



# YEAR 10 2023-2024 Autumn TERM 1

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning – Units 1 & 2

### Equations and Inequalities      Simultaneous Equations

#### UNIT 1: *Equations and Inequalities* **H & F (12 lessons)**

***Previously met: Y9 Autumn 2: form and solve equations and inequalities and Summer 5: representing inequalities***

#### Curriculum Intent

To be able to:

- Consolidate algebraic capability from KS3 and extend understanding of algebraic simplification and manipulation to include quadratic expressions.
- Translate simple situations or procedures into algebraic expressions or formulae; derive an equation, solve the equation and interpret the solution.
- Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem.
- Recognise, sketch and interpret graphs of linear functions.
- **Factorising quadratic expressions of the form  $x^2 + bx + c$ .**
- **Solve quadratic equations algebraically by factorising.**
- Solve linear inequalities in one **(or two) variable(s)**, **(and quadratic inequalities in one variable)**; represent the solution set on a number line, **(using set notation and on a graph)**.

#### Links and interleaving

#### Skills/Assessment Objective Links

- Use and interpret algebraic notation.
- Understand the difference between equality and equivalence.
- Collecting like terms.
- Expanding brackets.
- Substitution.
- Form and solve one-step and two-step equations.
- Form and solve equations with brackets.
- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
- Straight line graphs.
- Non-linear graphs.
- Equations of circles.
- Equation of the tangent to a circle.
- Real life graphs.
- Functions.
- Changing the subject of the formula.
- Algebraic fractions.
- Solve Quadratic equations by factorising, using the formula and completing the square.

## UNIT 2 : Simultaneous equations **H & F (12 lessons)**

### Previously met: New Content

To be able to:

- Consolidate algebraic capability from KS3 and extend understanding of algebraic simplification and manipulation to include quadratic expressions.
- Model situations mathematically and express the results using a range of formal mathematical representations, reflecting on how their solutions may have been affected by any modelling assumptions.
- Translate simple situations and procedures into algebraic expressions or formulae; derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution.
- Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems; interpret their solution in the context of the given problem.
- Solve two simultaneous equations in two variables (linear/linear **(or linear/quadratic)**) algebraically.
- Recognise, sketch and interpret graphs of linear functions and quadratic functions.

### Links and interleaving

- Use and interpret algebraic notation.
- Expanding brackets.
- Substitution.
- Form and solve one-step and two-step equations.
- Form and solve equations with brackets.
- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
- Straight line graphs.
- Non-linear graphs.
- Equations of circles.
- Equation of the tangent to a circle.
- Real life graphs.
- Functions.
- Changing the subject of the formula.
- Algebraic fractions.
- Solve quadratic equations by factorising, using the formula and completing the square.

**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	<p><b>Vocabulary Tier 2:</b> Command words displayed in the classroom and italicized/bold font used in shared resources/presentations. These are a constant focus in discussion and questioning,</p> <p><b>Vocabulary Tier 3:</b> Title slide in all shared resource presentations show the key vocabulary for each topic.</p> <p><b>Reading:</b> Underlining command words,</p> <p><b>Writing:</b> Modelling solutions</p> <p><b>Oracy:</b> Think, pair, share, discussion, verbal feedback (peer to peer), questioning, student modelling</p>
Becoming future ready	<p><b>Personal Skills:</b> 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.</p> <p><b>Employability:</b> 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.</p>
Adaptation	<ul style="list-style-type: none"> <li>• By progressive questioning: exploring pupils' understanding through interactive dialogue.</li> <li>• By outcome: different learners will produce different outcomes.</li> <li>• By resource: worksheets are clearly presented and accessible.</li> <li>• By intervention: by providing different levels of supervision and support.</li> <li>• By grouping/setting: according to prior attainment, gender, social preference, preferred learning style.</li> <li>• By offering optional activities: In class or as homework, to extend learning.</li> </ul>
QFT/SEND Provision	
Implementation Curriculum Delivery	<p><b><u>Unit 1 Equations and inequalities</u></b></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> <li>• Negative numbers</li> <li>• Expanding brackets</li> <li>• Order of operations</li> <li>• Notation-greater than/less than</li> <li>• Integers</li> <li>• Collecting like terms</li> <li>• Substitution</li> <li>• Drawing straight line graphs</li> <li>• Sketching quadratics</li> </ul> <p>Foundation Tier (up to Grade 5)</p> <ul style="list-style-type: none"> <li>• Solving equations including two-step and brackets</li> <li>• Forming equations (problem solving)</li> <li>• Solving inequalities</li> <li>• Representing solutions to inequalities on a number line</li> <li>• Drawing linear graphs and using them to solve equations.</li> <li>• Extension (covered next year) Solving quadratics by factorisation.</li> </ul> <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> <li>• Represent inequalities on a graph (shading regions)</li> <li>• Solving a quadratic by factorisation</li> <li>• Extension: solving a quadratic using completing the square and the formula</li> <li>• Solving quadratic inequalities (relate to the graph)</li> </ul>
Learning Outcomes (Knowledge)	

## **Unit 2 Simultaneous Equations**

### Pre-requisites

- Negative numbers
- Substitution
- Solving linear equations
- Solving quadratic equations
- Rearranging equations
- Drawing linear graphs
- Sketching quadratics

### Foundation Tier (up to Grade 5)

- Solving simple linear simultaneous equations
- Solving harder linear simultaneous equations
- Forming simultaneous equations in a context
- Solving linear simultaneous equations using graphs

### Additional content for Higher Tier (up to Grade 9)

- Solving simultaneous equations (one linear and one quadratic)
- Solving simultaneous equations using graphs (including quadratics and circles)
- Forming and solving simultaneous equations in context

### **Current learning to be developed in the future within:**

Students will extend their skills in Year 11 during:  
Autumn Block 4: Quadratic equations

### **Assessment**

Refer to assessment maps for formative and summative assessment opportunities.

### **Impact**

Attainment and Progress – Refer to assessment results / data review documentation.