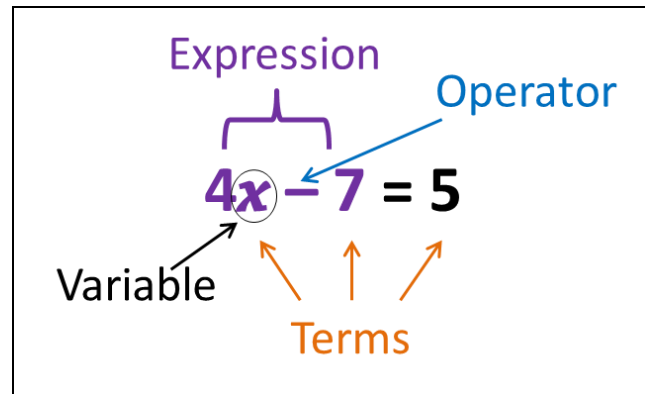


Key Vocabulary

Expression	Numbers, symbols and operators (such as + and x) grouped together that show the value of something. E.g. $2 + x$
Term	In Algebra a term is either a single number or variable. Terms are separated by + or - signs
Equation	An equation says that two things are equal. $4x - 7 = 5$
Formula (formulae)	An equation that has a real life context. Area = width x height
Function $F(x) = \dots$	It is like a machine that has an input and an output. A function is a mapping from a set of inputs to a set of possible outputs.
Variable	A variable is a letter, for example x, y or z, that represents an unspecified number. $6 + x = 12$.
Represent	What a variable may equal
Substitute	Replacing a "letter" with a given value
Evaluate	Evaluate is when you substitute a number for each variable and perform the arithmetic operations..
Like terms	Terms whose variables are the same.
Simplify / Collect	Grouping the like terms together

Key facts / Diagrams



Combine Like Terms	Unlike Terms	Why they are unlike
$2x + 9x = 11x$	$2x + 19a$	Variables different
$4w - w = 3w$	$4w + 3w^2$	Exponents different
$8y + 5y = 13y$	$8y + 5$	No variable in the second term

Simplify (group like terms)

$$2ab - 4 + ab + b^2 + b^2$$

$$3ab - 4 + 2b^2$$

Substitute:
 $a=10 \quad b=4$

$$3a - 2b$$

$$3 \times 10 - 2 \times 4$$

$$30 - 8 = 22$$

Expand:

$$6(x + y) = 6x + 6y$$

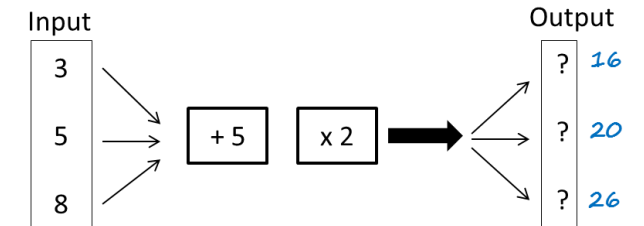
$$2x(4 + 3x) = 8x + 6x^2$$

Common misconceptions

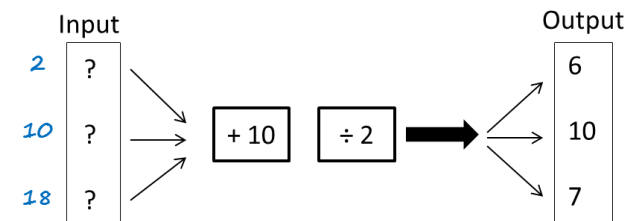
- Some pupils may think that it is always true that $a=1, b=2, c=3$
- It is a misconception to think that: $a^2 = a \times 2$
- When working with an expression such as $5a$, some pupils may think that if $a=2$, then $5a = 52$.
- Some pupils may think that $3(g+4) = 3g+4$
- The convention of not writing a coefficient of 1 (i.e. '1x' is written as 'x' may cause some confusion. In particular some pupils may think that $5h - h = 5$

Worked examples

Establish outputs from given inputs



Establish inputs from given outputs



To work this out do the inverse:

Output = 6 $6 \times 2 - 10 = 2$ (input)