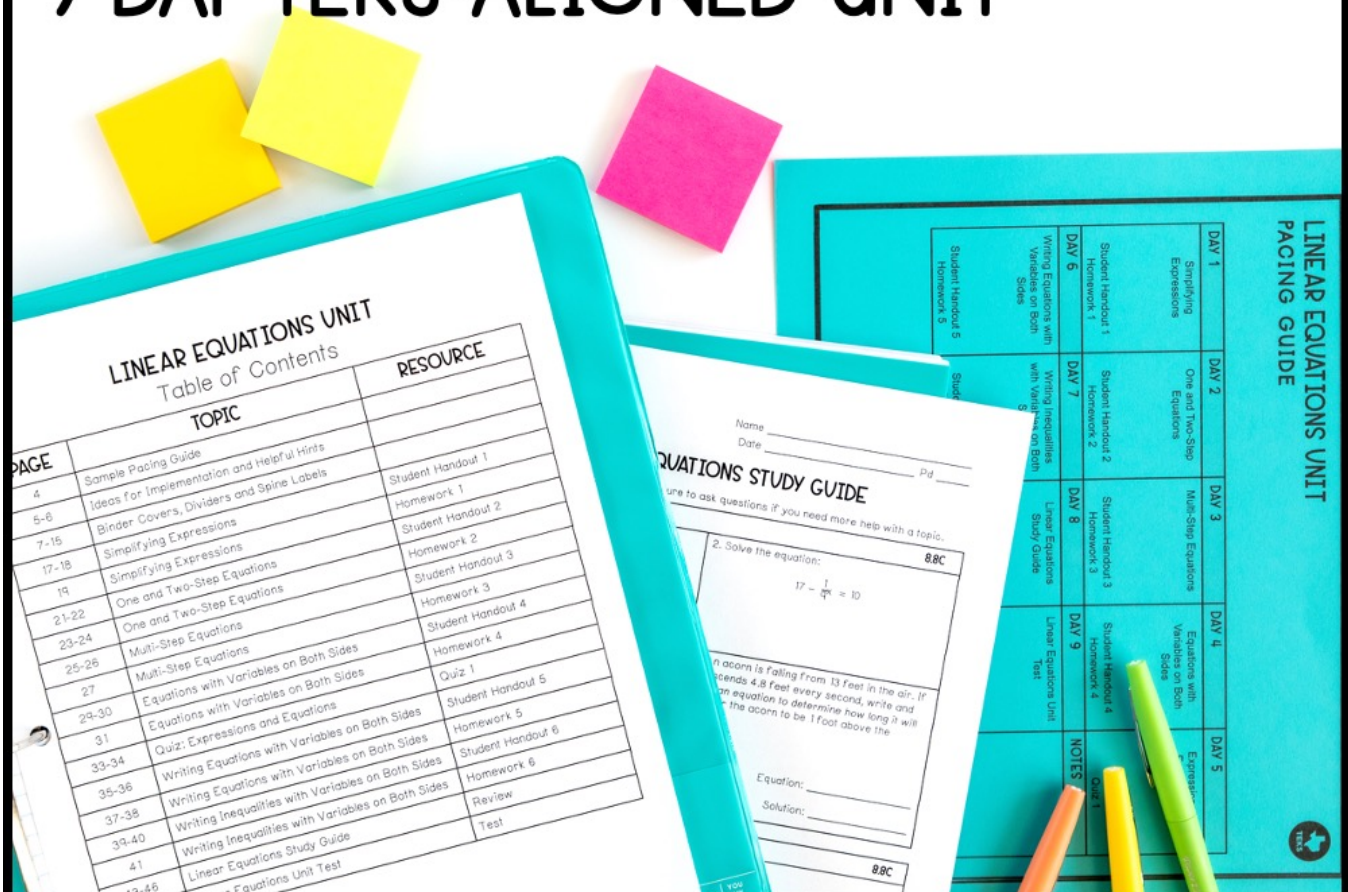# learning focus:

- ✓ model and solve equations with variables on both sides
- ✓ write equations and inequalities representing real-world situations
- ✓ write a real-world problem given an equation or inequality

LINEAR EQUATIONS UNIT
9 DAY TEKS-ALIGNED UNIT

8th GRADE

A MANEUVERING THE MIDDLE ® RESOURCE

LINEAR EQUATIONS

a 9 day TEKS-aligned unit
TEKS: 8.8A, 8.8B, 8.8C

8th GRADE

ready-to-go, scaffolded student materials

LINEAR EQUATIONS UNIT
Table of Contents

LINEAR EQUATIONS

A 9 day TEKS-aligned unit
TEKS: 8.8A, 8.8B, 8.8C

8th GRADE

student friendly + real-world application

scaffolded concepts

Unit: Linear Equations
Student Handout 1

Name _____
Date _____ Pd_____

SIMPLIFYING EXPRESSIONS

Mrs. Thornberry wrote three examples of expressions on the board as shown. Using the examples, write your prediction of what makes something a mathematical expression in the space below her examples.

−25

EXPRESSION	• A mathematical and _____ • Will not have an
TERM	• A term is a cons
COEFFICIENT	• The number in f
LIKE TERMS	• Must have both exponent (or ___

Use the definitions above to help you com

1. Give an example of an expression with four terms.	2. List a express 6
4. Give an example of a like term for eac	
a. 14y _____	b. -9b ____
5. Circle the letter of any card that gives	

| A. | B. |
| $\frac{1}{4}$c and -9c | 2.2n and 2.2 |

SIMPLIFYING EXPRESSIONS

• We can simplify algebraic expressions by combining _____ _____.
• Be careful when you are combining terms to check the _____ that is in front of the term.

A group of friends went to the movies and bought the tickets (t), drinks (d) and popcorn (p) shown.
• Use the given variables to write an expression representing the individual items purchased:

• Simplify the expression by combinin

In 6-11, simplify each expression by c

| 6.
13r + 5r + 2n | 7. |
| 9.
-18.7b + 4b − 0.3b | 10. |

Apply your knowledge of simplifying e

12. Simplify an expression for the per the rectangle.
17.4x − 0.8 cm
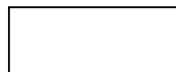
Perimeter: _____

Summarize today's lesson:

Unit: Linear Equations
Homework 1

Name _____
Date _____ Pd_____

SIMPLIFYING EXPRESSIONS

Match each expression with the correct simplified expression. Use the corresponding letter with each solution to help you solve the riddle.

1	4x − 2x − 20x + x	2	$-\frac{4}{7} + \frac{2}{7}x − 14x + \frac{4}{7}$
3	7 − 9x − 15 + 12x	4	-2.4x + 3.8x − x
5	-0.8x + 40 − 8x − 35	6	$12\frac{5}{6}x − 14x + \frac{1}{6}x$
7	-3x + 14 − 11 + 11x	8	3.75x − 5 − 8.75x + 4.5 + 0.5

| A: -5x | E: -8.8x + 5 | O: 3x − 8 | L: 0.4x | G: -x | W: 8x + 3 |
| R: -17x | B: $-13\frac{5}{7}$x | M: -8x | U: $-2\frac{1}{6}$x | D: $-13\frac{1}{7}$x | N: -5.5x |

WHAT IS A BIRD'S FAVORITE SUBJECT?

___ ___ ___ ___ ___ ___ ___ ___
3   7   4   6   5   2   1   8

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interactive practice

A MANEUVERING THE MIDDLE® RESOURCE

LINEAR EQUATIONS

a 9 day TEKS-aligned unit
TEKS: 8.8A, 8.8B, 8.8C

streamline your planning process with unit overviews

LINEAR EQUATIONS
OVERVIEW

READINESS STANDARDS

8.8C Model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants.

SUPPORTING STANDARDS

8.8A Write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants.

8.8B Write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants.

BIG IDEAS

- Mathematical and real-world situations can be modeled and solved with equations
- Inequalities and equations

ESSENTIAL QUESTIC

- How can equations be used
- When would it be likely that
- How do I know which inequa

✓ **key vocabulary**

✓ **vertical alignment**

sample pacing calendar

LINEAR EQUATIONS UNIT
PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Simplifying Expressions	One and Two-Step Equations	Multi-Step Equations	Equations with Variables on Both Sides	Expressions and Equations Quiz
Student Handout 1 Homework 1	Student Handout 2 Homework 2			

DAY 6	DAY 7
Writing Equations with Variables on Both Sides	Writing Inequalities with Variables on Both Sides
Student Handout 5 Homework 5	Student Handout 6 Homework 6

LINEAR EQUATIONS UNIT
OVERVIEW

TOPIC	TEACHING TIPS
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 from Grade 7.
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.

Inequalities with Variables on Both Sides	• Knowing the correct inequality sign to use will be key to students mastering this topic. When students are trying to decide the sign for a phrase, such as "no more than" or "at least," I like to have them ask 3 questions:
	  1. Can it be equal to the value?
	  2. Can it be more than the value?
	  3. Can it be less than the value?
	
	Furthermore, using the phrases in every day situations can help students know which symbol is correct. For example, if students are told they have to have "at least" a 90 to make an A, they know it can be greater than or equal to a 90 because of their familiarity with the topic.

teaching ideas

LINEAR EQUATIONS

8th GRADE

a 9 day TEKS-aligned unit
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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.

Answers
1. _____
2. _____
3. _____

1. Simplify the expression by combining like terms.

$$12 + 3.4x - 5.4x - x$$

A. -3x + 12   B. 9x

2. Which value of x makes the equation

$$\frac{2}{5}x + 10 =$$

A. x = 100   B. x = 12

3. Which of the following answer choices
collected on the left and the constants ha

$$-2$$

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

4. After making the swim team, Farrah
purchased a swimsuit, a swim cap, and a
of goggles. The swimsuit was twice as m
the goggles, and the swim cap was half th
price of the goggles. If the total cost of th
items was $59.50, what was the price of
swimsuit?

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 WRITE AND SOLVE LINEAR EQUATIONS.   8.8C

1. Solve the equation:

$$\frac{x}{-3.5} + 33 = 30$$

2. Solve the equation:

3. A sprout in Jessie's garden is $5\frac{1}{5}$ c
grows $1\frac{3}{10}$ cm each week. Write and
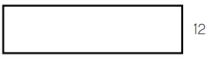equation in order to determine how
weeks it will take for the plant to be

Equation: _____

Solution: _____

I CAN WRITE AND SOLVE MULTI-STEP EQ

5. Solve the equation:

$$-4 + w + 17 - \frac{2}{3}w = 16$$

7. The perimeter of the rectangle sh
value of x.

12

4x − 6

EIGHTH GRADE CURRICULUM

LINEAR EQUATIONS

UNIT TWO: ANSWER KEY

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answer keys included

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