Expressions and equations

Terms	Illustrations	Definitions
Abstract thinking		Thinking logically without the use of concrete material or visual representations.
Algebra		The use of letters and numbers to express information.
Algebraic terms	$2x$	This is the overall term used for shorthand algebra such as 4t or 5x
Distributive Law	$3 \times 2 + 3 \times 4 = 3 \times (2+4)$	Multiplying a number by a group of numbers added together is the same as doing each multiplication separately
Early / Initial algebraic thinking		Understanding the order of numbers, their place on the number line and how they can be combined. Also understanding that the equal sign '=' shows balance e.g. $2 + 2 = 4$.
Equality / Balance		The equal sign indicates that one quantity is the same as another. Visualising the equals sign (=) as a balance point is very useful
Equation	$x + 2 = 6$ $\quad$ $4x - 2 = 10$ $4x = 12$ $x = 3$	Equations use letters, numbers, signs and symbols and allow given situations or conditions to be expressed in the most concise way possible. An equation has an equals sign to show balance.

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Evaluating algebraic expressions	Example of evaluating: Evaluate 2t + 3f, where t = 2 and f = 6 • 2t = 2 x 2 = 4 • 3f = 3 x 6 = 18 • 2t + 3f = 4 + 18 So you can evaluate the expression: 2t + 3f = 22	When we substitute a specific value for each letter, and then perform the operations, it's called evaluating the expression.
Expression	Let's use the letter c to represent 1 car. We therefore have 4c. We can simplify terms: t+t+t+t+t can be written as 5t	Numbers, symbols and operators grouped together that show the value of something.
Factorising	Example of factorising: Factorise 2y + 6 • Both 2y and 6 have a common factor of 2: • 2y is 2 x y • 6 is 2 x 3 So you can factorise the expression into: 2(y + 3)	The process of finding the factors in an expression. It is like "splitting" an expression into a multiplication of simpler expressions.
Factors of algebraic equations		If numbers share one or more factors, then they are called the common factors of those numbers. Common factors can be applied in algebraic equations to organise in to simpler equations. It is best to find the highest common factor.

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Formula		A mathematical relationship or rule expressed in symbols *e.g. the formula for volume of a box is $V = l \times b \times h$*
Greater than	4 > 1	The symbol '>' means greater than e.g. 7 > 4. The symbol always points to the lowest number/value.
Inequality / Imbalance		A symbol for "is not equal to" ($\neq$) is required when quantities on either side do not have the same value.
Inequation / Inequality		An inequality does not have an 'equality' sign but instead uses either 'greater than' sign, 'greater than or equal to' sign, 'less than' sign or 'less than or equal to' sign.
Less than	1 < 4	The symbol '<' means less than e.g. 2 < 5. The symbol always points to the lowest number/value.
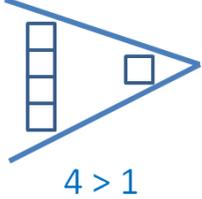
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Operators	$+ \quad - \quad \times \quad \div$	Symbols are part of the universal language of mathematics. The four operators +, −, ×, ÷ are the first set of symbols that learners usually become familiar with.
Pictures and symbols in algebra		Symbols can also replace numbers or operators and can have completely different values e.g. 4 + * = 10 △ x 4 = 20 3?50 − 1?50 = 4700
Simplifying equations / collecting like terms	2x + 3x + x =6x	Making similar equations easier to work with. *E.g. knowing* a + a + a = 3a
Solution Sets	$x + 4 > 10$ $x > 6$ Therefore the solution set is any number greater than 6.	A set of numbers that lists all possible solutions to a given mathematical problem.
Substitution	$x + 6$ *where* $x = 2$ We substitute the value of x into our expression. Therefore : $2 + 6 = 8$	Replacing a letter in an algebraic expression with a numerical value. Different letters can be given different numerical values, unless they are constants such as Pi (π). If a letter appears more than once in an expression, the same numerical value is assigned each time.

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Variables	$$4x - 7 = 5$$ ↑ Variable	A variable quantity, as its name suggests, can change in value. In algebra, letters can be assigned a number.