



# YEAR 11 Autumn TERM 1

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning – Units 1, 2 and 3

Expanding and factorising      Changing the subject  
Functions

### Curriculum Intent

#### CHS UNIT 1 (WRM 4): Expanding and factorizing **H (8)** **and F(12)**

**Previously met: Y8 (single bracket expansion) Y9 (expand binomials) Y10 (H-factorising quadratics)**

To be able to:

- Expand a single bracket
- Expand a double bracket
- **Expand three linear brackets**
- Factorise a single bracket
- Factorise quadratics of the form  $x^2 + bx + c$
- **Factorise quadratics of the form  $ax^2 + bx + c$**
- Solve quadratic equations
- **Solve quadratic equations by completing the square and using the quadratic formulae**
- Simplify complex algebraic expressions including algebraic fractions

#### Links and interleaving

Substitution, graphs, linear equations, graph transformations, roots, simultaneous equations.

#### CHS UNIT 2 (WRM 5) : Changing the subject **H(8) F(4)**

**Previously met: Y9 Autumn: Rearranging formulae, Y10 Autumn: rearranging with simultaneous equations, Summer: Algebraic manipulation,**

To be able to:

- Solve linear equations (review)
- Change the subject of a formula (including area, volume, kinematics and *links with Science*)
- **Change the subject when the subject appears more than once.**

#### Links and interleaving

Revisit negative numbers, links to graphs, Substitution, area, perimeter, volume, kinematics, Science formulae

### Skills/Assessment Objective Links

## CHS UNIT 3 (WRM 1): **Gradients and Lines F (8) and H (8)**

**Previously met: Y8, Y9 and Y10 (simultaneous equations and parallel lines)**

To be able to:

- Plot and interpret graphs.
- Interpret the gradient of a straight-line graph as a rate of change.
- Use the form  $y = mx + c$  to identify parallel and **perpendicular** lines.
- Find the equation of a line through two given points.
- Find the equation of a line through one point with a given gradient.
- Use a graph to find the solutions to simultaneous linear equations.
- **Use a graph to find the solution to simultaneous equations when one is linear, and one is quadratic.**

### Links and interleaving

Scatter graphs and lines of best fit, solving linear equations.

**Spiritual, moral, social, and cultural development**

**SMSC:** Making choices, looking for patterns which may reflect the natural world, supporting and collaborating with each other, realisation that mathematics is an international language and making cultural links as we explore the history of mathematics.

**PSHE/British Values:** Working collaboratively, being respectful during discussion and valuing contributions made by others

**Skills Builder: Key skills in numeracy used in all topic areas.**

**Numeracy**

**Focus on key skills.**

**Literacy**

**Vocabulary Tier 2: Command words displayed in the classroom and italicized/bold font used in shared resources/presentations. These are a constant focus in discussion and questioning,**

**Vocabulary Tier 3: Title slide in all shared resource presentations show the key vocabulary for each topic.**

**Reading: Underlining command words,**

**Writing: Modelling solutions**

**Oracy: Think, pair, share, discussion, verbal feedback (peer to peer), questioning, student modelling**

**Becoming future ready**

**Personal Skills:** As a Mathematics student you will learn many skills: you will gain opportunities to listen to others supportively and to use questioning to develop your own understanding, you will learn how to cope with challenging questions and how to build up your resilience, you will get the chance to work on your own and with others. You will develop problem solving skills and you will learn how to break a problem down into smaller more manageable steps. You will learn how to collaborate with others when solving problems and you will learn how to articulate your solution to a problem.

**Employability:** Mathematical skills are invaluable in the workplace. There are many transferable skills which are much valued by employers. Specific career paths for each topic are discussed at the beginning of each unit of work.

**Adaptation**

**QFT/SEND Provision**

- By progressive questioning: exploring pupils' understanding through interactive dialogue.
- By outcome: different learners will produce different outcomes.
- By resource: worksheets are clearly presented and accessible.
- By intervention: by providing different levels of supervision and support.
- By grouping/setting: according to prior attainment, gender, social preference, preferred learning style.
- By offering optional activities: In class or as homework, to extend learning.

<b>Implementation Curriculum Delivery</b>	<p><b><u>Unit 1 Expanding and Factorising (WRM UNIT 4)</u></b></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> <li>• Order of operations</li> <li>• Expanding brackets</li> <li>• Collecting like terms</li> <li>• Laws of indices</li> <li>• Negative numbers</li> <li>• Multiples and factors</li> </ul> <p>Foundation Tier (up to Grade 5)</p> <ul style="list-style-type: none"> <li>• Expand, simplify and factorise a single bracket.</li> <li>• Expand two brackets.</li> <li>• Solve equations.</li> <li>• Solve quadratics by factorisation</li> </ul> <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> <li>• Factorise complex quadratics.</li> <li>• Solve quadratic equations by factorisation.</li> <li>• Complete the square, solve and link to graphs.</li> <li>• Solve quadratics using the quadratic formula.</li> </ul> <p><b><u>Unit 2 Changing the subject (WRM unit 5)</u></b></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> <li>• Negative numbers</li> <li>• Balancing equations.</li> <li>• Substitution.</li> <li>• Roots of equations (intercepts)</li> </ul> <p>Foundation Tier (up to Grade 5)</p> <ul style="list-style-type: none"> <li>• Solving equations and inequalities.</li> <li>• Solving equations in the context of shape.</li> <li>• Substitution into formula.</li> <li>• Changing the subject of a formula.</li> </ul> <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> <li>• More complex changing the subject including when the subject appears more than once.</li> <li>• Use iteration: interval for roots (link to graphs), rearranging formula and iteration</li> </ul> <p><b><u>Unit 3 Gradients and Lines (WRM unit 1)</u></b></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> <li>• Coordinates</li> <li>• Horizontal and vertical lines</li> <li>• Plotting points</li> <li>• Simultaneous equations from graphs</li> </ul> <p>Foundation Tier (up to Grade 5)</p> <ul style="list-style-type: none"> <li>• Plotting linear graphs</li> <li>• Understanding <math>y=mx+c</math></li> <li>• Parallel lines</li> <li>• Equation of a line from a graph</li> <li>• Equation of a line from two points or from one point and gradient</li> </ul> <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> <li>• Perpendicular lines.</li> </ul>
<b>Learning Outcomes (Knowledge)</b>	
<b>Current learning to be developed in the future within:</b>	<p>A Level mathematics: Graphs, transformations, modelling, algebra,</p>
<b>Assessment</b>	<p>Refer to assessment maps for formative and summative assessment opportunities.</p>
<b>Impact</b>	<p>Attainment and Progress – Refer to assessment results / data review documentation.</p>