



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Foundation – Algebra 1

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 simplify algebraic expressions	<ul style="list-style-type: none"> Students will know how to collect like terms Students will know how to simplify algebraic expressions involving multiplication, including where the index laws need to be applied Students will know how to simplify algebraic expressions involving division, including where the index laws need to be applied. Students will know how to simplify algebraic expressions where the index law for brackets is required e.g. Simplify $(2x^2)^3$ 	<p>Algebraic Expression – A collection of variables and/or integers without an equals sign. It cannot be solved.</p> <p>Simplify – make (something) simpler or easier to do or understand.</p> <p>Co-efficient – a number placed before and multiplying the variable in an algebraic expression</p>	<ul style="list-style-type: none"> Students should be able to simplify numerical expressions using the index laws Students should be able to add and subtract negative numbers Students should be able to square and cube numbers 	
To learn how to expand single brackets	<ul style="list-style-type: none"> Students will know how to expand single brackets by multiplying a single term over a bracket. Students will know how to expand multiple single brackets and simplify the answer by collecting 'like terms'. 	<p>Expand – in maths, expand means multiply out</p>	<ul style="list-style-type: none"> Students will need to know how to multiply algebraic expressions Students will need to know how to collect like terms Students will need to know how to calculate with negative numbers 	
To learn how to expand double brackets	<ul style="list-style-type: none"> Students will know how to expand double brackets and simplify answers by collecting 'like terms'. 		<ul style="list-style-type: none"> Students will need to know how to expand single brackets Students will need to know how to calculate with negative numbers 	
To learn how to form algebraic expressions	<ul style="list-style-type: none"> Students will know how to form expressions representing a worded situation. Students will know how to form expressions to represent area and perimeter. 	<p>Perimeter – the distance around the outside of a shape</p> <p>Area – the amount of space inside a 2D shape</p>	<ul style="list-style-type: none"> Students will need to know how to calculate perimeter and area 	
To learn how to factorise expressions into a single bracket	<ul style="list-style-type: none"> Students will know how to factorise algebraic expressions into single brackets 	<p>Factorise – put back into brackets by bringing common factors outside</p> <p>Highest Common Factor – the largest number that both or all of the numbers can be divided by</p>	<ul style="list-style-type: none"> Students need to know how to find the HCF of two numbers 	
To learn how to factorise quadratics into double brackets	<ul style="list-style-type: none"> Students will know how to factorise quadratics in the form $ax^2 + bx + c$ where b and c are either positive or negative and a = 1 Students will know how to factorise the difference of two squares where the coefficient of x^2 is 1 	<p>Quadratic – involving a squared algebraic term but no other power higher than 2</p>	<ul style="list-style-type: none"> Students need to know how to expand double brackets Students need to know how to calculate with negative numbers 	

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To learn how to substitute into formulae	<ul style="list-style-type: none"> Students will know how to substitute positive and negative integers into formulae. Students will know how to substitute positive and negative numbers into worded formulae. Students will know how to substitute positive and negative numbers into kinematics formulae. 	<p>Substitution: the action of replacing someone or something with another person or thing. In algebra "substitution" means putting numbers where the letters are in an algebraic expression</p>	<ul style="list-style-type: none"> Students need to be able to calculate with negative numbers Students need to be able to use BIDMAS 	
To learn how to solve problems involving function machines	<ul style="list-style-type: none"> Students will learn how to use function machines to do one and two step calculations including inverse operations. Students will know that inverse operations are the opposite of each-other, they will know that the inverse of addition is subtraction, the inverse of multiplication is division, the inverse of squaring is square rooting and vice versa etc. Students will know that functions are a relation or expression involving one or more variables. 	<p>Inverse – opposite</p>	<ul style="list-style-type: none"> Students should know how to use the four operations with positive and negative integers. 	
To learn how to solve linear equations	<ul style="list-style-type: none"> Students will know how to solve simple two step linear equations with one unknown using the balancing method e.g. $2x+3=15$. Students will be able to solve linear equations involving fractions and brackets. 	<p>Solve – find an answer Equation – A mathematical statement that two amounts, or groups of symbols representing an amount, are equal: Example $3x - 3 = 15$ Linear Equation – an equation between two variables that can be written in the form $y=mx+c$. Linear equations give a straight line when plotted on a graph.</p>	<ul style="list-style-type: none"> Students should already know how to solve one-step equations Students will need to know how to expand single brackets 	
To learn how to solve linear equations involving brackets and fractions.	<ul style="list-style-type: none"> Students will know how to calculate with fractions. Students will know how to expand single brackets by multiplying a single term over a bracket. Students will know how to solve an equation that involved expanding one or more brackets. Students will know how to solve an equation that involves fractional unknowns. <p>Extension Solve with unknowns on both sides</p>		<ul style="list-style-type: none"> Students will need to know how to solve basic 1 step linear equations Students will need to know how to solve 2 step equations. 	
To learn how to form and solve equations from worded scenarios	<ul style="list-style-type: none"> Students will know how to set up and solve equations for a word problem. 		<ul style="list-style-type: none"> Students will need to know how to solve linear equations Students should know how to form expressions. 	

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<p>To learn how to form and solve linear equations from shape problems.</p>	<ul style="list-style-type: none"> Students will know how to solve shape problems by forming equations 		<ul style="list-style-type: none"> Students will need to know how to solve linear equations Students should know how to form expressions. Students will need to know how to calculate perimeter and area 	
<p>To learn how to interpret inequalities and represent them on number lines</p>	<ul style="list-style-type: none"> Students will know that an inequality is a symbol $>$, \leq, $<$, \geq that can be used to compare two values. Students will know how to use the inequality symbols correctly Students will know that $>$ means greater than, \leq means less than or equal to, $<$ means less than and \geq means greater than or equal to Students will know how to list integers that satisfy an inequality e.g. $-2 < x < 3$. Students will know how to represent inequalities on number lines. Students will know how to write linear inequalities to represent a set shown on a number line. 	<p>Integer – whole number Inequality – a symbol which makes a non-equal comparison between two numbers or other mathematical expressions e.g. $>$, $<$, \geq and \leq Satisfies – meet the expectations, needs, or desires of</p>	<ul style="list-style-type: none"> Students should be able to use the four operations with positive and negative integers. 	
<p>To learn how to solve linear inequalities</p>	<ul style="list-style-type: none"> Students will know the solution set is the set of values that satisfy a given set of equations or inequalities. Students will know how to solve simple linear inequalities in one variable, and represent the solution set on a number line. Students will solve an inequality such as $-3 < 2x + 1 < 7$ and show the solution set on a number line. Students will know how to solve two inequalities in x, find the solution sets and compare them to see which value of x satisfies both. 	<p>Solve – find an answer</p>	<ul style="list-style-type: none"> Students will know how to list integers that satisfy inequality e.g. $-2 < x < 3$. Students will know how to represent inequalities on number lines. Students will know how to construct inequalities to represent a set shown on a number line. Students know how to solve one and two step equations. 	
<p>To learn how to rearrange formulae</p>	<ul style="list-style-type: none"> Students will know how to rearrange simple formulae to change the subject. Students will know how to rearrange kinematic formulae. Students will know that rearrange means change the position of. Students will know how to change the subject of a more complicated formula involving powers and roots. Students will know that Kinematics concerns the motion of objects, 	<p>Rearrange – change the position of. Formula – A mathematical relationship or rule expressed in symbols. Example $A = \pi r^2$</p>	<ul style="list-style-type: none"> Students should have the ability to use negative numbers with the four operations and recall and use hierarchy of operations and understand inverse operations Students should know how to expand brackets. 	