Linear number sequences

Vocabulary

A linear number sequence is a sequence where each value increases or decreases by the same amount each time. Each number in a linear number sequence is called a term. The constant change between each number is called the term to term rule. To identify the term to term rule, find the difference between the two adjacent terms.

When you know the term to term rule, you can use it to find the next number in the sequence. It can also be used to find a missing number within a sequence.

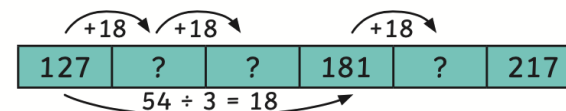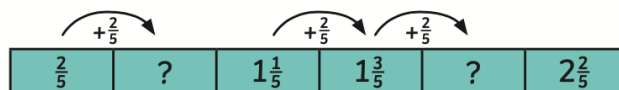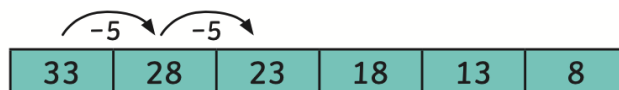| term to term rule |
| variable |
| unknown |
| expression |
| equation |
| formula |
| one-step equation |
| two-step equation |
| substitution |
| pairs of unknowns |
| enumerate |

−5   −5

| 33 | 28 | 23 | 18 | 13 | 8 |

$+\frac{2}{5}$ $+\frac{2}{5}$ $+\frac{2}{5}$

| $\frac{2}{5}$ | ? | $1\frac{1}{5}$ | $1\frac{3}{5}$ | ? | $2\frac{2}{5}$ |

+0.4   +0.4   +0.4

| 0.5 | 0.9 | 1.3 | 1.7 | ? | ? |

+18   +18   +18

| 127 | ? | ? | 181 | ? | 217 |

54 ÷ 3 = 18

Forming expressions

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

Add 14 to a	$a + 14$
Subtract 20 from b	$b - 20$
Multiply c by 4	$4c$
12 more than d	$d + 12$
Multiply e by 3 and subtract 5	$3e - 5$
Add 12 to f and then multiply by 2	$2(f + 12)$

Forming equations

$$a + 14 = 20$$
$$b - 20 = 15$$
$$4c = 28$$
$$d + 12 = 30$$
$$3e - 5 = 10$$
$$2(f + 12) = 44$$

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

Equations with unknowns

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

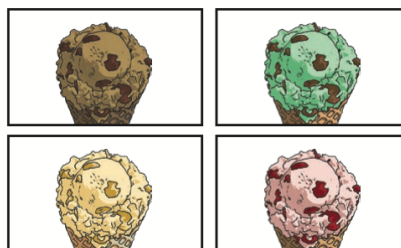| $ab = 18$	
a	b
1	18
2	9
3	6
6	3
9	2
18	1

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

Possibilities

Ways to make a complete list on answers to a problem.
- use a system for finding the possibilities
- organise your findings in an ordered list or table
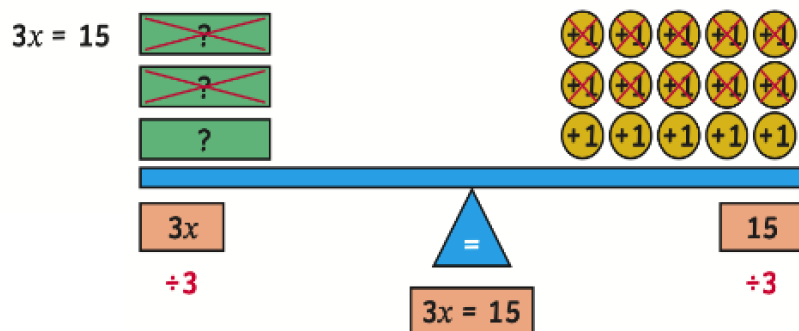- have a way of deciding when all possibilities have been found

There are four ice cream flavours.

Two scoops of two different flavours give six possible combinations.

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

Solving equations

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 'x' to avoid confusion.

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.

$3x = 15$

$3x$	$=$	15
$\div 3$		$\div 3$

$3x = 15$

$2x + 4 = 10$

$2x + 4$	$=$	10
-4		-4
$\div 2$	$x = 3$	$\div 2$