

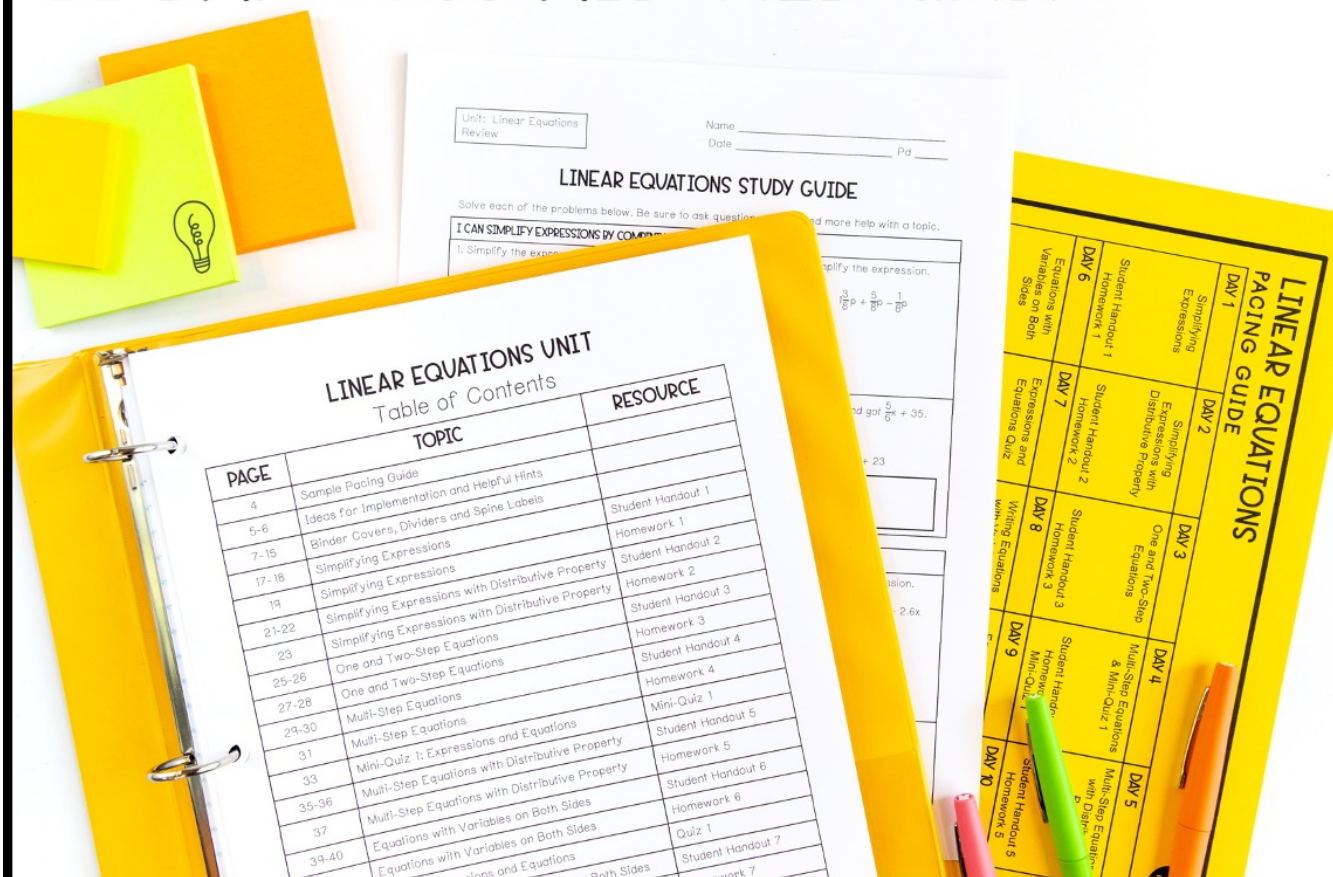
learning focus:

- ✓ review one-step, two-step and multi-step equations
- ✓ solve equations with variables on both sides
- ✓ solve equations with special cases, including using the distributive property

LINEAR EQUATIONS UNIT

11 DAY CCSS-ALIGNED UNIT

8th
GRADE



A MANEUVERING THE MIDDLE® RESOURCE

LINEAR EQUATIONS



an 11 day CCSS-aligned unit
CCSS: 8.EE.7.A, 8.EE.7.B

**ready-to-go, scaffolded
student materials**

LINEAR EQUATIONS UNIT

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student friendly + real-world application

skill application

Unit: Linear Equations
Student Handout 5

Name _____
Date _____ Pd _____

MULTI-STEP EQUATIONS WITH DISTRIBUTIVE PROPERTY

Two friends met up for coffee and dessert. Each friend got a medium drink and two cupcakes, and one friend bought a mug for \$12.00. The friend who bought the mug paid for their order, and the total was \$29.00.

a. If a medium cup of coffee costs \$3.50, lines at the right to write an equation to solve for c, the cost of a cupcake.

b. Distribute and combine like terms on the equation.

c. Solve for c.

Similar to the example above, when equations are more complex, follow the steps to solve below. Apply the steps to solve the equations below.

STEPS TO SOLVE

- _____ first
- _____ like terms (if needed)
- _____ the equation

Solve each equation. Be sure to show all work.

2. Solve the equation.

$$4 + 2(x - 8) = 44$$

Unit: Linear Equations
Homework 5

Name _____
Date _____ Pd _____

MULTI-STEP EQUATIONS WITH DISTRIBUTIVE PROPERTY

Solve each equation below. Then, find the sum of the solutions in the three columns. If the problems are answered correctly, the sum of each column will be the same.

COLUMN #1	COLUMN #2	COLUMN #3
A $4(2x - 7) - 2x = -10$	B $3.3(n - 8) - n = 1.2$	C $12 + \frac{1}{5}(10c + 5) = 59$
D $8.6w + 2.2(2w - 5) = 54$	E $\frac{1}{3}(2ly + 39) = -36$	F $\frac{5}{4}(20z + 12) = -35$
G $\frac{1}{2}v - 12 + 20 = 14$	H $1.4(x + 5) + 1.6x = 52$	I $-12 = 19k - 4k + 3$
SUM: _____	SUM: _____	SUM: _____

Summarize today's lesson:

self-checking
practice

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CCSS: 8.EE.7.A, 8.EE.7.B

streamline your planning
process with unit overviews

LINEAR EQUATIONS OVERVIEW



STANDARDS

8.EE.7.A Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

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

BIG IDEAS

- Equations can be solved to find a missing variable, and linear equations may have one, none or infinitely many solutions.
- Expressions can be expanded.

ESSENTIAL QUESTIONS

- How can you expand an expression?
- What determines if terms are like terms?
- How can you distinguish an equation from an expression?

LINEAR EQUATIONS PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Simplifying Expressions	Simplifying Expressions with Distributive Property	One and Two-Step Equations	Multi-Step Equations & Mini-Quiz 1	Multi-Step Equations with Distributive Property
Student Handout 1 Homework 1	Student Handout 2 Homework 2		Student Handout 4	
DAY 6	DAY 7			
Equations with Variables on Both Sides	Expressions and Equations Quiz			
Student Handout 6 Homework 6	Quiz 1			
DAY 11				
Linear Equations Unit Test				
Test				

LINEAR EQUATIONS OVERVIEW



TOPIC	TEACHING TIPS
Simplifying Expressions	Visit https://jeopardylabs.com/play/distributive for a Jeopardy game that includes combining like terms and the distributive property. This could be a fun class competition after the lesson has been taught. I usually group my students in teams for Jeopardy.
One and Two-Step Equations	To practice, consider partnering students and showing an equation on the board. Have one student instruct the other on how to solve as the student listening writes each step and solution. Then, show a new equation and have students switch roles. This gives students a chance to teach and reinforce what they remember about one and two-step equations.
Multi-Step Equations	After students have had time to practice, have "Board Races." Two students will come up to the board and race to solve an equation shown on the board. The person who solves it correctly first stays up at the board for the next equation with a new competitor. I like to have the students who aren't at the board working the equations on notebook paper to help check the solutions. An element of competition makes repetitive practice more fun!
Equations with Variables on Both Sides	Search illuminations.nctm.org for "Geology Rocks Equations" for a great visual and lesson where students use tactile representations to solve for missing values. Use dry erase markers to practice on white boards to make practice more fun.
Equations with Special Cases	Be sure to give students a chance to write their own equations with special cases to demonstrate their understanding. It may be helpful to pose a question with "blanks" to fill in. For example, ask students to write an equation with no solution by filling in each blank with a number 0-9 below: $9x - 4x + 2 + x = ______ x + ______$

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teaching
ideas

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CCSS: 8.EE.7.A, 8.EE.7.B

unit study guide + assessments



quizzes



editable unit test

Unit: Linear Equations
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: EXPRESSIONS AND EQUATIONS

Answer each question and be sure to show work when necessary.

1. Which is the correct simplified version of the expression shown below after combining like terms?

$12 + 3.4x - 5$

A. $-3x + 12$ B. $9x$

2. Which is the correct simplified version of the expression shown below after distributing and combining like terms?

$8(-\frac{1}{4}x + 1)$

A. $8x + 8$ B. $8x + 1$

3. Simplify the expression.

$\frac{3}{5}b - 2 + 7b - 12 - \frac{2}{5}b + 14$

5. Which of the following shows the equation shown below with the constants collected on one side?

$-2x + 15 = 3x - 10$

A. $-9x = 15$ B. $5x = 25$

Unit: Linear Equations
Review

Name _____
Date _____ Pd _____

LINEAR EQUATIONS STUDY GUIDE

Solve each of the problems below. Be sure to ask questions if you need more help with a topic.

I CAN SIMPLIFY EXPRESSIONS BY COMBINING LIKE TERMS.

1. Simplify the expression.

$-17b + a - 23b + 24a - 10$

2. Simplify the expression.

3. Simplify the expression.

4. Michelle simplified an expression. Explain her error and include the correct simplified expression.

I CAN SIMPLIFY EXPRESSIONS BY EXPANDING.

5. Simplify the expression.

$15 - 8(3x - 7) + x$

6. Simplify the expression.

8. Write an expression for the area of the rectangle.

EIGHTH GRADE CURRICULUM

LINEAR EQUATIONS

UNIT THREE: ANSWER KEY

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answer keys
included

