

# learning focus:

- ✓ solve multi-step linear equations including those with variables on both sides
- ✓ solve literal equations for a specified variable
- ✓ solve multi-step linear inequalities including those with variables on both sides

## EQUATIONS & INEQUALITIES UNIT

### 12 DAY TEKS-ALIGNED UNIT

A collage of math resources. In the foreground, a clipboard holds a "Table of Contents" for the "EQUATIONS AND INEQUALITIES UNIT". Behind it, a "STUDY GUIDE" and a "PACING GUIDE" are visible. The pacing guide is a pink sheet with columns for "DAY 1" through "DAY 4" and rows for "Simplifying Expressions", "Multi-Step Equations", and "Equations with Variables on Both Sides".

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation and Helpful Hints	Student Handout 1
7-15	Binder Covers, Dividers and Spine Labels	Homework 1
17-18	Simplifying Expressions	Student Handout 2
19	Simplifying Expressions with Distributive Property	Homework 2
21-22	Simplifying Expressions with Distributive Property	Student Handout 3
23	Simplifying Expressions with Distributive Property	Homework 3
25-26	Solving Multi-Step Equations	Student Handout 4
27-28	Solving Multi-Step Equations	Homework 4
29-30	Equations with Variables on Both Sides	Quiz 1
31	Equations with Variables on Both Sides	Student Handout 5
33-34	Equations with Variables and Equations	Homework 5
35-36	Quiz: Expressions and Inequalities	Student Handout 6
	Solving One and Two-Step Inequalities	Homework 6
	Solving One and Two-Step Inequalities	Student Handout 7

A MANEUVERING THE MIDDLE® RESOURCE

# EQUATIONS & INEQUALITIES



a 12 day TEKS-aligned unit

TEKS: A.5A, A.5B, A.12E

ready-to-go, scaffolded  
student materials

## EQUATIONS AND INEQUALITIES UNIT

### Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation and Helpful Hints	
7-15	Binder Covers, Dividers and Spine Labels	
17-18	Simplifying Expressions	Student Handout 1
19	Simplifying Expressions	Homework 1
21-22	Simplifying Expressions with Distributive Property	Student Handout 2
23	Simplifying Expressions with Distributive Property	Homework 2
25-26	Solving Multi-Step Equations	Student Handout 3
27-28	Solving Multi-Step Equations	Homework 3
29-30	Equations with Variables on Both Sides	Student Handout 4
31	Equations with Variables on Both Sides	Homework 4
33-34	Quiz: Expressions and Equations	Quiz 1
35-36	Solving One and Two-Step Inequalities	Student Handout 5
37	Solving One and Two-Step Inequalities	Homework 5
39-40	Solving Multi-Step Inequalities	Student Handout 6
41	Solving Multi-Step Inequalities	Homework 6
43-44	Inequalities with Variables on Both Sides	Student Handout 7
45	Inequalities with Variables on Both Sides	Homework 7
47-48	Quiz: Inequalities	Quiz 2
49-50	Literal Equations	Student Handout 8
51	Literal Equations	Homework 8
53-55	Equations and Inequalities Study Guide	Review
57-59	Equations and Inequalities Unit Test	Test

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# EQUATIONS & INEQUALITIES



a 12 day TEKS-aligned unit  
TEKS: A.5A, A.5B, A.12E

## student friendly + real-world application

scaffolded  
concepts

Unit: Equations and Inequalities  
Student Handout 2

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### SIMPLIFYING EXPRESSIONS WITH DISTRIBUTIVE PROPERTY

a. Write in words the meaning of  $3(12)$ .  
b. Applying your thinking from part a, write the meaning of  $3(x - 4)$ .

c. Use algebra tiles to sketch  $3(x - 4)$ . Then write the simplified expression.

**DISTRIBUTIVE PROPERTY**

- The distributive property states that  $a(b + c) = ab + ac$ .
- Algebraically, we can distribute a number or variable to each term inside the parentheses.
- Be careful with your signs.

Using the distributive property, simplify the expressions.

1. $4(x + 2)$	2. _____
4. $\frac{1}{2}(x - 9)$	_____

What makes example 5 different than question 4?

Simplify the expressions by distributing and combining like terms, if necessary.

6. $16x + 5.6(2x - 11)$	7. $13(1.4 + 2w)$	8. $\frac{3}{4}(16m - 5) - \frac{3}{2}$
9. $15.4 - 5.2(3f + 1.2)$	_____	_____

11. Shondra simplified the following expression but made an error. Describe her mistake and then correctly simplify the expression.

$$\begin{aligned} 26.7 - 6.3(6x - 10.1) \\ 26.7 - 37.8x - 63.63 \\ -37.8x - 36.93 \end{aligned}$$

13. Oscar is painting a wall with the following dimensions. Write the simplified expression for the area of the wall.

$$\begin{array}{|c|} \hline 40.5 \\ \hline \end{array} \quad \begin{array}{|c|} \hline 8.3w + 2 \\ \hline \end{array}$$

Summarize today's lesson:

Unit: Equations and Inequalities  
Homework 2

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

### SIMPLIFYING EXPRESSIONS WITH THE DISTRIBUTIVE PROPERTY

Each of the cards on the left simplifies to the same expression as one of the cards on the right. Find the matching expressions to complete the sentences below.

**A**  
 $-1 + 0.4(3x - 20)$

**B**  
 $5x - 7.4(x - 3) + 8.1$

**C**  
 $-6 + \frac{1}{4}x + 3(\frac{1}{4}x + 6)$

**D**  
 $16.5 - 2(5.1x + 9)$

**E**  
 $12 + 5(4x - 6)$

**F**  
 $17x - 4(4x - 3)$

**G**  
 $-0.8(3x - 31) + 5.5$

**H**  
 $-22.8 + 0.6(2x + 23)$

**I**  
 $11x + 3(3x - 6)$

**J**  
 $-4.2x - 3(2x + 0.5)$

- Card A and Card \_\_\_\_\_ simplify to the expression \_\_\_\_\_.
- Card B and Card \_\_\_\_\_ simplify to the expression \_\_\_\_\_.
- Card C and Card \_\_\_\_\_ simplify to the expression \_\_\_\_\_.
- Card D and Card \_\_\_\_\_ simplify to the expression \_\_\_\_\_.
- Card E and Card \_\_\_\_\_ simplify to the expression \_\_\_\_\_.

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self-checking  
practice



# EQUATIONS & INEQUALITIES



a 12 day TEKS-aligned unit  
TEKS: A.5A, A.5B, A.12E

streamline your planning  
process with unit overviews

## EQUATIONS AND INEQUALITIES OVERVIEW



### STANDARDS

READINESS	SUPPORTING
<b>A.5A</b> solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides	<b>A.5B</b> solve linear inequalities in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides  <b>A.12E</b> solve mathematic and scientific formulas, and other literal equations, for a specified variable



key vocabulary



vertical alignment



sample  
pacing  
calendar

### DIG IDEAS

- Equations are two mathematical or infinite solutions.
- Equations and inequalities can be solved.
- Expressions, equations, and problems.

### ESSENTIAL QUESTIONS

- How can expressions, equations, and inequalities be solved?
- What determines when an equation or inequality is true?
- What are the benefits of representing mathematical relationships with equations and inequalities?

## EQUATIONS & INEQUALITIES PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Simplifying Expressions  Student Handout 1 Homework 1	Simplifying Expressions with the Distributive Property  Student Handout 2 Homework 2	Multi-Step Equations  Student Handout 3	Equations with Variables on Both Sides  Student Handout 4	Expressions and Equations Quiz
DAY 6	DAY 7			
One and Two-Step Inequalities  Student Handout 5 Homework 5	Multi-Step Inequalities  Student Handout 6 Homework 6			
DAY 11	DAY 12			
Equations & Inequalities Review  Unit Study Guide	Equations and Inequalities Test  Unit Test			

## EQUATIONS & INEQUALITIES OVERVIEW



TOPIC	TEACHING TIPS
Simplifying Expressions	<ul style="list-style-type: none"><li>Write several different types of terms on the board. Ask two students to come up to the board with a fly swatter. When you call out a term, the first student to "swat" a like term wins a point for the team. Continue with other students. Keep score if your students can handle it. ☺</li><li>Give each student a lanyard with various terms written (<math>2x</math>, <math>2y</math>, <math>2x^2</math>, etc.) and ask them to find their families. Students will then attempt to group up based on various characteristics, typically by like terms. If they are incorrect, have them keep trying. If they are correct, have them find the rest of their family members. This great idea was shared by a friend and reader, Kayla.</li><li>Using colored pencils or shapes to group like terms is helpful for introducing this concept and for students who are struggling. A t-chart can also help organize work.</li><li>Watch for students who struggle to remember the coefficient of 1 in front of a lone variable.</li><li>Consider using a box method to model the distributive property. Algebra tiles work great, too!</li></ul>
Solving Equations	<ul style="list-style-type: none"><li>Start by displaying a very long and complex equation on the board. Explain that today you are laying the foundation for these types of equations.</li><li>Whiteboard races, markers, and graffiti activities are all great ideas to spice up practice. Search <a href="http://www.maneuveringthemiddle.com">www.maneuveringthemiddle.com</a> for the post called "Turn Any Worksheet into an Activity" for more details and ideas.</li><li>If you choose to use algebra tiles as a model, then make sure that students understand the concept of zero pairs. You can find more information about algebra tiles here: <a href="http://www.maneuveringthemiddle.com/why-you-should-use-algebra-tiles">www.maneuveringthemiddle.com/why-you-should-use-algebra-tiles</a></li><li>Draw a line through the equal sign to separate the two sides of the equation.</li><li>Make sure to actually say "2 times x equals 5" which helps remind students what operation is happening between the 2 and the x.</li></ul>

teaching  
ideas



# EQUATIONS & INEQUALITIES



a 12 day TEKS-aligned unit  
TEKS: A.5A, A.5B, A.12E

## unit study guide + assessments



quizzes



editable unit test

Unit: Equations and Inequalities  
Quiz 1

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

**QUIZ: EXPRESSIONS AND EQUATIONS**

Show all work as you answer each question below. Record your solutions in the box at the right.

1. Write a simplified expression for the model below.

x	x	x	x	x	-x	-x
1	1	1	1	1	1	1

Answers

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

2. Which of the following expressions is equivalent to  $5(-3a + 6)$ ?

a.  $-3(-5a + 10)$       b.  $5(-3a - 6)$

3. Write a simplified expression for the perimeter of the rectangle at the right.

4. Which value of  $n$  makes the equation  $2n + 1 = 11$  true?

a.  $n = 11$       b.  $n = 2.5$

5. Which value of  $p$  makes the equation  $3p - 1 = 5$  true?

a.  $p = 2.05$       b.  $p = -6.33$

6. Solve the equation below.

$-3(2x + 1) = 15$

Unit: Equations and Inequalities  
Review

Name \_\_\_\_\_  
Date \_\_\_\_\_ Pd \_\_\_\_\_

**EQUATIONS AND INEQUALITIES STUDY GUIDE**

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

**I CAN SIMPLIFY ALGEBRAIC EXPRESSIONS.**

1. Simplify an expression of the model.

x	x	x	-x	-x	1	-1	1
1	1	1	1	1	1	-1	1
1	1	1	1	1	1	-1	1

2. Give an example of a like term for each of the following.

3. Simplify each expression.

a.  $-2(3x - 9)$  \_\_\_\_\_  
b.  $5(12 - 5b)$  \_\_\_\_\_  
c.  $-8(-a + 10)$  \_\_\_\_\_

4. Simplify each expression.

**I CAN SOLVE LINEAR EQUATIONS AND INEQUALITIES.**

6. Solve the equation.

$$\frac{2}{3}(9w - 24) = -10$$

8. Solve the equation.

$$-11 + 1.5(2 - 6d) + 1.5d = 29$$

ALGEBRA 1 CURRICULUM

**EQUATIONS & INEQUALITIES**

UNIT ONE: ANSWER KEY

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answer keys  
included

