# Math

Monday 1.23.2017

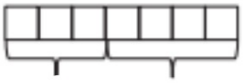
# Lesson 1: The Relationship between Addition and Subtraction.

**Opening Exercise**

a. Draw a tape diagram to represent the following expression: $5 + 4$.

b. Write an expression for each tape diagram.

i. 

ii. 

In a moment, you'll receive 10 squares.

- If each of the squares represents 1 unit, represent the number 3 using the squares provided.
- Add two more squares to your tape diagram.
- Write an expression to represent how we created a tape diagram with five squares.

- Remove two squares from the tape diagram.
- Alter our original expression $3 + 2$ to create an expression that represents what we did with the tape diagram.
- Evaluate the expression.
- Let's start a new diagram. This time, create a tape diagram with six squares.
- Use your squares to demonstrate the expression $6 + 4$.
- Remove four squares from the tape diagram.
- Alter the expression $6 + 4$ to create an expression to represent the tape diagram.

- How many squares are left on your desk?
- Evaluate the expression.
- How many squares did we start with?
- What effect did adding four squares and then subtracting the four squares have on the number of squares?
- What if I asked you to add 215 squares to the six squares we started with and then subtract 215 squares? Do you need to actually add and remove these squares to know what the result will be? Why is that?

What do you notice about the expressions we created with the tape diagrams?

Write an equation, using variables, to represent what we just demonstrated with tape diagrams.

Remember that a variable is a letter that represents a number.

Use the shapes provided to create tape diagrams to demonstrate this equation. (you may work with your partner)

Why is the equation $w + x - x = w$ called an identity?

Now, you have about 12 minutes to work on the exercises in your book...

Please write your name on your paper and carefully tear it out of the book. If you need help, ask!

- In every problem we did today, why did the final value of the expression equal the initial expression?
- Initially, we added an amount and then subtracted the same amount. Later in the lesson, we subtracted an amount and then added the same amount. Did this alter the outcome?
- Why were we able to evaluate the final expression even when we did not know the amount we were adding and subtracting?

# Math

Tuesday 1.24.2017

# Lesson 2: The Relationship between Multiplication and Division.

Yesterday, we worked on identities around addition and subtraction. Do you remember what we discovered?

Today we will be looking at the relationship between multiplication and division.

What do you predict we will find out?

**Opening Exercise**

**Draw a pictorial representation of the division and multiplication problems using a tape diagram.**

a. $8 \div 2$

b. $3 \times 2$

## Discussion

Provide each pair of students with a collection of 20 squares, which they use to create tape diagrams throughout the lesson.

- Build a tape diagram to represent 9 units.
- Divide the 9 units into three equal groups.
- Write an expression to represent the process you modeled with the tape diagram.
- Evaluate the expression.
- Use your squares to demonstrate what it would look like to multiply 3 by 3.

- Alter our original expression, $9 \div 3$, to create an expression that represents what we did with the tape diagram.

- Evaluate the expression.

- What do you notice about the expression of the tape diagram?

- Write an equation, using variables, to represent the identities we demonstrated with tape diagrams. Draw a series of tape diagrams to demonstrate this equation.

# Exploratory Challenge

Work in pairs or small groups to determine equations to show the relationship between multiplication and division. Use tape diagrams to provide support for your findings

1. Create one equation to show the relationship between multiplication and division. These equations should be identities and include variables. Use the squares to develop these equations.

2. **Write your equations on large paper. Show a series of tape diagrams to defend each of your equations.**

In a moment, you will have the opportunity to look at each others' work.

**Use the following rubric to critique other posters.**

1. **Name of the group you are critiquing**
2. **Equation you are critiquing**
3. **Whether or not you believe the equations are true and reasons why**

You have the remaining class time to work on your exit ticket.

This must be completed before you leave class!

## Exit Ticket

1. Fill in the blanks to make each equation true.

   a. $12 \div 3 \times \_\_\_\_ = 12$

   b. $f \times h \div h = \_\_\_\_$

   c. $45 \times \_\_\_\_ \div 15 = 45$

   d. $\_\_\_\_ \div r \times r = p$

2. Draw a series of tape diagrams to represent the following number sentences.

   a. $12 \div 3 \times 3 = 12$

   b. $4 \times 5 \div 5 = 4$

# Math

Wednesday 1.25.2017

Today, we are going to work on some practice problems identifying properties.

Name:_____

Find each product #1-4:

1) 2(-3)

2) -4(3)

3) -5(-2)

Write each subtraction expression as an addition expression and solve#5-8:

4) -4(6)

5) 5-7

6) 6-10

Find each sum #9-12:

7) -5-9

8) 11-10

9) 6+(-9)

10) -8+4

11) 4+(-4)

12) 7+(-10)

Write an algebraic expression for each verbal expression#13-16:

13) five more than twice a number

14) the difference of a number and 15

15) three less than a number

16) the quotient of a number and 10

1) Write an equation using three integers that is an example of the Distributive Property.

2) Find the Error: Julia and Catelyn are using the distributive property to simplify 3(x+2). Who is correct? Explain your reasoning in the space provided.

| Julia | Catelyn |
| --- | --- |
| 3(x+2)= 3x+2 | 3(x+2)=3x+6 |

Use the distributive property to write each expression as an equivalent expression. Then evaluate it.

3) 5(7+8)

4) 2(9+1)

5) (2+4)6

6) 4(x+3)

7) (n+2)3

8) 8(y-2)

9) -6(x-5)

10) Suppose you work in a grocery store 4 hours on Friday and 5 hours on Saturday. You earn $6.25 per hour.

A) Write two different expressions to find your wages.

B) Find the total wages for that weekend.

Use the Distributive property to write each expression as an equivalent expression. Then evaluate it.

12) 2(6+1)

13) 5(7+3)

14) (4+6)9

15) (4+3)3

16) (9+2)4

17) (8+8)2

18) 7(3-2)

19) 6(8-5)

20) -5(8-4)

21) -3(9-2)

22) (8-4)(-2)

23) (10-3)(-5)

24) One movie ticket costs $7, and one small bag of popcorn costs $3. Write two equivalent expressions for the total cost of four movie tickets and four bags of popcorn, then find the cost. Show your work!

25) A volleyball uniform costs $15 for the shirt, $10 for the pants, and $8 for the socks. Write two equivalent expressions for the total cost of 12 uniforms. Then find the cost. Show your work.

Use the distributive property to write each expression as an equivalent algebraic expression.

26) 2(x+3)

27) 5(y+6)

28) 3(n+1)

29) 7(y+8)

30) (x+3)4

31) (y+2)10

32) (3+y)6

33) (2+x)5

34) 3(x-2)

35)9(m-2)

36) 8(z-3)

37) 15(s-3)

38) (r-5)6

39) (x-3)12

40) (t-4)5

41) (w-10)2

42) -2( z+4)

43) -5(a+10)

44) -2(x-7)

45) -5(w-8)

46) (y-4)(-2)

47) (a-6)(-5)

48) 2(x+y)

49) 3(a+b)

# Math

Thursday 1.26.2017

You'll need a post it note.

On the next slide is a series of questions...write your name, and your answers on the post-it.

In the algebraic expression

$2x+3$

Which term is the constant?

[redacted]

[redacted]

## Standard 6.EE.2a

Write expressions that record operations with numbers and with letters standing for numbers. eg: express the calculation "subtracy y from 5" as 5-y.

The next step we need to practice is translating word problems into algebraic expressions so that we can solve them. We are somewhat familiar with these now...

The next step is to plug in a value for the variable and solve it.

Solve X+15 when x = 5

Solve 5x when x = 25

Questions?

As per  usual, in a moment you'll have time to practice on your own.

# Math
# Friday January 27, 2016

You'll need your notebook

Standard 6.EE.3

Apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6(4x + 3y)

You're used to using the distributive process this way(copy this down):

$2(3x+1)$

$3(x+y)$

But did you know that you can work backwards too?

Try these ones on your own.

16+32x

50x+25y

45x+27

75x+150y

63y+18x

32+40x

225x+25y

80x+60y