My mathematical journey

What do I need to remember from before?

Directed numbers (NP6)

What will I learn about in this unit?

Variable unknowns

Algebraic expressions

Substitution

Equations

Where does this lead?

Simplifying expressions (A2)

Multiplying expressions (A3)

Linear equations (A4)

Formulae (A5)

Key words and symbols: what I need to say and write accurately

Word	Explanation
variable	a number that can change its value, represented by a letter such as x or a green tile when we do not know its value
constant	a number that does not change, is fixed
operation	something that takes input numbers and turns them into output numbers, such as addition (including subtraction), multiplication (including division), exponentiation (including roots)
term	the parts of an expression separated by $+$ or $-$. e.g. in the expression $4x - \frac{1}{2}y$, the terms are $4x$ and $\frac{1}{2}y$

My mathematical journey

What do I need to remember from before?

Repeated multiplications and exponents (NP4)

Directed numbers (NP6)

Expressions (A1)

What will I learn about in this unit?

Adding and subtracting expressions

Multiplying and dividing expressions

Index laws

Forming expressions

Where does this lead?

Expanding and factorising brackets (A3)

Solving equations (A4)

Sequences (A7)

Quadratic expressions (A11)

Indices and surds (NP15)

Key words and symbols: what I need to say and write accurately

Word	Explanation
variable	a number that can change its value, represented by a letter such as $\boldsymbol{x}$ or a green tile
constant	a number that does not change, is fixed
operation	something that takes input numbers and turns them into output numbers, such as addition (including subtraction), multiplication (including division), exponentiation (including roots)
expression	a collection of constants, variables and operations e.g. $\boldsymbol{4x}$, $\boldsymbol{2p-5}$ and $\boldsymbol{x^2+3x+6}$ are all expressions
term	the parts of an expression separated by $+$ or $-$. e.g. in the expression $\boldsymbol{4x-\frac{1}{2}y}$, the terms are $\boldsymbol{4x}$ and $\boldsymbol{\frac{1}{2}y}$

Fingertip facts: what I need to learn by heart

The index laws

1. When we multiply powers with the same base, we can add their exponents.

$$x^7 \cdot x^3 = x^{10}$$

2. When we divide powers with the same base, we can subtract their exponents.

$$\frac{x^7}{x^3} = x^4$$

3. When we find a power of a power, we can multiply the exponents together.

$$(x^2)^3 = x^6$$

My mathematical journey

What do I need to remember from before?

Area models for multiplication (NP3)

Collecting like terms (A2)

What will I learn about in this unit?

Expanding expressions with brackets

Factorising expressions as the opposite of expanding

Expanding two brackets

Where does this lead?

Solving equations (A4)

Formulae (A5)

Inequalities (A8)

Quadratic expressions (A11)

Key words and symbols: what I need to say and write accurately

Word	Explanation
variable	a number that can change its value, represented by a letter such as x or a green tile
constant	a number that does not change, is fixed
operation	something that takes input numbers and turns them into output numbers, such as addition (including subtraction), multiplication (including division), exponentiation (including roots)
expression	a collection of constants, variables and operations e.g. $4x$, $2p - 5$ and $x^2 + 3x + 6$ are all expressions
term	the parts of an expression separated by $+$ or $-$. e.g. in the expression $4x - \frac{1}{2}y$, the terms are $4x$ and $\frac{1}{2}y$
expand	write an expression containing brackets *without* the brackets, by multiplying e.g. $2(x - 5) = 2x - 10$
factorise	write an expression without brackets as a multiplication *with* brackets e.g. $2x - 10 = 2(x - 5)$

My mathematical journey

What do I need to remember from before?

Equality & inverse operations (NP2, NP3, NP4)

Solving equations (A1)

Simplifying expressions (A2)

Expanding brackets (A3)

What will I learn about in this unit?

Mathematical equality

Balancing an equation

Solving all types of linear equations

Where does this lead?

Rearranging formulae (A5)

Equations of a line (A6)

Quadratic equations (A12)

Using equations to solve geometry and probability problems (GM2 – GM11, SP7)

Key words and symbols: what I need to say and write accurately

Word	Explanation
unknown	a number that we do not know, represented by a letter
expression	a collection of constants, variables and operations e.g. $4x$, $2p - 5$ and $x^2 + 3x + 6$ are all expressions
equation	when we write two expressions equal to one another e.g. $2 + 3 = 5$, $2x + 3 = 5$ and $2x + 3 = 5x - 6$ are all equations
term	the parts of an expression separated by $+$ or $-$ e.g. in the expression $4x - \frac{1}{2}y$, the terms are $4x$ and $\frac{1}{2}y$
solve	when we solve an equation, we find out what the value of the unknown is

Fingertip facts: what I need to learn by heart

An equation must always be balanced: whatever we do to one side we must also do to the other.

My mathematical journey

What do I need to remember from before?

Arithmetic strategies (NP1, 2, 3, 4)

Order of operations (NP5)

Negative numbers (NP6)

Algebraic expressions (A1, 2, 3)

Solving equations (A4)

What will I learn about in this unit?

Substituting numbers into expressions and formulae

Writing and using formulae

Rearranging formulae to change the subject

Where does this lead?

All further algebra units

Using formulae in geometry (GM3 onwards)

Advanced proportion (NP13)

Advanced probability and statistics (A Level)

Key words and symbols: what I need to say and write accurately

Word	Explanation
variable	A letter that represents many numbers (a letter whose value can vary) e.g. x, y, θ
constant	A fixed number e.g. 2, -1.8, π
expression	A collection of any variables, constants and operations e.g. $2x + 5$, $a - b$, $3p$, $\frac{n+5}{7}$, $3 \times 4 - 2^3$
substitute	Replace a variable with a constant e.g. When $x = 3$, the value of $2x - 1$ is $2 \times 3 - 1$, or 5.
evaluate	Work out the value of a calculation. e.g. "Evaluate 2 + 3" means "Work out the value of 2 + 3."
formula (pl. formulae or formulas)	A set of instructions to work something out. A formula can be written in words, as an expression or as an equation. Here is a formula in words: Area = length × width Here is the formula as an expression: lw Here is the formula as an equation: $A = lw$
subject	The subject of a formula is the variable that is 'on its own' on one side of the equation. e.g. In the formula $A = lw$, the subject is A.
rearrange	Rearranging a formula means changing its subject. e.g. $A = lw$ can be rearranged to make l the subject: $l = \frac{A}{w}$