Knowledge Rich Curriculum Plan

Year 7 Support – Algebraic Expressions, Equations and Inequalities

Lesson/Learning Sequence	Intended Knowledge: *Students will know that…*	Tiered Vocabulary	Prior Knowledge: *In order to know this, students need to already know that…*	Assessment
To learn how to simplify algebraic expressions by collecting like terms.	• 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 $2b + 3b = 5b$ **Opportunity for challenge:** • Students will know how to collect like terms involving multiple terms. E.g.$2x + 7y + 4x + 6y = 6x + 13y$	Algebraic Expression – A collection of variables and/or integers without an equal's sign. It cannot be solved.	• Students need to know what an expression is. • Students need to know how to add and subtract integers.	Mini-Assessment 5
To learn how to multiply algebraic expressions.	• 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. $5 \times g \times g = 5g^2$ **Opportunity for challenge:** • Students will know how to simplify expressions using index laws.		• Students need to know how to multiply integers.	Mini-Assessment 5
To learn how to divide algebraic expressions.	• 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 $\frac{6t}{2t} = 3$ **Opportunity for challenge:** Students will know how to simplify expressions using index laws.		• Students need to know how to divide integers	Mini-Assessment 5
To learn how to expand single brackets.	• Students will know how to expand single brackets by multiplying a single integer term over a bracket. • 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. **Opportunity for challenge:** • Students will know how to expand multiple single brackets and simplify the answer by collecting like terms.	Expand – in maths, expand means multiply out	• Students need to know how to multiply algebraic expressions.	Mini-Assessment 5
To learn how to substitute numbers into expressions.	• 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 integers into simple algebraic expressions. • Students will know that once a substitution has taken place then the order of operations applies. **Opportunity for challenge:** • Students will know how to substitute positive and negative numbers into expressions.	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	• Students need to know how to use the order of operations.	Mini-Assessment 5

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To learn how to use function machines.	• 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 function machines to complete two step operations. • Students will know how to use inverse operations to find an input using the output.	Inverse – something that is the opposite or reverse of something else.	• Students need to know how to add, subtract, multiply and divide integers.	Mini-Assessment 5
To learn how to solve one step linear equations.	• 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. $\frac{x}{3} = 2$	Equation – A mathematical statement that two amounts, or groups of symbols representing an amount, are equal: Example 3x - 3 = 15	• Students need to know how to use function machines to apply operations. • Students need to know how to use a function machine to apply inverse operations.	Mini-Assessment 5
To learn how to solve two step linear equations.	• 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 need to know how to solve one step equations involving addition, subtract and multiplication.	Mini-Assessment 5
To learn how to use and interpret inequality symbols	• Students will know that > means greater than. • Students will know that < means less than. • Students will know that ≥ means greater than or equal to. • Students will know that ≤ means less than or equal to. • Students will know how to use the symbols <, >, =, ≠ to compare small and large integer numbers. • Students will know how to use the symbols <, >, =, ≠ to compare positive and negative numbers. **Opportunity for Challenge:** • Students will know how to use the symbols <, >, =, ≠ to compare decimals.	Inequality – a symbol which makes a non-equal comparison between two numbers or other mathematical expressions e.g. >, <, $\geq$ and $\leq$	• Students will need to know how to order positive and negative numbers	Mini-Assessment 5
To learn how to list integers that satisfy an inequality.	• 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. $-2 \leq x < 3$	Integer – whole number	• Students need to know how to compare numbers using the symbols >, < and =.	Mini-Assessment 5
To learn how to represent inequalities on number lines.	• 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 need to know how to list integers that satisfy an inequality.	Mini-Assessment 5