

Student Objective

(Obj. 1b) TSW learn the rules for multiplying/dividing integers and solve problems involving multiplication and division of integers.

Lesson

1-8 Multiplying/Dividing Integers (Textbook Pages: 44-47)

Last Night's Homework

Add and Subtract Integer Worksheet (6 problems)

Homework

Integer **Test Tomorrow** (Ordering, Adding, Subtracting, Multiplying, and Dividing)

Complete Study Guide

Review Notes and Classwork to prepare for test

Bellwork

Quiz – Adding and Subtracting Integers.

Prior Knowledge

- Review answers to bellwork quiz.
- Review previous day's homework.
- Over the last few days we have learned to order integers, add integers, and subtract integers.

Anticipatory Set

- **TODAY**, we build upon those skills and we'll learn to multiplying and dividing integers.
- Why do we need to learn how to multiply and divide integers?
Let's take a look at a real life example involving a famous sled dog named Balto who lived in a little town called Nome, Alaska.
- Display real-world weather example (Nome, Alaska).

Teacher Input

- Review bellwork.
- Review homework.
- Relate story of Balto and the weather in Nome, Alaska to multiply and dividing integers.
- Pass out student notes.
- Explain rules for multiplying/dividing integers.
- Demonstrate how to multiply/divide integers.
- Give students time to work you-try problems individually.
- Go over answers to you-try problems.
- Pass out Study Guide.
- Classwork: Have students work in "Think, Pair, Share" activity to complete their study guide. Review answers.
Extra Practice: Multiplying & Dividing WS or Integer Double Bubble Map

Assessment

Question the students for understanding. Monitor students as they work on "you try" problems.

Major **test** on integers next class.

Closure

1. How do you determine the sign when you are multiplying or dividing integers with 2 or more integers?
Count the negative signs. Even amount = positive answers. Odd amount = negative answer.
2. Announce:
Integer test next class! Work must be shown when adding and subtracting integers. The steps will be on the board for you to look at. Remember, circle any double signs and replace with one sign according to the chart, rewrite the problem, then follow the rule for same sign or different sign.

**Bellwork**
(obj. 1b)**Quiz Name:**

Adding and Subtracting Integers

Directions: Use the rules for adding and subtracting integers to solve the following problems. You **MUST** show your work. By this I just mean to follow your steps. Circle double signs and rewrite the problem when applicable.

B 1. $-37 + (-5) =$

- A. 42
B. -42
 C. 32
 D. -32

C 2. $-25 - (-5) =$

- A. 20
 B. 30
C. -20
 D. -30

A 3. $-8 - 2 =$

- A. -10**
 B. 10
 C. 6
 D. -6

A 4. Find the sum of the following expression:
 $-10 + 10$

- A. 0**
 B. 20
 C. -20
 D. -10

D 5. The temperature in Portland, Maine was 8° F at noon. By 10:00 pm the temperature had dropped to -4° F. Find the change (difference) in the temperatures. Write an equation, and then solve the problem. **$8 - (-4) = 12$**

- A. 4°
 B. -12°
 C. -4°
D. 12°

C 6. The chart lists class averages over a course of 3 years.

Mrs. Berg's Math		
Year	1 st Semester Average	2 nd Semester Average
2008	85	81
2009	77	82
2010	88	80

Describe (as an integer) the change in 2nd Semester averages between **2009** and **2010**.

- A. -8 B. 10 **C. -2** D. 2

**** Hint:** Did the average go up or down? This will help you determine the sign of your integer. Then, how much was the change.


Bellwork
 (obj. 1b)

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**** Hint:** Did the average go up or down? This will help you determine the sign of your integer. Then, how much was the change.



Adding & Subtracting Integers

Last Night's HW

Must show your work on this worksheet to get credit for it! By this I just mean to follow your steps. Circle double signs and rewrite the problem when applicable.

1. $-8 - (-6) = -2$

$-8 + 6 = -2$

2. $-25 - 8 = -33$

3. $-42 + (-50) = -92$

$-42 - 50 = -92$

4. $12 - (-2) = 14$

$12 + 2 = 14$

5. In January 2009, the temperature in Denver, Colorado was initially 32 degrees and dropped 38 degrees overnight. Write an equation. Then, use the integer rules to find the final temperature.

$32 - 38 = -6$

Answer: -6°

6. A football team lost 20 yards on a play and then gained back 32 yards. Write an equation. What is the net gain or loss?

$-20 + 32 = 12$

Answer: **12 yards gain**

Why learn how to Multiply and Divide Integers?

Real-World Example



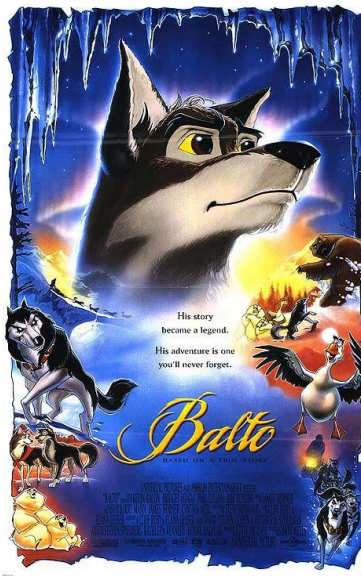
Nome, Alaska



Northern Lights from Nome, Alaska



Home of the famous sled dog, Balto who helped carry diphtheria sermon to Nome, Alaska in 1925 after a storm caused airplanes to not be able to deliver it.



If you know how to divide integers, you can determine temperature averages for Nome, Alaska! During a week in January, 2009 the temperatures for the week were as follows:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
-6°	-5°	-1°	1°	3°	3°	2°

$$\frac{-6 - 5 - 1 + 1 + 3 + 3 + 2}{7} = \frac{-3}{7} = -0.43 \text{ } ^\circ\text{F} \quad \text{average for the week}$$



Balto, at the Cleveland Museum of Natural History



Balto



Togo on display at the Iditarod Trail Sled Dog Race Gift Shop and Museum in Wasilla, Alaska.



Togo



When multiplying or dividing two or more integers:

Step 1

Multiply or divide the integers as asked.

$$-5 \cdot 4 \cdot 1 = 20$$

$$-6 \cdot -6 = 36$$

Step 2

Count the number of negative signs in your problem.

There is one negative sign!

There are two negative signs!

Step 3

Determine the sign of your answer as follows:

- Even number of negative signs → +
- Odd number of negative signs → -

Odd number of negatives: **-20**

Even number of negatives: **36**



Guide Practice:

1) $2 \cdot -6 = \underline{\hspace{2cm}}$

2) $-4(-3) = \underline{\hspace{2cm}}$

3) $-7 \cdot 3 = \underline{\hspace{2cm}}$

4) $-12 \div -3 = \underline{\hspace{2cm}}$

5) $\frac{18}{-9} = \underline{\hspace{2cm}}$

6) $-150 \div 50 = \underline{\hspace{2cm}}$

7) $3 \cdot (-2) \cdot (-1) \cdot (-4) = \underline{\hspace{2cm}}$

You Try!



- 1) Find the product: $3(-3) =$ _____
- 2) Find the product: $-5(10) =$ _____
- 3) Multiply: $-8 \cdot -3 =$ _____
- 4) Find the quotient: $-15 \div 3 =$ _____
- 5) Simplify: $(-5)(-4)(1)(5) =$ _____
- 6) From sea level, a sting ray dives 30 feet in 1 minute. At this pace, at what depth will the sting ray be in 3 minutes?

(Hints: If below sea level, what kind of integer is 30...positive or negative?

Also, it will be further down in the ocean after 3 minutes, so, should you \times or \div ?

Extra Practice

1. $3(-3) =$ _____
2. $3(-12) =$ _____
3. $7(-8) =$ _____
4. $7 \cdot -7 =$ _____
5. $-33 \div 11 =$ _____
6. $\frac{-100}{-20} =$ _____
7. $-38 \div (-2) =$ _____
8. $9 \cdot -3 =$ _____
9. $(-6)(10) =$ _____
10. Compare using $>$, $<$, or $=$. $-14 \div 2$ _____ $7 \cdot -1$
11. Which of the following describes the value of the product when a **negative** integer is multiplied by a **negative** integer?
 - A. greater than zero
 - B. less than zero
 - C. equal to zero
 - D. It can be any of the above.
12. Which of the following expressions has a product of -48 ?
 - A. $-8 \cdot 6$
 - B. $24(-2)$
 - C. $2 \cdot -6 \cdot 4$
 - D. All of the above

You Try!



Answer Key

1) Find the product: $3(-3) = -9$

2) Find the product: $-5(10) = -50$

3) Multiply: $-8 \cdot -3 = 24$

4) Find the quotient: $-15 \div 3 = -5$

5) Simplify: $(-5)(-4)(1)(5) = 100$

6) From sea level, a sting ray dives 30 feet in 1 minute. At this pace, at what depth will the sting ray be in 3 minutes?

(Hints: If below sea level, what kind of integer is 30...positive or negative?

Also, it will be further down in the ocean after 3 minutes, so, should you \times or \div ?

$-30 \times 3 = -90 \text{ feet}$

Extra Practice

Answer Key

1. $3(-3) = -9$
2. $-3(-12) = 36$
3. $8(-8) = -64$
4. $2 \cdot -6 \cdot -2 = 24$
5. $-33 \div 11 = -3$
6. $\frac{-100}{-20} = 5$
7. $-38 \div (-2) = 19$
8. $9 \cdot -3 = -27$
9. $(-6)(10)(2) = -120$
10. Compare using $>$, $<$, or $=$. $-14 \div 2 = 7 \cdot -1$
11. Which of the following describes the value of the product when a **negative** integer is multiplied by a **negative** integer?
 - A. **greater than zero**
 - B. less than zero
 - C. equal to zero
 - D. It can be any of the above.
12. Which of the following expressions has a product of -48 ?
 - A. $-8 \cdot 6$
 - B. $24(-2)$
 - C. $2 \cdot -6 \cdot 4$
 - D. **All of the above**



Study Guide: Integers

Test Next Class!

Ordering & Comparing Integers

- 1) Which list orders the integers from least to greatest?
- A. 335, 435, 672, 619, 824
 - B. 664, 753, 788, 877, 850
 - C. -250, -360, -382, -449, -489
 - D. -943, -726, -706, -351, -151
- 2) Which of the following correctly compares the two numbers?
- A. $121 > 187$
 - B. $-42 > -89$
 - C. $538 < -4,780$
 - D. $1,390 = 1,930$

Adding & Subtracting Integers

- 3) Solve $8 + (-10) =$
- 4) Simplify: $15 - (-5) =$
- 5) Simplify: $-9 - 9 =$
- 6) Simplify: $-20 + 50 =$
- 7) In Chicago, the temperature on Wednesday was -3° . On Thursday, the temperature dropped 12° . What was the temperature on Thursday?
- A. -9°
 - B. 9°
 - C. -15°
 - D. 15°
- 8) The record high for Florida is 107°F . The record low temperature is -2°F . What is the difference in temperature between the record high and record low? Write an equation, then solve.

Equation: _____

Answer: _____

Multiplying & Dividing Integers

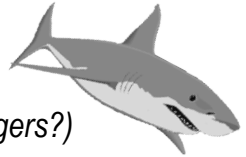
9) Solve the following: $-33 \div 11 =$ _____
 $-6(-6) =$ _____
 $-8 \cdot -3 \cdot -2 =$ _____
 $5 \times 5 =$ _____

10) Which of the following describes the value of the product when a negative integer is multiplied by a negative integer? (If necessary, write yourself an example to help.)

- A. greater than zero
- B. less than zero
- C. equal to zero
- D. It can be any of the above.

11) A shark descended to a depth of 35 feet in 1 second. If the shark continues to descend at this rate, how far will the shark be in 10 seconds?

(Hints: If below sea level, what kind of integer is 35...positive or negative? Also, he will be further down in the ocean in 10 seconds, so... should you multiply or divide the two integers?)



Equation: _____

Answer: _____

Mixed Review - Keeping our skills current! 😊

12) Consider the following expression. $8.5(y - \frac{1}{2})$

Which of the following correctly applies the distributive property to the expression?

- A. $(8.5 + y) - (8.5 - \frac{1}{2})$
- B. $(8.5 - y) + (8.5 - \frac{1}{2})$
- C. $8.5 \cdot y + 8.5 \cdot \frac{1}{2}$
- D. $8.5 \cdot y - 8.5 \cdot \frac{1}{2}$

13) Identify each property as either zero, identity, commutative, associative, or distributive.

_____ $(5 + 2) + 1 = 5 + (2 + 1)$

_____ $19 + 7 = 7 + 19$

_____ $157 + 0 = 157$

_____ $7(5 + 2) = 7 \times 5 + 7 \times 2$

_____ $258 \times 0 = 0$



Study Guide: Integers

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 - D. $1,390 = 1,930$

Adding & Subtracting Integers

- 3) Solve $8 + (-10) =$ **-2**
- 4) Simplify: $15 - (-5) =$ **20**
- 5) Simplify: $-9 - 9 =$ **-18**
- 6) Simplify: $-20 + 50 =$ **30**
- 7) In Chicago, the temperature on Wednesday was -3° . On Thursday, the temperature dropped 12° . What was the temperature on Thursday? **$-3 - 12 =$**
- A. -9°
 - B. 9°
 - C. **-15°**
 - D. 15°
- 8) The record high for Florida is 107°F . The record low temperature is -2°F . What is the difference in temperature between the record high and record low? Write an equation, then solve.

Equation: **$107 - (-2) =$**

Answer: **109°F**

