*Day 3*

Math 6 Plus

Distributive Properties and Equivalent Expressions

Mathematics Learning Objectives:

Students will be able to create a model of the distributive property.

Students will be able to use the distributive property to create equivalent expressions.

Essential Question: How can we use the distributive property to simplify expressions?

Mathematics Standards:

**6.EE.3** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*

Mathematical Practice Standards:

**MP.1** Make sense of problems and persevere in solving them.

**MP.2** Reason abstractly and quantitatively.

**MP.3** Construct viable arguments and critique the reasoning of other.

**MP.4** Model with Mathematics.

**MP.7** Look for and make use of structure.

Materials:Warm-up week 3, Understanding Properties of Operations Answer Key, Algebra Tiles,

               Algebra Tiles packet, Algebra Tiles & Distributive property Sheet, color pencils,

               pencil

Homework: Algebra Tiles & Distributive property homework (Homework grade)

Time:  Assume 50 minutes

|  |  |  |
| --- | --- | --- |
| Time | Teacher Actions | Student Engagement |
| 10 minutes | Teacher will post daily agenda on document camera instructing students to write homework in agenda, start the warm-up week 3 Wednesday and Thursday, and take out any materials needed for the day. Teacher will give students 5 minutes to work on the warm-up then go over answers in 5 minutes or less. | Students will write homework in agenda and immediately start working on warm-up week 3 Wednesday and Thursday. After 5 minutes, students will volunteer to share their answers. Students will correct any answers if necessary. Then one student from each row will collect warm-up books and put them on shelf. Meanwhile, students should take out the materials needed for the day if they haven’t already. |
| 10 minutes | Teacher will state and/or display homework answers on document camera.  Teacher will go over 4-5 problems briefly. | Students will check homework answers and ask questions. |
| 20 minutes | Teacher will briefly review definition of distributive property and an example with a variable: 3(x+3) Teacher will explain that you can adding first then multiplying will not help here unless we knew the value of x. So we have to use strategy 2 which is multiplying the number outside the parentheses by each number in the parentheses then add. So 3x+9 is the equivalent expression.  Teacher will then model by introducing Algebra Tiles. Long rectangular green tiles represent the variable and small yellow tiles represent the number 1. So 3x+9 can be modeled on document camera by placing 3 groups of x+3 or 3 groups each containing one green tile and 3 yellow tiles. Then we group like tiles together so the 3 green tiles are together and 9 yellow tiles are together. So our expression is 3x+9. Teacher may also model 3(2x+5)= 6x+15  Algebra Tile guided practice (10 min): Teacher will then hand students algebra tile packets containing practice problems, examples, guided notes, and a set of algebra tiles. Students  will work in groups of 2-3 on problems with help from teacher if necessary. | Students will pay attention and volunteer to explain distributive property or help out with the examples.    Students will pay attention when teacher models with algebra tiles.    Students will work with one or two partners to complete the algebra tiles packet and may ask teacher questions is necessary. |
| 10 minutes | Teacher will go over answers to practice problems on document camera. Students can ask questions.  If time, teacher will guide students through practice problems algebraically without using algebra tiles.  Teacher will explain the homework. Students will use their paper algebra tiles at home to model the expressions then draw and color their representations on their homework and solve some distributive property problems algebraically. | Students will check their answers to algebra tile activity and ask any questions.  Students may practice solving problems algebraically.  Students will receive homework. |

Sources:

<http://www.npschools.org/userfiles/58/Classes/499/a1%20distributive%20property%20activity.pdf>

<http://www.spfk12.org/cms/lib07/NJ01001501/Centricity/Domain/422/TOC%2016%20Answers.pdf>

*Day 4*

Math 6 Plus

Combining Like Terms (Day 1)

Mathematics Learning Objectives:

Students will be able to use  properties to rewrite and simplify mathematical expressions.

Students will be able to use a variety of methods to write expressions that are equivalent.

Essential Question: How and when can we simplify expressions?

Mathematics Standards:

**6.EE.3** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.*

***6.EE.4*** *Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*

Mathematical Practice Standards:

**MP. 2** Reason abstractly and quantitatively.

**MP.3**  Construct viable arguments and critique the reasoning of others.

**MP.4** Model with Mathematics.

Materials:Warm-up week 3, Algebra Tiles & Distributive property Answer Key, Starburst Activity: Combining like terms

Homework: Combining like terms Homework

Time:  Assume 50 minutes

|  |  |  |
| --- | --- | --- |
| Time | Teacher Actions | Student Engagement |
| 10 minutes | Teacher will post daily agenda on document camera instructing students to write homework in agenda, start the warm-up week 3 Wednesday and Thursday, and take out any materials needed for the day. Teacher will give students 5 minutes to work on the warm-up then go over answers in 5 minutes or less. | Students will write homework in agenda and immediately start working on warm-up week 3 Wednesday and Thursday. After 5 minutes, students will volunteer to share their answers. Students will correct any answers if necessary. Then one student from each row will collect warm-up books and put them on shelf. Meanwhile, students should take out the materials needed for the day if they haven’t already. |
| 10 minutes | Teacher will state and/or display homework answers on document camera.  Teacher will go over 4-5 problems briefly. | Students will check homework answers and ask questions. |
| 20 minutes | Teacher will briefly explain how to combine like terms and that we can only add or subtract like terms. Teacher will guide students through simplifying 4x+3y+2x+7=6x+3y+7. Teacher will then demonstrate that example using starburst similar to what they did the previous day with algebra tiles. The orange starbursts represent x, the red represent y, and the yellow represent the number 1. Teacher will model by placing 4 orange,3 red, 2 orange, and 7 yellow starburst on document camera. Teacher will then rearrange and group starbursts by color. This will give us a total of 6 blue (6x), 3 red (3y), and 7 yellow (7). So 6x+3y+7.  Teacher will then have students work in groups of 2-3 students to complete the starbursts activity as practice for combining like terms. Teacher will let students learn from each other and may only guide students and facilitate learning. | Students will pay attention and take notes.    Students will work with one or two other group members to solve the problems and may ask teacher questions if necessary. |
| 10 minutes | Teacher will go over answers to activity and answer student questions then pass out homework. | Students will check answers then ask questions.  Students will receive homework. |

**Understanding Distributive Property with Algebra Tiles**

Directions: You will model distributive property using algebra tiles. The green rectangular tile represents the variable, **x**, and the small yellow square tile represents the constant, 1. You will model each expression to find the equivalent expression then draw your model underneath each expression. You can use colored pencils or just label your figures with G for green and Y for yellow. Work with your group member and ask questions if you need help.

**KEY: x= 1=**

**Examples:**

The expression 3(x+3) can be modeled using algebra tiles as 3 groups of x+3 as shown below on the left. You can then combine like tiles (terms) to create an equivalent, simplified expression.

**3(x+3) = x+3 + x+3 + x+3 = 3x+9**

x+3

x+3

x+3

The expression 3(2x+5) can be modeled using algebra tiles as 3 groups of 2x+5 as shown below on the left. You can then combine like tiles (terms) to create an equivalent, simplified expression.

**3(2x+5) = 2x+5 + 2x+5 + 2x+5 = 6x+15**

2x+5

2x+5

2x+5

**Practice Modeling with Algebra Tiles**

Directions: Create an expression of each model.

1. 2. 3.

Directions: Use tiles to represent the following expressions then write an equivalent expression without parenthesis. (Model each expression using algebra tiles to figure out the equivalent expression. Draw and color/label your model underneath each problem.)

4. 2(x+7) 5. 6(2x+1)

6. 5 (x+1) 7. 4 (x+2)

8. Does 3(2x+5) equal 6x+5 or 6x+15? Explain your answer.

Directions: In problems 10-12, decide if the distributive property was applied correctly. Explain your answer.

10. 4(x+3)= 4x+7

11. 7(2x+1)= 14x+7

12. 5(x+4)= 4+ 5x

13. Suppose one of our classmates was absent from class today. She will need to know what the distributive property means. Look over your work on this activity and briefly describe the distributive property below.

Starbursts Activity: Combining like terms

Notes:

**1. To add or subtract, you *must have* like terms.**

Ex. 3x+2x Since they have the same variable we can combine like terms by adding the coefficients to get 5x. We cannot add 3x+3y because they have different variables.

2. **To multiply or divide, you *don't need* like terms**. You just multiply the coefficients and variables together.

Ex. 2x ∙ 2y= 4xy

3. **Always follow the order of Operations when evaluating expressions containing multiple operations.**

Directions: Use Starburst to create expression models and combine like terms (colored/flavored Starbursts). Draw your models for #1-4 using color pencils or labeling your figures for each color.

= the variable x = the variable y = 1

1. 5x+ 3y+ 2x+ y+ 3

2. 5+ 2(3x+2)

3. 4x+ 3+ 2y+ 3y+x

4. x+ 2(3y+2y) + 1

Directions: Use your starburst models to simplify the following expressions.

5. 3x+ 4y+ 5y

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

7. 2(3x) +4y+ 3

8. 5 (2x+ 3) +3(2y)

9. 5(x+2y)

10. Misha goes to the store to buy apples and bananas. He puts 2 bunches and 6 apples in his cart. A bunch of bananas contains 5 bananas.

a. write an expression to represent the amount of fruit Misha gets

b. As Misha gets to the checkout line, he realizes he wants to get 3 more bunches of bananas and 3 more apples for his friends. **Write the new expression** for the total number of apples and bananas he has now **then combine like terms** to find the simplified equivalent expression.

c. If the bananas cost $0.59 each and the apples cost $0.62 each. How much did Misha pay for his groceries?