

learning focus:

- ✓ add, subtract, factor, and expand linear expressions with rational coefficients
- ✓ solve two-step and multi-step equations including using the distributive property
- ✓ write and solve equations that represent real-world situations

EXPRESSIONS & EQUATIONS UNIT

13 DAY CCSS-ALIGNED UNIT

7th
GRADE

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation & Helpful Hints	
7-16	Binder Covers, Dividers, and Spine Labels	Student Handout 1
17-18	Simplifying Expressions	Homework 1
19	Simplifying Expressions	Student Handout 2
21-22	The Distributive Property I	Homework 2
23	The Distributive Property I	Student Handout 3
25-26	The Distributive Property II	Homework 3
27	The Distributive Property II	Quiz 1
29-30	Expressions Quiz	Student Homework 4
31-32	One-Step Equations	Homework 4
33	One-Step Equations	Student Handout 5
35-36	Two-Step Equations	Homework 5
37	Two-Step Equations	Student Handout 6
39-40	Two-Step Equations with Rational Numbers	Homework 6
41	Two-Step Equations with Rational Numbers	Student Handout 7
43-44	Multi-Step Equations with the Distributive Property	Homework 7
45	Multi-Step Equations with the Distributive Property	Student Handout 8

A MANEUVERING THE MIDDLE® RESOURCE

EXPRESSIONS & EQUATIONS



a 13 day CCSS-aligned unit

CCSS: 7.EE.1, 7.EE.2, 7.EE.3, 7.EE.4, 7.EE.4A

ready-to-go, scaffolded
student materials

EXPRESSIONS & EQUATIONS UNIT

Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation & Helpful Hints	
7-16	Binder Covers, Dividers, and Spine Labels	
17-18	Simplifying Expressions	Student Handout 1
19	Simplifying Expressions	Homework 1
21-22	The Distributive Property	Student Handout 2
23	The Distributive Property	Homework 2
25-26	Distributing a Negative Number	Student Handout 3
27	Distributing a Negative Number	Homework 3
29-30	Expressions Quiz	Quiz 1
31-32	One-Step Equations	Student Handout 4
33	One-Step Equations	Homework 4
35-36	Two-Step Equations	Student Handout 5
37	Two-Step Equations	Homework 5
39-40	Two-Step Equations with Rational Numbers	Student Handout 6
41	Two-Step Equations with Rational Numbers	Homework 6
43-44	Multi-Step Equations with the Distributive Property	Student Handout 7
45	Multi-Step Equations with the Distributive Property	Homework 7
47-48	Solving Equations Quiz	Quiz 2
49-50	Writing Equations	Student Handout 8
51	Writing Equations	Homework 8
53-54	Applying Multi-Step Equations	Student Handout 9
55	Applying Multi-Step Equations	Homework 9
57-60	Expressions and Equations Unit Study Guide	Study Guide
61-63	Expressions and Equations Unit Test	Test

©Maneuvering the Middle LLC, 2016

EXPRESSIONS & EQUATIONS

7th
GRADE

a 13 day CCSS-aligned unit

CCSS: 7.EE.1, 7.EE.2, 7.EE.3, 7.EE.4, 7.EE.4A

student friendly + real-world
application

self-checking
practice

Unit: Expressions and Equations
Homework 5

Name _____
Date _____ Pd _____

TWO-STEP EQUATIONS

Henry is playing memory with different math cards. Solve for x on each card and record the matching sets below.

A $7x - 28 = 14$	B $9x - 9 = 18$	C $x =$	D $x =$
E $\frac{x}{4} + 9 = 11$	F $4x - 16 =$		
I $48 = 3x - 15$	J $0.5x + 15 =$		
M $\frac{x}{5} + 7 = 17$	N $84 = 24 +$		

A		B	
$x =$		$x =$	
E		F	
$x =$		$x =$	

Solve the equations below for practice. Roll a pair of dice and find the sum of the two numbers showing. Solve that problem.

	SOLVE	SOLUTION
2	$4x - 8 = 32$	
3	$6x + 9 = 27$	
4	$x - 2.7 = 15.4$	
5	$\frac{2}{3}x + 10 = 16$	
6	$\frac{x}{6} + 2 = 16$	
7	$19 = 5 + 7x$	
8	$\frac{x}{3} - 14 = 9$	
9	$5.37 + x = 12.89$	
10	$42 = 6x - 24$	
11	$10x + 25 = 50$	
12	$58 = 7x - 5$	

SHOW WORK HERE:

Use your understanding of solving equations to solve the problem below.

5. JP was asked to place a check mark next to the equation that is true. Check over his work and correct any errors.

QUESTION #1	QUESTION #2
<input checked="" type="checkbox"/> $8x - 15 = 41$	<input checked="" type="checkbox"/> $1.5x + 4 = 14.5$

6. Each of the students below made a statement. Write the student(s) who made a true statement.

HANNAH
The first step is to subtract 18 from both sides.

To solve the equation, you should subtract 18 from both sides.

Summarize today's lesson:

Unit: Expressions and Equations
Student Handout 5

Name _____
Date _____ Pd _____

TWO-STEP EQUATIONS

Finley and Drake each write an equation below. Finley says that both equations have a solution of $x = 5$. Drake says that is not true. Determine who is correct and justify your reasoning.

FINLEY
 $5x = 25$

DRAKE
 $5x + 5 = 25$

STEPS TO SOLVE

- Use inverse operations to undo addition and subtraction.
- Use inverse operations to undo multiplication and division.
- _____ the equation by isolating the variable.

Use algebra tiles to solve the equation modeled below.

$x + x + 1 = 1 + 1 + 1$ → \square → \square

Solve the following two-step equations. Draw algebra tiles if needed, and then check your work.

1. $10 + 3k = 22$	CHECK & GRAPH: $\longleftarrow \longrightarrow$	2. $19 = 4p - 5$	CHECK & GRAPH: $\longleftarrow \longrightarrow$
3. $\frac{r}{2} - 8 = 16$	CHECK & GRAPH: $\longleftarrow \longrightarrow$	4. $7 = 2w - 3$	CHECK & GRAPH: $\longleftarrow \longrightarrow$

©Maneuvering the Middle LLC, 2016

use of grade
level modeling

EXPRESSIONS & EQUATIONS 7th GRADE

a 13 day CCSS-aligned unit

CCSS: 7.EE.1, 7.EE.2, 7.EE.3, 7.EE.4, 7.EE.4A

streamline your planning
process with unit overviews

EXPRESSIONS AND EQUATIONS OVERVIEW



STANDARDS

- 7.EE.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- 7.EE.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
- 7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
- 7.EE.4** Use variables to represent quantities in real-world or mathematical problems, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
- 7.EE.4A** Solve word problems leading to equations of the form $px+q=r$ and $p(x+q)=r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of operations used in each approach.



key vocabulary



vertical alignment



sample
pacing
calendar

BIG IDEAS

- Mathematical and real-world
- Expressions are mathematical
- An expression can include like terms
- Expressions are used in real-world situations

ESSENTIAL QUESTION

- What process can you use to solve a problem?
- Why do properties of operations matter?
- Why do we differentiate between expressions and equations?
- How can a real-world situation be modeled with an equation?

EXPRESSIONS AND EQUATIONS PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Simplifying Expressions	The Distributive Property	Distributing a Negative Number	Expressions Quiz	One-Step Equations
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3		Student Handout 4
DAY 6	DAY 7			
Two-Step Equations	Two-Step Equations with Rational Numbers			
Student Handout 5 Homework 5	Student Handout 6 Homework 6			
DAY 11	DAY 12			
Applying Multi-Step Equations	Expressions and Equations Unit Study Guide			
Student Handout 9 Homework 9	Unit Study Guide			

EXPRESSIONS AND EQUATIONS OVERVIEW



TOPIC	TEACHING TIPS
Combining Like Terms	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 the point for the team. Continue with other students. Keep score if your students can handle it. ☺
The Distributive Property	Help students to see that they are already familiar with the distributive property by connecting it to $4(5+2)$. Then, show students how the same process applies even with a variable. Students tend to struggle when distributing a negative number, especially a negative one. It might help struggling students to highlight the value that is being distributed before they begin solving the problem.
Properties of Operations	Properties are a struggle to recall and apply. I suggest creating a large anchor chart with a three-column table. Include the name of the property and an example of two equivalent expressions. The key concept students should be able to recognize is that each property results in an equivalent expression; the property does not change the problem.
Solving One-Step Equations	Start by displaying a very long and complex equation on the board. Explain that today you are setting the foundation for these types of equations. Then, require students to show their steps as they solve. This will come in handy when rational numbers are included in a few days.
Solving Two-Step Equations	Give students individual white boards and have them work in teams of three. With one equation written on the board, the first person will solve step one. The second person will complete the second step in solving and the third will check the equation. Have groups hold up their boards when they are finished.
Solving Equations Application	I found that if students were able to create a scenario based on a given equation, they are more likely to be able to write an equation from a situation. Consider displaying an equation and giving partners one minute to create a scenario. Then, choose groups to share and ask the class to make any corrections to their scenario. This can get a bit silly as students might use other classmates' names or goofy situations.

teaching
ideas



EXPRESSIONS & EQUATIONS

7th
GRADE

a 13 day CCSS-aligned unit

CCSS: 7.EE.1, 7.EE.2, 7.EE.3, 7.EE.4, 7.EE.4A

unit study guide + assessments



quizzes



editable unit test

Unit: Expressions and Equations
Quiz 1

Name _____
Date _____ Pd _____

Answers

1. _____
2. _____
3. _____

QUIZ: EXPRESSIONS

Answer the following questions.

1. Which of the sets of terms below does NOT include like terms?

- A. $9m$, $-9m$, $7m$ B. $1p$, $-7p$, $7p$
C. 30 , -25 , 25 D. $6x$, 6

2. Which is the correct simplified version of $3(2x + 4) - 2(3x - 1)$?

- A. $66x + 8$ B. $74x + 14$
C. $-2x + 8$ D. $6x + 14$

3. Which of the following is an example of like terms?

- A. $17y$, y , 17 B. $15x$, 15
C. 18 , $21g$, 24 D. $-5x$, 5

4. Which of the following expressions represents the perimeter of the figure below?

- A. $5x - 10$ B. $5x - 6$
C. $10x - 12$ D. $10x - 20$

5. Which of the following is a true statement?

- A. $-4(w + 8)$ is equivalent to $-4w + 32$.
B. $-2.5(4p - 16)$ is equivalent to $-10p + 40$.
C. $\frac{1}{2}(8 - 4g)$ is equivalent to $4 + 2g$.
D. All of the above are true.

Unit: Expressions and Equations
Review

Name _____
Date _____ Pd _____

EXPRESSIONS & EQUATIONS UNIT STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.

I CAN ADD & SUBTRACT LINEAR EXPRESSIONS WITH RATIONAL COEFFICIENTS.

1. $5d - 7 - d + 4$

3. $7.8c + 6p - 3.4c - 10$

I CAN FACTOR & EXPAND (DISTRIBUTIVE PROPERTY)

5. Simplify each expression using the distributive property.

a. $2.5(r - 1)$

b. $-8(3f - 9)$

c. $(f + p)4$

7. Simplify the expression by distributing then combining like terms.

$5(b + 6) - 3b$

SEVENTH GRADE CURRICULUM

EXPRESSIONS & EQUATIONS

UNIT TWO: ANSWER KEYS

answer keys
included

©MANEUVERING THE MIDDLE, 2016

A MANEUVERING THE MIDDLE® RESOURCE