

MANCHESTER COLLEGE
Department of Education

LESSON PLAN by: Kyler Kearby

Lesson: Multiplying and dividing integers

Length: 25 minutes

Grade Intended: Pre-Algebra (7th)

Academic Standard:

7.2.1: Solve addition, subtraction, multiplication, and division problems that use integers, fractions, and decimals, and combinations of the four operations.

Performance Objective:

When the students are given eleven problems that involve multiplying and/or dividing integers, they will correctly solve eight out of the eleven problems.

Assessment:

The students will be assigned eleven homework problems. For each problem, the students must compute the product or quotient. The teacher will not only evaluate the students on their answers, but also on their shown work.

Advanced Preparation by Teacher:

- Review lesson plan and make sure it applies to entire classroom
- Upload Pre-Algebra Notetaking Guide pgs. 16 – 17 onto computer (attached)
- Create and print off five copies of the “Relay Race” worksheet (attached)
- Create and print off answer key of the “Relay Race” worksheet (attached)
- Smartboard

Procedure:

Introduction/Motivation:

First, answer any questions the students may have over the previous day’s homework. Afterwards, say to the students, “The last couple of days we have gone over adding and subtracting integers. Today, we will discuss multiplying and dividing integers.” On the Smartboard, list these different multiplication and division sentences. Ask the students, “When taking a close look at the signs of these different products and quotients, are there any conclusions that you can make about the sign of any product or quotient?” (Bloom: Analysis). Make sure they understand that the product or quotient of two integers with the same sign is positive and the product or quotient of two integers with different signs is negative. Tell them that this idea is extremely important for today’s lesson.

$4 \times 2 = 8$
$4 \times -2 = -8$
$-4 \times -2 = 8$
$-4 \times 2 = -8$
$8 \div 4 = 2$
$-8 \div 4 = -2$
$8 \div 2 = 4$
$-8 \div 2 = -4$

Step-by-Step Plan:

1. Project 1 – 7 Notes up onto the screen. Discuss the lesson with the students. While going over the lesson, ask the following questions:
 - a. In terms of the sign of a product or quotient, why does the same rule apply to both multiplication and division problems? (Bloom: Comprehension)
 - b. Is it possible to divide a number by zero? (Bloom: Knowledge)
 - c. If you multiply a negative integer by a negative integer and then by another negative integer, will its product be positive or negative? (Bloom: Application) (Gardner: Logical/Mathematical and Interpersonal)
2. Ask the students if they have any questions over the notes. Pass out a “Relay Race” worksheet to the first person in each column of desks. Tell them that each column of desks is a team, so there will be five teams. Explain to the class that the person with the worksheet right now will compute the first problem. Then, he/she will pass it back to the next person. The second person will insert the previous answer into the blank space of the next problem and then, compute the problem. This procedure will continue until all five problems have been answered. If a team only has four members, explain to them that one person will have to answer two problems. Tell the students that the first and last answers are additive inverses of each other, so this criteria must be met before they come check their answers with the teacher. The first team to answer their five problems correctly is the winner. After a team has won, go over the answers with the class. (Gardner: Logical/Mathematical, Bodily-Kinesthetic and Interpersonal)
3. Ask the students if they have any questions about multiplying and dividing integers. If they have questions, answer them. Otherwise, have the students get their textbooks out and assign them problems (12 – 25 odd, 29, 31, 33, 44) on pgs. 44 – 46. Let the students work on this assignment for the rest of the class period. Walk around the room and answer questions the students may have. (Gardner: Logical/Mathematical and Interpersonal)

Closure:

With a few minutes left in the class period, say to the students, “You should now feel pretty good about your abilities to add, subtract, multiply and also divide integers. Having a good understand of these concepts will be very beneficial as we progress through the rest of Pre-Algebra.” Ask the students, “Do you think that the rules we have learned about in regards to the signs of sums, differences, products and quotients of integers can also be applied to all rational numbers, such as decimals and fractions? (Bloom: Synthesis)

Adaptations/Enrichment:**Student with speech impairment:**

Give clear and precise directions and encourage the student to answer questions. When called upon, let them speak at their own pace and be willing to help them if they seem to be struggling.

1.7

Multiplying and Dividing Integers

Goal: Multiply and divide integers.

Multiplying Integers

Words

The product of two integers with **the same** sign is **positive**.

The product of two integers with **different** signs is **negative**.

The product of any integer and 0 is **0**.

Numbers

$2(4) = 8 \quad -2(-4) = 8$

$2(-4) = -8 \quad -2(4) = -8$

$2(0) = 0 \quad -2(0) = 0$

Example 1 Multiplying Integers

a. $-5(-8) = 40$ Same sign: Product is **positive**.

b. $-8(7) = -56$ Different signs: Product is **negative**.

c. $-51(0) = 0$ The product of any integer and 0 is **0**.

Checkpoint Find the product.

1. $7(-12)$

-84

2. $-9(-5)$

45

3. $-250(0)$

0

4. $-4(11)$

-44

Dividing Integers

Words

The quotient of two integers with

the same sign is **positive**.

The quotient of two integers with

different signs is **negative**.

The quotient of 0 and any nonzero

integer is **0**.

Numbers

$$8 \div 4 = 2$$

$$-8 \div (-4) = 2$$

$$-8 \div 4 = -2$$

$$8 \div (-4) = -2$$

$$0 \div 4 = 0$$

$$0 \div (-4) = 0$$

Example 2 Dividing Integers

a. $-63 \div (-9) = 7$ Same sign: Quotient is **positive**.

b. $24 \div (-4) = -6$ Different signs: Quotient is **negative**.

c. $0 \div (-2) = 0$ The quotient of 0 and any nonzero integer is **0**.

✓ Checkpoint Find the quotient.

5. $0 \div (-43)$

0

6. $32 \div (-4)$

-8

7. $-28 \div 7$

-4

8. $-38 \div (-19)$

2

Relay Race

Questions	Answers
1. $2 \times 8 \div 4 \times -2$	
2. $6 \times \underline{\quad} \div 24$	
3. $-7 \times 6 \div \underline{\quad}$	
4. $-3 \times \underline{\quad} \div 9 \times -5$	
5. $\underline{\quad} \div -7 \times 16 \div -10$	

Relay Race (Answer Key)

Questions	Answers
1. $2 \times 8 \div 4 \times -2$	-8
2. $6 \times -8 \div 24$	-2
3. $-7 \times 6 \div -2$	21
4. $-3 \times 21 \div 9 \times -5$	35
5. $35 \div -7 \times 16 \div -10$	8