



# Year 6 – Maths – Algebra

## Key vocabulary

term to term rule

variable

unknown

expression

equation

formula

one-step equation

two-step equation

substitution

pairs of unknowns

enumerate

## Links to other learning

**Year 6** - Use simple formulae; Generate and describe linear number sequences; Express missing number problems algebraically; Find pairs of numbers that satisfy an equation with 2 unknowns; Enumerate possibilities of combinations of 2 variables.

## Key questions

What is a formula?

What does enumerating mean?

Can you think of an example of when we'd need to use a formula?



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## Forming expressions and equations

An expression is a group of numbers, letters and operation symbols.

Add 14 to  $a$

Subtract 20 from  $b$

Multiply  $c$  by 4

12 more than  $d$

Multiply  $e$  by 3 and subtract 5

Add 12 to  $f$  and then multiply by 2

$$a + 14$$

$$b - 20$$

$$4c$$

$$d + 12$$

$$3e - 5$$

$$2(f + 12)$$

$$a + 14 = 20$$

$$b - 20 = 15$$

$$4c = 28$$

$$d + 12 = 30$$

$$3e - 5 = 10$$

$$2(f + 12) = 44$$

An equation is a number statement with an equal sign (=). Expressions on either side of the equal sign are of equal value.



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## Formulas/formulae

(The word formula has two possible plural forms, formulae and formulas.)

A formula is a special type of equation that shows the relationship between different substituted variables. Formulas are often used in geometry to find area and volume.

$$\text{Area of rectangle} = \text{length} \times \text{width}$$

$$\text{Area of triangle} = (\text{base} \times \text{height}) \div 2$$

$$(12.5 \times \text{hours worked}) + 25 = \text{cost of job}$$

# Year 6 – Maths – Algebra

## Equations with Pairs of Unknowns

In an equation with two unknown numbers, there may be **several** possible values for the unknowns that will balance the equation.

| $ab = 18$ |     |
|-----------|-----|
| $a$       | $b$ |
| 1         | 18  |
| 2         | 9   |
| 3         | 6   |
| 6         | 3   |
| 9         | 2   |
| 18        | 1   |

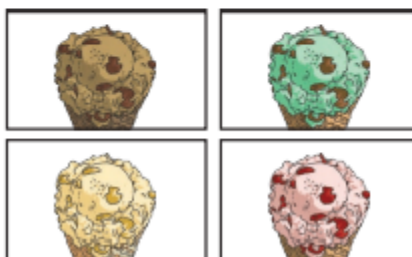
| $2a + b = 10$ |     |
|---------------|-----|
| $a$           | $b$ |
| 2             | 6   |
| 3             | 4   |
| 4             | 2   |
| 5             | 0   |

## Enumerating Possibilities

Enumerating means making a complete list of answers to a problem.

- Use a system for finding the possibilities.
- Organise your findings in an ordered list or table.
- Have a way of deciding when all possibilities have been found.

There are four ice cream flavours.

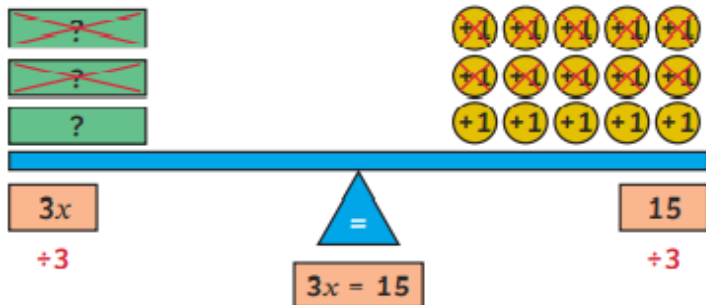


Two scoops of two different flavours give six possible combinations.

- chocolate and strawberry
- chocolate and vanilla
- chocolate and mint
- strawberry and vanilla
- strawberry and mint
- vanilla and mint

In algebra, missing numbers in equations are represented by letters. Any letter can be used but often the letter  $x$  is used. An algebraic  $x$  is written to look different to a normal letter 'x' to avoid confusion.

$$3x = 15$$



The multiplication sign is not used in algebra to avoid confusing it with the algebraic  $x$  used to show a missing number. Inverse operations are used to isolate the letter on one side of the equation.

$$2x + 4 = 10$$

