

KEVICC Key Stage 3 Curriculum Subject: Mathematics		Key Vocabulary and notation.	
Spring Half-Term 2 Directed Number and Fractional Thinking			
Term: Year 7 Spring Term – Block Four	Topic: Directed Number	Positive	Fraction button
<p>What is the essential knowledge from this unit? What do students need to remember and understand?</p> <p>Students will only have had limited experience of directed number at primary school, so this block is designed to extend and deepen their understanding of this. Multiple representations and contexts will be used to enable students to appreciate the meaning behind operations with negative integers rather than relying on a series of potentially confusing rules. As well as exploring directed number in its own right, this block provides valuable opportunities for revising and extending earlier topics, notably algebraic areas such as substitution and the solution of equations; in particular students will be introduced to two-step equations for the first time in this block.</p> <p>National curriculum content covered:</p> <ul style="list-style-type: none"> Select and use appropriate calculation strategies to solve increasingly complex problems. Use the four operations, including formal written methods, applied to integers, both positive and negative. Recognise and use relationships between operations including inverse operations. Use square and square roots. Use a calculator and other technologies to calculate results accurately and then interpret them appropriately. Substitute numerical values into formulae and expressions, including scientific formulae. Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors. Simplify and manipulate algebraic expressions to maintain equivalence. Understand and use standard mathematical formulae <p>We know that breaking the curriculum down into small manageable steps should help students to understand concepts better. As a result, for each block of content in the scheme of learning we have provided the following 'small step' breakdown for this unit as follows:</p> <p>Lesson One - Understand and use representations of directed numbers Lesson Two - Order directed numbers using lines and appropriate symbols Lesson Three - Perform calculations that cross zero Lesson Four - Add directed numbers Lesson Five - Subtract directed numbers Lesson Six - Multiplication of directed numbers Lesson Seven - Multiplication and division of directed numbers Lesson Eight - Use a calculator for directed number calculations Lesson Nine - Evaluate algebraic expressions with directed number Lesson Ten - Introduction to two-step equations Lesson Eleven - Solve two-step equations Lesson Twelve - Use order of operations with directed numbers Lesson Thirteen - Understand that positive numbers have more than one square root (H) Lesson Fourteen - Explore higher powers and roots (H)</p> <p>Interleaving/Extension of previous work</p> <ul style="list-style-type: none"> Use conventional notation for the priority of operations. Forming and solving linear equations, including two-step equations. 		Negative	Substitute
		Reflection	Expression
		Symmetric	Order of
		Sea Level	operations
		Ascending	Solve
		Descending	Equation
		Smaller/bigger	Balance
		than	Solution
		Greater/less	Function
		than	machine
		Increase	Zero pair
		Decrease	Balance
		Difference	Positive/negative
		Add	solution
		Subtract	Order of
		Minus	operations
		Partition	Indices
		Zero pair	Brackets
		Product	Priority
		Commutative	Square
		Inverse	Square root
		Product	Power
		Calculator	Root
		Sign change	Exponent
		\pm	
		Mathematical questioning should be designed to unpick the structure of the maths and deepen the student's understanding. When students talk about mathematical concepts, they should develop the vital mathematical language that helps them explain their ideas fully.	
		Students are expected and encouraged to use terminology during all discussions, verbal feedback and in written content.	
<p>What prior learning supports understanding of this content?</p> <ul style="list-style-type: none"> Use mental and formal written methods of addition with integers and decimals. Find simple fractions and percentages of amounts. Workout simple fractions and percentages and percentages of amounts with and without a calculator. Represent tenths and hundredths on diagrams and number lines. Convert between mixed numbers and improper fractions. Add and subtract fractions with the same denominator, one denominator a multiple of the other, different denominators. 		<p>How does this content link to future learning?</p> <ul style="list-style-type: none"> Mental arithmetic strategies. Use known facts to drive other facts. Evaluate an algebraic expression given a related fact. Use estimation. Recognise prime, square and triangle numbers. Express a number as a product of prime factors. Powers and roots. Make and test conjectures. Understand and use counter examples. Negative square roots. Higher powers. 	
<p>Reading: <i>Where in the unit are students supported to read complex academic text?</i></p> <ul style="list-style-type: none"> Reading and understanding mathematical questions and problems' – teacher input. Decoding complex examination questions - explain what they are asking the student to do' – teacher input. Following instructions to solve problems - break down the tasks – teacher input. Recognising terminology, numbers, and symbols. Recognising patterns and relationships in mathematics. 		<p>Writing: <i>Independent writing tasks and how they are structured</i></p> <ul style="list-style-type: none"> Using the correct subject specific terminology for numbers and symbols – examination papers, class books. Responding to questions that ask for an explanation or a reason – examination papers, class books. Self-evaluation, reviewing, reflecting and analysis of own work –, class books, personalised learning checklists and analysis. Creating notes that can be used later for revision purposes - class books, revision cards, mind maps etc. 	

Key assessments:

How will students review the information learned?

End of block assessments.

End of block assessments provide a quick progress check at the end of each block of learning to make sure students have understood the content covered.

A Core paper – it is envisaged that all students will take this paper, to provide a direct comparison with the performance of the rest of the cohort. All topics from each term will be covered, and the use of a calculator is expected.

End of term assessments.

A Foundation paper – students who are working below national expectations will have the opportunity to show their understanding of the material with more straightforward questions. Non calculator paper.

A Higher paper – students who are working at or above national expectations will have the opportunity to tackle more challenging questions on the same material, plus the extra objectives indicated as "Higher" in our scheme of learning. Non calculator paper.

How will feedback be seen?

Marked end of block and term assessments.

Personalised learning checklists for end of term assessments identifying strengths and areas of development.

Written teacher feedback and marking in compliance with faculty and College Marking Policies. Student responses to marking.

Students self-mark using purple pen. Verbal feedback given every lesson from teacher and peers as appropriate.

Teacher and student self-assessment of presentation of class books will be completed to ensure written work is of high standard and students are achieving their potential.