1) Teaching Objectives

Day One - Teacher objective – Students will understand that every integer has an opposite integer. Students will find and position integers and their opposites correctly on a number line.

Day Two - Teacher Objective – The students will recognize the correct placement of positive and negative integers on a number line and on the coordinate plane.

CCSS 6.N.S.6.a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., \(-(-3) = 3\) and that 0 is its own opposite.

CCSS 6.N.S.6.b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

CCSS 6.N.S.6.c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

MMFR 6.1.a. Compare and order rational numbers using symbols and a number line.

MMFR 6.1.g. Model addition and subtraction of integers with physical materials and the number line.

2) Instructional Activities – 2 days

Day One

- Bell Ringer – (display on smart board) TSW complete the following question on a number line (handout***):
  - Place the following numbers on the number line below: 0, 3, 6, 4, 7, 5, 2, 1
  - Where did you put 0 on the number line?
  (Answers may vary but use this opportunity to discuss the benefits of putting 0 in the middle on the number line – you might want to include this in your instructions)
  - What do you notice about the value of the numbers as you move from left to right?
    (Correct answer – the values increase)
  - What do you notice about the value of the numbers as you move from right to left?
    (Correct answer – the values decrease)
• What if you owed someone $7? Where would this go on the number line? How would we read that number?
  (Correct answer – it would go seven spaces to the left of 0 and would be shown with a negative sign, as in -7 and would be read “negative 7”)
• TTW pull a popsicle stick and the student whose name is called will come put -7 on the number line on the smart board.
• “Where and how have you seen integers used? Share with your group where you have seen integers for two minutes.”
• Allow two-three minutes, and then call on groups for examples (NASCAR times, under par in golf, stock market scores, etc.).
• TTW lead a discussion, “Today, after our lesson you will be able to recognize integers and their opposites on a number line. For instance, the integer -7 is the opposite of 7. Also, you will understand that the sum of opposites is zero. In your definition notebook, add these definitions”.
• TTW display the definitions on the smart board and pull a stick to determine which student will read it. 
  The definition for integer - the whole numbers and their opposites, including zero.  The definition for opposite – two integers are opposites if they are represented on the number line by points that are the same distance from zero, but in opposite directions from zero. The sum of two opposites is zero. 
  “For example, -3 is the opposite of what number?”
• Call on students to give the correct answer which is 3, and then ask students to identify opposite pairs, such as 6 & -6 in their groups.
• Allow students 5 minutes then call on groups to share an opposite pair from their list.
• Ask other students if they agree; listen and respond to student answers.
• Pass out Integer Number Line handouts and display a copy on the smart board.
• Have students put their pencil points on zero. Explain that when a positive number is called they will move their pencil that many places to the right, and if a negative number is called they will move their pencil that many places to the left.
• (Call on a student to model on the board while students work on their number lines) Call out 3 and wait while students move to positive 3, then call out negative 3, wait while students move their pencils 3 places to the left.
• Ask where their pencil is now? (Examples of answers; zero, back where I started) Explain that they just added two opposites.
• Write the number representation of the problem on the board 3 + (-3) = 0.
• Repeat with more problems of adding opposite pairs, calling on students to show on the board how they moved on their number line and how they represented the problem with numbers and symbols.
On smart board, display \(-7\) and ask students how to read this number and what it equals (the opposite of negative 7 = 7). If necessary, read it to them and prompt students to give the answer.

Then display the following problems and pull sticks for students to read and answer:

\[ -(-3) = (\text{the opposite of negative } 3 = 3) \]
\[ -(-6) = (\text{the opposite of } 6 = -6) \]
\[ -(-9) = (\text{the opposite of negative } 9 = 9) \]

Ask students if they notice a pattern when the negative sign is outside of the parenthesis. Explain, if necessary, that if the negative sign is outside of the parenthesis it is read as, “the opposite of”.

Closure Activity – have students write three integers on an index card and exchange cards with a partner. The partner finds and writes the opposite integer on the card. Exchange cards again and check each other’s answers. Turn in as you leave the classroom.

Teaser – tomorrow we will turn the number line on its head!

Day Two

Bell Ringer – TSW label a blank number line with positive and negative integers, including zero. As they work, pass out teacher-made number cards with positive and negative integers. Remind students of the class number line. Explain that when you give the signal, they will go and hang their card on the opposite number. Call one group at a time, and ask the other students if they agree. Discuss/correct as necessary.

TTW read *Sir Cumference and the Viking’s Map* to the class and then lead a discussion about the coordinate plane.

Explain to students that today that we will be turning the number line on its head. Ask what would happen if we drew a line perpendicular to their existing number line. Listen to responses and discuss.

Pass out rulers and have them draw such a line.

Display a coordinate plane on the smart board. Ask if anyone has seen a grid similar to this – maps, hurricane maps, etc. Explain that after today’s lesson students will be able to label the y-axis, the x-axis, and graph numbers on a coordinate plane.

Pass out copies of blank coordinate planes. Ask students to use their arms to show a horizontal line. Repeat, but ask for students to show a vertical line. Explain that the coordinate plane is made up of two number lines put together.

Pull a stick and call student to label the horizontal number line as the x-axis.

Pull a stick and call a student to label the vertical number line as the y-axis.

Have students label x-axis with integers.

Ask students where the positive numbers will go in relationship to zero (to the right of zero).

Ask the students where the negative numbers will go (to the left of zero).

Ask students if they have ever seen a vertical number line before.

Discuss where the positive and negative numbers will go (positive above zero and negative below zero).

Pick a stick and call on that student to label the y-axis with integers while students label their graph at their desk.

Ask students if we have two number lines, how many numbers will we need to be able to graph on the coordinate plane? (two numbers)

Let’s watch this [video](http://www.youtube.com/watch?v=l9z0i6KPGD4&feature=results_main&playnext=1&list=PLAAFB8BA65526870A) and discover how the coordinate plane helped someone find his way home.
“Now let’s begin graphing coordinate pairs. Let’s begin by graphing (3, 2) and label it. Pull a popsicle stick to choose a student to come up to the smart board and graph the point on the coordinate pane.

- Give students more pairs to graph, for example (-3, 2), (3, -2), (-3, -2), etc.
- Walk around with checklist, checking when students meet the criteria.
- Closure Activity – TTW pass out another coordinate plane to students. TTW randomly choose a student to roll a pair of number cubes that have positive and negative numbers on them. The student will choose which number will be the x-coordinate, and which will be the y-coordinate. For example, if the number cubes land on -1 and 2, the student chooses either -1 or 2 as the x-coordinate; the number not chosen for the x-coordinate will be the y-coordinate. Write the coordinate pairs on the board and have students graph and label the pair on the coordinate pair. TTW repeat this until 4 pairs of coordinates are called. TSW turn these in as they leave the classroom.

3) Materials and Resources
- Handout with number line teacher made. Number line to display on smart board from: http://www.helpingwithmath.com/resources/oth_number_lines.htm.
- Popsicle sticks with student names – one for each student present (to be used for randomly picking a student’s name).
- Smart board – Display: number line; definitions; blank number line; coordinate plane
- Student definition notebooks
- Integer cards (teacher made – write integers vertically on unlined index cards; hole punch top end and hang with an opened up paper clip)
- Class number line (made by hanging string or yarn horizontally on tack strip)
- Blank coordinate plane handouts (two will be needed).
- Book Sir Cumference and the Viking’s Map by Cindy Neuschwander, illustrated by Wayne Geehan (2012). Published by Charlesbridge, Watertown, MA.
- Video from: http://www.youtube.com/watch?v=l9zOi6KPGD4&feature=results_main&playnext=1&list=PLAAFB8BA65526870A
- Rulers
- Number cubes with positive and negative numbers.

4) Assessment
Formative – Closure activities and teacher will use checklist while making informal observations.
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<th>Names of Students</th>
<th>Integers &amp; Opposites</th>
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**Rubric:** 1 – Does not demonstrate understanding; 2 – Demonstrates some understanding, but made some errors; Demonstrates understanding but made 1 or 2 errors; Demonstrates understanding with no errors.
Coordinate Pairs to Graph - \((x, y)\)

1) _______________________

2) _______________________

3) _______________________

4) _______________________

5) _______________________

6) _______________________

7) _______________________
Helping with Math.com. (n.d.a) *Printable number lines for math.* Retrieved from


Math Lambert (2010). *Coordinate plane.* Uploaded by munchie10323 Retrieved from

http://www.youtube.com/watch?v=i9z0i6KPGD4&feature=results_main&playnext=1&list=PLAAFB8BA65526870A