Generalising Arithmetic

Vocabulary

Algebra – We use letters to represent unknown values

Term – A single number or piece of algebra (e.g. 6 , x, -4, xy, 5h, etc.)

Expression – A combination of terms and operations (+, −,×,÷)

Simplify – To write using less terms or smaller numbers

Expand – To multiply out brackets

Factorise – To find a common factor and write expression as bracket

Simplifying Algebra

There are two basic rules for simplifying algebra.

Rule 1: Collect like terms **Mathswatch Video:A6**

You can add/subtract similar things together

(i.e collect like things)

Example:

$3x + 4x = 7x$

$8xy - 2xy = 6xy$

Both terms have the same thing in them (letter)

Only one term has a r

$3r + 4 \neq 7r$

Rule 2: Multiplying Algebra **Mathswatch Video:A7a**

When you are multiplying algebra, multiply the numbers first and then the letters and combine

Example:

$4 \times y = 4y$

$5x \times 6 = 30x$

Remove the multiplication sign

Multiply the numbers and then the letters

$3c \times 4d = 12 \times c \times d = 12cd$

$z \times z = z^2$

Something times itself is squaring

Expanding Brackets **Mathswatch Video:A8**

When you are asked to expand a bracket, you are being asked to multiply everything inside the bracket by what is outside.

Example: Expand $3(2x - 10)$

TOP TIP: By drawing arrows we are reminding ourselves what we are multiplying together

$3(2x - 10)$

$3 \times 2x = 6x$

$3 \times 10 = 30$

$6x - 30$

Keep the operator the same

Factorising **Mathswatch Video:A9**

Factorising is the opposite of expanding, so our goal is to put the expression into a bracket.

Example: Factorise $5x + 45$

$5x$	45
1	1
(5)	3
x	(5)
	9
	15
	45

$5x + 45$

$5(x + 9)$

Step 1: List all the factors for both numbers (this may include letters)

Step 2: Pick the largest common factor (HCF)

Step 3: Put your HCF outside the bracket and divide both numbers by it

Step 4: Write your answers inside the brackets