Math 9 *Name:* _____

6.2 – Solving Equations using Balance Strategies

Date: _____

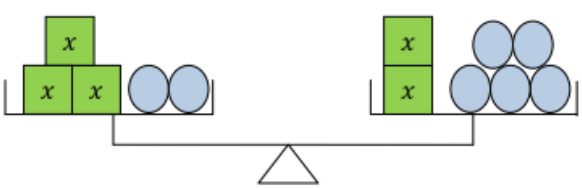
An equation represents a ***mathematical model*** of a problem from Science, Engineering, Business, etc.

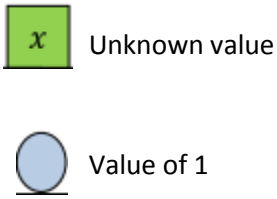
An equation has ***variables*** whose numerical values are ***not known***. We find the values by ***solving*** the equation.

The values of the variables have to be such that when we **substitute** them in for the variable, the **total value of the left side** of the equation must **equal** the **total value of the right side** of the equation.

An equation can be viewed as a **BALANCED SCALE** with the tipping point at the **EQUAL SIGN**.

e.g. $3x+2=2x+5$





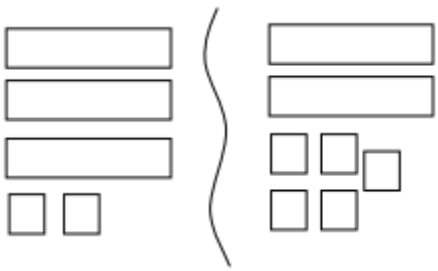
The "equation scale" shown above has boxes labelled as x on both sides. We need to find what number can be placed in each box so that the "equation scale" remains balanced.

Trial & Error Method

Guess Value for x	**Left Side**	**Right Side**	**Still balanced?**

Algebra Tiles Method

$3x+2 \quad = \quad 2x+5$



Algebraic Method

Remove all x - tiles/ x -terms from <u>one</u> side & remove all unit tiles from the <u>other</u> side

$3x \; + \; 2 \quad = \quad 2x \; + \; 5$

Solve: $2m + 2 = -3m - 8$

Solve: $4x - 5 = 2x + 4$

Solve: $6 - 3n = -9 + 2n$

Solve: $4a - 6 = 6a + 2$

Solve: $3(2x+2) = 2(x-5)$

Solve: $4(x-2) = 2(x-6)$

Solving Equations with Rational Coefficients

Solve: $\frac{5x}{3} - \frac{3x}{2} = 2$

Solve: $\frac{a}{3} = \frac{2a}{4} - 1$

Solve: $\frac{3f}{5} + \frac{5f}{3} = -2$