- Students should not need this last step, but we could review it.

Let students solve in this way, verifying that we get the same result.

We can do more examples.

Students can do the usual follow-up activities.

NOTES

- If students have worked well and practiced both with negative leading coefficients and x on the right side, then there is no inherent advantage or disadvantage, only a preference, which the students can choose. It is standard practice, however, to write the final answer as $x =$, with the x on the left side. They should solve both ways to see they are the same, and this can be reflected in follow-up activities where they solve it both ways and compare.

SOLVING MULTI-STEP EQUATIONS

PREREQUISITES

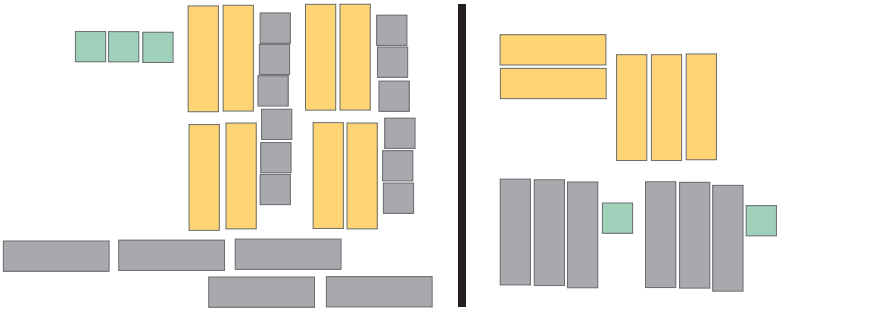
Distributive Property (Ch. 8) and *Combining Like Terms* (Ch. 7). We could do this before *Variables on Both Sides of the Equation*, but we would be limited in our examples.

MATERIALS

Algebra tiles
Special symbols

PRESENTATION

Ask students to represent an equation such as $3 + 4(2x - 3) - 5x = 2x + 3x - 2(3x - 1)$.



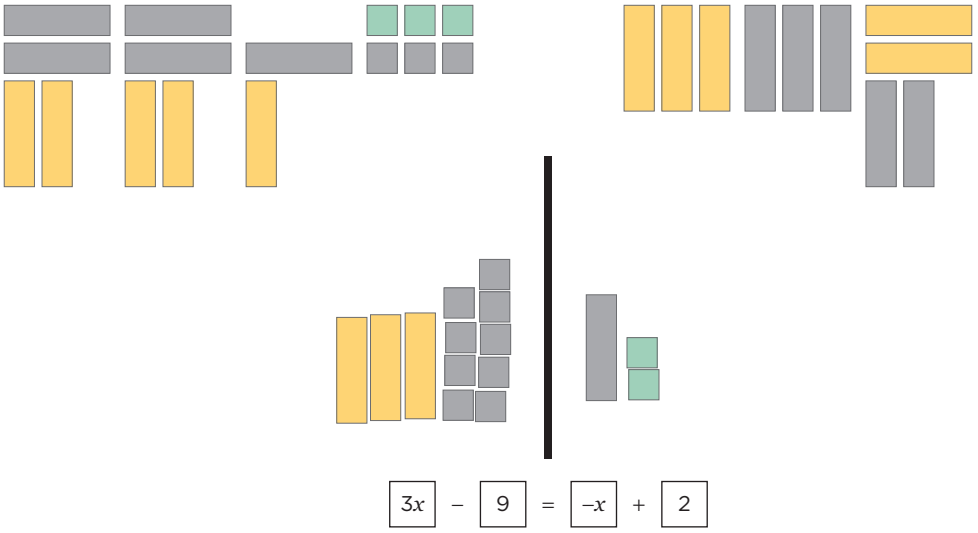
$$\boxed{3} + \boxed{4}\left(\boxed{2x} - \boxed{3}\right) - \boxed{5x} = \boxed{2x} + \boxed{3x} - \boxed{2}\left(\boxed{3x} - \boxed{1}\right)$$

SAY "Wow! How will we ever figure out what x is? There is so much here!"

Students can discuss.

SAY "We can consolidate all the x's on the left and the units on the left, and the same thing on the right. Right now, they are scattered all over."

Gather the same types of pieces and remove zero pairs.



$3x - 9 = -x + 2$

SAY "Now we have gathered like terms. We did not change any amounts on either side of the equal sign. We just made everything simpler by combining like terms. Let's show this with the writing."

Students use the distributive property and combine like terms to arrive at the same result of $3x - 9 = -x + 2$.

SAY "Now we can continue to solve as we have before."

Students can finish solving the equation with the materials or in writing.

SAY "When we see lots of terms on one side of the equation, before we deal with both sides, we should just deal with one side at a time. We should simplify it as much as we can, and then try to solve for x."

We can do further examples.

Students can do the usual follow-ups.

NOTES

- Students can enjoy doing complicated-looking long equations. It is always curious when something seemingly large comes down to something simple, like $x = 2$. Students can also try to make up long equations that simplify neatly. This challenge uses many different skills.