

## Elements Curriculum Plan

### Subject: Mathematics (GCSE Higher Curriculum)

#### Building Block 6a ≈ KS4 (Y10)

Half-Term	Topic/Content	Skills	Personal Development
Autumn 1	Non calculator methods	<ul style="list-style-type: none"> <li>• Revisit types of number- extend to include rational and irrational</li> <li>• Revisit Arithmetic</li> <li>• Revisit Fraction arithmetic</li> <li>• Evaluate calculations involving percentages</li> <li>• Work with exact answers in area and volume</li> </ul>	Communication Problem Solving Life Skills
	Types of number and sequences	<ul style="list-style-type: none"> <li>• Use factors multiples primes and prime factorisation</li> <li>• Recognise arithmetic and geometric sequences</li> <li>• Recognise and use other sequences</li> </ul>	Communication Problem Solving Life Skills
	Indices and roots	<ul style="list-style-type: none"> <li>• Work out powers and roots</li> <li>• Use the rule of indices</li> <li>• Calculate with numbers and standard form</li> </ul>	Communication Problem Solving Life Skills
<b>Assessment</b>			
Autumn 2	Ratio and fractions	<ul style="list-style-type: none"> <li>• Use ratios including with mixed units</li> <li>• Fractions in ratios</li> <li>• Fractions from ratios</li> <li>• Combining ratios</li> <li>• Unit pricing (best buys)</li> <li>• Currency Conversions</li> </ul>	Communication Problem Solving Life Skills Staying safe
	Percentages and Interest	<ul style="list-style-type: none"> <li>• Convert Fractions Decimals and percentages</li> <li>• Find percentages and percentage changes</li> <li>• Find one number as a percentage of another</li> <li>• Calculate simple and compound interest</li> <li>• Evaluate exponential change</li> <li>• Find original values</li> </ul>	Communication Problem Solving Life Skills Staying safe
	Geometry Circles	<ul style="list-style-type: none"> <li>• Name parts of a circle and perform related calculations</li> <li>• Review area and circumference</li> </ul>	Communication Problem Solving Life Skills

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		<ul style="list-style-type: none"> <li>• Find areas and volumes related to circles, cylinder, cone sphere, etc.. and parts thereof for higher pupils.</li> </ul>	
<b>Assessment</b>			
Spring 1	Angles and bearings	<ul style="list-style-type: none"> <li>• Review BB3-5 angles</li> <li>• Understand and use bearings</li> </ul>	Communication Problem Solving Life Skills Staying safe Teamwork
	Congruence similarity and enlargement	<ul style="list-style-type: none"> <li>• Understand the difference between congruency and similarity</li> <li>• Review Transformations from BB3-BB5</li> <li>• Enlarge a shape about a given point</li> <li>• Find missing sides in similar shapes including similar triangles</li> <li>• Understand and use the conditions for a pair of congruent triangles</li> </ul>	Communication Problem Solving Life Skills Staying safe
	Trigonometry	<ul style="list-style-type: none"> <li>• Understand trigonometric ratios</li> <li>• Work out missing lengths and angles in right angled triangles</li> <li>• Know and use the exact trig values</li> </ul>	Communication Problem Solving Self-Motivation
<b>Assessment</b>			
Spring 2	Algebra- representing solutions of equations and inequalities	<ul style="list-style-type: none"> <li>• Recap terminology and equations from BB3- BB5</li> <li>• Form and solve equations and inequalities in a variety of contexts including with unknowns on both sides.</li> <li>• Represent solutions to inequalities on a number line</li> <li>• Represent solutions to equations graphically</li> </ul>	Communication Problem Solving Life Skills Self-Motivation
	Simultaneous equations	<ul style="list-style-type: none"> <li>• Understand what a simultaneous equations is</li> <li>• Solve simultaneous equation in puzzle form</li> </ul>	Communication Problem Solving Life Skills

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		<ul style="list-style-type: none"> <li>• Understand the meaning of solution, appreciating that some equations have more than one solution</li> <li>• Form and solve pair of simultaneous equations graphically</li> <li>• Form and solve a pair of simultaneous equations algebraically</li> </ul>	Self-Motivation
<b>Assessment</b>			
Summer 1	Vectors	<ul style="list-style-type: none"> <li>• Understand vector notation</li> <li>• Vector arithmetic- addition, subtraction, and multiplication by a scalar</li> <li>• Vectors and translations</li> </ul>	Communication Problem Solving Self-Motivation
	Delving into Data- The data handling cycle	<ul style="list-style-type: none"> <li>• Understand sampling including possible limitations</li> <li>• Construct and interpret tables and line graphs for time series</li> <li>• Understand and represent grouped data</li> <li>• Understand and identify correlation</li> <li>• Use lines of best fit, understand the problems of extrapolation</li> <li>• Construct and interpret frequency polygons</li> <li>• Evaluate measure of location and dispersion</li> <li>• Use statistical diagrams</li> <li>• and measures to compare distributions</li> </ul>	Communication Problem Solving Life Skills Staying Safe Self awareness
<b>Assessment</b>			
Summer 2	Review and revision project	Review and revise areas from throughout the year apply skills of investigation and A02 and A03 through investigation and problem solving opportunities	Communication Problem Solving Life Skills Self Motivation Self awareness
<b>Assessment</b>			

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#### Building Block 6b ≈ KS4 (Y11) **HIGHER**

Half-Term	Topic/Content	Skills	Personal Development
Autumn 1	1. Fractions, Percentages and ratio	<ul style="list-style-type: none"> <li>• Calculating a percentage change before and after</li> <li>• Compound interest and depreciation</li> <li>• Reverse percentage change</li> <li>• Four operations with fractions including improper and mixed fraction Algebraic fractions</li> <li>• Ratio sharing (one value, shared value, difference in value)</li> <li>• Ratio- merging different ratios and problem solving problems.</li> </ul>	Communication Problem Solving Life Skills Staying Safe
	2. Indices and surds	<ul style="list-style-type: none"> <li>• Laws of indices- Addition, subtraction, negative and fractional</li> <li>• Standard form and calculating with standard form</li> <li>• Simplifying surds</li> <li>• Rationalising the denominator with surds.</li> </ul>	Communication Problem Solving Self-motivation
	3. Functions and working with circles	<ul style="list-style-type: none"> <li>• Use function notation</li> <li>• Translating functions</li> <li>• Inverse functions</li> <li>• Composite functions and instantaneous rates of change</li> <li>• Area under graph- Trapezium rule</li> <li>• Equation of a circle</li> <li>• Tangent to a circle</li> </ul>	Communication Problem Solving Self-motivation
	4. 3D Shapes	<ul style="list-style-type: none"> <li>• Recognising faces, edges and vertices</li> <li>• Surface area of cubes, cuboids, triangular prisms and cylinders</li> </ul>	Communication Problem Solving Self-motivation

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		<ul style="list-style-type: none"> <li>• Volumes of cubes, cuboids, prisms, cylinder and cones, pyramids and spheres</li> </ul>	Life Skills
<b>Assessment</b>			
Autumn 2	5. Quadratic equations	<ul style="list-style-type: none"> <li>• Factorising quadratic expressions</li> <li>• Factorise and solve quadratic expressions</li> <li>• Using the quadratic formula</li> <li>• Determine whether a solution (x,y) is a solution to both a linear and a quadratic equation</li> </ul>	Communication Problem Solving Self-motivation
	6. Simultaneous equations	<ul style="list-style-type: none"> <li>• Expand and simplify double brackets to form quadratic expressions</li> <li>• Factorise quadratic expressions</li> <li>• Solve quadratic expressions with an x coefficient equal to 1</li> </ul>	Communication Problem Solving Self-motivation
	7. Algebraic manipulation	<ul style="list-style-type: none"> <li>• Solve linear equations</li> <li>• Solve inequalities (representing a set on a number line)</li> <li>• Form and solve equations and inequalities in the context of shapes</li> <li>• Change the subject of a formula(including function machines)</li> <li>• Change the subject of a more complex formula</li> <li>• Change the subject of a formula where the subject appears more than once</li> <li>• Solve equations by iteration</li> </ul>	Communication Problem Solving Self-motivation
	8. Sequences and graphs	<ul style="list-style-type: none"> <li>• Plot and read from quadratic graphs</li> <li>• Plot and read from cubic graphs</li> <li>• Identify and interpret roots of quadratics</li> <li>• Perpendicular lines on graphs</li> <li>• Solve a pair of simultaneous equations (one linear and one quadratic) using graphs</li> <li>• Using exponential graphs</li> <li>• Using reciprocal graphs</li> <li>• Recognising graph shapes.</li> </ul>	Communication Problem Solving Self-motivation Life skills

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Assessment			
Spring 1	9. Proportion	<ul style="list-style-type: none"> <li>• Use scale factors</li> <li>• Ratio problems for area and volume</li> <li>• Understand direct proportion</li> <li>• Direct proportion equations</li> <li>• Calculate with pressure and density</li> <li>• Understand inverse proportion</li> <li>• Inverse proportion equations</li> </ul>	Communication Problem Solving Self-motivation Life Skills
	10. Probability	<ul style="list-style-type: none"> <li>• Construct and interpret frequency trees</li> <li>• Construct simple tree diagrams</li> <li>• Calculate probabilities from tree diagrams</li> <li>• Construct Venn diagrams</li> <li>• Calculate probabilities from Venn diagrams</li> <li>• Construct and interpret two way diagrams</li> <li>• Construct and interpret sample space diagrams</li> <li>• Calculate relative frequency</li> </ul>	Communication Problem Solving Self-motivation Life Skills
	11. Pythagoras	<ul style="list-style-type: none"> <li>• Understand the relationship between the sum of area of the squares constructed on the side of a right angled triangle</li> <li>• Use Pythagoras theorem to calculate the length of the hypotenuse</li> <li>• Use Pythagoras theorem to calculate the length of the shorter sides.</li> <li>• Use Pythagoras theorem to solve problems in 3D alongside trigonometry</li> </ul>	Communication Problem Solving Self-motivation
Assessment			
Spring 2	12. Angles	<ul style="list-style-type: none"> <li>• Use angle facts to calculate missing angles</li> <li>• Calculate missing angles in special triangles (equilateral, right angled isosceles)</li> <li>• Identify corresponding angles</li> <li>• Identify alternate angles</li> </ul>	Communication Problem Solving Self-motivation Life skills

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		<ul style="list-style-type: none"> <li>• Use angle facts to find missing angles in parallel lines</li> <li>• Calculate interior and exterior angles</li> <li>• Calculate the number of sides in a regular polygon has given the interior/exterior angle</li> <li>• Know and use circle theorems</li> <li>• Solve problems using a combination of circle theorems and angle facts.</li> </ul>	Communication Problem Solving Self-motivation
	13. Trigonometry	<ul style="list-style-type: none"> <li>• Correctly label sides of a right angled triangle (hypotenuse, opposite, adjacent)</li> <li>• Identify the correct trigonometric ratio (Using SOHCAHTOA)</li> <li>• Calculate missing sides and lengths with and without rearranging</li> <li>• Calculate missing angles using sine, cosine or tangent</li> <li>• Recognise sine cosine and tangent graphs</li> <li>• Use the Sine Rule and Cosine rule to find missing angles and sides in non right angled triangles</li> <li>• Use trigonometry in 3D cases</li> <li>• Use Sine to find the area of any triangle given the correct information</li> </ul>	
Assessment			
Summer 1	14. Revision	<ul style="list-style-type: none"> <li>• Additional content to be identified by monitoring and using the mocks and other assessment materials to help identify need.</li> </ul>	Communication Problem Solving Self-motivation Self-awareness
Assessment			
Summer 2	15. Final exams		

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Assessment			

**Rationale –**

**BB3-5**

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**BB6ab**

As above, plus:

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