Algebra Readiness

Unit 2 – Numbers and Operations

Part 2 – Mult/Div & Order of Operations

Algebra Readiness – Fall Outline

Unit	Target #	Learning Target
Unit 1: Numbers and Operations	1	I can add and subtract integers.
	2	I can add and subtract decimals.
	3	I can multiply and divide integers.
	4	I can multiply and divide decimals.
	5	I can find the value of expressions using the order of operations.
Unit 2: Working with Ratios and Fractions	6	I can write, simplify, and find equivalent ratios.
	7	I can add and subtract fractions.
	8	I can multiply and divide fractions.
	9	I can convert between fractions, decimals, and percents.
	10	I can solve real-world percent problems.

Class Notes and Activities

Lesson: 3.1-Multiplying Integers
E.Q.:

Warmup

Big Ideas

Multiplying With Integers For each situation, decide if the answer would be negative or positive.

a.   **Adding** groups of **Positive** numbers.   Sign of answer is _____

b.   **Adding** groups of **Negative** numbers.   Sign of answer is _____

c.   **Subtracting** groups of **Positive** numbers…   Sign of answer is _____

d.   **Subtracting** groups of **negative** numbers…   Sign of answer is _____

The Sign of a Product:

When **multiplying** numbers with…   The answer is…

Same Sign ⟹ **Positive**

Different Sign ⟹ **Negative**

Warmup

Wrap-up

Lesson: 3.2 Dividing Integers
E.Q.:

Warmup

Big Ideas

The Sign of a Quotient:

When **dividing** numbers with…   The answer is…

Same Sign $\longrightarrow$ Positive

Different Sign $\longrightarrow$ Negative

Warmup

Wrap-up

Lesson: 4.1 Multiplying Decimals

E.Q.:

Warmup

Big Ideas

Warmup

Wrap-up

Lesson: 4.2-Dividing Decimals

E.Q.:

Warmup

Big Ideas

Warmup

Wrap-up

Lesson: 5.1-Order of Operations

E.Q.:

Warmup

Big Ideas

Warmup

Wrap-up

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Unit 1 Assignments

Number and Operations

Assignment 3.1: Multiplying Integers

Multiplying With Integers For each situation, decide if the answer would be *negative or positive*.

    a.   When <u>multiplying</u> integers **with the same sign**, the sign of answer is _____

    b.   When <u>multiplying</u> integers **with different signs**, the sign of answer is _____

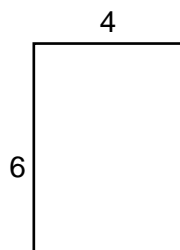2. Label the length and width of the rectangle then find the area. Show the multiplication problem you used.

    a.

                                                              b.

    c.

                                                              d.

3. Find the area of the rectangles. Show the multiplication problem you used
    a.
                                                              b.

              8

    3

                                                      4

                                                    6
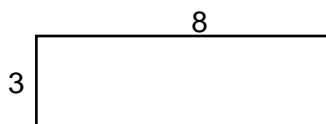
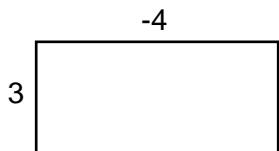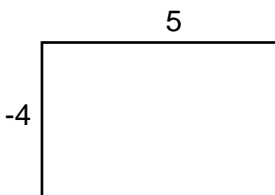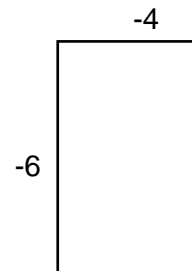4. Use the area models to write a multiplication problem and solve

                                                                                 -4
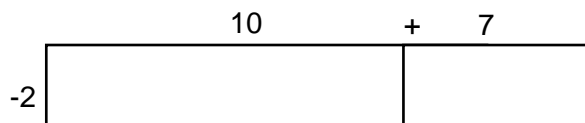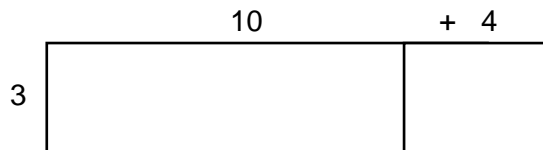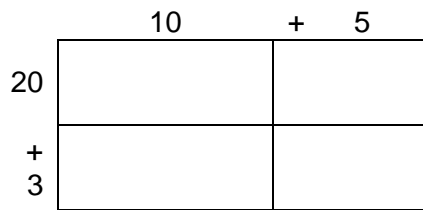
    a.   b.   5   c.

        -4

                     -4

    3   -6

    d.   3(_____ + _____)=   e.   -2(_____ + _____)=

                    10   + 4   10   +   7
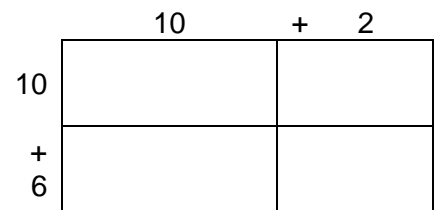
    3   -2

5. Use the area models to multiply these multiple digit problems.
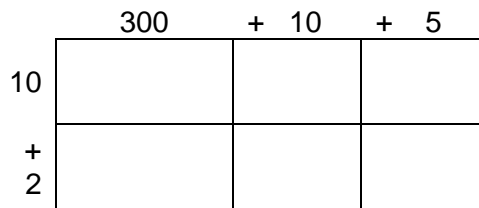Find the area of each box, then add all the boxes.

a. $23 \cdot 15 =$

	10	+ 5
20		
+ 3		

b. $16 \cdot 12 =$

	10	+ 2
10		
+ 6		

c. $315 \cdot 12 =$

	300	+ 10	+ 5
10			
+ 2			

d. $14 \cdot 24 =$

Assignment 3.2: Multiplying Integers

Find each product.

4. 5(2) = _____

5. −4(−1) = _____

6. −3(6) = _____

7. −4(−5) = _____

8. 3(−11) = _____

9. −12(2) = _____

10. 10(6) = _____

11. −4(−2) = _____

12. 8(−4) = _____

13. 9(3) = _____

14. −2(−7) = _____
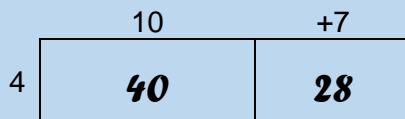
15. 6(−6) = _____

Practicing Larger Products with Distribution. For each larger product, break up the second factor into two smaller numbers that you can multiply easily. The use the area model to multiply the 2 parts and add.
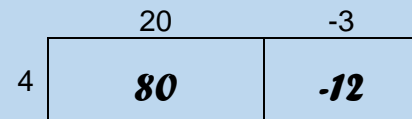
Example: $4(17) =$?

Jamie says: "I think I'll break 17 up into 10+7
$$4(17) = 4(10 + 7)$$
$$= 40 + 28 = 68"$$

	10	+7
4	**40**	**28**

Jimmy says: "I think I'll break 17 up into 20-3
$$4(17) = 4(20 - 3)$$
$$= 90 - 12 = 68"$$

	20	-3
4	**80**	**-12**

17.   3(19) =

18.   7(13) =

3		

7		

19.   −4(23) =
(hint: just find 4(23) first)

20.   −8(−29)
(hint: is this different than 8(29)?)

4		

| 8		

Assignment 3.3 Dividing Integers

Dividing With Integers. For each situation, decide if the answer would be *negative or positive*.

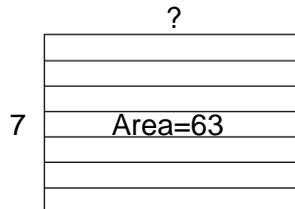   a. When <u>dividing</u> integers **with the same sign**, the sign of answer is _____

    b. When <u>dividing</u> integers **with different signs**, the sign of answer is _____

Write a division problem represented by the picture and find the length of the missing side.
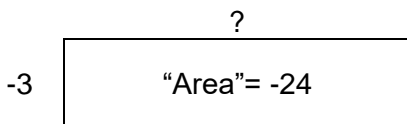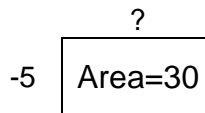
1.   **32 ÷ 4 =**

?

4 | Area=32

2. $\frac{63}{7} =$

?

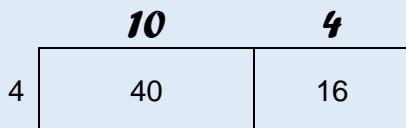7 | Area=63

3.

?

-3 | "Area"= -24

4.

?

-5 | Area=30
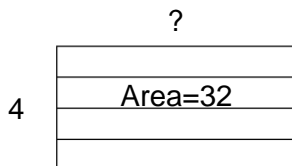
Practicing Larger Division with Distribution. For each area model, find the missing lengths for the rectangles, then add them to get your answer.
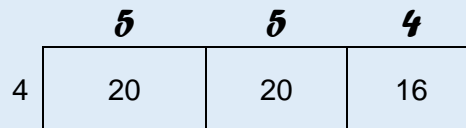
Example: $\frac{56}{4} =?$

Jamie says: "I think I'll break 56 up into 40+16

$\frac{56}{4} = \frac{40+16}{4} = 10 + 4 = 14$

10   **4**

4 | 40 | 16

Jimmy says: "I think I'll break 56 up into 20+20+16

$\frac{56}{4} = \frac{20+20+16}{4} = 5 + 5 + 4 = 14$

5   **5**   **4**

4 | 20 | 20 | 16

5. $\frac{65}{5} = \frac{50+15}{5} =$ _____ + _____ = ___

?   ?

5 | 50 | 15

6. $\frac{42}{6} = \frac{30+12}{6} =$ _____ + _____ = ___

?   ?

6 | 30 | 12

7. $\frac{72}{6} = \frac{+}{6} =$ _____ + _____ = ___

6 | | |

8. $\frac{108}{9} = \frac{+}{9} =$ _____ + _____ = ___

9 | | |

18
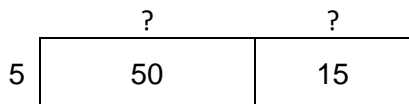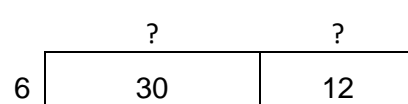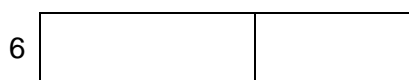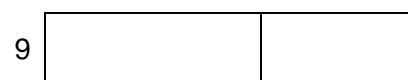
Assignment 3.4: Dividing Integers

Find each quotient (in other words... divide). Draw an area model if it helps. Break it into 2 smaller problems if it helps.

1. $10 \div 2 =$

2. $-\frac{14}{2} =$

3. $-\frac{20}{4} =$

4. $-30 \div -5 =$

5. $-12 \div (-3) =$

6. $\frac{30}{-2} =$

7. $\frac{40}{10} =$

8. $-8 \div (-2)$

9. $-\frac{21}{7} =$

10. $-49 \div (-7) =$

11. $\frac{22}{-2} =$

12. $-\frac{100}{25} =$

Write a multiplication or division problem to answer these questions.

13.

Joy added ice cubes to her lemonade. The change in temperature of her lemonade was $-10°$ F. If she added 5 ice cubes, what integer represents the change in temperature per ice cube?

_____ ÷ _____ = _____

14.

Jake is making iced tea. He has ice cubes which he uses to cool the iced tea. Each ice cube lowers the temperature of the liquid by $3°$ F. He adds 4 ice cubes to the tea. What integer represents the change in temperature of the iced tea?

_____ · _____ = _____ ° F

Assignment 3.5: Multiplying and Dividing Integers

INTEGERS
multiplying and dividing

Instructions:

Answer the question on the start square. The answer will be in one of the pathways attached to it. Color it in and then follow that pathway to the next question. Repeat until you reach the Finish square!

9×-4=	-8	72÷-9=	9	**START** 30÷-5=	28	4×7=

Row 1: 9×-4= | -8 | 72÷-9= | 9 | START 30÷-5= | 28 | 4×7=

Vertical paths row 1-2: -36 | 36 | 132 | 6 | -6 | 11 | -28

Row 2: 7×-6= | 49 | -12×-11= | -132 | -99÷-9= | -11 | -42÷7=

Vertical paths row 2-3: -42 | 42 | -156 | -144 | -81 | 35 | -35

Row 3: -80÷-8= | -10 | -6÷-3= | -72 | 9×9= | -40 | -5×-7=

Vertical paths row 3-4: 10 | 9 | 63 | 6 | -9 | 81 | 7

Row 4: 5×2= | -10 | 2×-10= | -7 | -30÷-5= | -7 | **FINISH**

Vertical paths row 4-5: -5 | 10 | 2 | -3 | -120 | 120 | 6

Row 5: -54÷-6= | 1 | 12÷4= | 3 | -12×10= | 108 | -12×-8=
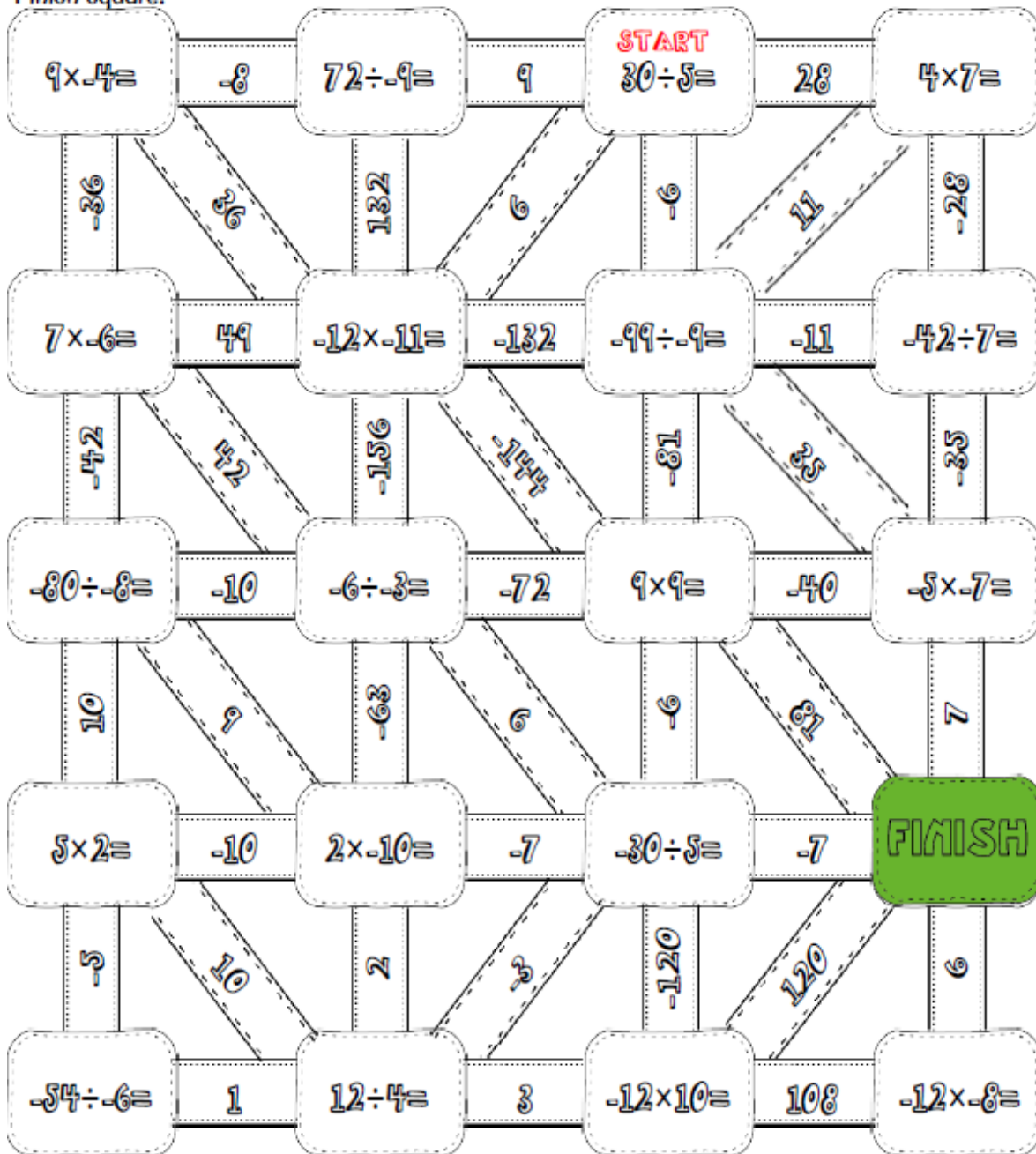
Assignment 4.1: Multiplying Decimals

Multiply. Ignore the decimal and the negative, multiply, then place a decimal and negative sign in the answer (if it is negative.) Use distribution and area models

1. $7(3.2) =$

2. $2(0.4) =$

3. $0.9(-0.2) =$

4. $-5(1.9) =$

5. $-9(5.4) =$

6. $0.6(-13.2) =$

7. $-6.5(-3.1) =$

8. $2.2(11.7) =$

9. $-12.3(5.1) =$

10.

During a drought, the water level in a pond decreased 2.6 centimeters each week. This continued for 4.5 weeks.

 a. Which value in this situation should be represented by a negative number? Why?

 b. Write a multiplication equation that represents the total change in water depth over the past 4.5 weeks.

11.

Alan used a meal card in the university cafeteria to pay for his lunch. Each day he used his card for lunch, the balance remaining on the card decreased by $3.62. What number represents the total change in value on his card if he used the card for 8 lunches last month?

12.

Bryan lost weight by walking every day. He lost an average of 0.6 kilograms each week for 7 weeks. What number represents his total change in weight?

Assignment 4.2: Dividing Decimals

Divide. Start by moving the decimals the same in the divisor and the dividend until the divisor is whole number. Decide the sign of the answer, then ignore the negatives to divide.
Then use long-hand division adding zeros to the divisor as needed.

1. $\dfrac{1.4}{7} =$

2. $\dfrac{-.44}{1.1} =$

3. $\dfrac{1.25}{-0.1} =$

4. $-165 \div (-7.5) =$

5. $-2.16 \div 0.24 =$

6. $11.05 \div (-2.6) =$

7. Kristy has a gift card for a coffee shop where she always orders the same thing. The value on her card decreased by $28.80 after 8 coffees.
   a. Which value in this situation would be represented by a negative number?

   b. Write a division equation that represents the change in value on her card for one coffee.

8. Carlos made a cup of hot chocolate and left it sitting on the table. Each minute, the temperature of the hot chocolate decreased by 0.8°F. After a while, the temperature of the hot chocolate had decreased by 14.4°F. How many minutes had Carlos' hot chocolate been cooling?

9. Ryan bought flowers and chocolates for his parents for their anniversary. The flowers cost $48.95 and the chocolates cost $8.50. He and his two brothers split the cost of the items evenly between the three of them. How much did each brother pay?

Assignment 5.1: Parenthesis

1) $(18 \cdot 2) \div 6$

2) $(2 + 1) \div 3$

3) $3 - (4 - 2)$

4) $(6 + 4) \cdot 5$

5) $3 - (6 + 5)$

6) $(2 \cdot 7) + 2$

7) $3 - (5 - 5)$

8) $15 \div (6 - 1)$

9) $(5 \times 2) + 2$

10) $5(4 - 6)$

11) $\big((14 - 4) \cdot 2\big) \div 4$

12) $\big((13 - 3) \cdot 2\big) \div 5$

13) $(9 - 6) \div (5 - 2)$

14) $(3 + 1)(1 + 5)$

Assignment 5.1: Parenthesis-Exponents

Evaluate each Expression

1) $1^2 + 6$

2) $3^3 - 3$

3) $(18 \div 6)^2$

4) $(1 + 3)^2$

5) $4 \div (6 - 4)^2$

6) $(15 \div 5)^3 - 5$

7) $6(6 - 5)^3$

8) $6^2 - (5 + 6)$

9) $3^2 \div 3 + 2$

10) $18 \div (5 + (6 - 5)^2)$

11) $4^3 - 4^2 - 3$

12) $(2 + 4) \div (3^2 - 6)$

Assignment 5.3: Order of Operations

Evaluate each Expression using the order of Operations

1) $4 - 5 \div 5$

2) $5 \cdot 3 - 6$

3) $(14 - 2) \div 2 \cdot 4$

4) $12 \div 4 + 2 + 5$

5) $4 \cdot 12 \div 4 + 1$

6) $1 + 3 \div (2 + 1)$

7) $1 + 6 \cdot 5 - 2$

8) $5 \cdot 5 - 2 \cdot 3$

9) $3 \cdot 9 \div 3 \cdot 1^3$

10) $4 + (3 \cdot 2) \div (5 - 2)$

11) $2 \cdot 5 + 6 + 3 - 6$

12) $5(2 + 3) - 6 \div 2$

13) $3 \cdot 4 - (5 \cdot 3) \div 3$

14) $(1 + 8) \div (4 + 4 - 5)$

15) $(2 + 4)^2 - 6 - (4 + 2)$

16) $3 \cdot 4 - 1 - (4 - 2)^2$