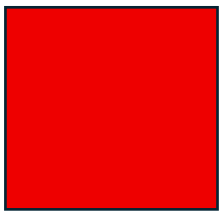
Getting Started with Algebra Tiles

Algebra Tiles

Introduction

Algebra tiles are hands-on maths manipulatives used to visualise algebraic expressions and equations. Each tile is double-sided and features two colours. The blue/green/yellow side represents a positive value, and the red side represents the negative values.

There are three different size tiles.

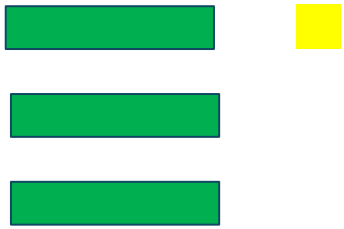
- The small squares or unit tiles +1 or  -1
- The rectangular tiles or variable tiles  +X or  -X
- The large squares or X^2 tiles  $+X^2$ or  $-X^2$

By placing a positive tile directly next to its corresponding negative tile creates a ‘zero pair’ as they cancel each other out. For example, +  = 0. Together they equal zero and by removing the cancelled out zero pairs will help to see exactly what the variable equals.

Starting Activities: Algebraic Substitution

Example 1: Find **3x + 1** if **x = 2**

STEP 1: Model the expression **3x + 1** with the tiles



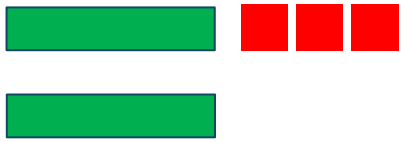
STEP 2: Using the information x=2, substitute each x tile for two 1 tiles.

Now it is easy to see that if **x=2** then **3x + 1 =7**

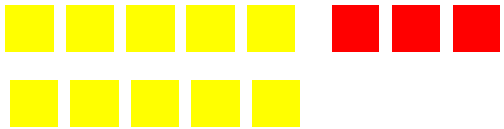
Starting Activities: Algebraic Substitution

<u>Example 2:</u> Find 2**x** – **3** if **x = 5**

STEP 1: Model the expression **2x - 3** with the tiles.



STEP 2: Using the information x=5, substitute each x tile for five 1 tiles.

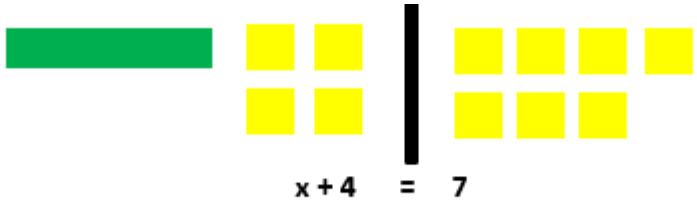


STEP 3: Each red tile cancels out a yellow tile because they are additive inverses. So, if **x = 5** then **2x - 3 = 7**

Moving On: Solving Equations

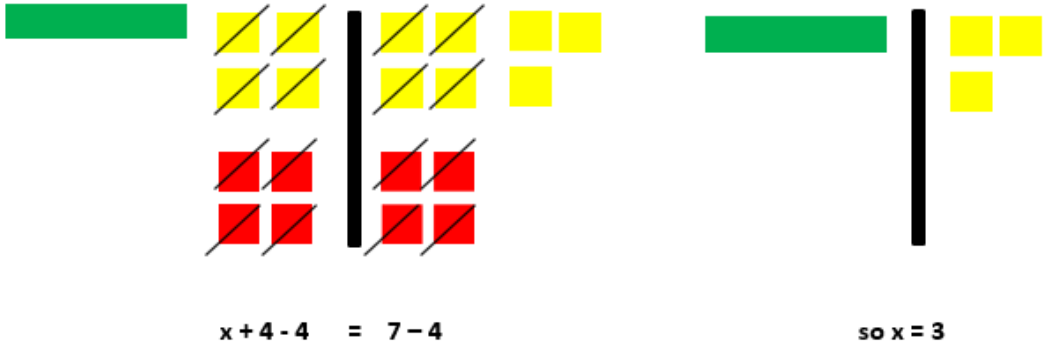
Example 1: x + 4 = 7

STEP 1: Model the equation using the tiles. You will need a defined space for each side of the equation.



STEP 2: We need to isolate the variable tiles (x) to find their value.

To do this we create additive inverse pairs. Each of the four '+1' tiles from the left can be paired with the four '-1' tiles to create 0 pairs, thus removing them from the calculation. Both sides of the equation maintain equality.

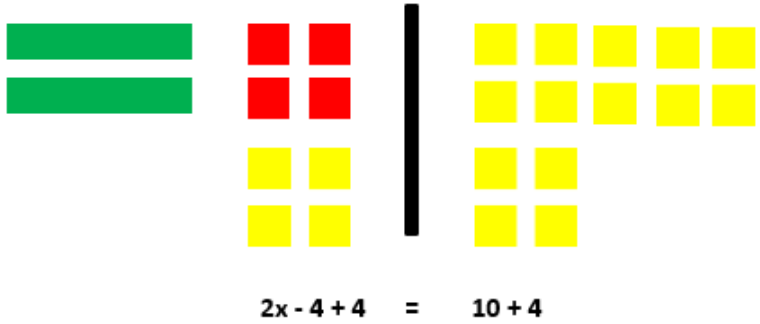


Example 2: $2x - 4 = 10$

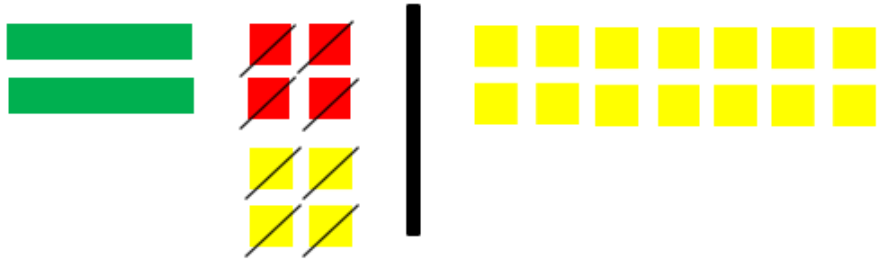
STEP 1: Model the equation using the tiles. You will need a defined space for each side of the equation.

STEP 2: We need to isolate the variable tiles (x) to find their value.

To do this we create additive inverse pairs. Each of the four '-1' tiles from the left, pair them with 4 ‘+1’ tiles, thus removing them from the calculation, then add four ‘+1’ tiles to the right to maintain equality.



2x - 4 + 4 = 10 + 4



So 2x = 14

So x = 7