



The Sutton Academy

# Knowledge Rich Curriculum Plan

Year 9 Core – Place Value and Calculations

Lesson/Learning Sequence	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
<p><b>To learn how to compare and order numbers.</b></p>	<ul style="list-style-type: none"> <li>• Students will know how to solve real life problems that involve comparing positive and negative integers</li> <li>• Students will know that to order decimals we must compare each digit within the number individually, starting with the highest value digit.</li> <li>• Students will know how to use the symbols <math>&lt;</math>, <math>&gt;</math>, <math>=</math>, <math>\neq</math> to compare small and large integer numbers.</li> <li>• Students will know how to use the symbols <math>&lt;</math>, <math>&gt;</math>, <math>=</math>, <math>\neq</math> to compare positive and negative numbers.</li> <li>• Students will know how to use the symbols <math>&lt;</math>, <math>&gt;</math>, <math>=</math>, <math>\neq</math> to compare decimals.</li> <li>• Students will know how to compare a mixture of negative numbers and decimals.</li> </ul>	<p><b>Integer</b> – a whole number  <b>Decimal</b> – a number whose whole number part and the fractional part is separated by a decimal point  <b>Compare</b> - estimate, measure, or note the similarity or dissimilarity between.  <b>Order</b> – the arrangement of people or things in relation to each other according to a particular sequence, pattern, or method.  <b>Ascending</b> – going up  <b>Descending</b> – going down  <b>Negative</b> – Less than zero  <b>Inequality</b> – a symbol which makes a non-equal comparison between two numbers or other mathematical expressions e.g. <math>&gt;</math>, <math>&lt;</math>, <math>\geq</math> and <math>\leq</math></p>	<ul style="list-style-type: none"> <li>• Students should already know how to order positive and negative integers</li> </ul>	<p>Mini-Assessment 1</p>
<p><b>To learn how to calculate with negative numbers.</b></p>	<ul style="list-style-type: none"> <li>• Students will know how to add and subtract with negative numbers using a number line.</li> <li>• Students will know how to multiply a positive number to a negative number.</li> <li>• Students will know how to multiply two negative numbers together.</li> <li>• Students will know how to divide when one number is positive and one is negative.</li> <li>• Students will know how to divide when both numbers are negative.</li> <li>• Students will know how to solve real life problems involving negative numbers.</li> </ul> <p><b>Avoid using terminology such as 2 negatives make a positive. Make sure students understand why.</b></p>	<p><b>Negative</b> – Less than zero  <b>Sum</b> – The result of adding two or more numbers</p>	<ul style="list-style-type: none"> <li>• Students need to know how to add and subtract positive integers using the column method</li> <li>• Students need to know how to multiply and divide positive integers.</li> </ul>	<p>Mini-Assessment 1</p>
<p><b>To learn how to multiply decimals.</b></p>	<ul style="list-style-type: none"> <li>• Students will know how to multiply decimals by firstly multiplying the decimals by a power of 10 to produce integer values.</li> <li>• Students will know how to multiply their new integer values using the column method.</li> <li>• Students will know how to lastly divide by the same powers of 10 as used in their first step to produce their decimal product.</li> <li>• Students will know how to solve real life problem involving the multiplication of decimals using the column method- money problems.</li> <li>• Students will know how to solve multi-step problems involving multiplication of decimals.</li> </ul>	<p><b>Decimal</b> – a number whose whole number part and the fractional part is separated by a decimal point  <b>Integer</b> – a whole number</p>	<ul style="list-style-type: none"> <li>• Students need to know how to multiply and divide by powers of 10.</li> <li>• Students need to know how to multiply numbers using column multiplication.</li> </ul>	<p>Mini-Assessment 1</p>

Lesson/Learning Sequence	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 divide integers.	<ul style="list-style-type: none"> <li>• Students will know how to use short division to produce a decimal answer – they will not express these answers using remainders.</li> <li>• Students will know how to divide integers by other integers using long division.</li> <li>• Students will know how to solve more complex multi-step and/or worded problems involving multiplication and division with integers.</li> </ul>		<ul style="list-style-type: none"> <li>• Students should already know how to divide integers using short division</li> </ul>	Mini-Assessment 1
To learn how to divide with decimals.	<ul style="list-style-type: none"> <li>• Students will know how to divide a decimal by an integer using short division.</li> <li>• Students will know how to divide a decimal by an integer using long division.</li> <li>• Students will know how to divide a decimal by a decimal by firstly multiplying both numbers by a matching power of 10.</li> <li>• Students will know that the power of 10 needs to at least make that the decimal you are dividing by an integer value.</li> <li>• Students will know how to divide their resulting values to produce an overall answer to the problem without needing to make any extra adjustments.</li> <li>• Students will know how to solve multi-step problems involving multiplication and division of decimals</li> </ul>		<ul style="list-style-type: none"> <li>• Students need to know how to divide integers using short division.</li> <li>• Students need to know how to multiply by powers of 10.</li> </ul>	Mini-Assessment 1
To learn how to use numerical index laws.	<ul style="list-style-type: none"> <li>• Students will know how to use the basic index law for multiplication with an integer base.</li> <li>• Students will know how to use the basic index law for division with an integer base.</li> <li>• Students will know how to use the basic index law for brackets with an integer base.</li> <li>• Students will know how to interpret the power of 0.</li> <li>• Students will know how to use the basic index laws involving negative powers.</li> </ul> <p><b>Opportunity for challenge:</b></p> <ul style="list-style-type: none"> <li>• Students will know how to use a mixture of the index laws within the same problem.</li> </ul> <p><b>Show students how it works rather than just using tricks.</b></p>	Indices – (Plural of index) or powers, are the small floating number that goes next to a number or letter	<ul style="list-style-type: none"> <li>• Students need to know how to calculate with integer powers – particularly squares and cubes.</li> </ul>	Mini-Assessment 1
To learn how to use the order of operations.	<ul style="list-style-type: none"> <li>• Students will know how to know and identify different aspects of BIDMAS.</li> <li>• Students will know how to use BIDMAS to solve a calculation.</li> <li>• Students will know how to use BIDMAS to solve calculations involving indices.</li> <li>• Students will know how to use BIDMAS to solve calculations involving several steps.</li> <li>• Students will know that division and multiplication are interchangeable operations.</li> <li>• Students will know that when a calculation has only addition and subtract involved that they must calculate from left to right.</li> <li>• Students will know how to place brackets in a calculation to obtain a certain answer.</li> </ul> <p><b>They will not think that division comes before multiplication or addition comes before subtraction.</b></p> <p><b>Opportunity for challenge:</b></p> <ul style="list-style-type: none"> <li>• Students will know how to solve BIDMAS problems involving negative numbers.</li> </ul>	Indices – (Plural of index) or powers, are the small floating number that goes next to a number or letter	<ul style="list-style-type: none"> <li>• Students need to know how to calculate powers and roots of integer numbers.</li> <li>• Students need to know how to add, subtract, multiply and divide integer numbers.</li> <li>• Students need to know how to calculate with negatives</li> </ul>	Mini-Assessment 1