Year 7 Knowledge Organiser –

Expressions and equations

Objectives
Understand and use the concepts and vocabulary of expressions, equations, formulae and terms

Use and interpret algebraic notation

Collect like terms

Expand single brackets

Solve linear equations in one unknown algebraically

Key Vocabulary

Variable – an unknown value, represented by a letter

Term – a single number or variable, or numbers or variables multiplied or divided by each other (positive or negative)

Expression – two or more terms added and/or subtracted

Equation – an expression that contains an equals symbol

Formula – a relationship or rule

Like Terms - terms that have the same variables and powers

Inverse – reverse or opposite of a function

Expand – to multiply each term in the bracket by the expression outside the bracket

Algebraic notation…

$\equiv$ is the identity symbol and is used to show equivalent expressions/terms

$a + a + a + a \equiv 4a$

$4 \times a \equiv 4a$

'4 lots of a'

Note: The number comes before the variable.

The number being multiplied by the letter is called a **coefficient**.

$a \times a \equiv a^2$

$a \times a \times a \equiv a^3$

$2 \times a \times a \times a \equiv 2a^3$

$a \div b \equiv \dfrac{a}{b}$

$a \times b \equiv ab$

(variables multiplied together are written in alphabetical order)

Collecting like terms
Only **like terms** can be combined

$4x \ +5b \ -2x \ +10b$

$2x \ + \ 15b$

x^2 and x^3 are not like terms despite having the same variable because they have different powers.

Variable	Term	Expression	Equation	Formula
a	$4a$	$4 - a$	$4 - a = 6$	$A = l \times w$
b	$4a^2$	$4 + a$	$8 = a + 4$	$A = \pi r^2$
c	$\dfrac{a}{4}$	$4a^2 + 3a^2$	$\dfrac{a}{4} = b$	$a^2 + b^2 = c^2$
d	$\dfrac{-3a^2}{4}$	$\dfrac{a}{4} - 2$	$a^2 + 4 = 8$	$S = \dfrac{D}{T}$

Solving linear equations…

The aim is to get the unknown on its own.
Tip: Always show a full written method, lining up your equals signs down the page.

eg 1

Inverse of +5 is -5

$2y + 5 = 13$

$2y = 13 - 5$

Inverse of x2 is ÷2

$2y = 8$

$y = {}^8/_2$

$\underline{y = 4}$

eg 2

Inverse of -4 is +4

$^c/_2 - 4 = 6$

$^c/_2 = 6 + 4$

Inverse of ÷2 is x2

$^c/_2 = 10$

$c = 10 \times 2$

$\underline{c = 20}$

Expanding single brackets
Multiply each term inside the bracket by the term outside of the bracket.

$3(2x + 4)$

$3 \times 2x \ + \ 3 \times 4$

$6x + 12$

$4(y + 2) + 2(5 - y)$

$4y + 8 \ + \ 10 - 2y$

$2y + 18$