



YEAR 10 Summer TERM 2

'An ambitious curriculum that meets the needs of all'

Medium Term Planning – Unit 13, 14, and 15

Types of number and sequences

Indices and roots

Manipulating

expressions

Curriculum Intent

UNIT :13 Types of number and sequences **H** **(4) F (8)**

Previously met: Y9 Spring 1 and Summer 6 (prime decomposition) Summer 6: nth term of a sequence.

To be able to:

- Factors, multiples, primes, HCF and LCM.
- Describe and continue sequences.
- Recognise and use sequences of triangular, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions (r^n where n is an integer, and r is a positive rational number **(or a surd) (and other sequences)**).
- Deduce expressions to calculate the n th term of linear **(and quadratic)** sequences.

Links and interleaving

- Recognise linear and non-linear sequences.
- Generate sequences from an algebraic rule.
- Find the n th term of a linear sequence.
- Factors and multiples.
- Prime factorisation.
- HCF and LCM.
- Types of number..

Skills/Assessment Objective Links

UNIT :14 Indices and Roots **F and H (8 hours)**

Previously met: Y9 Summer 6 (including standard form)

To be able to:

- Recognise and use sequences of square and cube numbers.
- **Estimate powers and roots of any given positive number.**
- Calculate with roots, and with integer **(and fractional)** indices.
- Calculate with numbers in standard form $A \times 10^n$ where $1 \leq A < 10$ and n is an integer.
- Simplifying expressions involving sums, products and powers, including the laws of indices.

Links and interleaving

- Understand the difference between equality and equivalence.
- Collecting like terms.

- Simple algebraic fractions.
- Expand over a single bracket.
- Simplify expressions involving brackets.
- Identify and use formulae, expressions, identities and equations.
- Expand a pair of binomials.
- Work with indices.
- Explore powers of powers.
- Order of operations.
- Prime factorisation.
- Writing numbers of any size in standard form.
- Rational and real numbers.

UNIT :15 Manipulating Expressions H (8 hours) F (2)

To be able to:

- Simplify expressions
- Use identities
- **Four rules with algebraic fractions**
- Equations and inequalities with fractions
- **Add and subtract with algebraic fractions**
- **Solve equations with algebraic fractions**
- Algebraic argument and proof

Links and interleaving

- Fractions
- Proof
- Brackets
- Collecting like terms
- Indices
- Expansion
- Negative numbers
- Order of operation
- Equations
- Inequalities

	<ul style="list-style-type: none"> • Simple algebraic fractions. • Expand over a single bracket. • Simplify expressions involving brackets. • Identify and use formulae, expressions, identities and equations. • Expand a pair of binomials. • Work with indices. • Explore powers of powers. • Order of operations. • Prime factorisation. • Writing numbers of any size in standard form. • Rational and real numbers. <h2>UNIT :15 Manipulating Expressions H (8 hours) F (2)</h2> <p>To be able to:</p> <ul style="list-style-type: none"> • Simplify expressions • Use identities • Four rules with algebraic fractions • Equations and inequalities with fractions • Add and subtract with algebraic fractions • Solve equations with algebraic fractions • Algebraic argument and proof <h3><u>Links and interleaving</u></h3> <ul style="list-style-type: none"> • Fractions • Proof • Brackets • Collecting like terms • Indices • Expansion • Negative numbers • Order of operation • Equations • Inequalities
Spiritual, moral, social, and cultural development	<p>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.</p> <p>PSHE/British Values: Working collaboratively, being respectful during discussion and valuing contributions made by others</p> <p>Skills Builder: Key skills in numeracy used in all topic areas.</p>
Numeracy	Focus on key skills.
Literacy	<p>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,</p> <p>Vocabulary Tier 3: Title slide in all shared resource presentations show the key vocabulary for each topic.</p> <p>Reading: Underlining command words,</p>

	<p>Writing: Modelling solutions Oracy: Think, pair, share, discussion, verbal feedback (peer to peer), questioning, student modelling</p>
Becoming future ready	<p>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.</p> <p>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.</p>
Adaptation	<ul style="list-style-type: none"> • 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.
QFT/SEND Provision	
Implementation Curriculum Delivery	<p><u>Unit 13: Types of Numbers and Sequences</u></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> • Factors, multiples and primes • HCF and LCM • Venn diagrams • Sequences <p>Foundation Tier (up to Grade 5)</p> <ul style="list-style-type: none"> • Prime factorisation including LCM and HCF. • nth term of a sequence • Other sequences: geometric and Fibonacci <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> • Sequences with surds • Quadratic sequences
Learning Outcomes (Knowledge)	<p><u>Unit 14: Indices and Roots</u></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> • Square and cube numbers • Multiplying and dividing by ten <p>Foundation Tier (up to Grade 5)</p> <ul style="list-style-type: none"> • Calculate higher powers and roots. • Standard form • Rules of indices • Negative indices and zero indices <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> • Fractional indices • Links to surds
	<p><u>Unit 15: Manipulating expressions.</u></p> <p>Pre-requisites</p> <ul style="list-style-type: none"> • Simplify expressions. • Rules of indices • Rules of fractions. • Equations and inequalities <p>Foundation Tier (up to Grade 5)</p>

	<ul style="list-style-type: none"> • Equations and inequalities with fractions • Algebraic proof <p>Additional content for Higher Tier (up to Grade 9)</p> <ul style="list-style-type: none"> • Simplify algebraic fractions. • Solve equations and inequalities with algebraic fractions. • Further algebraic proof
Current learning to be developed in the future within:	<p>Y11 Spring 5: Revisit data and probability.</p> <p>Y11 Spring 5: Product rule for counting</p>
Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.