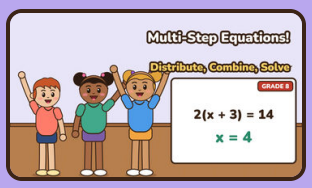
HAKILLO KIDS · TEACHER GUIDE · COMMON CORE EDITION · GRADE 8 · LESSON 3

Multi-Step Equations



COMMON CORE
8.EE.C.7.b

VIDEO LENGTH
4:49 · Virginia SOL edition also available

WATCH THE LESSON FREE
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PRACTICE ONLINE
learn.hakillokids.org · videos stop for each question, scored automatically

8.EE.C.7.b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Materials: Algebra tiles, whiteboards.

Students will

- Use the distributive property to solve equations.
- Combine like terms before solving.
- Solve equations with variables on both sides.
- Distribute to every term inside parentheses.

Key words

distributive property	a(b + c) = ab + ac
like terms	terms with the same variable part
variables on both sides	an x term on each side of the equal sign
inverse operations	operations that undo each other

Before the video 2 minutes

Show 2(x + 3) = 14 with algebra tiles. Ask: “What does the 2 outside the parentheses mean?”

What happens in the video

0:00	Welcome and today's goal: multi-step equations
0:20	2(x + 3) = 14: distribute, then solve, x = 4
0:39	3x + 2x - 4 = 21: combine, then solve, x = 5
0:59	5x + 3 = 2x + 12: x = 3
1:18	Spot the mistake: distribute to both terms
1:44	Your turn! Students answer during each pause (see below)
4:29	Recap and goodbye

Spot the mistake at 1:18

> **Sam:** Two times x plus five, equals eighteen. Distribute: two x plus five equals eighteen!
> **Ivy:** Hmm... did the two multiply the five too?
> **Mia:** It multiplies both terms. Two x plus ten equals eighteen. Two x equals eight, so x equals four.
> **Sam:** Oops! Distribute to every term. Four!

- Ask: “Did the 2 multiply the 5 too?” (It must.)
- Model 2(x + 5) with algebra tiles: two groups of x + 5.
- Solve 2x + 10 = 18: x = 4.

Your-turn pauses students answer out loud, then the characters give the answer

TIME	QUESTION	ANSWER IN THE VIDEO
1:45	Three times x minus two, equals twelve. What is x?	Six! Three x minus six equals twelve.
2:02	Four x plus x equals twenty-five. What is x?	Five! Five x equals twenty-five.
2:18	Six x minus two equals four x plus eight. What is x?	Five! Two x equals ten.
2:34	Two times x plus four, equals twenty. What is x?	Six!
2:49	Seven x plus three minus two x equals twenty-three. What is x?	Four! Five x plus three equals twenty-three.
3:06	Five times x minus one, equals three x plus seven. What is x?	Six! Five x minus five equals three x plus seven.
3:25	x plus nine equals four x. What is x?	Three! Nine equals three x.
3:40	Three times two x plus one, equals twenty-seven. What is x?	Four! Six x plus three equals twenty-seven.
3:57	Eight x minus three x plus two equals seventeen. What is x?	Three!
4:12	Four times x plus two, equals two x plus twenty. What is x?	Six! Two x equals twelve.

Tip: pause the video a little longer on any question your class finds hard, and ask a student to explain how they know.

After the video: talk about it

1. What is your first step when you see parentheses?
2. Why do we move the x terms to one side?
3. Solve 3(x - 2) = x + 8 and check.

Go further

Equation creation: students start with x = 3 and build a multi-step equation by doing the same steps to both sides, then trade.

Answer key for the practice page

1. x = 5
2. x = 6
3. x = 4
4. x = 3
5. x = 7
6. 30 + 10m = 15m, m = 6 months

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HAKILLO KIDS · GRADE 8 · LESSON 3 · PRACTICE

Multi-Step Equations

Name: _____ **Date:** _____

1. **3(x + 4) = 27**

   Answer: _____

2. **4x + 2x - 5 = 31**

   Answer: _____

3. **7x - 4 = 3x + 12**

   Answer: _____

4. **2(3x - 1) = 16**

   Answer: _____

5. **5(x - 2) = 2x + 11**

   Answer: _____

6. **Gym A costs $30 plus $10 per month. Gym B costs $15 per month. After how many months do they cost the same? Write and solve an equation.**

   Answer: _____

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