Using Manipulatives to Meet Common Core Math Standards

Stacy Remphrey & Megan Zimmermann
Charles F. Patton Middle School
Kennett Square, PA

Representing and Evaluating Expressions involving Fractions: Day 2

1. **One-half of 4x + 6** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:	2. **Two-thirds of 9x - 3** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:
3. **Three-fifths of 10x + 15** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:	4. **Three-fourths of 4x - 12** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:

Extra:

5. **Two-thirds of 5x + 3** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:	6. **Four-fifths of 10x - 8** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:
7. **One-third of 7x + 5** Draw a picture: Write a sentence describing what you did. Write the expression using numbers:	Answer the following questions: a. What do the numerators of the fractions represent? b. What do the denominators of the fractions represent?

Expressions Unit- Simplifying Expressions by Combining Like Terms

1. $\frac{2}{3}(6x+9) + 3x$ a. Draw a picture representing the expression. b. Write a sentence describing how you simplified the expression c. Show your steps algebraically	**2. $\frac{2}{7}(7x-14) - 2x$** a. Draw a picture representing the expression. b. Write a sentence describing how you simplified the expression c. Show your steps algebraically
3. $5x + \frac{3}{5}(5x+10)$ a. Draw a picture representing the expression. b. Write a sentence describing how you simplified the expression c. Show your steps algebraically	**4. $2x - 3(x+13) + x$** a. Draw a picture representing the expression. b. Write a sentence describing how you simplified the expression c. Show your steps algebraically

Factoring out a Greatest Common Factor of an expression: Expressions Unit Day 3

1. **For the expression 4x + 8**	2. **For the expression 6x + 9**
Draw a picture:	Draw a picture:
Divide it up into the highest amount of equal groups possible.	Divide it up into the highest amount of equal groups possible.
I have _____ groups of _____.	I have _____ groups of _____.
Rewrite the expression according to the grouping you have done.	Rewrite the expression according to the grouping you have done.
Terms are added or subtracted. What are the terms of our expression?	What are the terms of our expression?
The Greatest Common Factor (GCF) is the largest number that can go into two or more numbers. What is the greatest common factor of the terms you listed above?	What is the greatest common factor of the terms you listed above?

3. **For the expression 5x + 5** Draw a picture: Divide it up into the highest amount of equal groups possible. I have _____ groups of _____. Rewrite the expression according to the grouping you have done. What are the terms of our expression? What is the greatest common factor of the terms you listed above?	2. **For the expression 8x - 10** Draw a picture: Divide it up into the highest amount of equal groups possible. I have _____ groups of _____. Rewrite the expression according to the grouping you have done. What are the terms of our expression? What is the greatest common factor of the terms you listed above?

Now try these.

Factor out the GCF of the expressions.

1. $15x - 20$
2. $18 + 6x$
3. $4x^2 + 5x$
4. $7x^3 - 8x$

Solve Equations with Fractions Day 1

$\frac{1}{3}x = 4$	Model
Write	Write Algebraically

$\frac{x}{4} = \frac{3}{4}$	Model
Write	Write Algebraically

$\frac{x}{4} = -2$	Model
Write	Write Algebraically

$\frac{5x-5}{5} = -4$	Model
Write	Write Algebraically

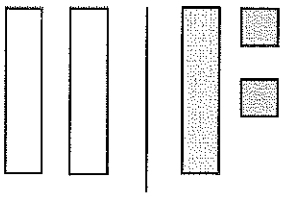
Practice:

Solve for x. You may use the manipulatives if you choose.

1. $\frac{1}{5}x = 2$
2. $\frac{3}{4}x = 6$
3. $\frac{x}{5} = 3$
4. $\frac{3x+6}{3} = -4$

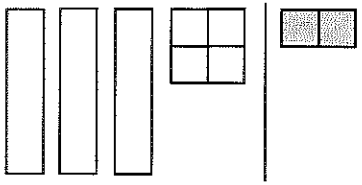
Solving Equations Using Algebra Tiles

Name _____ **Date**_____

Equation	Tile Model	Written Description of Procedure	Mathematical Procedure (Algorithm)
$x + 2 = 3$			
$2x - 4 = 8$			
$2x + 3 = x - 5$			
			

Solving Equations, Using Algebra Tiles – Jigsaw Puzzle 2

Name _____ **Date**_____

Equation	Tile Model	Written Description of Procedure	Mathematical Procedure (Algorithm)
$2x + 1 = 5$			
			
		1. Three negative *x*s and two units are the same as 5. 2. Subtract two units from each side of the equation. 3 Divide both sides of the equation into two equal groups. 4. Flip both sides of the equation to make them opposites. 5. One *x* is equal to one negative unit.	
			$2x - 3 = x + 2$ $\underline{-x} \quad \underline{-x}$ $x - 3 = 2$ $\underline{+3} \quad \underline{+3}$ $x = 5$

Equations Quiz: Pre-Algebra

Calculator is allowed.

For the given equation, be sure to answer each part:

$\frac{2}{3}x + 1 = 3$

1. Draw the algebra tiles that you would use to model the equation.	2. Write out the steps you would do to solve the equation.
3. Solve the equation algebraically.	4. Check your answer.

5. $x + 3 = 19$

6. $-4x - 10 = 18$

7. $3x - 2 + 2x = 13$

8. $3(x + 2) = x - 4$