

Lesson 14: Equivalent Linear ExpressionsNYS Learning Standards:

7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Learning Outcome:

- Add and subtract linear expressions with fractional and decimal coefficients by combining like terms.
- Simplify expressions that include the distributive property, multiple variable terms, and negative numbers.
- Apply properties of simplifying expressions to contexts such as perimeters and areas of triangles and rectangles.
- Determine whether two expressions are equivalent.
- Write equivalent expressions for linear expressions.

Vocabulary:

- Equivalent Expressions: **expressions that have the same value for every possible value of the variable.**

- **For example:** $x + x + 4 + 2x \rightarrow 4x + 4 \rightarrow 4(x + 1)$

Distributive Property: **when you multiply each addend separately and then add the products.**

$$6(x + 5) \rightarrow 6x + 30$$

$$-3(y - 2) \rightarrow -3y + 6$$

$$-4(m + 9) \rightarrow -4m - 36$$

$$-7(-3 + 1) \rightarrow 21 - 7$$

Factoring: **to break up an expression into numbers that can be multiplied together to get the original expression.**

$$25m + 20 \rightarrow 5(5m + 4)$$

Step #1: Find GCF (Greatest Common Factor) for all terms.

Step #2: Divide each term by the GCF (Greatest Common Factor).

Step #3: Bring your GCF to the outside of your expression as if you're going to multiply it back.

****Remember: If you don't do Step #3, your expressions $25m + 20$ will not be equivalent to $5m + 4$.****

Combining Like Terms: **add/subtract similar terms (same last name)**

$$6n + 3m - 2m = 6n + m$$

$$-2r + 6b - 3b + 7r = 3b + 5r$$