| Maths | Autumn 1 (Half term 1) | Autumn 1 continued (Half term 1) | Autumn 2 (Half term 2) | Autumn 2 continued (Half term 2) |
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| Year 11S | **Curriculum (S)**<br><br>**1 Number Properties 1**<br>• Understand how to to use 4 operations with integers including worded problems (consolidation of previous basic numeracy work)<br>• Understand how to use the 4 operations with decimals up to three or more decimal<br>• places.<br>• Understand how to use 4 operations with directed (negative) numbers including where BIDMAS is involved.<br>• Be able to add, subtract, multiply and divide fractions (mixed and proper fractions)<br>• Understand and use inverse operations.<br>• Use BIDMAS including indices, reciprocals, roots and negatives<br><br>**2 Geometry & Measures**<br>• Recap prior learning how to derive and use the formula for finding the sum of interior angles of any polygon is $180x(n-2)$ where n represents the number of sides.<br>• Recap knowledge of and use of the fact that the sum of exterior angles = $360°$ therefore $360 \div n$ (where n represents the number of sides) = the size of an exterior angle and $360 \div$ an exterior angle = n.<br>• Recap the properties of the special quadrilaterals and understand how to use these properties to deduce the values of missing angles in special quadrilaterals and regular and irregular polygons in a variety of different geometrical problems.<br>• Understand how to units of measurement to calculate, estimate, measure and solve problems in a variety of contexts.<br>• Understand how to convert between area measures (mm² to cm², cm² to m², and vice versa) and between volume measures (mm³ to cm³, cm³ to m³, and vice versa)<br><br>**3 Number Properties 2**<br>• Understand and use knowledge of standard form, converting freely between numbers written in standard form and as ordinary numbers.<br>• Understand how to complete calculations using all four operations using numbers in standard form without calculator and with a calculator.<br>• Understand how to solve problems in context where the numbers are either very large or small and which require the use of standard form. | **Curriculum (S)**<br><br>**4 Algebra 1**<br>• Extend work om substituting positive and negative integers into formulae and expressions including expressions with squared and cubed terms.<br>• Understand how to substitute fractions and decimals into formulae and expressions including those that contain brackets.<br>• Understand how to use formulae for perimeter and area of standard shapes, the volume and surface area of standard prisms including cylinder based problems, working backwards to find missing lengths etc.<br>• Understand how to solve problems involving the use of compound measures such as speed and rates of pay.<br>• Understand how to solve problems involving the use of unit pricing including solving worded problems and finding best value<br><br>**5 Fractions, decimals, %**<br>• Understand how to use fractions, percentages and decimals to compare proportions.<br>• Understand how to convert between fractions, percentages and decimals to use the most appropriate method in any given question.<br>• Recap using single multipliers for working out percentages of amounts, percentage increase and decrease and original value problems (reverse percentages).<br>• Interpret fractions, percentages and decimals as a multipliers when solving problems and use these to solve problems in a variety of contexts using a calculator.<br><br>**5 Fractions, decimals, % (continued)**<br>• Understand how to solve problems finding percentage increases/decreases following changes in values.<br>• Understand how to work out the price after VAT and income after tax in problems in a variety of contexts including service charges on restaurant bills.<br>• Understand how to solve financial problems by working out the value of savings after a period of compound interest and simple interest.<br>• Identify a fraction of an amount.<br>• In problems understand how to solve calculations where it is necessary to express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 | **Curriculum (S)**<br><br>**Revision**<br><br>**Mock I Exams**<br><br>**6 Approximation**<br>• Recap - Rounding numbers to the nearest integer, 10, 100, 1000, rounding to a given number of decimal places and rounding to a given number of significant figures.<br>• Understand how to estimate answers to calculations using rounding to 1sf and solve worded estimation problems.<br>• Use a calculator to enter complex calculations and round the answer to a given degree of accuracy.<br>• Recognise that upper and lower bounds exist for rounded values.<br>• Understand how to give the limits of accuracy of measurements using inequality notation and upper and lower bounds in simple context.<br><br>**7 Algebra 2**<br>• Recap the understanding and use the vocabulary of expression, equation, inequality, term and factor.<br>• Understand how to expand double brackets to give quadratics of the form $ax² + bx + c$.<br>• Recap and extend factoring single brackets by taking out common factors.<br>• Extend factorising to include factorising quadratics of the form $x²+ bx + c$, including the difference of 2 squares.<br>• Consolidate simplifying expressions involving sums, products and index laws.<br>• Understand how to solve more complex linear equations with unknown on both sides. | **Curriculum (S)**<br><br>**8 Collecting & Interpreting Data**<br>• Consider data sets with outliers and whether the outliers should be ignored or included and how they could/do affect measures of central tendency (mean, median, mode) and range.<br>• Understand and know how to take samples of data by random, stratified, systematic, quota and cluster.<br>• Be able to understand when sampling can be representative of population data.<br><br>**9 Sequences and Graphs**<br>• Recap being able to plot and read coordinates in all four quadrants and spot patterns in coordinates.<br>• Extend drawing scatter graphs accurately, interpreting a variety of scales and accurately including a line of best fit where appropriate.<br>• Recognise and explain what correlation means in relation to the question, understand that it does not indicate causation.<br>• Understand how to use a scatter graph to predict patterns, however, understand the dangers of doing so when extrapolating the results<br>• Work with and recognise square, cubic, triangular and Fibonacci sequences.<br>• Recap - Deducing and justifying an expression to describe the nth term of an arithmetic sequence (include ascending and descending sequences)<br>• Understand and find the nth term and explain where it is has come from in relation to a pictorial sequence given.<br>• Link the nth term of a sequence to the corresponding graphical representation.<br>• Understand how to generate a sequence from a formula for the nth term. For example $3n + 5$, $-4n +5$ and if the nth term $= n² + 2n$ show that this gives 3, 8, 15, …<br>• Understand how to recognise and find the next term/s and the nth term of simple quadratic sequences.<br>• Understand how to work out the value of a term in a geometrical progression of the form $r^n$ where n is an integer $> 0$<br><br>**10 Proportion 1**<br>• Understand equivalent ratios, what a ratio actually means and reduce a ratio to its lowest form including those with different units.<br>• Divide quantities in a given ratio with and without a calculator where the ratio can have more than two elements eg. A:B:C is 1:4:5.<br>• Understand how to compare proportions when given a ratio of two quantities. |

| Maths | Spring 1 (Half term 3) | Spring 1 continued (Half term 3) | Spring 2 (Half term 4) | Summer 1 (Half term 5) | Summer 2 (Half term 6) |
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| Year 11S | **Curriculum (S)**<br><br>**10 Proportion 1 (continued)**<br><br>• Understand how to solve ratio and proportion problems in a variety of contexts and appreciate that a ratio or fraction can be used to represent a multiplicative relationship between two quantities given as a ratio.<br>• Understand how to use the ratio 1 : n with map scales and plans and x:y for mixing concentrations.<br>• Understand how to calculate proportional amounts in a variety of contexts using methods including the unitary method.<br>• Recognise some fractions equivalent to terminating decimals and some to recurring decimals.<br><br>**11 Ratio and Scale**<br>• Link ratios and proportion/ fractions and solve simple problems.<br>• Link ratios to linear functions representing the ratios as simple linear graphs and using them to predict values.<br><br>**16 Triangles & Construction**<br>• Use trigonometry (SOHCAHTOA) in simple contexts to work out missing sides and angles in right angled triangles and extend to more complicated geometrical situations.<br><br>**12 Shape Properties**<br>• Recap being able to label correctly and use the correct notation for angles and sides in geometrical situations, knowing and using the notation for angles, parallel lines, equal length sides and lines of symmetry.<br>• Be able to write down descriptions of shapes using correct terms and notations and draw diagrams of geometric shapes from given descriptions including triangles.<br>• Recap being able to Identify from correctly labelled diagrams, congruent shapes, similar shapes and those with line and given orders of rotational symmetry.<br><br>**13 Algebra 3**<br>• Understand how to change the subject of a formulae given in a variety of forms (the subject will not appear twice)<br>• Be able to use algebra to support and understand a simple proof.<br>• Construct a simple proof using algebraic expressions to support an argument or verify a statement such as showing the result will always be odd.<br>• Recognise that, for example, 5x + 5 = 16 is an equation, but 5x + 5= 5(x + 1) is an identity.<br>• Understand how to show that two expressions are equivalent.<br>• Be able to represent expressions as functions with input and output in number machines and understand inverse operations. | **Curriculum (S)**<br><br>**14 Transformations**<br>• Review all Transformations.<br>• Complete and fully describe rotations.<br>• Transform and describe reflections, given a reflection line and simple equations of straight lines.<br>• Transform and describe enlargements with positive , and simple fractional scale factors (on a square grid or plan paper).<br>• Transform and describe translations.<br>• Understand how to describe fully all transformations and determine result of combinations of transformations.<br>• Know that the word invariant means 'does not move'<br><br>**15 Probability**<br>• Use a variety of representations to show all the possible outcomes of an event, for example in Venn diagrams, two-way tables, lists, tallies (exploring different sample spaces).<br>• Understand and discuss the pros and cons of using each different representation and understand that in certain situations some are more appropriate.<br>• Understand how to calculate the probability of an event occurring when presented information in a sample space diagram including Venn diagrams and know the symbols/terminology used in Venn diagrams.<br>• Be able to complete a simple probability tree and frequency tree.<br><br>**16 Triangles & Construction (continued)**<br>• Recap Applying Pythagoras' Theorem, finding the unknown side in a right-angled triangle (any two given sides).<br>• Additionally, be able to show that a triangle is/isn't right-angled. | **Curriculum (S)**<br><br>**17 Interpreting Data**<br>• Recap - Drawing and interpreting pie charts and frequency diagrams for grouped and discrete data (including a frequency polygon)<br>• Recap - Calculating the estimated the mean average from grouped data in a table and identify the class interval containing median and that containing the modal value.<br>• Compare averages and range to compare data sets and say whether a hypothesis is supported.<br><br>**Mock II**<br><br>**18 Circles**<br>• Recap - Recalling all the of the circle parts/properties.<br>• Recap - Solving Area and circumference of a circle problems related to compound shapes and area and perimeter of other compound shapes, being able to split a compound shape into 2 or more identified shapes and calculate their areas and perimeter.<br>• Understand how to use the formula for surface area and volume of spheres, pyramids, cones and composite solids.<br><br>**19 Proportion 2**<br>• Understand and be able to use formulae that represent both direct and inverse proportion. (Construction of formulae is not needed)<br>• Know that the value represented by K is the constant of proportionality and identify what this may be in simple cases. For example in L =K/W where L and W are the dimensions of a rectangle K is the area of the rectangle.<br>• Understand that x is inversely proportional to y means that x is proportional to 1/y.<br>• Answer questions such as; if x doubles what happens to y?<br>• Be able to match graphs representing direct and inverse proportion with equations and contexts in simple instances.<br><br>**20 Solving equations and inequalities**<br>• Understand how to solve quite difficult equations but not those involving algebraic fractions.<br>• Understand that solving linear equations in x when the equation is made equal to zero (y=0) is the same as finding the point where the graph crosses the x axis.<br>• Understand how to solve two linear simultaneous equations algebraically.<br>• Understand how to solve worded problems that require translating to two linear simultaneous equations.<br>• More changeling problems will involve being able to solve quadratic equations by factorisation.<br><br>**21 Plotting and sketching graphs**<br>• Understand how to draw a quadratic curve and identify turning point and roots of the equation graphically.<br>• Extend as appropriate to drawing simple cubic curves, and identify roots and turning points.<br>• Understand how to plot other graphs in real contexts including speed time, distance time and conversion graphs.<br>• Be able to plot the graph of y=1/x with x ≠ 0 or other simple reciprocal functions. | **Curriculum (S)**<br><br>**Revision**<br><br>**Final Exam 1** | **Curriculum (S)**<br><br>**Revision**<br><br>**Final Exam 2**<br><br>**Final Exam 3** |