


Subject	Year	Month		
Mathematics	8	September		
Topic:				
CALCULATING WITH NEGATIVES				6 LESSONS
Content (Intent)				
Prior Learning Y7 Sept - Calculating with all four operations (including decimals) Y7 Oct - Know all squared numbers up to 144. - The order of operations (BIDMAS) Y7 May - Convert between an improper fraction and a mixed number		Future Learning Continuously used throughout KS3 and KS4 in topics such as expanding, substitution, solving and other numerical calculations.		
Objectives <ul style="list-style-type: none"> Addition with a mixture of positive and negative numbers Subtraction with a mixture of positive and negative numbers Multiplication with a mixture of positive and negative numbers Square and cube positive and negative numbers Division with a mixture of positive and negative numbers Understand how to use the order of operations including powers and roots and negative values. Apply calculating with negatives and the order of operation in SUBSTITUTION questions. 		For teaching purposes Possible questions <ul style="list-style-type: none"> Convince me that $-3 - -7 = 4$ Show me an example of a calculation involving addition of two negative numbers and the solution -10. And another... Misconceptions <ul style="list-style-type: none"> may use a rule stated as ‘two minuses make a plus’ and make many mistakes as a result; e.g. $-4 + -6 = 10$ may incorrectly apply the principle of commutativity e.g. $4 - 7 = 3$ may think that $x^2 = -9$ when $x = -3$. The fact that a calculator applies the correct order means that $-3^2 = -9$ and this actually reinforces the misconception. In this situation brackets should be used: $(-3)^2 = 9$ 		
Pedagogical notes (implementation)		How will understanding be assessed & recorded (Impact)		
<ul style="list-style-type: none"> how to enter negative numbers into calculator and interpret the display. use the language ‘negative number’, and not ‘minus’, to avoid confusion with calculations <ul style="list-style-type: none"> $-2 - 5 =$ negative 2 subtract 5 $4 - - 6 = 4$ subtract negative 6 Taking away a negative will make the value go up. Do not use “two minuses make a plus” BIDMAS is not a topic; it’s a tool to remember “the Order of Operations”. 		8BAM2 Negative Numbers End of term Assessment in December End of Year Assessment in June How can parents help at home? MathsWatch clips (Qualification KS3) N18, N19a, N19b		
Further reading/discussion				
Reading / Enrichment NRICH: Adding and subtracting positive and negative numbers NRICH: History of negative numbers KM: Summing up KM: Developing negatives KM: Sorting calculations KM: Maths to Infinity: Directed numbers NRICH: Working with directed numbers	Literacy Negative number Directed number Improper fraction Top-heavy fraction Mixed number Operation Inverse Long multiplication Short division Power Indices Roots	Numeracy Links	Careers Links Bank manager Deep sea diver Weather Forecast	