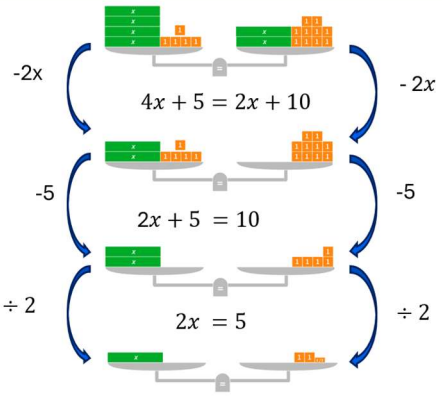
Solving Equations With an Unknown on Both Sides

When you have an **unknown variable on both sides** of an equation, start by removing the variable from one side. Typically, it's easiest to get rid of the smaller or negative variable first. This makes solving the equation easier.

To solve an equation with an unknown on both sides:

1. Model the equation on a balance scale.
2. Identify the smallest or negative x. Remove it using the inverse operation. Keep the scale balanced by doing the same operation on both sides.
3. Now use the inverse operations to isolate x on one side of the scale.
4. Check your answer by substituting the value of x back into the original equation. If both sides are equal, it's correct.
5. State your final answer.

(Images were created using free virtual manipulatives available at Polypad.com.)



Check
(4 x 2.5) + 5 = 15
(2 x 2.5) + 10 = 15✓

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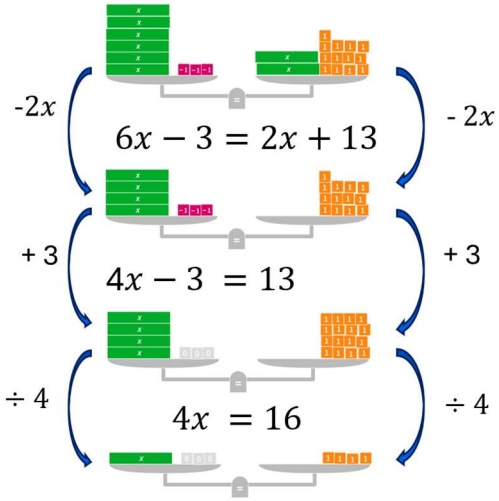
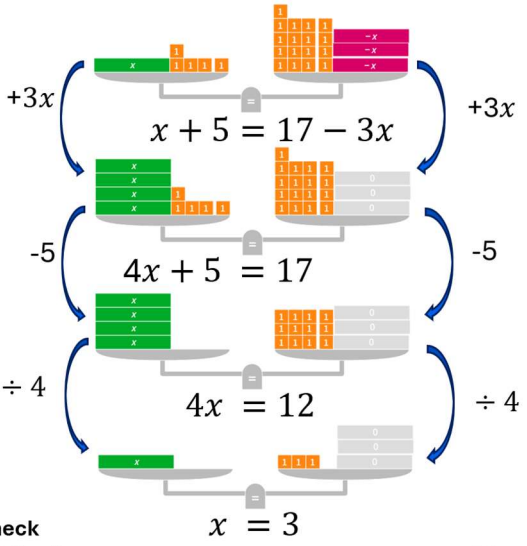


Check
(6 x 4) – 3 = 21
(2 x 4) + 13 = 21✓



Check
(3 +1) = 4
10 – (2 x 3) = 10 – 6 = 4✓

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