



Year 10 Standard Higher Scheme of Work

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| <b>Overview</b> | <p>The purpose of the Maths curriculum is to equip students with uniquely powerful ways to describe, analyse and solve problems and to make them more prepared for the real world.</p> <p>We do this by providing a secure understanding of mathematical concepts, from basic principles of mathematics to complex topics that combine several areas of study into a single question.</p> <p>In Year 10 we continue to concentrate on retention of knowledge and depth of learning. In doing this, all our students have the opportunity to master key skills. The Higher Scheme of work gives students access to the Higher content.</p> |
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| <b>Autumn Term</b> | <p><b>Half Term 1</b></p> <p><b>Rearrange Formulae</b></p> <ul style="list-style-type: none"> <li>■ Rearrange formulae to change the subject in a geometrical context</li> <li>■ Change the subject involving the use of square roots and squares</li> <li>■ Calculate radius or diameter when Sector area or Arc length is given</li> <li>■ Rearrangement complex formulae involving fractions, roots and powers and where the subject appears on both sides of the formula</li> </ul> <p><b>Linear Graphs</b></p> <ul style="list-style-type: none"> <li>■ Plot Coordinates in 4 quadrants</li> <li>■ Plot straight line graphs</li> <li>■ Recognise, sketch and interpret straight line graphs</li> <li>■ Find approx solutions using a graph</li> <li>■ Find the coordinates of the midpoint of a line segment</li> <li>■ Real life graphs: conversion graphs, fixed charge and cost per unit</li> <li>■ Recognise and interpret graphs of direct and inverse proportion</li> <li>■ Plot and draw graphs of straight lines in the form <math>ax + by = c</math></li> </ul> <p><b><math>y = mx + c</math></b></p> <ul style="list-style-type: none"> <li>■ Identify and interpret gradients and intercepts of straight-line graphs</li> <li>■ Identify and interpret gradient from an equation <math>y = mx + c</math></li> <li>■ Find the equation of a straight line from a graph</li> <li>■ Use <math>y = mx + c</math> to identify parallel</li> <li>■ Find the equation of a line through two given points or through one point with a given gradient</li> <li>■ Know that the gradient of a straight line is interpreted / rate of change</li> </ul> | <p><b>Half Term 2</b></p> <p><b>Quadratic graphs, turning points and roots</b></p> <ul style="list-style-type: none"> <li>■ Recognise, sketch, and interpret graphs of ... quadratic functions</li> <li>■ Identify roots, intercepts and turning points of a quadratic function</li> <li>■ Find roots of a quadratic algebraically by factorisation</li> <li>■ Find approximate solutions using a graph</li> <li>■ Identify the line of symmetry of a quadratic graph</li> <li>■ Find roots of a quadratic algebraically by factorisation - with rearrangement needed</li> </ul> <p><b>Further Expanding, Factorising &amp; Algebraic Fractions</b></p> <ul style="list-style-type: none"> <li>■ Expanding more than two brackets</li> <li>■ Factorising quadratic expressions form <math>ax^2 + bx + c</math></li> <li>■ Deduce turning points by completing the square</li> <li>■ Simplify algebraic fractions</li> <li>■ Multiply, divide, add and subtract algebraic fractions</li> </ul> <p><b>Linear Simultaneous Equations</b></p> <ul style="list-style-type: none"> <li>■ Solve two simultaneous equations in two variables (linear/linear) algebraically</li> <li>■ Find approximate solutions using a graph</li> <li>■ Derive two simultaneous equations, solve the equation and interpret the solution</li> </ul> <p><b>Further Graphs</b></p> <ul style="list-style-type: none"> <li>■ Recognise and sketch cubic graphs and the reciprocal graph</li> <li>■ Plot and interpret ... reciprocal graphs</li> </ul> | <p><b>Half Term 1</b></p> <p>The week before half term break we have our first Foundation GCSE Paper.</p> <p><b>Half Term 2</b></p> <p>Just before Christmas Break. Covering content from Autumn Term</p> |

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| Autumn Term | <ul style="list-style-type: none"> <li>■ Identify and interpret the gradient from an equation <math>ax + by = c</math></li> <li>■ Perpendicular lines</li> <li>■ Generate equations of lines perpendicular to the given line</li> </ul> <p><b>Compound Measures</b></p> <ul style="list-style-type: none"> <li>■ Interpret distance–time graphs,</li> <li>■ Change between standard units time, mass, length, money, volume, area</li> <li>■ Change between compound units e.g. speed, rates of pay, prices</li> <li>■ Intervals for graph scales</li> <li>■ Density and pressure</li> </ul> | <ul style="list-style-type: none"> <li>■ Recognise and interpret graphs that illustrate direct and inverse proportion</li> <li>■ Sketch and interpret graphs of exponential functions <math>y = kx</math> for positive values of <math>k</math> and integer values of <math>x</math></li> <li>■ Draw circles, centre the origin, equation <math>x^2 + y^2 = r^2</math></li> <li>■ Sketch graphs of simple cubic functions, given as three linear expressions</li> </ul> |  |
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| Spring Term | Half Term 3   | Half Term 4   | Assessment  |
|             | <p><b>Probability</b></p> <ul style="list-style-type: none"> <li>■ Apply systematic listing strategies</li> <li>■ Describe probability using the probability scale, tables and frequency trees</li> <li>■ Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments</li> <li>■ Calculate expected outcomes</li> <li>■ Mutually exclusive events sum to one</li> <li>■ Experimental and theoretical probability</li> <li>■ Venn diagrams and appropriate notation</li> <li>■ Possibility spaces/sample spaces</li> <li>■ Find a missing probability from a list or table including algebraic terms</li> <li>■ Unbiased samples and effects of increasing sample size</li> <li>■ Probability tree diagrams for independent and dependent events</li> <li>■ Calculate the probability of independent and dependent combined events</li> <li>■ Sets / combinations using Venn diagrams</li> <li>■ Conditional probabilities: <ul style="list-style-type: none"> <li>■ Use a two-way table</li> <li>■ Use a tree diagram</li> <li>■ Use a Venn diagram</li> </ul> </li> </ul> <p><b>Capture &amp; Recapture Standard Form</b></p> <ul style="list-style-type: none"> <li>■ Convert large and small numbers into standard form and vice versa</li> <li>■ Add and subtract numbers in std form</li> <li>■ Multiply and divide numbers in std form</li> <li>■ Use of a calculator in std form calculations</li> </ul> | <p><b>Simple Interest</b></p> <ul style="list-style-type: none"> <li>■ Use percentages in real-life situations e.g. price after VAT, value of profit or loss, simple interest, income tax</li> </ul> <p><b>Growth &amp; Decay</b></p> <ul style="list-style-type: none"> <li>■ Set up, solve and interpret the answers in growth and decay problems, including compound interest</li> <li>■ Identify the interest rate in compound interest questions</li> <li>■ Set up, solve and interpret the answers in growth and decay problems</li> </ul> <p><b>Ratio (further)</b></p> <ul style="list-style-type: none"> <li>■ Simplify ratios</li> <li>■ Divide a quantity into a given ratio</li> <li>■ Write ratios as fractions</li> <li>■ Compare lengths, areas and volumes using ratio notation and scale factors</li> <li>■ Solve ratio problems involving the change of a ratio within a question</li> <li>■ Relate ratios to fractions and to linear functions</li> <li>■ Solve complex multi-step problems involving fractions and probability</li> </ul> <p><b>Recurring decimals</b></p> <ul style="list-style-type: none"> <li>■ Change recurring decimals into their corresponding fractions</li> <li>■ By writing the denominator in terms of its prime factors, decide whether fractions can be converted to recurring or terminating decimals (Recognise that every terminating decimal has its fraction with a 2 and/or 5 as a common factor in the denominator)</li> </ul> | <p><b>Half Term 3</b></p> <p>The week before half term break we have our second Foundation GCSE Paper.</p> <p><b>Half Term 4</b></p> <p>Just before Easter Break. Covering content from Autumn Term and Spring Term</p> |

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| Spring Term | <p><b>Proportion (further)</b></p> <ul style="list-style-type: none"> <li>■ Interpret equations and graphs that describe direct and inverse proportion</li> <li>■ Identify direct proportion from a table of values, by comparing ratios of values, for x squared and x cubed relationships</li> <li>■ Write statements of proportionality for quantities proportional to the square, cube or other power of another quantity</li> <li>■ Set up and use equations to solve word and other problems involving direct proportion or inverse proportion</li> <li>■ Use <math>y = kx</math> to solve direct proportion problems, including questions where students find k, and then use k to find another value</li> </ul> <p>Solve problems involving inverse proportionality</p> |  |
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| Summer Term | <p><b>Half Term 5</b></p> <p><b>Statistics</b></p> <ul style="list-style-type: none"> <li>■ Draw and Interpret Frequency tables, bar charts, composite bar charts, pie charts, pictograms, vertical line charts, stem and leaf (including back-to-back)</li> <li>■ Mean, mode, median, modal class</li> <li>■ Range and outliers</li> <li>■ Compare the mean, median, mode and range (as appropriate) of two distributions using bar charts, dual bar charts, pictograms and back-to-back stem and leaf</li> <li>■ Recognise the advantages and disadvantages between measures of average</li> <li>■ Scatter graphs - recognise correlation</li> <li>■ Recognise types of data: primary secondary, quantitative and qualitative</li> <li>■ Understand sample and population</li> <li>■ Listing combinations</li> <li>■ Sampling</li> <li>■ Interpret and construct tables and line graphs for time series data</li> <li>■ Scatter graphs - draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends while knowing the dangers of so doing</li> </ul> <p><b>Surds</b></p> <ul style="list-style-type: none"> <li>■ Simplify and manipulate algebraic expressions involving surds</li> <li>■ Simplify surd expressions involving squares</li> <li>■ Understand surd notation</li> </ul> | <p><b>Half Term 6</b></p> <p><b>Right angled trigonometry</b></p> <ul style="list-style-type: none"> <li>■ Trigonometry in right angled triangles</li> <li>■ Know the exact values of <math>\sin\theta</math> and <math>\cos\theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ, 60^\circ</math> and <math>90^\circ</math>. Know the exact value of <math>\tan\theta</math> for <math>\theta = 0^\circ, 30^\circ, 45^\circ</math> and <math>60^\circ</math></li> </ul> <p><b>Similar Shapes</b></p> <ul style="list-style-type: none"> <li>■ Use formal geometric proof for the similarity of two given triangles</li> <li>■ Identify the scale factor of an enlargement of a similar shape as the ratio of the lengths of two corresponding sides, using integer or fraction scale factors</li> <li>■ Find missing lengths in similar 3D solids</li> <li>■ Relationships between areas and volumes in similar figures</li> <li>■ Understand the effect of enlargement on angles, perimeter, area and volume of shapes and solids</li> <li>■ Write the lengths, areas and volumes of two shapes as ratios in their simplest form</li> <li>■ Find missing areas and volumes in similar 3D solids</li> <li>■ Know the relationships between linear, area and volume scale factors of mathematically similar shapes and solids</li> <li>■ Use the relationship between enlargement and areas and volumes of simple shapes and solids</li> </ul> | <p><b>Assessment</b></p> <p><b>Half Term 5</b><br/>Last Week of HT5<br/>third GCSE<br/>Foundation Paper</p> <p><b>Half Term 6</b><br/>Summer Exam these exams cover all the topics learnt in year 9 in equal measures.</p> |
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| <b>Summer Term</b> | <ul style="list-style-type: none"> <li>■ Expand and simplify single and double brackets involving surd manipulation</li> <li>■ Rationalise denominators</li> </ul> <p><b>Bounds</b></p> <ul style="list-style-type: none"> <li>■ Calculate the upper and lower bounds of numbers given to varying degrees of accuracy</li> <li>■ Calculate the upper and lower bounds of an expression involving the four operations</li> <li>■ Find the upper and lower bounds in real-life situations using measurements given to appropriate degrees of accuracy</li> <li>■ Find the upper and lower bounds of calculations involving perimeters, areas and volumes of 2D and 3D shapes</li> <li>■ Calculate the upper and lower bounds of calculations, particularly when working with measurements</li> </ul> | <ul style="list-style-type: none"> <li>■ Solve problems involving frustums of cones where you have to find missing lengths first using similar triangles</li> </ul> <p><b>Quadratic Sequences</b></p> <ul style="list-style-type: none"> <li>■ Continue a quadratic sequence and use the nth term to generate terms</li> <li>■ Find the nth term of quadratic sequences</li> </ul> |  |
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| <b>Useful Resources for Supporting Your Child at Home:</b>   | <b>Homework:</b>  |
| <ul style="list-style-type: none"> <li>■ <a href="http://whgs-academy.sparxmaths.uk">whgs-academy.sparxmaths.uk</a></li> <li>■ <a href="http://curriculum.unitedlearning.org.uk">curriculum.unitedlearning.org.uk</a></li> <li>■ <a href="http://trockstars.com">trockstars.com</a></li> <li>■ <a href="http://www.bbc.co.uk/bitesize/subjects/zqhs34j">www.bbc.co.uk/bitesize/subjects/zqhs34j</a></li> <li>■ <a href="http://mmerevise.co.uk">mmerevise.co.uk</a></li> </ul> | <p>Sparx Homework is set automatically weekly, and students have 7 days to achieve 100%</p> |