



# YEAR 8 2023-2024 Spring TERM 1

'An ambitious curriculum that meets the needs of all'

## Medium Term Planning

7. Brackets, equations, and inequalities (2 week before Christmas and 2 weeks after) 8. Sequences 9. Indices

### Curriculum Intent

**UNIT 7: Brackets, equations, and inequalities (2 week before Christmas and 2 weeks after) - 13/14 lessons**

#### *Previously met:*

- Express missing number problems algebraically (Year 6).
- Find pairs of numbers that satisfy an equation with two unknowns (Year 6).
- Understand the difference between equality and equivalence (Year 7, Aut 2).
- Collecting like terms (Year 7, Aut 2).
- Form and solve one-step equations (Year 7, Aut 2).
- Form and solve two-step equations (Year 7, Spr 2).

To be able to:

- Form algebraic expressions.
- Use directed number with algebra.
- Multiply out a single bracket.
- Factorise into a single bracket.
- Expand multiple single brackets and simplify.
- **Expand a pair of binomials. (H)**
- Solve equations, including with brackets.
- Form and solve equations with brackets.
- Understand and solve simple inequalities.
- Form and solve inequalities.
- **Solve equations and inequalities with unknowns on both sides.**
- **Form and solve equations and inequalities with unknowns on both sides.**
- Identify and use formulae, expressions, identities and equations.

### Skills/Assessment Objective Links

#### REMINDER – Strategies for teaching.

- Avoid using grid method expansion of brackets for stronger classes
- When solving, write the inverse step underneath both sides as you go through each step
- For support classes function machines can be used to model equations

#### Links and interleaving

- Use of negative numbers and fractions throughout.
- Solve equations set in the context of earlier context – shapes, angles, probability, ratio etc.
- This unit can encompass all topics. A suggestion would be to include some fractions when expanding a pair of binomials.

## UNIT 8: Sequences – (7 lessons)

### *Previously met:*

- Primes, squares and triangular numbers (**Yea 7 Sum 2**)
- Sequences (**Year 7 Aut 1**)

To be able to:

- Generate Sequences given a rule in words
- Generate Sequences given a simple algebraic rule
- Generate Sequences given a complex algebraic rule
- **Find the rule for the nth term of a linear sequence (H)**

#### REMDINER – Strategies for teaching.

- Compare to the 'hidden times table' rather than go back to the 'zero term' when finding the nth term

### Links and interleaving

- Types of numbers (squares, primes etc)
- Pattern spotting

## UNIT 9: Indices– (7 lessons)

### *Previously met:*

- New Y8 content, however they have met squares, cubes and roots during Algebraic notation (**Year 7 Aut 1**) and Equality and Equivalence (**Year 7 Aut 2**)

To be able to:

- Add and subtract expressions with indices
- Simplify algebraic expressions by multiplying indices
- Simplify algebraic expressions by dividing indices
- Use the addition law for indices
- Use the addition and subtraction law for indices
- **Explore powers of powers (H)**

#### REMDINER – Strategies for teaching.

- Write divisions as fractions
- When introducing multiplying and division laws, write out in full  
Eg  $x^4 \times x^3$  should be written as  $(x \times x \times x \times x) \times (x \times x \times x)$

### Links and interleaving

- Algebraic fractions
- Algebra in the context of shape
- Simplifying expressions

<b>Spiritual, moral, social, and cultural development</b>	<p><b>SMSC:</b> 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.</p> <p><b>PSHE/British Values:</b> Working collaboratively, being respectful during discussion and valuing contributions made by others</p> <p><b>Skills Builder:</b> Key skills in numeracy used in all topic areas.</p>
<b>Numeracy</b>	Focus on key skills.
<b>Literacy</b>	<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>
<b>Becoming future ready</b>	<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>
<b>Adaptation</b>	<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>
<b>QFT/SEND Provision</b>	
<b>Implementation Curriculum Delivery</b>	<p><b>Support (S), Core (C), Extension (E).</b></p> <p><b>Brackets equations and inequalities - small steps</b></p> <ul style="list-style-type: none"> <li>• Form algebraic expressions. (S)</li> <li>• Use directed number with algebra. (S) – Some classes will need a full recap on directed number.</li> <li>• Multiply out a single bracket. (C)</li> <li>• Factorise into a single bracket. (C)</li> <li>• Expand multiple single brackets and simplify. (C)</li> <li>• <b>Expand a pair of binomials. (E)</b></li> <li>• Solve equations, including with brackets. (C)</li> <li>• Form and solve equations with brackets. (C)</li> <li>• Understand and solve simple inequalities. (C)</li> <li>• Form and solve inequalities. (C)</li> <li>• <b>Solve equations and inequalities with unknowns on both sides. (E)</b></li> <li>• <b>Form and solve equations and inequalities with unknowns on both sides. (E)</b></li> <li>• Identify and use formulae, expressions, identities and equations. (C)</li> </ul> <p><u>Extension</u></p> <ul style="list-style-type: none"> <li>• Expand three brackets.</li> <li>• Factorise quadratics.</li> </ul> <p><b>Sequences - small steps</b></p> <ul style="list-style-type: none"> <li>• Generate Sequences given a rule in words (S)</li> <li>• Generate Sequences given a simple algebraic rule (S/C/E)</li> <li>• Generate Sequences given a complex algebraic rule (C/E)</li> <li>• Find the rule for the nth term of a linear sequence (E)</li> </ul> <p><u>Extension</u></p> <ul style="list-style-type: none"> <li>• Decreasing sequences</li> </ul>
<b>Learning Outcomes (Most Powerful Knowledge)</b>	

	<ul style="list-style-type: none"> <li>• Introduction to nth term of basic quadratic sequences (finding the link between second differences and the coefficient of <math>n^2</math>)</li> </ul> <p><b>Indices- small steps</b></p> <ul style="list-style-type: none"> <li>• Add and subtract expressions with indices (S)</li> <li>• Simplify algebraic expressions by multiplying indices (S/C)</li> <li>• Simplify algebraic expressions by dividing indices (S/C)</li> <li>• Use the addition law for indices (C/E)</li> <li>• Use the addition and subtraction law for indices (C/E)</li> <li>• Explore powers of powers (E)</li> </ul> <p><u>Extension</u></p> <ul style="list-style-type: none"> <li>• Simplifying algebraic fractions</li> </ul>
Current learning to be developed in the future within:	<p><u>Brackets, equations and inequalities</u></p> <ul style="list-style-type: none"> <li>• Change the subject of a formula. <b>(Year 9, Aut 1)</b></li> <li>• Testing algebraic conjectures. <b>(Year 9, Aut 1)</b></li> <li>• Representing inequalities <b>(Year 9, Sum 2)</b></li> <li>• Factorise quadratics of the form <math>x^2 + bx + c</math> <b>(Year 10, Aut 1)</b></li> <li>• Represent solutions to inequalities on number lines <b>(Year 10, Aut 1)</b></li> <li>• Form and solve linear simultaneous equations. <b>(Year 10, Aut 1)</b></li> <li>• Solve quadratic equations and inequalities by factorising. <b>(Year 10, Aut 1)</b></li> <li>• Solve simultaneous equations, one linear and one quadratic. <b>(Year 10, Aut 1)</b></li> <li>• Maintain equivalence using the rules of indices. <b>(Year 10, Sum 2)</b></li> <li>• Completing the square. <b>(Year 11, Aut 1)</b></li> <li>• Change the subject of a formula where the subject appears more than once. <b>(Year 11, Aut 1)</b></li> <li>• Form and solve quadratic equations by factorising <b>(Year 11, Aut 1)</b></li> <li>• Solve quadratic equations using the formula and completing the square <b>(Year 11, Aut 1)</b></li> </ul> <p><u>Sequences</u></p> <ul style="list-style-type: none"> <li>• Functions <b>(Year 11 Aut 2)</b></li> <li>• Algebraic Reasoning <b>(Year 11 Spr 1)</b></li> </ul> <p><u>Indices</u></p> <ul style="list-style-type: none"> <li>• Standard Index Form <b>(Year 8 Spr 2)</b></li> <li>• Forming and Solving Equations <b>(Year 9 Aut 1)</b></li> <li>• Representing solutions to equations and inequalities <b>(Year 10 Aut 1)</b></li> <li>• Indices and Roots <b>(Year 10 Sum 2)</b></li> <li>• Changing the subject <b>(Year 11 Aut 1)</b></li> <li>• Algebraic Reasoning <b>(Year 11 Spr 1)</b></li> </ul>
Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.