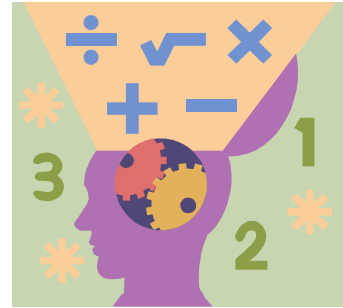


Algebra/Geometry Institute Summer 2010

Faculty Name: Patrick Evans

School: Hayes Cooper Center

Grade Level: 6th



- 1 Teaching objective(s) The student will identify, compare, and order integers and find absolute value
MS 1.a. Compare and order rational numbers using symbols ($<$, $>$, and $=$) and a number line. (DOK 1)
MS 1.k. Explain the meaning and relationship between absolute value and opposites. (DOK 2)
- 2 Instructional Activities
Describe completely the class activities for your lesson.

Part 1: Intro

- A. Ask students to listen to the following problems (Problems will be on a transparency):
 - Chicago is known for its cold winters. One morning this past winter, it was 9° . The temperature dropped 16° by the afternoon of the same day. What was the temperature that afternoon?
 - Julie has a checking account. Her last balance was \$50.00. If she wrote a check for \$45.00, how much would she have left in her checking account?
 - Johnny was keeping stats for his high school football team. He recorded the first three plays of the game. On the first play, his team didn't gain any yards. On the second play, his team gained 5 yards. On the third play, his team lost 7 yards. What was the total amount of yards gained after the first three plays?
- B. Encourage students to share their answers to each of the questions.

Part 2: Integers

- C. Demonstrate the use of positive and negative integers by using a visual for each problem (Thermometer, bank statement, and a diagram of a football field) as the class comes to a conclusion about the correct answer to each question.

- D. Guide students to the conclusion that the number line can be extended to show negative numbers.
- E. Draw the number line on the board and only label 0 through 10.
- F. Ask the students the following questions:
- As you move to the right on the number line, what is happening? (**Each number increases in value.**)
 - As you move to the left on the number line, what is happening? (**Each number decreases in value.**)
 - As we continue to go left, what do you think will come after 0? (**-1, -2, -3, etc.**)
- G. Introduce the vocabulary words integer, positive integer, and negative integer to the class.
- **Integers** – the set of whole numbers and their opposites
 - **Positive integers** – integers to the right of zero on the number line.
 - **Negative integers** – integers to the left of zero on the number line.
- H. Allow time for student questions.
- I. Put students into groups of four.
- J. Give each group a deck of cards without the jokers.
- K. Tell students that they are going to play a game called match the opposite.
- L. Tell the students that hearts and diamonds are negative (red) and clubs and spades are black (positive).
- M. Inform students that the object of the game is to match as many opposites as possible. (ex. If a student draws a four of diamonds or hearts then he or she will need to draw a four of clubs or spades in order to have an opposite pair.)
- Each player will take a turn and turn two cards over one at a time.
 - If both cards are opposite, the player will get a point. (Student will keep cards if they are opposite.)
 - If the two cards do not match then the player will turn them back over and the game will continue with the next player.
 - The player with the most opposite pairs in each group wins.

Part 3: Opposites

- N. Introduce the vocabulary word opposite.
- **Opposite** – two numbers that are an equal distance from zero on the number line.
- O. Direct students to do the following:
- Locate the integer positive 7 on the number line.
 - Locate the integer negative 7 on the number line.
 - Count the number of units that it will take to get from zero to positive 7.

- Count the number of units that it will take to get from zero to negative 7.
- Locate the following integers on the number line and count the number of units from zero to each of the integers on the number line. (3;-3, 5;-5, 2;-2)

P. Ask students the following question:

- What did you notice about each integer and its opposite? **Both were the same distance away from zero.**

Part 4: Absolute Value

Q. Introduce the vocabulary word absolute value.

- Absolute value – the distance of an integer from zero on a number line

R. Write the following examples on the board:

- **Ex.** $|3| = 3$ **NOTE:** Read the following expression like it is written in parenthesis. (The absolute value of three equals three because positive three is three units from zero.)
- $|-5| = 5$ **NOTE:** Allow a student to write the following expression on the board.
- $2 = |-2|$ **NOTE:** Allow a student to write the following expression on the board.

S. Allow time for student questions.

Part 5: Number line

T. Direct students' attention to a number line that is hanging in front of the room.

- Give each student an index card with an integer on it.
- Direct them to hang the integer that they have in the correct place on the number line.
- Allow each student to share what integer they had and why they decided to hang it where it is located. (Students must come to a conclusion as to whether each integer is in the correct place, state the distance the integer is from zero, and the opposite of the integer.)
- Allow time for student questions.
- Tell students, "Today we have learned how to identify, compare order integers, and find absolute value.

NOTE: Make sure that students understand that plus and minus are used for addition and subtraction. Positive and negative are used for reading positive and negative integers.

3 Materials and Resources

Identify various materials and equipment needed for lesson activities. Provide complete references (include textbook and additional resources)

- Maletsky, E.M. & McLeod, J. (2009) HSP Math T.E. Volume 2, Orlando, FL: Harcourt. Inc.
- 50 index cards (each with an integer on it)
- 4 decks of cards
- thermometer, Check book register, and diagram of a football field
- butcher paper
- markers
- yarn
- paper clips

4 Assessment

Describe completely the assessment to be used for this lesson.

- The student will be given a handout to complete. (Attachment 1)
- The student will follow the directions on the handout.
- The student will record all written work on his or her own paper.

NAME _____ DATE _____ # _____

Math Quiz (Integers)

1. Draw a number line which includes the integers negative five through positive five. Find $|-4|$ using the number line above to assist you.

Write the opposite integer.

2. +5
3. -9
4. -16
5. 7
6. -100

Write an integer to represent each situation.

7. a gain of 10 yards
8. a \$6 decline in volume

Order from least to greatest.

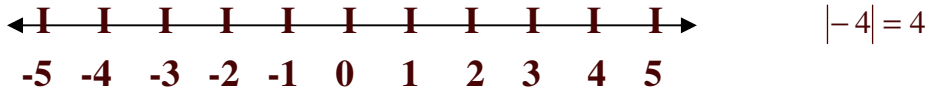
9. -5, 3, -7, 0

10. Explain how to use a number line to compare two integers.

NAME _____ DATE _____ # _____

Math Quiz (Integers)

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Write the opposite integer.

2. +5 (**-5**)
3. -9 (**9**)
4. -16 (**16**)
5. 7 (**-7**)
6. -100 (**100**)

Write an integer to represent each situation.

7. a gain of 10 yards (**+10**)
8. a \$6 decline in volume (**-6**)

Order from least to greatest.

9. -5, 3, -7, 0 (**-7, -5, 0, 3**)

- 10. Explain how to use a number line to compare two integers. (Possible explanation: Locate each integer on a number line. The greater integer is the one farther to the right.)**