection **H2.7D** solve simultaneous equations in two unknowns, one equation being linear and the other being quadratic				
Extension Opportunities		Problems that require students to set up and solve a pair of simultaneous equations in a real-life context, such as 2 adult tickets and 1 child ticket cost £28, and 1 adult ticket and 3 child tickets cost £34. How much does 1 adult ticket cost? Link the solution of simultaneous equations to their graphical representation.				
Additional Teacher Notes		Reinforce the fact that some problems may produce one inappropriate solution, which can be ignored. Clear presentation of working out is essential. Link with graphical representations.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
18 Function notation.	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H3.2A** understand the concept that a function is a mapping between elements of two sets **H3.2B** use function notations of the form f(x) = … and f : x α … **H3.2C** understand the terms 'domain' and 'range' and which values may need to be excluded from a domain **H3.2D** understand and find the composite function fg and the inverse function f^{-1} Teaching ideas and resources here				
Extension Opportunities		Forming and solving equations using functions. E.g. solve f(x) = g(x) Give the graph of f(x) and use that to find f(3) and f(x) = 2				
Additional Teacher Notes		Link with algebraic manipulation and equation solving.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
19 Calculus	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**H3.4A** understand the concept of a variable rate of change **H3.4B** differentiate integer powers of x **H3.4C** determine gradients, rates of change, stationary points, turning points (maxima and minima) by differentiation and relate these to graphs **H3.4D** distinguish between maxima and minima by considering the general shape of the graph only **H3.4E** apply calculus to linear kinematics and to other simple practical problems Teaching ideas and resources here				
Extension Opportunities		Find the values of x for which the graph of $y = x^2 - x + 3$ has a gradient of 7 Given that $s = t^3 + 2t^2$ find the value of t for which the particle is instantaneously at rest.				
Additional Teacher Notes		Link with solving linear and quadratic equations				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
20 Compound Measures	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F4.4G** use compound measure such as speed, density and pressure **F4.9A** convert measurements within the metric system to include linear and area units **F4.10A** convert between units of volume within the metric system Teaching ideas and resources here				
Extension Opportunities		Find the mass of an object, having first to find its volume. Work out the average speed of a journey.				
Additional Teacher Notes		Practise converting time into decimals. Ensure that conversions between metric units are known. Ensure that consistent units are used when solving problems.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
21 Geometry of shapes	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F4.1B** use angle properties of intersecting lines, parallel lines and angles on a straight line **F4.1D** understand the terms 'isosceles', 'equilateral' and 'right-angled triangles' and the angle properties of these triangles **F4.2B** understand and use the term 'quadrilateral' and the angle sum property of quadrilaterals **F4.2C** understand and use the properties of the parallelogram, rectangle, square, rhombus, trapezium and kite **F4.2D** understand the term 'regular polygon' and calculate interior and exterior angles of regular polygons **F4.2E** understand and use the angle sum of polygons **H4.7A** provide reasons, using standard geometrical statements, to support numerical values for angles obtained in any geometrical context involving lines, polygons and circles Teaching ideas and resources here				
Extension Opportunities		Multi-step "angle chasing"-style problems that involve justifying how students have found a specific angle will provide opportunities to develop a chain of reasoning. Geometrical problems involving algebra, whereby equations can be formed and solved, allow students the opportunity to make and use connections with different parts of mathematics.				
Additional Teacher Notes		Students must be encouraged to use geometrical language appropriately, 'quote' the appropriate reasons for angle calculations and show step-by-step deduction when solving multi-step problems. Emphasise that diagrams in examinations are seldom drawn accurately. Use triangles to find angle sums of polygons; this could be explored algebraically as an investigation.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
22 Constructions and Bearings	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F4.5B** construct triangles and other two-dimensional shapes using a combination of a ruler, a protractor and compasses **F4.5D** use straight edge and compasses to: (i)construct the perpendicular bisector of a line segment (ii) construct the bisector of an angle **F4.4D** understand angle measure including three-figure bearings **F4.5C** solve problems using scale drawings **F4.11B** use and interpret maps and scale drawings Teaching ideas and resources here				
Extension Opportunities		Problems involving combinations of bearings and scale drawings can provide a rich opportunity to link with other areas of mathematics and allow students to justify their findings.				
Additional Teacher Notes		Drawings should be done in pencil. Construction lines should not be erased.				

Maths Scheme of Work – IGCSE Higher Grade 5-9

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<tr>
<td>23
Perimeter, area and volume</td>
<td>‘F’ prefixes in learning opportunities indicate learning from foundation tier.</td>
<td>
<table>
<tr><td>F4.9B</td><td>find the perimeter of shapes made from triangles and rectangles</td></tr>
<tr><td>F4.9C</td><td>find the area of simple shapes using the formulae for the areas of triangles and rectangles</td></tr>
<tr><td>F4.9D</td><td>find the area of parallelograms and trapezia</td></tr>
<tr><td>H4.9A</td><td>find perimeters and areas of sectors of circles</td></tr>
<tr><td>F4.10C</td><td>find the surface area of simple shapes using the area formulae for triangles and rectangles</td></tr>
<tr><td>F4.10D</td><td>find the surface area of a cylinder</td></tr>
<tr><td>F4.10E</td><td>find the volume of prisms, including cuboids and cylinders, using an appropriate formula</td></tr>
<tr><td>H4.10A</td><td>find the surface area and volume of a sphere and a right circular cone using relevant formulae</td></tr>
</table>

Teaching ideas and resources here
</td>
<td></td><td></td><td></td><td></td>
</tr>
<tr>
<td colspan="2">Extension Opportunities</td>
<td>Using compound shapes or combinations of polygons that require students to subsequently interpret their result in a real-life context.
Multi-step problems, including the requirement to form and solve equations, provide links with other areas of mathematics.
Combinations of 3D forms such as a cone and a sphere where the radius has to be calculated given the total height.</td>
<td></td><td></td><td></td><td></td>
</tr>
<tr>
<td colspan="2">Additional Teacher Notes</td>
<td colspan="4">Encourage students to draw a sketch where one isn’t provided.
Ensure that examples use different metric units of length, including decimals.
Emphasise the need to learn the circle formulae; “Cherry Pie’s Delicious” and “Apple Pies are too” are good ways to remember them.
Ensure that students know it is more accurate to leave answers in terms of π, but only when asked to do so.</td>
</tr>
</table>

Maths Scheme of Work – IGCSE Higher Grade 5-9

Unit	Prior Knowledge From IGCSE Foundation	Learning Opportunities	Colour band	Edexcel Award	Functional skills	GCSE
24 Pythagoras theorem and trigonometry	**'F'** prefixes in learning opportunities indicate learning from foundation tier.	**F4.8A** know, understand and use Pythagoras' Theorem in two dimensions **F4.8B** know, understand and use sine, cosine and tangent of acute angles to determine lengths and angles of a right-angled triangle **F4.8C** apply trigonometrical methods to solve problems in two dimensions **H4.8A** understand and use sine, cosine and tangent of obtuse angles **H4.8B** understand and use angles of elevation and depression Teaching ideas and resources here				
Extension Opportunities		Combined triangle problems that involve consecutive application of Pythagoras' theorem or a combination of Pythagoras' theorem and the trigonometric ratios. Link to 'real-life' situations. E.g. link with bearings and scale drawings.				
Additional Teacher Notes		Students may need reminding about surds. Scale drawings are not acceptable. Calculators need to be in degree mode. Use a suitable mnemonic to remember SOHCAHTOA. Use Pythagoras' theorem and trigonometry together.				