

Modelling Equations

You can model an equation using concrete materials, such as algebra tiles. In the figures below, shaded tiles are positive and white tiles are negative.

-  = positive x -tile
-  = negative 1-tile
-  = positive 1-tile

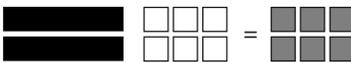
1. Model each equation using algebra tiles or diagrams.

a) $2x = 8$

b) $4r - 2 = 10$

c) $5p + 1 = 11$

2. Write the equation modelled by the algebra tiles.

a) 

b) 

Solving an Equation

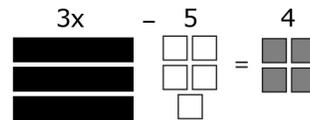
Two ways of solving an equation are:

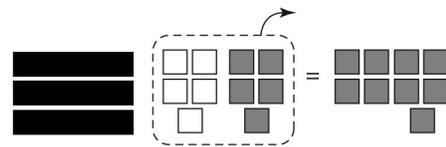
- perform the opposite operation on both sides of the equal sign
- model the equation and then balance it

Solve $3x - 5 = 4$.

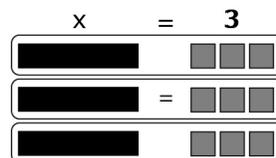
$$\begin{aligned} 3x - 5 &= 4 \\ 3x - 5 + 5 &= 4 + 5 \\ 3x &= 9 \\ \frac{3x}{3} &= \frac{9}{3} \\ x &= 3 \end{aligned}$$

$3x - 5 = 4$

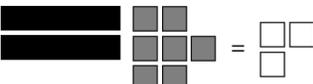


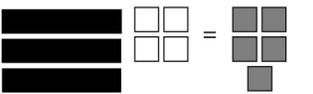


$x = 3$



3. Solve each equation modelled by algebra tiles.

a)  =

b)  =

4. Solve each equation.

a) $3r = -12$

b) $\frac{s}{2} = 3$

c) $3p - 2 = -14$

d) $12 - 2x = -4$

Checking an Equation

You can check your solution to an equation by substituting your answer back into the equation. Both sides should have the same value.

Check if $x = 5$ is the solution to $4x + 3 = 23$.

$$\begin{aligned} \text{Left Side} &= 4x + 3 \\ &= 4(5) + 3 \\ &= 20 + 3 \\ &= 23 \end{aligned}$$

$$\text{Right Side} = 23$$

Left Side = Right Side

The solution, $x = 5$, is correct.

5. Show whether $x = -4$ is a solution to each equation.

a) $5x + 7 = -13$

b) $12 - 5x = 8$

6. Solve and check.

a) $x - 2 = 5$

b) $3t + 4 = 10$

c) $2g - 7 = -11$