



YEAR 7 Autumn TERM 1

'An ambitious curriculum that meets the needs of all'

Medium Term Planning

Directed number, Sequences and Algebraic Notation

UNIT: Directed Number (Part 1), (6 lessons as 1 will be for a baseline assessment)

Curriculum Intent

Previously met: See notes from KS2 National Curriculum

- Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero. (Year 5).
- Use negative numbers in context, and calculate intervals across zero. (Year 6).

To be able to:

- Understand and use representations of directed numbers.
- Order directed numbers.
- Perform calculations that cross zero.
- Add and subtract negative numbers.
- Multiplication and division of negative numbers.
- Using a calculator for directed number calculations.

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We must be trying to use negative number tiles to show how negative numbers work, even for the higher attaining class. Also, we have time to recap this topic during spring term 4.

Links and interleaving

- Real life contexts, such as money, temperature, sea level.

Sequences (7 lessons)

Previously met: See notes from KS2 National Curriculum

- Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule. (Year 6).

To be able to:

- Describe and continue a sequence given diagrammatically.
- Predict and check the next term(s) of a sequence.
- Represent sequences in tabular and graphical forms.
- Recognise the difference between linear and non-linear sequences.
- Continue numerical linear sequences
- Continue numerical non-linear sequences
- Explain the term-to-term rule of numerical sequences in words
- **Find missing numbers within sequences.**

Links and interleaving

- Calculators should be used throughout this unit, building in teaching efficient use of calculators and informal estimation.
- All material in this unit is revisited and extended in forthcoming units
- Relationships between diagrams and number sequences

Skills/Assessment Objective Links

	<p>Links with linear graphs.</p> <ul style="list-style-type: none"> Sequences with fractions and negative numbers. <p><i>Algebraic Notation (7 lessons).</i></p> <p><i>Previously met: See notes from KS2 National Curriculum</i></p> <ul style="list-style-type: none"> Use simple formulae. (Year 6). Express missing number problems algebraically. (Year 6). Find pairs of numbers that satisfy an equation with two unknowns. (Year 6). Enumerate possibilities of combinations of two variables. (Year 6). Introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand. (Year 6). <p>To be able to:</p> <ul style="list-style-type: none"> Given a numerical input, find the output of a single function machine. Use inverse operations to find the input given the output. Use diagrams and letters to generalise number operations. Use diagrams and letters with single function machines. Find the function machine given a simple expression. Substitute values into single operation expressions. Find numerical inputs and outputs for a series of two function machines. Use diagrams and letters with a series of two function machines. Find the function machine given a two-step expression. Substitute values into two-step expressions. Generate sequences given an algebraic rule. Represent one and two-step functions graphically. <p><u>Links and interleaving</u></p> <ul style="list-style-type: none"> Calculators should be used throughout this unit, building in teaching efficient use of calculators and informal estimation. All material in this unit is revisited and extended in forthcoming units. Substitution is an interleaving topic. Sequences. Graphs
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</p> <p>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</p>

	<p>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>Support (S), Core (C), Extension (E).</p> <p>Directed number (part 1) – small steps</p> <ul style="list-style-type: none"> • Understand and use representations of directed numbers. (S) • Order directed numbers. (S) • Perform calculations that cross zero. (S) • Add and subtract negative numbers. (C) • Multiplication and division of negative numbers. (C) • Using a calculator for negative number calculations (C) <p><u>Extension tasks – These could be interleaved within the core knowledge</u></p> <ul style="list-style-type: none"> • Start to introduce negative fractions, decimals with the four operations. (Higher attaining pupils should have seen adding fractions and decimals from primary school). • Comparing numbers with inequalities. (This is not in the primary curriculum, but I am certain some will be aware of them). <p>Sequences – small steps</p> <ul style="list-style-type: none"> • Describe and continue a sequence given diagrammatically. (S) • Predict and check the next term(s) of a sequence. (S) • Continue numerical linear sequences (S) • Recognise the difference between linear and non-linear sequences. (C) • Explain the term-to-term rule of numerical sequences in words (C) • Continue numerical non-linear sequences (C) • Represent sequences in tabular and graphical forms. (C) • Find missing numbers within sequences. (E) <p><u>Extension tasks</u></p> <ul style="list-style-type: none"> • Work with sequences, linear and non-linear, involving negative numbers and fractions. • Nth term of a linear sequences. • Fibonacci sequence. <p>Algebraic notation -small steps</p> <ul style="list-style-type: none"> • Given a numerical input, find the output of a single function machine. (S) • Use inverse operations to find the input given the output. (S) • Use diagrams and letters to generalise number operations. (C) • Use diagrams and letters with single function machines. (C) • Find the function machine given a simple expression. (C) • Substitute values into single operation expressions. (C) • Find numerical inputs and outputs for a series of two function machines. (C) • Use diagrams and letters with a series of two function machines. (C) • Find the function machine given a two-step expression. (C) • Substitute values into two-step expressions. (C) • Generate sequences given an algebraic rule. (E) • Represent one and two-step functions graphically. (E) <p><u>Extension</u></p> <ul style="list-style-type: none"> • Substitution into more complex formulae, involving negative numbers. • Function machines involving square and square roots.
Learning Outcomes (Most Powerful Knowledge)	

<p>Current learning to be developed in the future within:</p>	<p><u>Directed number – All of the topics below will be visited within Year 7 and will involve negative numbers</u></p> <ul style="list-style-type: none"> • Coordinates. • Solving equations. • Sequences. • Simplifying algebraic expressions. • Adding and subtracting fractions <p><u>Sequences</u></p> <ul style="list-style-type: none"> • Nth term of linear sequences. • Nth term of quadratic sequences • Geometric sequences. • Links between linear sequences and graphs. <p><u>Algebraic notation</u></p> <ul style="list-style-type: none"> • Expanding brackets. • Solving equations. • Solving inequalities. • Indices involving algebra. • Simultaneous equations. • Forming and solving equation which can involve shape, probability, angles etc. • Quadratic equations. • Linear and quadratic graphs.
<p>Assessment</p>	<p>Refer to assessment maps for formative and summative assessment opportunities.</p>
<p>Impact</p>	<p>Attainment and Progress – Refer to assessment results / data review documentation.</p>