**Unit:** Understand Addition & Subtraction of Integers

**Domain:** The Number System (NS)

**Class:** 7th Grade Math

**Teacher:** Mrs. Mack

**Objective: 7. NS.** Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

**Standard:**

**7. NS. 1.** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal number line diagram.

**a.** Describe situations in which opposite quantities combine to make 0.

**b**. Understand that *p* + *q* as the number located a distance $\left|q\right|$ from p, in the positive or negative direction depending on whether *q* is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

**c.** Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

**Essential Question:** How can mathematics be used to provide models that help us represent addition and subtraction?

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| **Day** | **Focus Questions** | **By the end of the lesson, I can…** |
| **M** | How can mathematicians use a horizontal number line to add integers? | -Use a horizontal number line to add integers.-Explain that a sum of a number and its opposite is zero. |
| **T** | How can mathematicians find the distance between two integers using addition and absolute value?  | Find the distance between two integers using addition and absolute value. |
| **W** | How mathematicians create models to solve real-world problems involving addition of integers? | Create and use models to solve real-world problems involving addition of integers. |
| **R** | How can mathematicians use a horizontal number line to subtract integers? | Use a horizontal number line to subtract integers |
| **F** | How can mathematicians use subtraction and absolute value to find the distance between two integers on a number line? | Use subtraction and absolute value to find the distance between two integers on a number line |

**Interventions:** The teacher will assess the exit tickets completed daily. TTW deliver interventions the following day to students as needed.

**Notes:**

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**Monday**

**Lesson Duration: 50 minutes**

**Pre-Class:** Students will work on their bell ringer assignment and get out the appropriate materials for class.The students will complete five 6th grade review questions from each domain. **(5 minutes)**

**Review:** The teacher will quickly review the bell ringer questions. **(5 minutes)**

**Anticipatory Set (5 minutes)**

**Hook:** Show students the following image and ask “Which one doesn’t belong?” Give students 1 minute to think about it and then ask for a volunteer to share.



**Focus Question:** Say, “Our focus question is ‘How can mathematicians use a horizontal number line to add integers?’”

**Prerequisite Information:** Show students a horizontal number line beside a horizon. Say, “You have learned in previous math classes that horizontal lines are parallel to the horizon. Ask the class, “What is the opposite of horizontal lines?” (Vertical) Say, integers are whole numbers and their opposites which includes 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, and -5.” Point to the number line.

**Real World Connection:** Show students two states with their high and low temperatures.

* Say, “A common example of negative integer usage is the thermometer. Thermometers are similar to number lines, but vertical. They have positive integers above zero and negative integers below zero.”
* A few of the ways that integers are used in daily life are highway speed limits, clocks, addresses, thermometers and money. Integers are also used for football scores, altitude levels and maps. Positive integers, or whole numbers, are used in many ways during daily life.” ({Student 1: Provide a situation when you might see a positive integer and a negative integer.}{Possible Answers: I might see a positive integer on Drew Brees football jersey which is the number 9. I might see a negative integer on my mother’s bank statement. Its -93 dollars. }) Say, “Class, do you agree? Why or why not? Discuss.

**Importance/Relevance: Say, “**Integers are important because it helps us be more precise with our calculations when solving mathematical problems.

**Teaching: Input (10 minutes)**

*The teacher will…*

1. Inform students to turn in their instruction workbooks to pages 2 and 3.
2. Introduce lesson vocabulary while pointing at the word wall (absolute value, additive inverse, and integer).
3. Say, “In [mathematics](https://wiki.kidzsearch.com/wiki/Mathematics), the absolute value of a [real number](https://wiki.kidzsearch.com/wiki/Real_number) is the number without the sign. The absolute value of *2* is *2*, the absolute value of *-2* is also 2. This notation is to express a numbers distance from zero on a number line. The absolute value of 10 would be 10 since the number 10 is 10 numbers away from zero, same follows with negatives.”
4. Say, “The additive inverse is a number you add to another number to equal zero. This is also known as the opposite number.” Show these examples: *x* + (-*x*) = 0, (-*x*) + *x* = 0. ({Student 2: Provide a situation when you might use additive inverses.}{Possible Answers: I am 3 meters below sea level and I swim to the surface}) Ask other students if they agree or disagree. Discuss. . ({Student 3: Do you think the concept of additive inverse holds true for numbers other than integers?}{Answers: Yes} {Student 3: Explain. (Possible Answer: For example, take the number$\frac{1}{2}$, its opposite or additive inverse would be$-\frac{1}{2}$ .) Ask other students if they agree or disagree. Discuss.
5. Say, “We have talk about what an integer is, but let me remind you. Integers are whole numbers and their opposites which includes 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, and -5.”
6. Ask for a volunteers to read the page 2.

**Teaching: Modeling (5 minutes)**

*The teacher will…*

1. Tell students to look at page 3. Choose volunteers to read through the text.
2. Present question 1 at the bottom of page 3. Give students sentence starters to help the students answer the question.
3. Give every student a card that has an integer.

**Educational Brain Break: (5 minutes)**

*The student will…*

* Get out of their seats and find the classmate that has their additive inverse. (There will only be one person that has it.)

**Guided Practice: (10 minutes)**

**The student will…**

* Turn to page 3 and 4 in their practice workbook.
* Complete questions 1-10. *(What they do not finish is homework.)*

**Closure: (5 minutes)**

* The teacher will say, “Today we learned that integers are whole numbers and their opposites which includes 5, 4, 3, 2, 1, 0, -1, -2, -3, -4, and -5.
* We learned that absolute value is of a [real number](https://wiki.kidzsearch.com/wiki/Real_number) is the number without the sign.
* We also learned that the additive inverse is a number you add to another number to equal zero.
* We saw that if we add a number to its opposite, the sum will equal zero.
* We discussed the need for parentheses as a way to separate the operation from the sign of the integer.
* We saw that positive integers are represented to the right of zero on a horizontal number line, and negative numbers are represented to the left of zero on a horizontal number line.
* So now, I am going to give you an exit ticket answering the focus question: How can mathematicians use a horizontal number line to add integers? You have 3 minutes. You cannot leave without this completed ticket. And for goodness sake, please write your name on it.”

**Assessment:** Teacher observation and exit tickets.

**Materials**: instruction & practice workbooks, 30 integer notecards, PowerPoint