Solve Equations with Variables on Each Side Family Letter

Dear Family,

In this module, ***Solve Equations with Variables on Each Side***, students will draw on their knowledge of solving two-step equations to help them solve equations with variables on each side of the equal sign.

What Did Students Learn Previously?

In earlier grades, students used the Properties of Equality to write and solve one- and two-step equations. For example, to solve the equation $3x + 2 = 8$, students would first isolate the term containing the variable, $3x$, by subtracting 2 from each side of the equation. Once the variable term, $3x$, has been isolated, students divide both sides of the equation by 3 to find the value of x as $x = 2$.

What Will Students Learn in This Module?

Equations with Variables on Both Sides

- Students will solve equations with integer, decimal, or fraction coefficients.

$\frac{2}{3}x - 1 = 9 - \frac{1}{6}x$	Write the equation.
$\frac{4}{6}x - 1 = 9 - \frac{1}{6}x$	Rewrite with common denominators.
$6\left(\frac{4}{6}x - 1\right) = \left(9 - \frac{1}{6}x\right)6$	Multiply by 6 to eliminate fractions.
$4x - 6 = 54 - x$	Distributive Property

- In the above example, students could choose to find a common denominator for the two fractions, making it possible to add or subtract the variable terms. Or they could choose to multiply each side of the equation by the least common multiple to clear the fractions, as shown in lines 3 and 4 of the example above.

Equations with Grouping Symbols

- Students will write equations with grouping symbols (such as parentheses) on one or both sides of the equation, such as $3(x + 2) + 4 = x - 4(\frac{1}{2}x - 3)$.
- Students will solve equations with grouping symbols using the Distributive Property.

Number of Solutions

- Students will determine whether an equation has one solution, no solution, or infinitely many solutions.
- Students will write equations that have one solution, no solution, or infinitely many solutions.

What Vocabulary Terms Will Students Use?

Term	Definition
coefficient	The numerical term of a factor that contains a variable.
constant	A term without a variable.
like terms	Terms that contain the same variables to the same powers.
solution	A value that makes an equation true.

How You Can Provide Support

1. Support your child's understanding of writing equations with variables on each side by demonstrating how they can be used when choosing a *cell phone plan*.
   - Discuss with your child the various types of cell phone plans and explain that some plans include a phone, and some plans include only service.
   - With your child, investigate the cost of cell phones, the cost of plans that include cell phones, and the cost of plans that include only service.
   - Help your child to algebraically model the costs associated with each type of plan. For example, if a phone costs $600 and a service-only plan costs $50 per month, your child might write $c = 50m + 600$ and if a plan which includes a phone costs $125 per month, your child might write $c = 125m$. For each equation, c represents the total cost and m represents the number of months.
   - Have your child write an equation to find the number of months it would take for a person to pay the same amount for either plan. For example, your child might write $50m + 600 = 125m$ and find that $m = 8$.
   - Help your child interpret their solution. In the example above, $m = 8$ indicates that, after 8 months someone would have paid the same amount for each plan.
2. Encourage your child to have a positive, growth-oriented attitude towards mathematics and their learning.
   - Encourage them to ask questions – both at home and in class. Sometimes, an answer to a question will generate more questions. That's how you know they are learning!
   - Encourage your child to embrace challenges and remind them that every challenge is an opportunity to learn something new.
   - Celebrate successes – both small and large.
3. Contact me to arrange a time to discuss the specifics of your child's performance and how we can work together to help them succeed in this module.

Sincerely,

(Teacher's Name) (Email/Phone)