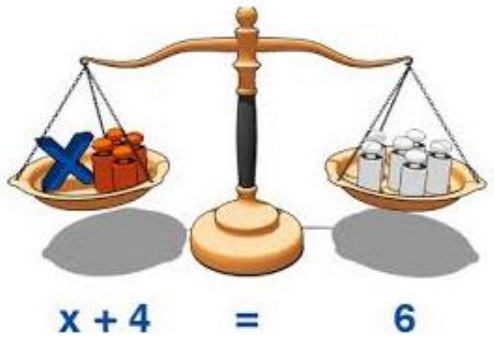
Year 7 – Unit 6 – Solving Equations – Knowledge Organiser

Objective
Use diagrams to solve equations
Use inverse operations to solve equations
Understand and use balancing to find equivalent equations
Use balancing to solve equations



Key Facts

Some of the most common methods for solving equations are the balancing method, the bar model method, using inverse operations and balancing scale pictures.

Solving equations requires you to find the value of x (or y, or z etc.) There are different kinds of equation:

- One Step Equation → $x + 15 = 21$
- Two Step Equation → $3x - 5 = 16$
- Multi-Step Equation → $4x + 6 + 3x - 18 = 23$

Solving Two Step Equations

Balancing Method:

$8b + 5 = 29$

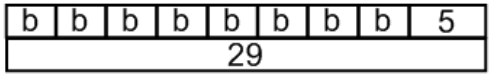
$-5 \quad -5$ — Step 1: Subtract 5 from both sides.

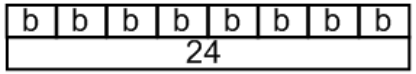
$8b = 24$

$\frac{8b}{8} = \frac{24}{8}$ — Step 2: Divide both sides by 8.

$b = 3$

Bar Model Method:





Key Concept Check

- Show me a one-step equation with a solution of 14. And another. And another …
- Show me a two-step equation with a solution of $-\frac{1}{2}$. And another. And another …
- Katy thinks that if $2x + 4 = 10$ then also $6x + 12 = 30$. Do you agree with Katy? Explain.
- Joshua thinks that if $2x + 6 = 5x + 1$ then also $x + 5 = 4x$. Do you agree with Joshua? Explain

Key words used in this unit:

Algebra – Maths dealing with letters/unknowns and numbers.

Unknown number – A number that we do not know or need to find, usually given as a letter/symbol.

Equation – A mathematical statement that contains an equals sign, e.g. $5x + 2 = 7$, the expression on the left is equal to (balanced with) the expression on the right.

Solve - To solve an equation is to find the value of the letter/unknown in the equation.

Operation – The 4 different types of operations are add (+), subtract (-), multiply (x) & divide (÷).

Inverse Operation - The opposite operation, e.g. the opposite of +4 is -4.

Inverse operations

operation	+	−	×	÷
inverse	−	+	÷	×