



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Foundation – Number 2

Lesson	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Step to Success	Feedback
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. 	<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 – sufficiently important to be worthy of attention</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 need to know how to round numbers to the nearest 10/100/1000 etc. Students need to know how to round to the nearest whole number. 	<p>Steps to Success - Rounding</p> <p>Step 1: Identify which number you are rounding to.</p> <p>Step 2: Look at the number to the right of the one identified. If it is below 5, then we keep the identified digit the same. If it is 5 or more, then we round up the identified digit.</p> <p>Step 3: Round down by cutting off the values to the right. Round up by adding one to the identified value.</p> <p>Step 4: Check your answer – Does it have a similar value to the number you started with?</p>	
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 need to know how to round to 1 significant figure. Students need to know how to divide by a decimal. 	<p>Steps to Success - Estimation</p> <p>Step 1: Round the values in the question to 1 significant figure.</p> <p>Step 2: Use BIDMAS to calculate the answer making sure to show each step.</p>	
To learn how to find 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> <p>Truncated – cut off. In maths, if a number has been truncated it has been cut off without considering how the number should be rounded.</p> <p>Split the vocabulary up between sections of the lesson.</p>	Students need to know how to round to different degrees of accuracy.	<p>Steps to Success – Finding Upper and Lower Bounds</p> <p>Step 1: List the values with the same degree of accuracy that would come before and after the number that has been rounded with the number in the question in the middle.</p> <p>Step 2: Find the midpoint of the lowest value and the value that has been rounded – this is the lower bound.</p> <p>Step 3: Find the midpoint of the highest value and the value that has been rounded – this is the upper bound.</p>	

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To learn how to find the HCF and LCM from lists.	<ul style="list-style-type: none"> Students will know what factors are and be able to list all factors of a number systematically. Students will know what multiples are and be able to list multiples of a number systematically. Students will know how to find the highest common factor (HCF) of two numbers using listing. Students will know how to find the lowest common multiple (LCM) of two numbers using listing. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to solve worded problems involving the LCM. 	<p>Multiple – A multiple is a number in the given number's multiplication tables</p> <p>Factor – A factor is a number that divides into a given number without leaving a remainder</p> <p>Common – shared by, coming from, or done by two or more people, groups, or things.</p> <p>Highest Common Factor – the largest number that both or all of the numbers can be divided by</p> <p>Lowest Common Multiple – the smallest number that is in both numbers' times tables</p>	<ul style="list-style-type: none"> Students need to know how to identify factors, multiples and prime numbers from a list. 	<p>Steps to Success – Highest Common Factor (HCF) from lists</p> <p>Step 1: List all the factors of both the numbers.</p> <p>Step 2: Identify the largest number they both have in common, this is the Highest common factor.</p> <p>Steps to Success- Lowest Common Factor (LCM) from lists</p> <p>Step 1: List the first 5-10 multiples of both numbers.</p> <p>Step 2: Identify the first multiple that is in both multiplication tables, this is the Lowest Common Multiple.</p>	
To learn how to find the HCF and LCM using a Venn diagram.	<ul style="list-style-type: none"> Students will know how to find the product of prime factors and write the solution in index form. Students will know how to find the highest common factor (HCF) of two numbers using a Venn diagram. Students will know how to find the lowest common multiple (LCM) of two numbers using a Venn diagram. 	<p>Prime Number – In maths, prime numbers are whole numbers greater than 1, that have only two factors: 1 and the number itself.</p> <p>Product – in maths, a product is the result of multiplication</p> <p>Product of Primes – a product in which every factor is a prime number</p> <p>Intersection - shows what items are shared between two or more categories</p>	<ul style="list-style-type: none"> Students need to know how to write a number as a product of its prime factors. 	<p>Steps for Success – Product of prime factors</p> <p>Step 1: To construct a factor tree, think of 2 numbers which multiply together to make the integer in the question.</p> <p>Step 2: Draw two branches coming down from the integer, and at the end of the branches write the two factors that you chose.</p> <p>Step 3: If a factor is prime, then circle it. If a factor is not prime, then repeat the process until each number at the end of each branch is prime.</p> <p>Step 4: Write the prime factors as a product in index form.</p> <p>Steps for Success – Finding the HCF and LCM from Venn diagrams.</p> <p>Step 1: Find the product of prime factors for both numbers.</p> <p>Step 2: Now draw a Venn diagram where each circle represents each number.</p> <p>Step 3: Cross off a common factor from both lists and place the number in the overlap/intersection of the Venn diagram. Repeat this until there are no common factor left.</p> <p>Step 4: Place any remaining numbers from the lists into the circle that represents that number.</p> <p>Step 5: To find the HCF, we multiply the numbers in the intersection (these are the factors that are common between both numbers). To find the LCM we multiply all of the numbers in the Venn diagram together.</p>	
To learn how to convert between standard form and ordinary numbers.	<ul style="list-style-type: none"> Students will know that a number written in standard form is written as $a \times 10^n$ where $1 \leq a < 10$ Students will know how to write large and small numbers in standard form in the form $a \times 10^n$ where $1 \leq a < 10$ Students will know how to convert numbers from standard form back into ordinary numbers. Students will know when a number is/isn't written in standard form because either $a > 10$ or $a < 0$ 	<p>Standard form - 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 $a \times 10^n$ where $1 \leq a < 10$</p>	<ul style="list-style-type: none"> Students need to know how to multiply and divide by powers of 10. 	<p>Steps to Success - Writing numbers in standard form</p> <p>Step 1: To write a number in standard form put the decimal point after the first significant figure. This will give you 'a' between 1 and 10.</p> <p>Step 2: Work out how many times you would have to multiply or divide that number by 10 to get the original number.</p> <p>Step 3: Write this after your number as $\times 10^n$ where n is positive if the number needs multiplying by 10 and negative if we need to divide the number by 10. The value of n tells us how many times we need to multiply or divide by 10.</p> <p>Steps to Success - Converting numbers out of standard form</p>	

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	<ul style="list-style-type: none"> Students will know how to adjust a number written in the form $a \times 10^n$ where $a > 10$ or $a \leq 0$ so that it is written in standard form (in the form $a \times 10^n$ where $1 \leq a < 10$) Students will know how to compare numbers written in standard form and how the $\times 10^n$ affects the size of one number compared with another. 			To convert a number that is written in the form $a \times 10^n$ out of standard form, when n is positive multiply the 'a' by 10, n times. When n is negative divide the 'a' by 10, n times.	
To learn how to add and subtract numbers written in standard form.	<ul style="list-style-type: none"> Students will know that to add and subtract numbers written in standard form. Students will know how to solve more complex problems with numbers written in standard form both with and without a calculator (as appropriate). 		<ul style="list-style-type: none"> Students need to know how to convert from standard form to ordinary numbers and vice versa. 	<p>Steps to Success - Adding and subtracting numbers in standard form</p> <p>Step 1: Write the numbers as ordinary numbers by multiplying or dividing by powers of 10.</p> <p>Step 2: Add or subtract the numbers using the column method.</p> <p>Step 3: Convert your answer into standard form, if necessary.</p>	
To learn how to multiply and divide numbers written in standard form.	<ul style="list-style-type: none"> Students will know how to multiply numbers in standard form. Students will know how to divide numbers in standard form. Students will know how to solve more complex problems with numbers written in standard form both with and without a calculator (as appropriate). 		<ul style="list-style-type: none"> Students need to know the index laws for multiplication and division. 	<p>Steps to Success – Multiplying numbers in standard form</p> <p>Step 1: Multiply the 'a' for each number written in standard form.</p> <p>Step 2: Multiply the two 10^n parts. Remember that we will need to add the powers.</p> <p>Step 3: Put the two parts back together.</p> <p>Step 4: If necessary, check your answer is written in standard form, if not you will need to adjust your answer.</p> <p>Steps to Success – Dividing numbers in standard form</p> <p>Step 1: Divide the 'a' for each number written in standard form.</p> <p>Step 2: Divide the two 10^n parts. Remember that we will need to subtract the powers.</p> <p>Step 3: Put the two parts back together.</p> <p>Step 4: If necessary, check your answer is written in standard form, if not you will need to adjust your answer.</p>	
To learn how to use a calculator.	<ul style="list-style-type: none"> Students will know how to use a calculator to carry out complex calculations and round answers as appropriate when necessary. Students will know how to use a calculator to carry calculations involving fractions, standard form, powers and roots. 		<ul style="list-style-type: none"> Students need to know how to round to decimal places and significant figures. 		