Year 8 Unit 3: Algebra

INEQUALITIES	
where **two expressions** are **not equal** in value	
strict	< **less** than > **greater** than
non-strict	≤ **less** than or **equal** to ≥ **greater** than or **equal** to

ALGEBRAIC NOTATION	
like terms	terms which are the same apart from their numerical coefficients: they are the **same variable** and have the **same power**
collect like terms	you can **add** or **subtract** like terms using the **coefficients**
simplifying algebraic fractions	**factorise** the **numerator** and **denominator** and **cancel common factors,** sometimes requires factorisation

INSTRUCTIONS: GENERAL	
evaluate	**find the value of**
form	to **write** or **produce**
substitute	**replacing letters with numbers** to calculate the **numerical value**
simplify	to reduce to its **simplest form**
expand	**multiply** terms inside a bracket by those outside the bracket, **remove the brackets using the grid method**

FACTORISING	
factorise	finding the **factors** of an expression the reverse of **expand**, it is when we write an expression **using brackets,** use **reverse grid**
factor	a quantity which **divides equally** into a number, e.*g. factors of 8 are **1, 2, 4 and 8***
factorising a general quadratic	quadratic: **$x^2 + bx + c$,** factorised form: **(x + ?)(x + ?)** '?' are **two numbers** whose **product is 'c'** and **sum is 'b', split the middle term** and put into a **reverse grid** to find the **brackets**
difference of two squares	quadratic: **$a^2 - b^2$** factorised form: **(a – b)(a + b)** **square root each number** from the **original expression**

Links to: LAWS OF INDICES	
When the **base is the same**, we use the following rules:	
multiplying	**add** the powers *e.g.* $x^a \times x^b = x^{a+b}$
dividing	**subtract** the powers *e.g.* $x^a \div x^b = x^{a-b}$
raising indices to other indices	**multiply** the powers. *e.g.* $(x^a)^b = x^{a \times b}$

INSTRUCTIONS: EQUATIONS	
solve	**find the value** of an unknown or **variable**, use **inverse operations** and the **balancing method**
rearrange	**changing the subject** of a formula sometimes called **transposing** use **inverse operations** and the **balancing method**, like when we solve an equation
inverse	the **opposite**
balance *an equation*	do the **same** to **both sides of the "="** use to **solve** an equation, or **rearrange** a formula
subject *of an equation*	a **single** unknown or **variable** that everything else is **equal** to
solution *of an equation*	a **value** we can put in **place of a variable** that makes the equation **true**
order of operations	the laws regarding the **order** in which to **calculate**, used in algebra too **brackets, other, multiply and divide, add and subtract**

SEQUENCES	
linear sequences	a sequence where the **difference between terms increases or decreases** by the **same amount** each time also known as an **arithmetic** sequence use **DiNO** to find the **nth term** to **generate a sequence substitute values of 'n' in**, e.g. 2nd term, n=2 *algebraically:* $x_n = \boldsymbol{an + b}$
common difference	the amount we **add** or **subtract** each time in a **linear sequence**
quadratic sequences	a sequence of numbers with an **n^2** in the **position to term rule** (nth term) the **second difference** between consecutive terms is **constant** *algebraically:* $x_n = \boldsymbol{an^2 + bn + c}$
geometric sequences	a sequence of numbers where each term is found by **multiplying** the **previous one by** a number called the **common ratio 'r'** *algebraically:* $x_n = \boldsymbol{ar^{n-1}}$ **increasing**: the **ratio** is an **integer**, **decreasing:** the **ratio** is a **fraction**
common ratio (r)	the amount we **multiply** by each time in a geometric sequence, can be a fraction

LINEAR SEQUENCES inks to: LINEAR GRAPHS	
y = mx + c	the **general equation** of a linear graph **m** is the **gradient** **c** is the **y-intercept**