



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 Core – Algebraic Expressions, Equations and Inequalities

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>To learn how to simplify algebraic expressions by collecting like terms.</p>	<ul style="list-style-type: none"> • Students will know that like terms are variables (such as x or y) that are the same. E.g. $2x$ and x are like terms, but x and y are not like terms. • Students will know that we can only add or subtract like terms. • Students will know how to collect like terms with single terms such as $y + y + y = 3y$. • Students will know how to collect like terms with terms multiplied by an integer bigger than one. e.g $2b + 3b = 5b$ • Students will know how to collect like terms involving multiple terms. E.g. $2x + 7y + 4x + 6y = 6x + 13y$ • Students will know that when adding or subtracting terms with same power, the power must stay the same. E.g. $x^2 + x^2 = 2x^2$ • Students will know how to collect like terms involving powers. E.g. $4x + 5x^2 - x + 6x^2 = 3x + 11x^2$ <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> • Students will know how to collect like terms with composite variables. e.g. $2ab + 3ab = 5ab$ 	<p>Algebraic Expression – A collection of variables and/or integers without an equal's sign. It cannot be solved.</p>	<ul style="list-style-type: none"> • Students need to know what an expression is. • Students need to know how to add and subtract integers. 	<p>Mini-Assessment 5</p>
<p>To learn how to simplify algebraic expressions.</p>	<ul style="list-style-type: none"> • Students will know that when multiplying algebraic terms together they must write each number side by side. E.g. $4 \times b = 4b$ • Students will know how to multiply with single terms such as $y \times y \times y = y^3$. • Students will know how to multiply algebraic expressions involving multiple letters and integers. E.g. $4 \times b \times c = 4bc$ or $4b \times 3c = 12bc$ • Students will know how to multiply algebraic expressions involving the same letter. E.g. $5 \times g \times g = 5g^2$ • Students will know how to simplify algebraic expressions involving multiplication by correctly applying the index laws. • Students will know that when dividing algebraic terms, they must write it as a fraction. E.g. $b \div 4 = \frac{b}{4}$ • Students will know how to divide simple algebraic expressions. E.g. $\frac{4t}{2} = 2t$ or $\frac{6t}{2t} = 3$ • Students will know how to simplify algebraic expressions involving division by correctly applying the index laws. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> • Students will know how to simplify algebraic expressions involving brackets by correctly applying the index laws. 		<ul style="list-style-type: none"> • Students need to know how to multiply and divide integers. • Students need to know how to square integers. 	<p>Mini-Assessment 5</p>
<p>To learn how to expand single brackets.</p>	<ul style="list-style-type: none"> • Students will know how to expand single brackets by multiplying a single integer term over a bracket. E.g. $2(x + 3)$ • Students will know that in order to fully expand a single bracket they must multiply the integer on the outside of the bracket to every term inside the bracket. • Students will know how to expand single brackets by multiplying an algebraic term over a bracket. E.g. $x(x - 4)$ <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> • Students will know how to expand single brackets by multiplying multiple terms over a bracket. e.g. $2ab(4a + b)$ 	<p>Expand – in maths, expand means multiply out</p>	<ul style="list-style-type: none"> • Students need to know how to multiply algebraic expressions. • Students need to know how to use index laws involving multiplications. 	<p>Mini-Assessment 5</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 expand two brackets and collect like terms.	<ul style="list-style-type: none"> Students will know how to expand multiple single brackets and simplify the answer by collecting like terms with a mixture of positive and negative values. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to expand multiple single brackets involving index laws and then collect the like terms. 		<ul style="list-style-type: none"> Students need to know how to expand brackets. 	Mini-Assessment 5
To learn how to factorise expressions into single brackets.	<ul style="list-style-type: none"> Students will know how to recognise common factors of algebraic terms. Students will know how to factorise algebraic expressions into a single bracket by taking out common numerical factors. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to factorise algebraic expressions into a single bracket by taking out common algebraic factors. 	Factorise – put back into brackets by bringing common factors outside	<ul style="list-style-type: none"> Students need to know how to multiply and divide algebraic expressions. Students need to know how to use index laws. 	Mini-Assessment 5
To learn how to substitute numbers into expressions and formulae.	<ul style="list-style-type: none"> Students will know that substitute means putting numbers in place of letters to calculate the value of an expression. Students will know how to substitute positive and negative integers into simple algebraic expressions. Students will know that once a substitution has taken place then the order of operations applies. Students will know how to substitute positive and negative integers into simple formulae. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to substitute positive and negative numbers into worded formulae. 	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	<ul style="list-style-type: none"> Students need to know how to use the order of operations. 	Mini-Assessment 5
To learn how to solve one step linear equations.	<ul style="list-style-type: none"> Students will know that function machines are used to apply operations in a given order to a value known as the input. Students will know that the final value produced by a function machine is known as the output. Students will know how to use function machines to complete one step operations. Students will know how to use inverse operations to find an input using the output. Students will know how to use algebraic methods to solve one step linear equations involving addition and subtraction to find an integer solution. E.g. $x + 7 = 10$ and $y - 4 = 8$ Students will know how to use algebraic methods to solve one step linear equations involving multiplication to find an integer solution. E.g. $3x = 18$ Students will know how to use algebraic methods to solve one step linear equations involving fractions to find an integer solution. E.g. $\frac{x}{3} = 2$ 	<p>Solve – find an answer</p> <p>Equation – A mathematical statement that two amounts, or groups of symbols representing an amount, are equal: Example $3x - 3 = 15$</p> <p>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 need to know how to add, subtract, multiply and divide integers. 	Mini-Assessment 5
To learn how to solve two step linear equations.	<ul style="list-style-type: none"> Students will know how to use function machines to complete two step operations. Students will know how to solve simple two step linear equations with one unknown to find an integer solution. e.g. $2x + 3 = 15$ Students will know how to solve two step linear equations involving fractions. E.g. $\frac{x}{2} + 3 = 4$ <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to solve equations involving a bracket. E.g. $2(4x + 6) = 10$ 		<ul style="list-style-type: none"> Students need to know how to solve one step equations involving addition, subtract and multiplication. Students need to know how to use a function machine to complete one step operations. 	Mini-Assessment 5

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To learn how to list integers that satisfy an inequality.	<ul style="list-style-type: none"> • Students will know that $>$ means greater than. • Students will know that $<$ means less than. • Students will know that \geq means greater than or equal to. • Students will know that \leq means less than or equal to. • Students will know how to use inequality signs to show inclusive and exclusive inequalities. • Students will know that inclusive means inequalities that concerns the symbols \leq, \geq. • Students will know that exclusive means inequalities that concerns the symbols $>, <$. • Students will know how to list some integers that satisfy an inequality. E.g. $x > 4$ or $x \leq 9$. • Students will know how to list integers that satisfy an inequality. e.g. $-2 \leq x < 3$ 	<p>Inequality – a symbol which makes a non-equal comparison between two numbers or other mathematical expressions e.g. $>, <, \geq$ and \leq</p> <p>Integer – whole number</p>	<ul style="list-style-type: none"> • Students need to know how to order numbers. 	Mini-Assessment 5
To learn how to represent and interpret inequalities on number lines.	<ul style="list-style-type: none"> • Students will know that $<$ and $>$ are represented by an open circle. • Students will know that \leq and \geq are represented by a closed circle. • Students will know how to represent inequalities such as $x \geq 3$. • Students will know that an arrow must be drawn to the end of the number line. • Students will know how to represent inequalities such as $-1 < x \leq 3$. • Students will know that a line must connect both circles. • Students will know how to write linear inequalities to represent a set shown on a number line such as $x < 5$ and $2 \leq x < 7$. 		<ul style="list-style-type: none"> • Students need to know how to list integers that satisfy an inequality. 	Mini-Assessment 5