



The Sutton Academy

# Knowledge Rich Curriculum Plan

Year 10 Foundation – Number 2

| Lesson/Learning Sequence                                       | Intended Knowledge:<br><i>Students will know that...</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Tiered Vocabulary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Prior Knowledge:<br><i>In order to know this, students need to already know that...</i>                                                                                                                                                                                                                                                                                                                                                | Assessment  |
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| To learn how to round to an appropriate degree of accuracy     | <ul style="list-style-type: none"> <li>Students will know how to round to a given number of decimal places.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p><b>Rounding</b> – making a number simpler but keeping its value close to what it was. The result is less accurate, but easier to use.</p> <p><b>Decimal Place</b> – the position of a digit to the right of a decimal point.</p>                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>Students should already know how to round to the nearest 10/100/1000 etc.</li> </ul>                                                                                                                                                                                                                                                                                                            | Exam Prep 1 |
| To learn how to round to a given number of significant figures | <ul style="list-style-type: none"> <li>Students will know that significant figures are 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</li> <li>Students will know that nonzero digits are always significant</li> <li>Students will know that Zeros between nonzero digits are always significant</li> <li>Students will know that trailing zeros are only significant if the number contains a decimal point</li> <li>Students will know how to round to a given number of significant figures</li> </ul> | <p><b>Significant</b> – sufficiently important to be worthy of attention</p> <p><b>Significant figures</b> – 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"> <li>Students should already know how to round numbers to a given number of decimal places</li> <li>Students should already know how to round numbers to a powers of 10.</li> </ul>                                                                                                                                                                                                                  |             |
| To learn how to estimate                                       | <ul style="list-style-type: none"> <li>Students will know how to estimate answers to simple calculations by rounding all of the numbers within a question to one significant figure.</li> <li>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</li> <li>Students will know how to estimate roots.</li> </ul>                                                                                                                                               | <p><b>Estimate</b> – an approximate calculation or judgement of the value, number, quantity, or extent of something.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Students will need to know how to round to a given number of significant figures</li> <li>Students will need to know how to divide by simple decimals</li> </ul>                                                                                                                                                                                                                                | Exam Prep 1 |
| To learn how to find error intervals                           | <ul style="list-style-type: none"> <li>Students will know how to find the upper and lowers bounds of numbers given to varying degrees of accuracy</li> <li>Students will know how to use inequality notation to specify error intervals due to rounding</li> <li>Students will know how to use inequality notation to specify error intervals due to truncation</li> </ul>                                                                                                                                                                                                                                          | <p><b>Upper bound</b> – an element greater than or equal to all the elements in a given set</p> <p><b>Lower bound</b> – an element less than or equal to all the elements in a given set</p> <p><b>Error interval</b> – 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><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 will need to know how to round to decimal places, nearest integer, 10/100/1000 etc. and significant figures</li> </ul>                                                                                                                                                                                                                                                                 | Exam Prep 1 |
| To learn how to use a calculator accurately                    | <ul style="list-style-type: none"> <li>Students will know how to efficiently use a calculator to carry out complex calculations involving positive and negative numbers, brackets, square, cube, powers and roots, and all four operations.</li> <li>Students will know how to add, subtract, multiply and divide mixed numbers using a calculator</li> </ul>                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>Students will need to know how to use the 4 operations on a calculator</li> <li>Students will need to know how to input fractions into a calculator, including mixed numbers.</li> <li>Students will need to know to convert fractions to decimals using the symbol to decimal button.</li> <li>Students will need to know how to input indices into the calculator including roots.</li> </ul> | Exam Prep 1 |

| Lesson/Learning Sequence                                                                                 | Intended Knowledge:<br><i>Students will know that...</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Tiered Vocabulary                                                                                                                                                                                                                                                                                                                                | Prior Knowledge:<br><i>In order to know this, students need to already know that...</i>                                                                                                                                                                                                                                                                     | Assessment |
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|                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Students will need to know how to input more complex calculations into a calculator, involving fractions, cubes and square roots.</li> <li>• Students will need to know how find a percentage using the percentage button.</li> <li>• Students will need to know how to use the <math>\pi</math> symbol</li> </ul> |            |
| <b>To learn how to identify factors, multiples and primes</b>                                            | <ul style="list-style-type: none"> <li>• Students will know what factors are and be able to list all factors of a number systematically</li> <li>• Students will know what multiples are and be able to list multiples of a number systematically</li> <li>• Students will know at least the first 10 prime numbers and be able to identify prime numbers from a list.</li> <li>•</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <p><b>Prime Number</b> – In maths, prime numbers are whole numbers greater than 1, that have only two factors: 1 and the number itself.</p> <p><b>Multiple</b> – A multiple is a number in the given number’s multiplication tables</p> <p><b>Factor</b> – A factor is a number that divides into a given number without leaving a remainder</p> | <ul style="list-style-type: none"> <li>• Students need a secure understanding of their multiplication tables</li> </ul>                                                                                                                                                                                                                                     |            |
| <b>To learn how to find the Highest Common Factor and Lowest Common Multiple for two or more numbers</b> | <ul style="list-style-type: none"> <li>• Students will know what Highest common factor means and how to find the highest common factor (HCF) of two or more numbers by listing</li> <li>• Students will know what lowest common multiple means and how to find the lowest common multiple (LCM) of two or more numbers by listing</li> <li>• Students will know how to solve more complex problems involving HCF or LCM including problems involving real life contexts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                         | <p><b>Common</b> – shared by, coming from, or done by two or more people, groups, or things.</p> <p><b>Highest Common Factor</b> – the largest number that both or all of the numbers can be divided by</p> <p><b>Lowest Common Multiple</b> – the smallest number that is in both numbers’ times tables</p>                                     | <ul style="list-style-type: none"> <li>• Students need to know how to find factors and multiples for a number</li> </ul>                                                                                                                                                                                                                                    |            |
| <b>To learn how to find the product of primes for a number and use it to calculate HCF and LCM</b>       | <ul style="list-style-type: none"> <li>• Students will know how to find the prime factor decomposition of positive integers and write as a product using index notation. They will also understand that the prime decomposition is unique for every number.</li> <li>• Students will know that the prime factor decomposition of a positive integer is unique – whichever factor pair you start with – and that every number can be written as a product of two factors.</li> <li>• Students will know how to find the lowest common multiple (LCM) and highest common factor (HCF) of two numbers from their prime factorisation using a Venn diagram</li> </ul>                                                                                                                                                                                                                                          | <p><b>Product</b> – in maths, a product is the result of multiplication</p> <p><b>Product of Primes</b> – a product in which every factor is a prime number</p>                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Students need to know their prime numbers</li> <li>• Students need to know how to write a calculation in its simplest form using indices</li> </ul>                                                                                                                                                                |            |
| <b>To learn how to convert between standard form and ordinary numbers.</b>                               | <ul style="list-style-type: none"> <li>• Students will know that a number written in standard form is written as a <math>a \times 10^n</math> where <math>1 \leq a &lt; 10</math></li> <li>• Students will know how to write large and small numbers in standard form in the form <math>a \times 10^n</math> where <math>1 \leq a &lt; 10</math></li> <li>• Students will know how to convert numbers from being written in standard form back into ordinary numbers</li> <li>• Students will know when a number is/isn't written in standard form because either <math>a &gt; 10</math> or <math>a &lt; 1</math></li> <li>• Students will know how to adjust a number written in the form <math>a \times 10^n</math> where <math>a &gt; 10</math> or <math>a \leq 1</math> so that it is written in standard form (in the form <math>a \times 10^n</math> where <math>1 \leq a &lt; 10</math>)</li> </ul> | <p><b>Standard form</b> - a way of writing down very large or very small numbers easily, a number is written in standard form when it is written in the form <math>a \times 10^n</math> where <math>1 \leq a &lt; 10</math></p>                                                                                                                  | <ul style="list-style-type: none"> <li>• Students need to be able to multiply and divide by powers of 10</li> </ul>                                                                                                                                                                                                                                         |            |

| Lesson/Learning Sequence                                                            | Intended Knowledge:<br><i>Students will know that...</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Tiered Vocabulary | Prior Knowledge:<br><i>In order to know this, students need to already know that...</i>                                                                                                                                               | Assessment |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                                                                                     | <ul style="list-style-type: none"> <li>Students will know how to compare numbers written in standard form and how the <math>\times 10^n</math> affects the size of one number compared with another</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                                                                                                                                                                                                                                       |            |
| <p><b>To learn how to add and subtract numbers written in standard form.</b></p>    | <ul style="list-style-type: none"> <li>Students will know that to add and subtract numbers written in standard form they must convert them into ordinary numbers first, add or subtract the numbers and then convert the answer back into standard form (where necessary)</li> <li>Students will know how to solve more complex problems with numbers written in standard form both with and without a calculator (as appropriate)</li> </ul> <p><b>*It would be worthwhile including questions for challenge where students require a calculator for some questions*</b></p>                                      |                   | <ul style="list-style-type: none"> <li>Students will need to know how to convert from standard form to ordinary numbers and vice versa.</li> <li>Students will need to know how to add and subtract integers and decimals.</li> </ul> |            |
| <p><b>To learn how to multiply and divide numbers written in standard form.</b></p> | <ul style="list-style-type: none"> <li>Students will know and understand that the quickest way to multiply numbers written in standard form we multiply together the 'a' in both number, multiply the <math>10^n</math> and then combine the two answers</li> <li>Students will know and understand that the quickest way to divide numbers written in standard form is to divide the 'a' in both number, divide the <math>10^n</math> and then combine the two answers</li> </ul> <p><b>*It would be worthwhile including questions for challenge where students require a calculator for some questions*</b></p> |                   | <ul style="list-style-type: none"> <li>Students will need to know the index laws for multiplication and division</li> </ul>                                                                                                           |            |