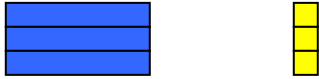


Balancing Equations

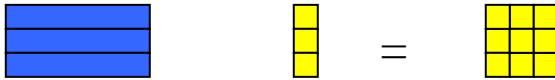
NAME _____

You can apply the Properties of Equality (Addition: add or subtract the same quantity to both sides; Multiplication: multiply or divide both sides by the same number) to solve algebraic equations. Isolate the variable on one side of the equation, with the solution alone on the other, just as you moved shapes in the balance pans. Always keep the pans balanced!

Using blue rectangles as the variables, for example, n , and yellow squares as numbers, we would call this collection $3n + 3$. Think of it in the left balance pan.



To solve $3n + 3 = 9$, show



To solve, our first step would be to remove 3 yellow squares from both sides, which will still be balanced, since we removed the exact same thing from both sides (Addition/Subtraction Property of Equality).

We now have $3n = 6$



If 3 blue rectangles equal 6 yellow squares, then 1 blue rectangle equals 2 yellow squares (Multiplication/Division Property of Equality).

$$n = 2 \quad \text{[one blue rectangle]} = \text{[two yellow squares]}$$

Draw sketches to demonstrate the equations below. Then apply the Properties of Equality to solve the equations, first with the sketches, and then with variables.

1. $2n + 4 = 10$

2. $3n = 12$

3. $7n + 6 = 13$