6th Grade CCA Unit #3: Algebra- Expressions and Equations

Unit #3: Algebra- Expressions and Equations

Resources: Big Ideas: Chapter 3

Common Core Standards: 7.EE.1; 7.EE.2; 7.EE.4a

Number	Learning Targets	Common Core Standard	Resources
11	I can simplify algebraic expressions.	7.EE.1; 7.EE.2	3.1
2	I can add and subtract linear expressions.	7.EE.1; 7.EE2	3.2
3	I can solve simple equations using addition and subtraction.	7.EE.4a	3.3
4	I can solve equations using multiplication and division.	7.EE.4a	3.4
5	I can solve two-step equations.	7.EE.4a	3.5
6	I can solve two-step word problems.	7.EE.4a	3.5Ext

My Practice:

Number	Pre-test:	Exit slip scores	Day #2 Homework	Extra Targeted Practice	Post-test:
1	/4				/8
2	/4				/10
3	/4				
4					/9
5	/3				
	/5				/10
6	/2				/6

My Final Pretest Score:/22	My Final Pretest Percent %
My Final Posttest Score:/51	My Final Posttest Percent: %
My percent of increase between the P	re and Post test scores =!

My Academic Goal

My Goal from the second unit was:	
Did I succeed in my goal?	
'es, because	
No. Things I will do differently next time	
	_
Ny Goal for the third unit is:	
o achieve my goal I will:	
)	
)	
)	
)	

3.0 Distributive Property and Expressions Notes

Distributive Property: To multiply a sum or difference by a number, multiply each number in the sum or difference by the number outside of the parentheses.

€0 Key Idea

Distributive Property

Words To multiply a sum or difference by a number, multiply each number in the sum or difference by the number outside the parentheses. Then evaluate.

Numbers
$$3(7 + 2) = 3 \times 7 + 3 \times 2$$
 Algebra $a(b + c) = ab + ac$
 $3(7 - 2) = 3 \times 7 - 3 \times 2$ $a(b - c) = ab - ac$

Steps for using the distributive property ("Jump the Fence"):

- 1.) The number outside the parentheses "jumps the fence" (distributes).
- 2.) The number tags everyone inside (tag = multiply).
- 3.) Simplify the expression by combining like terms if needed.

*Like Terms: terms within an expression that have the same variables raised to the same exponent; constant terms (numbers) are also like terms

Simplify each expression:

Simplify each expression:	
1.) 8(2x) =	2.) 7(x + 5)
3.) 9(2b - 6)	4.) 3(5w + 2) + 7w
5.) 6(3x + y + 4)	6.) 5 + 2(4x + 6)

Simplify:

7.) $2(2x^2 + 4x) - 3x^2 - 2x^3$	8.) $2xy - 5y - 3(x + y) - 5xy$

Are the exp	pressions o	equivalent?	Simplify.	Then explain	why or	why not.
9.) 4(3x + 2	()+3 and	12x + 20				

The Distributive Property (1 day)

Use the Distributive Property and mental math to find the product.

1. 4×31

(____x ___) + (____x ___) = ____

2. 7×49

(___x ___) + (___x ___) = ____

3. 6(38)

(____x ___) + (___x __) =

Use the Distributive Property to simplify the expression. Combine like terms if needed.

4.
$$8(5 + w)$$

5.
$$11(9+d)$$

4.
$$8(5+w)$$
 5. $11(9+d)$ **6.** $15(p-4+2)$

Simplify the expression by combining like terms.

7.
$$2x - 4 + 3x$$

7.
$$2x - 4 + 3x$$
 8. $4y - 1 - 3y + 2$ **9.** $x + 2(x - 4)$

9.
$$x + 2(x - 4)$$

- 10. A jazz band sells 31 large boxes of fruit and 74 small boxes of fruit for a fundraiser.
 - a. Use the Distributive Property to write and simplify an expression for the profit.





b. A large box of fruit costs \$9 and a small box of fruit costs \$4. What is the jazz band's profit?

POD: Simplify.

1.)
$$3x + 2x + x$$

2.)
$$5y - 2y + 3y$$

Objective: Students will be able to simplify algebraic expressions.

Vocabulary:

- 1.) Variable a letter that represents an unknown number
- 2.) Like Terms- Terms that have the same variables raised to the same exponents
- 3.) Coefficient The numerical factor of a term that contains a variable
- 4.) Constant A term without a variable.

Identify the terms and like terms

						۰
1.)	9x	- 2	+	7	- x	

2.) $z^2 + 5z - 3z^2 + z$

Terms:

Terms:

Like terms:

Like terms:

How to Simplify a Variable Expression:

1.) Combine "like terms" (variables with variables, numbers with numbers)

3.)	7у	+	6	-	1	+	12y
-----	----	---	---	---	---	---	-----

4.)
$$5x + 2y + 3x + 4$$

5.)
$$4(3d + 2) + 5d$$

6.)
$$\frac{3}{4}y + 12 - \frac{1}{2}y - 6$$

7.)
$$3x^2 + 2x + 4x - x^2$$

8.)
$$3x^2 + 2x + 6 + 2x^2 - x + 12$$

Determine whether the expressions are the same. Explain your reasoning.

9.) 3x + 2y + y + 5x and 8x + 3y	10.) $3(2x + 4) + 2x$ and $8x + 4$		



3.1

Algebraic Expressions Homework Day 1

Identify the terms and like terms in the expression.

1.
$$3x + 4 - 7x - 6$$

2.
$$-9 + 2.5y - 0.7y + 1 + 6.4y^2$$

Simplify the expression.

3.
$$5a^2 + a - 2a^2 + 6a$$

4.
$$m-\frac{1}{6}-4m+\frac{5}{6}$$

5.
$$3x^2 + 5x + 4 + x^2 - x + 5$$

6.
$$7(d-1)+2$$

7.
$$13g + 2(4k - g)$$

8.
$$20(p+2)+16(-3-p)$$

9. Write an expression in simplest form that represents the cost for shampooing and cutting *w* women's hair and *m* men's hair.

	Women	Men
Cut	\$15	\$7
Shampoo	\$5	\$2

3.1

Algebraic Expressions Homework Day 2

Identify the terms and like terms in the expression.

1.
$$-4y + 7 + 9y - 3$$

2.
$$3n^2 - 1.4n + 5n^2 - 6.4$$

Simplify the expression.

3.
$$-15m + 9m$$

4.
$$8k - 2(4 - 3k)$$

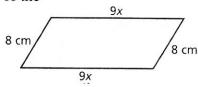
5.
$$3.2 - 9x + 7.1 - 3x$$

6.
$$25x - 6x^2 - 12x - 2x^2$$

7.
$$19a^2 - 7 - 3a + 2a^2 + 2$$

8.
$$\frac{5}{2}(6x-7)+\frac{4}{3}(2+9x)$$

9. Write an expression in simplest form that represents the perimeter of the polygon.



10. Are the expressions $8a^2 - 4b + 7a^2$ and $5(3a^2 - 2b) + 6b$ equivalent? Explain your reasoning.

Section 3.2: Adding and Subtracting Linear Expressions Notes

POD: Simplify

1.)
$$3y - 2 + y + 6$$

2.)
$$2(3x + 4) + 6x$$

Objective: Students will be able to add and subtract linear expressions.

Vocabulary:

1.) Linear Expression: An algebraic expression in which the exponent of the variable is 1.

Example: 3x + 6 NOT: $3x^2 + 6$

Find each sum.

Title Guert Guitt.					
1.) (x - 2) + (3x + 8)	 2.) (-4y + 3) + 2(6y - 5)				

Find each difference.

3.) $(5x + 6) - (-2x + 4)$	4.) (7y + 5) - 2(4y - 3)
	() (1 5) 0(05 0)
5.) $\frac{1}{2}(3x + 6) - (5x - 24)$	6.) (4 - 5y) - 2(3.5y - 8)

3.2

Adding and Subtracting Linear Expressions Homework Day 1

Find the sum or difference.

1.
$$(x-2)+(x+6)$$

2.
$$(2n-4)-(4n-3)$$

3.
$$2(-3y-1)+(2y+7)$$

4.
$$(1-3k)-4(2+2.5k)$$

5.
$$(6g-9)+\frac{1}{3}(15-9g)$$

6.
$$\frac{1}{2}(2r+4)-\frac{1}{4}(16-8r)$$

7. You earn (4x + 12) points after completing x levels of a video game and then lose (2x - 5) points. Write an expression that represents the total number of points you have now.

3.2

Adding and Subtracting Expressions Homework Day 2

Find the sum.

1.
$$(p-3)+(p-7)$$

2.
$$(3n-1)+(4-n)$$

3.
$$(3c + 2) + 4(1.3c - 5)$$

4.
$$(-6y - 2) + 5(3 + 2.5y)$$

5. After a week of rain, tadpoles appeared in your pond. After t minutes, you have (7t + 5) tadpoles and your friend has (8t - 3) tadpoles. Write an expression that represents the number of tadpoles you and your friend caught together.

Find the difference.

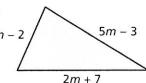
6.
$$(k+3)-(3k-5)$$

7.
$$(-6d + 2) - (7 + 2d)$$

8.
$$(7-3t)-5(-1.6t+5)$$

9.
$$(3x + 8) - 6(2.5x - 3)$$

10. Write a simplified expression that represents the perimeter of the triangle. 3m





Section 3.3: Solving Equations by Adding or Subtracting Notes

POD: Find each sum or difference

1.)
$$(-3y + 16) + 3(5y - 4)$$

2.)
$$(5x + 7) - (3x - 2)$$

Objective: Students will solve simple equations using addition and subtraction.

Vocabulary:

1. <u>variable</u> - a letter that represents an unknown number

2. inverse operations - operations that undo each other

Operation	Inverse Operation
Adding	Subtracting
Subtracting	Adding
Multiplying	Dividing
Dividing	Multiplying

Steps/Rules for Solving an Equation:

1. You want the variable to be alone on one side of the equation.

2. Use inverse operations to get the variable alone.

3. Check your solution using the original equation.

**Think of an equation as a balance scale. When you do something to one side of the equation, you must do the same thing to the other side of the equation to keep it "balanced".

Examples:

Examples:	
1.)	2.)
	•
3.)	4.)
3.)	7.)





5.)	6.)	

7.) Find the number: 4 less than a number n is -15.





Name: _____

Section 3.3: Solving Equations by Adding and Subtracting Homework Day 1

1.) x - 6 = -55	2.) -455 = n - 255	3.) -83.4 + m = 122
4.) x - 32.8 = -27	5.) -37 + h = -42	6.) q - 16 = 40
7.) k - (-17) = 29	8.) 261.9 + d = -48	9.) x + 34 = 212

10.) Find the number: 10 more than a number x is 3.





Solving Equations by Adding and Subtracting Homework Day 2

Solve the equation. Check your solution. Circle your final answer.

1.
$$x + 3 = 10$$

2.
$$b-6=-14$$
 3. $5=n+9$

3.
$$5 = n + 9$$

4.
$$y - 2.1 = 7.5$$

$$5. -6.4 = x + 4.3$$

4.
$$y - 2.1 = 7.5$$
 5. $-6.4 = x + 4.3$ **6.** $k - \frac{1}{3} = \frac{5}{6}$

7.
$$10.5 + p = -8.32$$

7.
$$10.5 + p = -8.32$$
 8. $3\frac{3}{4} = r + \frac{1}{8}$ **9.** $m + 1.06 = 5$

9.
$$m + 1.06 = 5$$

Find each number.

10. 5 more than a number y is -2.

11. -13 is 4 less than a number n.



Section 3.4: Solving Equations Using Multiplying or Dividing Notes

POD: Solve each equation.

1.)
$$-6 + x = -18$$

2.)
$$-11 = 7 + x$$

Objective: Students will be able to solve equations using multiplication or division.

Rules/Steps for Solving an Equation:

- 1. You want the variable to be alone on one side of the equation.
- 2. Use inverse operations to get the variable alone.
- 3. Check your solution using the original equation.

**Think of an equation as a balance scale. When you do something to one side of the equation, you must do the same thing to the other side of the equation to keep it "balanced".

Examples:

2.)
$$\frac{y}{-5.5} = -23$$

3.)
$$-4n = -21.6$$

4.) 8.2 =
$$\frac{x}{-3}$$



5.) $\frac{2}{3}x = -4$	6.) $-\frac{8}{5}x = 5$
	*

Find the number.

7.) The product of 15 and a number is -75.



Solving Equations with Multiplication and Division Homework Day 1

Solve the equation. Check your solution.

1.
$$\frac{d}{5} = -6$$

2.
$$8x = -6$$

3.
$$-15 = \frac{z}{-2}$$

4.
$$3.2n = -0.8$$

5.
$$-\frac{3}{10}h = 15$$

6.
$$\frac{2}{3}k = -4$$

Write the word sentence as an equation. Then solve.

- **7.** A number divided by -8 is 7.
- **8.** The product of -12 and a number is 60.

9. You earn \$0.85 for every cup of hot chocolate you sell. How many cups do you need to sell to earn \$55.25?



Solving Equations with Multiplication and Division Homework Day 2

Solve the equation. Check your solution.

1.
$$\frac{1}{4}b = 24$$

2.
$$-7n = 35$$

3.
$$\frac{y}{-3} = 33$$

4.
$$\frac{p}{5} = -32$$

5.
$$-3t = -4.2$$

6.
$$1.5q = -8.4$$

7.
$$-\frac{1}{5}d = -3$$

8.
$$14 = 3y$$

9.
$$\frac{5}{8}j = -10$$

Find the number.

10. A number multiplied by -5.5 is 22.

11. The quotient of a number and 0.2 is -2.6.

Solve.

12. You earn \$7.50 per hour at a fast food restaurant. You earned \$123.75 last week. How many hours did you work last week?

Section 3.5: Solving Two Step Equations Notes

POD: Solve each equation.

1.)
$$-6x = 49.2$$

2.)
$$7 = -\frac{x}{4.2}$$

Objective: Students will be able to solve two-step equations.

Vocabulary:

1.) Variable - a letter that represents an unknown number

2.) Inverse Operations - operations that undo each other

Operation	Inverse Operation
Adding	Subtracting
Subtracting	Adding
Multiplying	Dividing
Dividing	Multiplying

Steps for Solving an Equation:

- 1.) Locate the variable.
- 2.) Undo addition or subtraction.
- 3.) Undo multiplication or division.
- 4.) Check your solution using the original equation.

Examples

2.)
$$11 = 13 + \frac{x}{3}$$

3.)
$$8 - \frac{x}{4} = -6$$

27

5.)	12x -	8x	=	-52

/ \	x		5		1	
0.1	_	-	-	=	-	
,	4		6		2	

Name: _____

Section 3.5: Solving Two Step Equations Homework Day 1

Solve each equation.

1.)
$$82 = -4x + 2$$

2.)
$$5 - x = 19$$

3.)
$$14 = -4 + \frac{x}{5}$$

4.)
$$12 + 3x = -54$$

5.)
$$-8.15 - \frac{b}{2} = -6.3$$

8.)
$$5x + 3x = 48$$

9.) How do you check to make sure an equation is correct? Explain how you would check #7.

Solving Two Step Equations Homework Day 2

Solve the equation. Check your solution.

1.
$$3k - 2 = 10$$

2.
$$-10 = 2 + 5p$$

2.
$$-10 = 2 + 5p$$
 3. $-4x + 3 = -11$

4.
$$5 - \frac{x}{2} = 8$$

5.
$$-1 - 5h = 14$$

5.
$$-1 - 5h = 14$$
 6. $2.5 = -7 + 1.25$ r

7.
$$-4k + 3.6 = 7.8$$
 8. $-6 - n = 3$

8.
$$-6 - n = 3$$

9.
$$3 - \frac{x}{4} = -6$$

10.
$$7c - 2c = 45$$

10.
$$7c - 2c = 45$$
 11. $\frac{5}{6} + 3j = -\frac{2}{3}$ **12.** $3(k - 5) = -16$

12.
$$3(k-5) = -16$$

13. The quotient of a number and -1.5 is 21. Find the number.

Section 3.5E: Two-Step Equation Word Problems Notes

POD: Solve each equation	POD:	Solve	each	equation
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1.)
$$-6x + 4 = -20$$

2.)
$$\frac{x}{4}$$
 + 7 = 10

Objective: Students will be able to solve two-step word problems.

Steps for Writing an Equation:

- 1.) Read the problem to determine the number that represents the total put this number after the equal sign.
- 2.) Determine what is missing make this the variable.
- 3.) Determine the operation of the word problem.
- 4.) Solve the equation and label the solution with the correct unit.

Examples: Write an equation for each problem. Then solve.

1.) It costs \$2.50 to rent bowling shoes. Each game costs \$2.25. You have \$9.25. How many games can you bowl?

Equation:

Answer:

2.) The length of a rectangle is 4 meters more than twice its width. If the length of the rectangle is 14 feet, what is the width of the rectangle?

Equation:

Answer:

3.) Kyle bought a Nintendo Wii for \$199 and some games that cost \$46.99 each. The total cost was \$386.96. Write and solve an equation to find how many games Kyle bought.

Equation:

Answer:

4.) Joe's Grandpa is 75 years old. This is nine years less than seven times Joe's age. How old is Joe? **Equation:**Answer:



	Name
	Two Step Word Problems Homework Day 1
) Claire bought a vase that (20.99. How many roses did (cost \$5.99 and roses that cost \$1.25 each. The total cost was Claire buy? Write an equation and solve.

2.) Susie wanted to make a poster for her math presentation. She bought markers that cost \$0.79 each and a poster board that cost \$1.25. The total cost was \$7.57. How many markers did she buy? Write an equation and solve.

3.) Maggie is 29 years old which is 2 more than 3 times Vic's age. How old is Vic? Write an equation and solve.

4.) Molly rented a moving van for a flat rate of \$45 plus \$0.27 for each mile driven. When Molly returned the van, she paid \$77.40. How many miles did Molly drive? Write an equation and solve.

5.) A skating rink rents skates at \$3.95 for the first hour plus \$1.25 for each additional hour. When you returned the skates, you paid \$7.70. How many additional hours did you keep the skates? Write an equation and solve.

6.) An online company is having a sale, DVD are on sale, DVDs cost 6.95 each plus shipping & handling of \$5.25. You only have \$40.00 to spend. How many DVDs can you buy? Write an equation and solve.



Name:			Jnits:	Date:
	Section 3.5E: Ti	vo Step Word	Problems I	Homework Day 2
Write a two your answer.	-step equation for Show all of your	each problem. work!	Then solv	e your equation and check
1.) Kelly bought cost her \$3.55. Equation:	an ice cream sundae fo How many toppings did	r \$2.50 plus \$0.3 Kelly have on her	5 per topping. sundae?	. Altogether the ice cream sundae Answer:
2.) Emily bought and pictures. Ho Equation:	a camera for \$125 and ow many pictures did En	printed pictures aily print?	for \$0.15 eac	ch. She spent \$134.60 on her camer Answer:
3.) Hunter was ho party. How many Equation:	aving a pool party. The hours did Hunter's par	pool cost \$225 to ty last?	rent plus \$3!	5 per hour. He paid \$400 for his Answer:
.) The length of neters, what is th quation:	a rectangle is 3 meters ne width of the rectang	: less than twice in	ts width. If t	the length of the rectangle is 11 Answer:
) Jim is 5 less th quation:	nan 4 times Amanda's ag	ge. If Jim is 31 ye	ears old, how	old is Amanda? Answer:
The floor of a cor ryear. How many uation:	anyon has an elevation o y years will it take for :	of -14.5 feet. Ero the canyon floor t	sion causes t o have an elev	he elevation to change by -1.5 feet vation of -31 feet. Answer:

Unit 3: Expressions and Equations Homework Answer Key:

3.0 Homework Answer Key:

1.) (4 × 30	$(0) + (4 \times 1) = 12$	0 + 4 = 124	2.) (7 × 40	2.) (7 × 40) + (7 × 9) = 280 + 63 = 343				
3.) 228	4.) 40 + 8w	5.) 99 + 11d	6.) 15p - 30	7.) 5x - 4	8.) y + 1	9.) 3x - 8		
10a.) 31(2	20 - x) + 74(10	- y) =	10b.) \$785	-				
1360 - 3	1x - 74y							

3.1 Homework Day 1 Answer Key:

1.) Terms: 3x, 4, -7x, -6 LT: 3x & -7x; 4 & -6			2.) Terms: -9, 2.5y, -0.7y, 1, 6.4y² LT: 2.5y & -0.7y; 9 & 1			
3.) $3a^2 + 7$	4.) $-3m + \frac{2}{3}$	5.) $4x^2 + 4x + 9$	6.) 7d - 5	7.) 11g + 8k	8.) 4p - 8	9.) 20w + 9m

3.1 Homework Day 2 Answer Key:

3.) -6m	4.) 14k - 8	5.) 10.3 - 12x	6.) -8x ² +	13x	7.) 21a² - 3a - 5	8.) $27x - \frac{89}{6}(27x - 14.83)$	
9.) 8 + 8	+ 9x + 9x = 1	8x + 16	10.) ye	es; 15	a² - 4b		

3.2 Homework Day 1 Answer Key:

1.) 2x + 4	2.) -2n - 1	3.) -4y + 5	4.) -13k - 7	5.) 3g - 4	6.) 3r - 2	7.) 2x + 17
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3.2 Homework Day 2 Answer Key:

1.) 2p - 10	2.) 2n + 3	3.) 8.2c -	18	4.) 6.5y + 13	5.) 15† + 2	6.) -2k + 8	7.) -8d - 5
8.) 5t - 18	9.) -12x + 2	26 1	0.) 10)m + 2			

3.3 Homework Day 1 Answer Key:

1.) x = -49	2.)	n = -200	3.) m	= 205.4	4.) x = 5.8	5.) h = -5	6.) q = 56	7.) k = 12
8.) d = -309	.9	9.) x = 17	78	10.) x =	-7			

3.3 Homework Day 2 Answer Key:

1.) x = 7	2.) b = -8	3.) n = -4	4.) y = 9.6	5.) x = -10.7	6.) $k = 1\frac{1}{6}$	7.) p = -18.82
8.) $r = 3\frac{5}{8}$	9.) m = 3.94	10.) y = -7	11.) n = -9			

3.4 Homework Day 1 Answer Key:

	2.) x = -0.75	 4.) n = -0.25	5.) h = -50	6.) k = -6	7.) $\frac{x}{-8}$ = 7; x = -56
8.) -12x = 6		55.25; 65 cups			-8

3.4 Homework Day 2 Answer Key:

1.) b = 96	2.) n = -5	3.) y = -99	4.) p = -160	5.) † = 1.4	6.) q = -5.6	7.) d = 15	8.) $y = 4\frac{2}{3}$
9.) j = -16	10.) -5	.5x = 22; x =	-4 11.) $\frac{x}{0.2} = -$	2.6; x = -0.5	2 12.) 7.50	k = 123.75; x	c = 16.5 hours

3.5 Homework Day 1 Answer Key:

1.) x = -20	2.) x = -14	3.) x = 90	4.) x = -22	5.) b = -3.7	6.) x = 2	7.) n = 12	8.) x = 6		
9.) Plug in your answer to the equation to see if it makes the equation true. $7(12) + 16 = 100$; $84 + 16 = 100$;									
100=100; Therefore the statement is true!									

3.5 Homework Day 2 Answer Key:

1.) k = 4	2.) p = -2.4	3.) x = 3.5	4.) x = -6	5.) h = -3	6.) r = 7.6	7.) k = -1.05	8.) n = -9
9.) x = 36	10.)	:=9 1	.1.) j = -0.5	12.) $k = -\frac{1}{3}$	13.) $\frac{x}{-1.5}$ = 2	1; x = -31.5	

3.5E Homework Day 1 Answer Key:

1.) 5.99 + 1.25x = 20.99; 12 roses	2.) 0.79x + 1.25 = 7.57; 8 marker	s 3.) 2 + 3x = 29; 9 years old
4.) 45 + 0.27x = 77.40; 120 miles	5.) 3.95 + 1.25x = 7.70; 3 hours	6.) 6.95x + 5.25 = 40; 5 dvds

3.5E Homework Day 2 Answer Key:

1.) $2.50 + 0.35x = 3.55$; 3 toppings	2.) 125 + 0.15x = 134.60; 64 pictures	3.) 225 + 35x = 400; 5 hours
4.) 2x - 3 = 11; 7 meters	5.) 4x - 5 = 31; 9 years old	6.) -14.5 - 1.5x = -31; 11 years