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Solving Multi-Step Equations with Variables on Both Sides

$$5x + 1 = 2x + 10$$
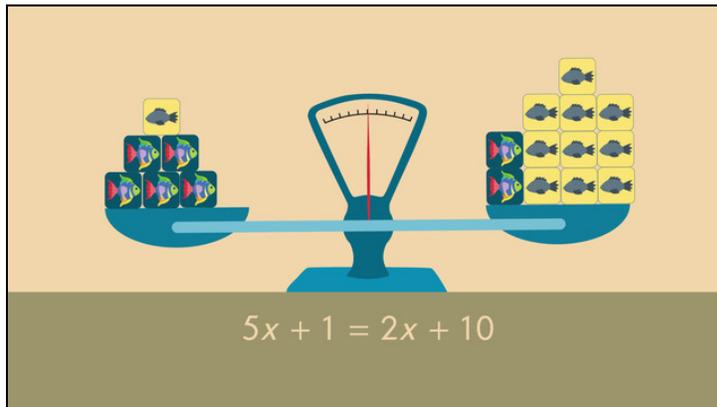
(1) **Evaluate how we can solve an equation.**

(2) Determine how many Grey Borings Emilio needs to exchange to buy one more Rainbow Blinkey.

(3) Decide which steps are needed to solve the equation $3 \times (2x - 5) + 10 = 4x + .9$

(4) Find the right equations for the fish on the scale.

(5) Decide when the numbers of inhabitants match.

(6) Solve the following equations.

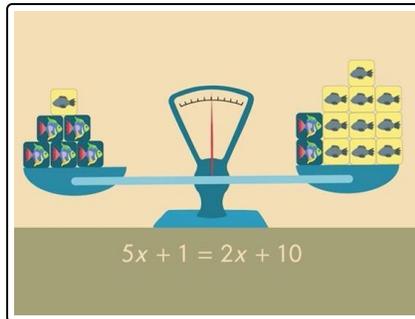**(+)** with lots of tips, answer keys, and detailed answer explanations for all of the problems.

⚠ The complete package, **including all problems, hints, answers, and detailed answer explanations** is available for all sofatutor.com subscribers.

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Worksheet: Solving Multi-Step Equations with Variables on Both Sides
Mathematics / Algebra 1 / Equations / Solving Multi-Step Equations with Variables on Both Sides

1
of 6

Evaluate how we can solve an equation.

Choose the correct statements.

$$5x + 1 = 2x + 10$$

A

An equation works like an imbalanced scale.

B

The opposite operation of addition is subtraction, and vice versa.

C

The opposite operation of multiplication is subtraction, and vice versa.

D

If we divide an equation by 3, we have to do this on both sides of the equation.

E

If we subtract 1, we have to do this on one side of the equation.

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Hints for solving these problems

1 of 6   Evaluate how we can solve an equation.

Hint #1

Look at the scale above. What do you see?

In the middle of the scale you can imagine an equal sign.

Both sides of an equal sign represent the same value.

Hint #2

If you only put a weight on the left side of a scale, the scale will be imbalanced. Since you want the scale to be balanced, you have to put the same weight on the right side as well.

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Answers and detailed answer explanations for these problems

1 of 6   Evaluate how we can solve an equation.

Answer key: B, D

Solving an equation can be thought of as a scale in balance.

In the middle of an equation there is an equal sign. On both sides we find equal terms.

Back to the scale: each operation has to be performed on both sides. Otherwise the scale will not be in balance. For example, in order to solve the equation $3x = 9$, we have to divide both sides by 3. That will leave us with $x = 3$.

Remember the rules concerning opposite operations:
- the opposite operation of addition is subtraction, and vice versa
- the opposite operation of multiplication is division, and vice versa