END GAME GOAL SETTING

Houston County School System Mathematics

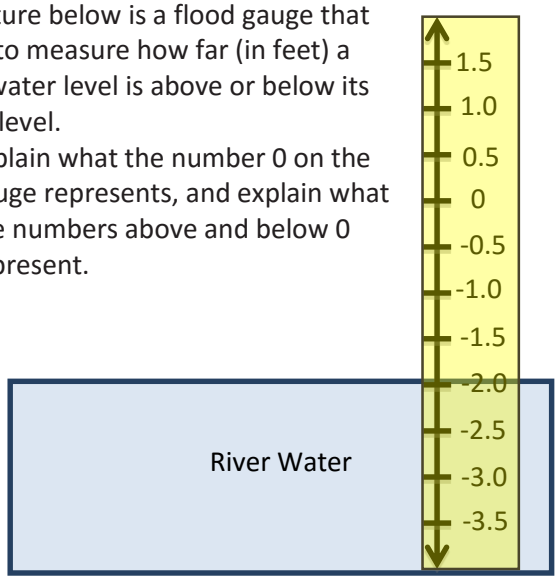
Student Name:		Teacher Name:
Grade: AC6th	Unit #: 2A	Unit Title: Rational Explorations
Approximate Start Date of Unit:		Approximate End Date (and Test Date) of Unit:

The following Statements and examples show the skills, concepts, and understandings that I will gain before the end of this unit.

(Initial in Box and & Date in the Space Provided When YOU CAN ☺) ☐	I can identify an integer and its opposite. I can use integers to represent quantities in real world situations. I can explain where zero fits into a situation represented by integers.

EXAMPLES:

1. The picture below is a flood gauge that is used to measure how far (in feet) a river's water level is above or below its normal level.
   a. Explain what the number 0 on the gauge represents, and explain what the numbers above and below 0 represent.



   b. Describe what the picture indicates about the river's current water level.

   c. What number represents the opposite of the water level shown in the picture, and where is it located on the gauge? What would it mean if the river water was at that level?

   d. If heavy rain is forecast for the area for the next 24 hours, what reading might you expect to see on this gauge tomorrow? Explain your reasoning.

2. Express each situation as an integer in the space provided.
   a. A gain of 56 points in a game. _____
   b. A fee charged of $2.50. _____
   c. A temperature of 32 degrees below zero. _____
   d. A 56 yard loss. _____
   e. The freezing point of water in Celsius. _____
   f. A $12,500 deposit. _____

3. Describe a situation that can be modeled by the integer -15. Explain what zero represents in the situation.

Student Notes/Comments/Questions

(Initial in Box and & Date in the Space Provided When YOU CAN ☺)	I can identify the location of zero on a number line in relation to positive and negative numbers. I can recognize opposite signs of numbers as locations on opposite sides of 0 on the number line. I can reason that a double negative is the opposite of that number itself; for example, $-(-2)$ is 2.

EXAMPLES:

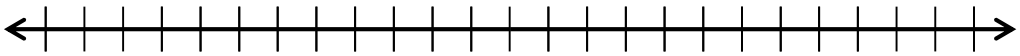
4. Find the opposite of each number and describe its location on the number line.
   g. -5
   h. 10
   i. -3
   j. 15

5. Will the opposite of a positive number *always, sometimes, or never* be a positive number? Explain your reasoning.

6. Mr. Kindle entered $-(-\$800)$ into a program. He made a note that read, "The opposite of the opposite of $\$800$ is $\$800$." Is his reasoning correct? Explain.

7. Read each description carefully and write an equation that represents the description.
   a. The opposite of negative seven.
   b. The opposite of the opposite of twenty-five.
   c. The opposite of fifteen.
   d. The opposite of negative thirty-six.

8. Write the integer that represents the statement. Locate and label each point on the number line below.
   a. The opposite of a gain of 6.
   b. The opposite of a deposit of $\$10$.
   c. The opposite of the opposite of 0.
   d. The opposite of the opposite of 4.
   e. The opposite of the opposite of a loss of 5.



Student Notes/Comments/Questions:

(Initial in Box and & Date in the Space Provided When YOU CAN ☺) ☐	I can recognize the signs of both numbers in an ordered pair indicate which quadrant of the coordinate plane the ordered pair will be located. I can reason that when only the x value in a set of ordered pairs are opposites, it creates a reflection over the y axis [e.g., (x, y) and (–x, y)]. I can recognize that when only the y value in a set of ordered pairs are opposites, it creates a reflection over the x axis [e.g., (x, y) and (x, –y)]. I can reason that when two ordered pairs differ only by signs, the locations of the points are related by reflections across both axes [e.g., (x, y) and (–x, –y)].

EXAMPLES:

9.

a. An ordered pair has coordinates that have the same sign. In which quadrant(s) could the point lie? Explain.

b. Another ordered pair has coordinates that are opposites. In which quadrant(s) could the point lie? Explain.

10. How are the ordered pairs $(4, 9)$ and $(4, -9)$ similar, and how are they different? Are the two points related by a reflection over an axis in the coordinate plane? If so, indicate which axis is the line of symmetry between the points. If they are not related by a reflection over an axis in the coordinate plane, explain how you know.

11. Given the point $(-5, 2)$, write the coordinates of a point that is related by a reflection over the x- or y-axis. Specify which axis is the line of symmetry.

Student Notes/Comments/Questions:

(Initial in Box and & Date in the Space Provided When YOU CAN ☺)	I can find and position integers and other rational numbers on a horizontal or vertical number line diagram. I can find a position pairs of integers and other rational numbers on a coordinate plane.

EXAMPLES:

12. Carlos uses a vertical number line to graph the points $-4,\ -2,\ 3$, and 4. He notices that -4 is closer to zero than -2. He is not sure about his diagram. Use what you know about a vertical number line to determine if Carlos made a mistake or not. Support your explanation with a number line diagram.

13. Use an appropriate scale to graph each of the following situations on the number line to the right. Also, write an integer to represent both situations.

    A hiker is 15 feet above sea level.

    A diver is 20 feet below sea level.

14. Locate and label each point described by the ordered pairs below. Indicate which of the quadrants the points lie in.

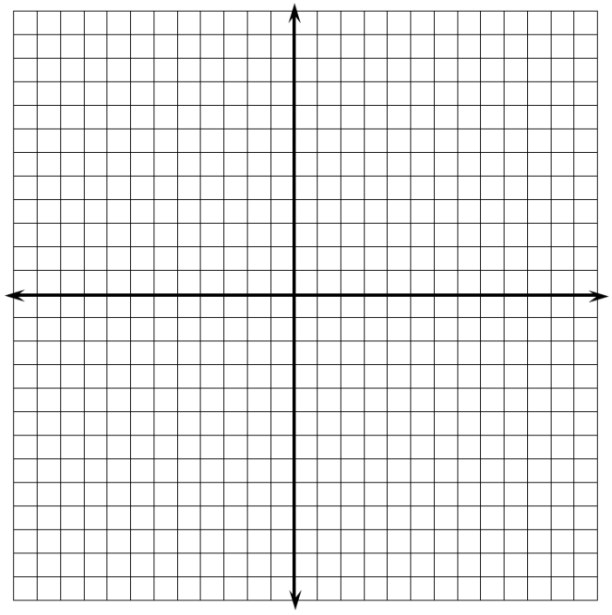
    a. $(7,2)$

    b. $(3,-4)$

    c. $(1,-5)$

    d. $(-3,8)$

    e. $(-2,-1)$



Student Notes/Comments/Questions:

(Initial in Box and & Date in the Space Provided When YOU CAN ☺)	I can interpret statements of inequality as statements about relative position of two numbers on a number line diagram.

EXAMPLES:

15. Andréa and Marta are testing three different coolers to see which keeps the coldest temperature. They placed a bag of ice in each cooler, closed the coolers, and then measured the air temperature inside each after 90 minutes. The temperatures are recorded in the table below:

Cooler	A	B	C
Temperature (°C)	-2.91	5.7	-4.3

Marta wrote the following inequality statement about the temperatures:

$$-4.3 < -2.91 < 5.7$$

Andréa claims that Marta made a mistake in her statement and that the inequality statement should be written as:

$$-2.91 < -4.3 < 5.7$$

Is either student correct? Explain.

16. The table below shows how some elevation samples compare to the level of the road:

Elevation Sample	G	H	I	J	K	L
Elevation (from the road)	3.1	-0.5	2.2	1.3	-4.5	-0.9

Write the values in the table in order from least to greatest.

_____ < _____ < _____ < _____ < _____ < _____

17. Write a statement comparing $-10°\text{F}$ and $-20°\text{F}$.

18. Henry, Janon, and Clark are playing a card game. The object of the game is to finish with the most points. The scores at the end of the game are: Henry: -7, Janon: 0, and Clark: -5. Who won the game? Who came in last place? Use a number line model and explain how you arrived at your answer.

19. Order the following from least to greatest: $-8,\ -19,\ 0,\ \frac{1}{2},\ \frac{1}{4}$

20. Order the following from greatest to least: $-12,\ 12,\ -19,\ 1\frac{1}{2},\ 5$

Student Notes/Comments/Questions:

(Initial in Box and & Date in the Space Provided When YOU CAN ☺) ☐	I can identify absolute value of rational numbers. I can interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. I can distinguish comparisons of absolute value from statements about order and apply to real world contexts.

EXAMPLES:

21. Use absolute value to explain how a debit of $8.98 and a credit of $8.98 are similar.

22. A local park's programs committee is raising money by holding mountain bike races on a course through the park. During each race, a computer tracks the competitors' locations on the course using GPS tracking. The table shows how far each competitor is from a check point.

Number	Competitor Name	Distance to Check Point
223	Florence	0.1 mile before
231	Mary	$\frac{2}{5}$ mile past
240	Rebecca	0.5 mile before
249	Lita	$\frac{1}{2}$ mile past
255	Nancy	$\frac{2}{10}$ mile before

a. The check point is represented by 0 on the number line. Locate and label points on the number line for the positions of each listed participant. Label the points using rational numbers.

b. Which of the competitors is closest to the check point? Explain.

c. Two competitors are the same distance from the check point. Are they in the same location? Explain.

d. Who is closer to finishing the race, Nancy or Florence? Support your answer.

23. Jamie told his math teacher: "Give me any absolute value, and I can tell you two numbers that have that absolute value." Is Jamie correct? For any given absolute value, will there always be two numbers that have that absolute value?

24. Mason was ordering the following rational numbers in math class: $-3.3,\ -15,\ -8\frac{8}{9}$

a. Order of the numbers from least to greatest.

b. List the order of their absolute values.

c. Explain why the orderings in parts (a) and (b) are different.

Student Notes/Comments/Questions

(Initial in Box and & Date in the Space Provided When YOU CAN ☺)

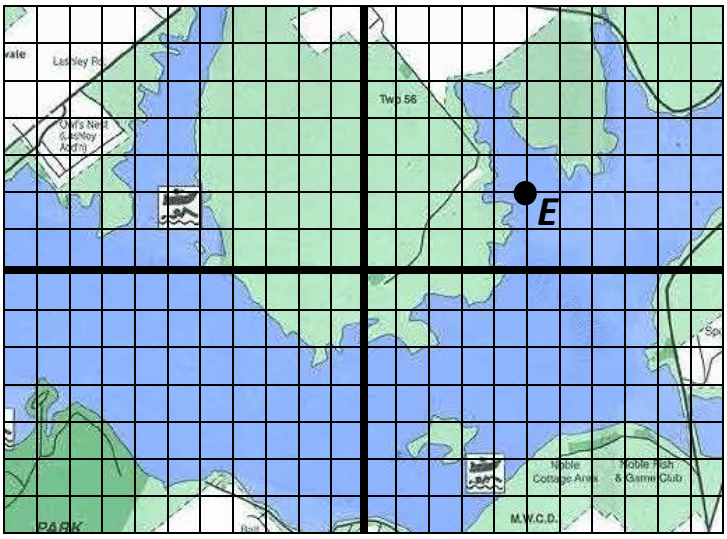
I can solve real-world problems by graphing points in all four quadrants of a coordinate plane. I can calculate the distances between two points with the same first coordinate or the same second coordinate using absolute value, given only coordinates.

EXAMPLES:

25. Complete the table using absolute value to determine the lengths of the line segments.

Line Segment	Point	Point	Distance	Proof
$\overline{AB}$	$(-3, 5)$	$(7, 5)$		
$\overline{CD}$	$(1, -3)$	$(-6, -3)$		
$\overline{EF}$	$(2, -9)$	$(2, -3)$		
$\overline{GH}$	$(6, 1)$	$(6, 16)$		
$\overline{JK}$	$(-3, 0)$	$(-3, 12)$		

26. For centuries, a mysterious sea serpent has been rumored to live at the bottom of Seneca Lake, the longest of the Finger Lakes. A team of historians used a computer program to plot the last five positions of the sightings.



a. Locate and label the locations of the last four sightings: $A\left(-9\frac{1}{2}, 0\right)$, $B\ (-3, -4.75)$, $C\ (9, 2)$, and $D\ (8, -2.5)$.

b. Over time, most of the sightings occurred in Quadrant III. Write the coordinates of a point that lies in Quadrant III.

c. What is the distance between point A and the point $\left(9\frac{1}{2}, 0\right)$? Show your work to support your answer.

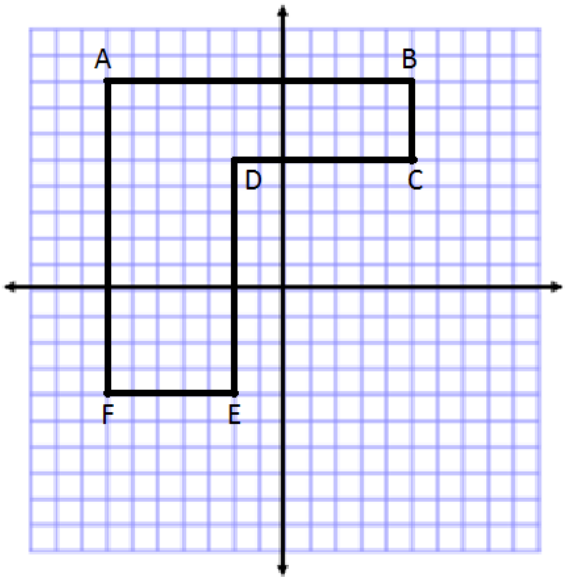
Student Notes/Comments/Questions

(Initial in Box and & Date in the Space Provided When YOU CAN ☺)

I can draw polygons in the coordinate plane.
I can use coordinates (with the same x-coordinate or the same y-coordinate) to find the length of a side of a polygon.
I can apply the technique of using coordinates to find the length of a side of a polygon drawn in the coordinate plane to solve real-world and mathematical problems.

EXAMPLES:

27. Complete the table using the diagram and absolute value to determine the lengths of the line segments.

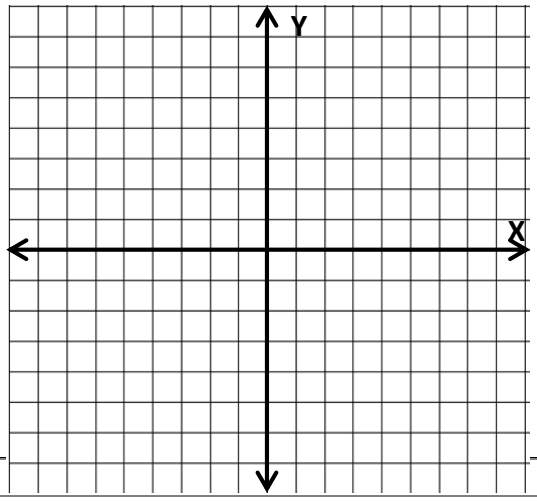


Line Segment	Point	Point	Distance	Proof
$\overline{AB}$				
$\overline{BC}$				
$\overline{CD}$				
$\overline{DE}$				
$\overline{EF}$				
$\overline{FA}$				

28. Name two points in different quadrants that form a vertical line segment that is 8 units in length.

29. Name two points in the same quadrant that form a horizontal line segment that is 5 units in length.

30. Graph a rectangle with area 12 units^2, such that its vertices lie in at least two of the four quadrants in the coordinate plane. State the lengths of each of the sides, and use absolute value to show how you determined the lengths of the sides.



Student Notes/Comments/Question