

Solving Linear Equations Topic Sequence

True sentences

Each of the following is true for $x = 2$. $X = 2$ is called the solution to the equation.
 $x = 2$; add 5: $x + 5 = 7$; subtract 3: $x + 2 = 4$; multiply by 2: $2x + 4 = 8$, etc.

Keeping the balance

- 1 and 2 step balance with envelopes and coins
 - writing the above as an algebraic equation; then solving
- 2 step balance with envelopes and missing coins
 - writing the above as an algebraic equation, then solving

Wrapping and unwrapping

Analogy – wrapping a present

Inverse operations

Wrapping an equation – start with $y = 2$ and do the same operation to both sides.

$$y = 2$$

e.g. $3y = 6$

$$3y + 5 = 11$$

Unwrapping $3y + 5 = 11$ is called solving the equation.

Solving simple equations

Always write an equivalent equation

One step equations with whole number solutions, solved algebraically

Scaffolding to encourage setting out.

One step equations involving integers, fractions, decimals, etc

e.g. $y + 5 = 2$, $3 + y = -3$, $y - 7 = -4$, $y - 1 = -8$, $-2y = 6$, $-y = 5$, $-y = -7$, $3y = 2$,

$$2y = -3$$
, $-3y = -1$, $\frac{y}{3} = -6$, $\frac{y}{-4} = 3$, $\frac{y}{-2} = -9$, $\frac{2}{3}y = -10$, $-\frac{3}{4}y = 6$, $25 = 0.3 \times y$

Two step equations with whole number solutions, solved algebraically

Scaffolding to encourage correct setting out

Two step equations involving integers, fractions, etc

Twinner's cookie jar as an aid to working out the steps.

Three and four step equations

Scaffolding to encourage correct setting out

Applications

Define the unknown(s)

Write the equation

Solve the equation

Applications involving geometry

Applications involving percent

Further equation solving

Equations in which the first step is adding like terms

Equations involving brackets

Balances with unknown on both sides of the equal sign, and equivalent algebra.

Equations with the unknown on both sides of the equal sign.

Equations with two or more terms involving fractions

Applications

Solving equations using a graphics calculator

Applications

Transforming Equations