Year 6

Knowledge Organiser Algebra

THIRD SPACE LEARNING

Key vocabulary

Algebra, variable, formula, equation, expression

Algebraic Expressions and Equations

A letter represents a variable – a missing number that can represent different values.

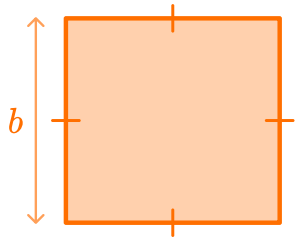
Two letters (or a number and a letter) next to each other mean they should be multiplied, e.g. $ab = a \times b$; $3y = 3 \times y$.

To calculate the variable, use inverse operations.

E.g. $2w + 3 = 11$ – firstly subtract 3 from both sides of the equation, so $2w = 8$.
Then, divide both sides by 2, so $w = 8$.

Express missing number problems algebraically

Examples:



$b + b + b + b = 4b$

If the perimeter is 12m, then $4b = 12$, so $b = 3$, so each side is 3m.
If the perimeter is 10cm, then $4b = 10$, so $b = 2.5$, so each side is 2.5cm.

If you have £15 and give some money away, this could be represented by the expression $15 - a$ (with a being the amount of money in pounds that you gave away).

Formulae

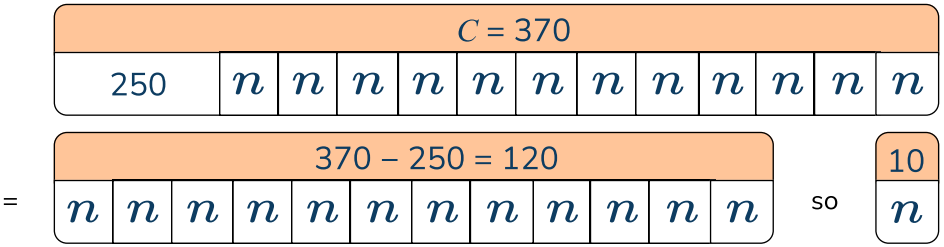
Formulae can be used in real life situations.
E.g. John has some photographs printed. The cost is £2.50 for postage and 12p for each print. John uses this formula for the total cost (C) in pence.

$$C = 250 + 12n$$

n stands for the number of photographs. The total cost for John is £3.70

How many photographs does he have printed?

If $C = 370$, then $370 = 250 + 12n$. To calculate n (the number of photographs), $370 - 250 = 12n$, so $120 = 12n$, so $10 = n$, so John had 10 photos printed.
This can be represented using bar models (see below).



Two variables

When there are two variables in an equation, there are multiple possible pairs of values that they could be.

Examples:

$ab = 24$		$c + d = 7$		$3e + f = 20$	
a	b	c	d	e	f
1	24	0	7	0	20
2	12	1	6	1	17
3	8	2	5	2	14
4	6	3	4	3	11
6	4	4	3	4	8