



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Intermediate – Calculations

Lesson Objective	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this, students need to already know that...</i>	Assessment
To learn how to calculate with negatives	<ul style="list-style-type: none"> • Students will know how to add and subtract positive integers to/from a positive or negative integer • Students will know how to add and subtract negative integers to/from a positive or negative integer • Students will know how to multiply positive and negative integers • Students will know how to divide positive and negative integers • Students will know how to square and cube positive and negative integers • Students will know how to solve real life problems involving calculating with negatives 	<p>Negative – Less than zero Product – in maths, a product is the result of multiplication Integer – a whole number Sum – The result of adding two or more numbers</p>	<ul style="list-style-type: none"> • Students need to know how to order negative and positive integers 	Exam Prep 1
To learn how to multiply decimals	<ul style="list-style-type: none"> • Students will know how to multiply decimals. They will know that to do this they need to multiply the decimals by powers of ten to achieve integers which they can then multiply more easily using column multiplication. They will know that they then divide by an appropriate power of 10 at the end to achieve the accurate answer. • Students will know how to solve worded problems involving multiplication of decimals • Students will know how to divide a decimal by an integer • Students will know how to divide a decimal by a decimal. They will know that the easiest way to do this is to write the calculation as a fraction and eliminate the decimal from the denominator by multiplying the numerator and denominator by an appropriate power of 10 before then carrying out the calculation • Students will know how to solve worded problems involving the division of decimals 	<p>Decimal – a number whose whole number part and the fractional part is separated by a decimal point</p>	<ul style="list-style-type: none"> • Students will know how to multiply and divide by 10, 100, 1000 etc. • Students need to know how to multiply integers using the column method. 	Exam Prep 1
To learn how to divide decimals	<ul style="list-style-type: none"> • Students will know how to divide a decimal by an integer • Students will know how to divide a decimal by a decimal. They will know that the easiest way to do this is to write the calculation as a fraction and eliminate the decimal from the denominator by multiplying the numerator and denominator by an appropriate power of 10 before then carrying out the calculation • Students will know how to solve worded problems involving the division of decimals • 	<p>Divide – the act or process of separating or sharing</p>	<ul style="list-style-type: none"> • Students will need to know how to multiply and divide by powers of 10. • Students will need to know how to write equivalent fractions 	
To learn how to use the index laws	<ul style="list-style-type: none"> • Students will know how to use the basic index laws for multiplication, division and brackets with integer base • Students will know how to interpret the power of 0 	<p>Indices – plural of index, in maths, an index, or a power, is the small floating number that goes next to a number or letter</p>	<ul style="list-style-type: none"> • Students will need to have knowledge of using the four operations with whole numbers. • Students will need to be able to use negative numbers with the four operations, recall and use the hierarchy of operations and understand inverse operations. 	Exam Prep 1

Lesson Objective	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this, students need to already know that...</i>	Assessment
To learn how to interpret fractional and negative indices.	<ul style="list-style-type: none"> • Students will know how to evaluate negative powers • Students will know how to evaluate fractional powers where the power is a unit fraction (e.g. 1/2, 1/3) • Students will know how to evaluate more difficult fractional powers where the power is a non-unit fraction (e.g. 2/3) 	<p>Indices – plural of index, in maths, an index, or a power, is the small floating number that goes next to a number or letter</p> <p>Reciprocal – The reciprocal of a number is 1 divided by the number</p>	<ul style="list-style-type: none"> • Students will need to know how to use the basic index laws for multiplication, division and brackets with integer base • Students will need to be able to calculate with negative numbers • Students will need to know how to evaluate roots and powers 	Exam Prep 1
To learn how to round to an appropriate degree of accuracy	<ul style="list-style-type: none"> • Students will know how to round to a given number of decimal places. • Students will know how to round to a given number of significant figures • Students will know that nonzero digits are always significant • Students will know that zeros between nonzero digits are always significant • Students will know that leading zeros are never significant • Students will know that trailing zeros are only significant if the number contains a decimal point 	<p>Significant – sufficiently important to be worthy of attention</p> <p>Rounding – making a number simpler but keeping its value close to what it was. The result is less accurate, but easier to use</p> <p>Significant figures – the digits in a number that contribute to the degree of accuracy of the value and that we start counting significant figures at the first nonzero digit</p>	<ul style="list-style-type: none"> • Students should already know how to round to the nearest 10/100/1000 etc. 	Exam Prep 1
To learn how to estimate	<ul style="list-style-type: none"> • Students will know how to estimate answers to simple calculations by rounding all of the numbers within a question to one significant figure. • Students will know how to estimate answers to more complex, multi-step calculations by rounding numbers within a question to one significant figure including where there is a decimal in the denominator • Students will know how to estimate roots. 	<p>Estimate – an approximate calculation or judgement of the value, number, quantity, or extent of something.</p>	<ul style="list-style-type: none"> • Students will need to know how to round to a given number of significant figures • Students will need to know how to divide by simple decimals 	Exam Prep 1
To learn how to find upper and lower bounds and write error intervals	<ul style="list-style-type: none"> • Students will know how to find the upper and lower bounds of numbers given to varying degrees of accuracy • Students will know how to use inequality notation to specify error intervals due to rounding • Students will know how to use inequality notation to specify error intervals due to truncation 	<p>Upper bound – an element greater than or equal to all the elements in a given set</p> <p>Lower bound – an element less than or equal to all the elements in a given set</p> <p>Error interval – an expression written using inequalities that shows the range of possible values that a number could have been before it was rounded or truncated.</p> <p>Inequality – a symbol which makes a non-equal comparison between two numbers or other mathematical expressions e.g. $>$, $<$, \geq and \leq</p>	<ul style="list-style-type: none"> • Students will need to know how to round to decimal places, nearest integer, 10/100/1000 etc. and significant figures 	Exam Prep 1