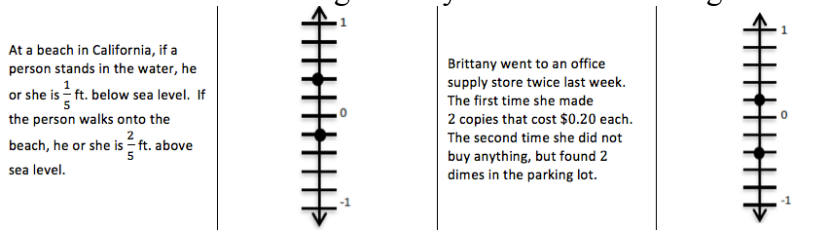
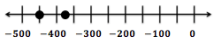
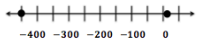
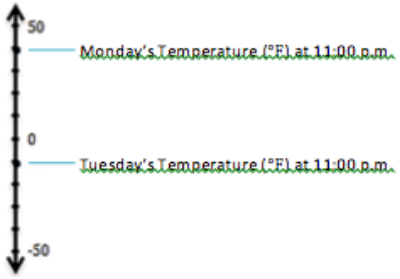
Grade Level	Sixth Grade	**Content Area**	Mathematics
Course Title (grades 9-12 Only)	N/A		
Expected Prior Knowledge *List the knowledge/skills mastered earlier in the year that are foundational to the mastery of the Required Standard(s).*	Scholars have previously applied their understanding of locating and ordering positive rational numbers to work with negative numbers on a number line and in real-world contexts. Scholars have learned and used the vocabulary and context related to opposite quantities (e.g. deposit/withdraw, elevation above/below sea level, debit/credit) and their relationship to 0 and recognized the location of opposites on the number line as being the same distance from 0 but in opposite directions. Scholars have used inequality symbols (<, >) to compare the magnitude and locations on the number line of positive and negative rational numbers.		
Alignment to Program of Instruction *Describe how the methods of instruction found in this sequence of lessons align to the Program of Instruction described in the application package.*	Arizona Career and College Readiness Core math standards form the basis for The Grande Innovation Academy's math curriculum. Scholars will learn standards using Arizona Career and College Readiness Core strands and the knowledge and skills scholars learn will build from year to year. The Grande Innovation Academy will use EngageNY math modules along with manipulatives to build conceptual understanding. Additionally, The First in Math online program will be used for developing automaticity with math facts to increase mathematical fluency. Each year at The Grande Innovation Academy scholars in grade Kindergarten through eighth will participate in a school wide Math Olympics program to generate motivation for math fluency.		
Standard Number* and Description *The standard number and description of the Required Standard(s) being instructed and assessed to mastery in the curriculum sample.*	**6.NS.C.7.** *Understand ordering and absolute value of rational numbers.* *b. Write, interpret, and explain statements of order for rational numbers in real- world contexts. For example, write –3 oC > –7 oC to express the fact that –3 oC is warmer than –7 oC.* *c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.*		
Materials/Resources Needed *List all items the teacher and students will need for the entire sequence of instruction (excluding common consumables)*	Individual whiteboards Dry erase markers Interactive math journals Document camera Number line including positive and negative integers Pre-cut Activity Cards with problem sets		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Cluster, Standard (e.g., 6.EE.B.7). For HS Math, use Conceptual Category-Domain, Cluster, Standard (e.g., A-REI.C.6).*

Lesson (add as needed)	**Instructional Strategies -** *List and describe teacher actions, lesson by lesson, which will provide students with opportunities to engage the grade-level rigor defined by the Required Standard(s). Indicate alignment of instructional strategies to specific component(s) or content/skill(s) of the Required Standard/component.*	**Student Activities -** *Describe the activities, lesson by lesson, in which students will engage to allow them to master the grade-level rigor defined by the Required Standard(s). Indicate alignment of student activities to specific component(s) or content/skill(s) of the Required Standard/component.*
1	**Objective**: Scholars write, interpret, and explain statements of order for rational numbers in the real world. **Anticipatory Set:** The following list of numbers is displayed on the board and scholars are instructed to order them from least to greatest: 0, -4, 1/4, -1/2, 1, -3 3/5, 2, -4.1, -0.6, 23/5, 6, -1, 4.5, -5, 2.1 Time is given for scholars to agree on the correct order and then each group shares their answer and reasoning with the class. Sample discussion questions: • How did you begin to sort and order the numbers? What was your first step? • What was your next step? What did you do with the two groups of numbers? • How did you know where to place 1/4 and 23/5? • How did you order the negative numbers? • How did you order the negative non-integers? • How could you write this list as an inequality statement? **Direct Instruction/Guided Practice:** Teacher uses example problems to model writing, interpreting, and explaining statements of order for rational numbers using real-world contexts. Number lines will be referenced and used as needed for scaffolding. • Sam has $10 in the bank. He owes his friend Hank $2.25. He owes his sister $1.75. Consider the three rational numbers related to this story of Sam's money. Write and order them from greatest to least using an inequality statement. What does this inequality statement mean?	**Anticipatory Set:** Scholars work in groups of three or four to order the rational numbers from least to greatest. Scholars come to a consensus on the correct order, and share with the class their strategies and thought processes. Sample responses to discussion questions: • Answers will vary. Our group began by separating the numbers into two groups: negative numbers and positive numbers. Zero was not in either group, but we knew it fell in between the negative numbers and positive numbers. • Answers will vary. We ordered the positive whole numbers and then took the remaining positive numbers and determined which two whole numbers they fell in between. • Since 1/4 is less than a whole (1) but greater than zero, we knew the rational number was located between 0 and 1. We know that 23/5 is the same as 4 3/5, which is more than 4 but less than 5, so we knew the rational number was located between 4 and 5. • First we started with the negative integers: -5, -4, and -1. -5 is the least because it is farthest left at 5 units to the left of zero. Then came -4, and then came -1, which is only 1 unit to the left of zero. • We know -1/2 is equivalent to -5/10, which is to the right of -0.6 (or -6/10) since -0.5 is closer to zero than -0.6. Then we ordered -4.1 and -3 3/5. Both numbers are close to -4, but -4.1 is to the left of -4, and -3 3/5 is to the right of -4 and to the left of -3. Lastly, we put our ordered group of negative numbers to the left of zero and our ordered group of positive numbers to the right of zero and ended up with -5 < -4.1 < -4 < -3 3/5 < -1 < -0.6 < -1/2 < 0 < ¼ < 1 < 2 < 2.1 < 4.5 < 23/5 < 6 **Direct Instruction/Guided Practice:** Scholars take notes of example problems in interactive math journals. Scholars respond to teacher questioning during checks for understanding. • 10 > -1.75 > -2.25, shows that having $10 in the bank is a higher amount than owing either $1.75 or $2.25. Owing $2.25 means you have the least amount of money because you would need to repay that first before having anything to spend. • -1.50, -1.00, 0.25, 1.50 The opposite of -1.50 is 1.50, and 1.50

	• During their most recent visit to the optometrist (eye doctor), Kadijsha and her sister, Beth, had their vision tested. Kadijsha's vision in her left eye was -1.50, and her vision in her right eye was the opposite number. Beth's vision was -1.00 in her left eye and +0.25 in her right eye. Order the rational numbers from least to greatest and explain your reasoning. • Jason is entering college and has opened a checking account, which he will use for college expenses. His parents gave him $200 to deposit into the account. Jason wrote a check for $85.00 to pay for his calculus book and a check for $25.34 to pay for miscellaneous school supplies. Write the three rational numbers related to the balance in Jason's checking account in order from greatest to least. Explain the process you used to determine the order of the numbers. **Independent Practice:** Teacher provides practice problems and time to work before engaging class discussion. During work time, teacher circulates and provides additional support as needed. During discussion, teacher looks for differences in valid reasoning and discusses those differences when appropriate. For each problem, list the rational numbers that relate to each situation. Then, order them from least to greatest, and explain how you made your determination. 1. There are three pieces of mail in Ms. Thomas's mailbox: a bill from the phone company for $38.12, a bill from the electric company for $67.55, and a tax refund check for $25.89. (A bill is money that you owe, and a tax refund check is money that you receive.) 2. Monica, Jack, and Destiny measured their arm lengths for an experiment in science class. They compared their arm lengths to a standard length of 22 inches. The listing below shows, in inches, how each student's arm length compares to 22 inches. Monica: -1/8 Jack: 1 3/4 Destiny: -1/2 **Closure/Exit Ticket:** Teacher assesses scholar understanding	is farthest right on the number line, so it is the greatest. -1.50 is the same distance from zero but on the other side, so it is the least number. Negative one is to the right of -1.50, so it is greater than -1.50, and 0.25 is to the right of -1.00, so it is greater than -1.00. Finally, 1.50 is the greatest. • 200, -25.34, -85.00 There was only one positive number, 200, so I know that 200 is the greatest. I know 85.00 is farther to the right on the number line than 25.34, so its opposite, -85.00, will be farther to the left than the opposite of 25.34. This means -85.00 is the least, and -25.34 would be between -85.00 and 200. **Independent Practice:** Scholars work on practice problems and be prepared to share and support their conclusions with the whole group. **Closure/Exit Ticket:** Scholars complete exit ticket to demonstrate

	based on exit ticket answers and adjusts instruction accordingly. 1. If three numbers are ordered from least to greatest and the order is *a, b, c*, what would the order be if the same three numbers were arranged in order from greatest to least? How did you determine the new order? 2. How does graphing numbers on a number line help us determine the order when arranging the numbers from greatest to least or least to greatest? 3. Order the following set of rational numbers from least to greatest in an inequality statement, and explain how you determined the order. -3, 0, -1/2, 1, -3 1/3, 6, 5, -1, 21/5, 4	mastery. 1. *c, b, a* This is the correct order because it has to be exactly the opposite order since we are now moving right to left on the number line, when originally we moved left to right. 2. Using a number line helps us order numbers because when numbers are placed on a number line they are placed in order. 3. -3 1/3 < -3 < -1 < -1/2 < 0 < 1 < 4 < 21/5 < 5 < 6
2	**Objective**: Scholars compare and interpret rational numbers' order on the number line, making statements that relate the numbers' location on the number line to their order. **Anticipatory Set:** Teacher displays the number line diagram below. In a whole-group discussion, create a real-world situation that relates to the numbers graphed on the number line. Include an explanation of what zero represents. **Direct Instruction/Guided Practice:** Teacher passes out Activity Card sets to each small group of scholars to match and analyze. Teacher circulates during activity to address any difficulties and provide additional support as needed. After groups are finished, teacher leads whole-class discussion of answers and reasoning. **Independent Practice:** Teacher provides practice problems and time to work before engaging class discussion. During work time, teacher circulates and provides additional support as needed. During discussion, teacher looks for differences in valid reasoning	**Anticipatory Set:** Scholars should copy number line diagram into notebook and contribute suggestions to help the story evolve and come to a final state. Scholars write the related story in their student notebook. **Direct Instruction/ Guided Practice:** Scholars work in small groups of three or four on the set of Activity Cards. They must match the word story card to its related number line card and write a statement relating the numbers' placement on the number line to their order. Scholars should use inequality symbols as well as written reasoning. Scholars will present their statements to the class and discuss reasoning and any differences that might exist. 

	and discusses those differences when appropriate. 1. Sierra had to pay the school for two textbooks that she lost. One textbook cost $55 and the other cost $75. Her mother wrote two separate checks for each expense. Write two integers that represent the change to her mother's checking account balance. Then write an inequality statement that shows the relationship between these two numbers. 2. Jason ordered the numbers -70, -18, and -18.5 from least to greatest by writing the following statement: -18<-18.5<-70. Is this a true statement? Explain. 3. Write a real-world situation that is represented by the following inequality: -19<40. Explain the position of the numbers on a number line. **Closure/Exit Ticket:** Teacher assesses scholar understanding based on exit ticket answers and adjusts instruction accordingly.	The Navy Seals are practicing new techniques. The blue submarine is 450 ft. below sea level, while the red submarine is 375 ft. below sea level.  Dolphins love to jump out of the water. Dolly, the dolphin, can jump 5 meters above the water and swim 450 meters below the surface of the water.  **Independent Practice:** Scholars work on practice problems and be prepared to share and support their conclusions with the whole group. **Closure/Exit Ticket:** Scholars complete exit ticket to demonstrate mastery. Interpret the number line diagram shown below, and write a statement about the temperature for Tuesday compared to Monday at 11: 00 p.m. 
3	**Objective**: Scholars describe the absolute value of a number as its distance from zero on the number line and use absolute value to find the magnitude of a positive or negative quantity in a real-world situation. **Anticipatory Set:** Teacher instructs scholars to work in pairs for two minutes to come up with as many examples possible of different rational numbers that are the same distance from zero. After the time is up, class discussion follows: • What are some examples you found? • How do you know they are the same distance from zero? • What is the relationship between these numbers? • How do each pair of numbers relate to zero?	**Anticipatory Set:** Scholars work with partners to identify opposite rational numbers and justify their answers. They create a page with their work to be shown underneath the document camera. Scholars participate in class discussion. **Direct Instruction:** Scholars take vocabulary and example

Direct Instruction: Teacher introduces the term *absolute value* and help scholars define it as the distance between a number and zero on the number line and realize that a number and its opposite share the same absolute value.
Teacher also uses the term *magnitude* during discussion and relates it to absolute value.
Teacher uses absolute value notation (e.g. |-4| = 4, |79| = 79) to model example problems.
Teacher uses real-world scenarios to show magnitude (e.g. Temperatures in degrees Fahrenheit recorded one day in January included -6, -4, and 3. Which temperature was furthest from zero/had the greatest magnitude?)

Guided Practice: Teacher poses situations/questions for scholars to answer on their whiteboards for practice and discussion:

- Meg is playing a card game with her friend Iona. The cards have positive and negative numbers printed on them. Meg exclaims: "The absolute value of the number on my card equals 8!" What is the number on her card? Is that the only option? How do you know those are possibilities?
- Give a positive and negative number whose absolute value is greater than 3. Explain how to justify your answer using the number line.
- What are some situations that can be represented by the absolute value of 10? Defend your choices.
- Can the absolute value of a number ever be negative? Why not?
- In math class, Carl and Angela are debating about integers and absolute value. Carl said two integers can have the same absolute value and Angela said one integer can have two absolute values. Who is right? Defend your answer.
- I am thinking of two numbers. Both have the same absolute value. What must be true about the two numbers?

Independent Practice: Teacher provides practice problems and time to work before engaging class discussion. During work time, teacher circulates and provides additional support as needed.

problem notes in their interactive math journals.

Scholars create mind sketches (small pictures) to help understand the vocabulary terms and make connections to learning.

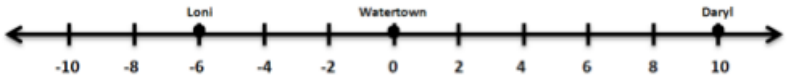
Scholars answer questions posed by teacher during checks for understanding.

Guided Practice: Scholars solve problems using personal whiteboards and discuss reasoning with partners and in whole group when called on by teacher.

Independent Practice: Scholars work on practice problems and be prepared to share and support their conclusions with the whole group.

Jami's bank account statement shows the transactions below. Represent each transaction as a rational number describing how it changes Jami's account balance, then find the absolute values and order the magnitudes from greatest to least. Explain why the rational numbers that you chose appropriately reflect the given transactions.

Listed Transactions	Debit $12.20	Credit $4.08	Charge $1.50	Withdrawal $20.00	Deposit $5.50	Debit $3.95	Charge $3.00
Change to Jami's account							
Absolute Values							

	During discussion, teacher looks for differences in valid reasoning and discusses those differences when appropriate. **Closure/Exit Ticket:** Teacher assesses scholar understanding based on exit ticket answers and adjusts instruction accordingly. Loni and Daryl call each other from different sides of Watertown. Their locations are shown on the number line below using miles. Use absolute value to explain who is a further distance (in miles) from Watertown. How much closer is one than the other?  	Scholars are encouraged to politely challenge the reasoning of their classmates when applicable. **Closure/Exit Ticket:** Scholars complete exit ticket for review of mastery.
S.A.	*Provide an opportunity for the student to complete the summative assessment items which is clearly separate from instruction and guided or independent practice, and in which the student is assessed independently. In the Student Activities column, provide a brief description of the summative assessment (S.A.) items that will allow students to demonstrate mastery of the rigor of the Required Standard(s)/components, and the context in which the items will be administered.*	For the assessment, scholars will be asked to order points and solve equations. The scholar will order and solve word problems to demonstrate mastery of the standard.

Summative Assessment Item 1:

Using the given information and chart, solve: Mary manages a company that has been hired to flatten a plot of land. She took several elevation samples from the land and recorded those elevations in a table:

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

Question: Write an inequality statement to order the elevations from least to greatest.

Answer: -4.5 < -0.9 < -0.5 < 1.3 < 2.2 < 3.1

There are four points possible for this answer (see rubric). Mastery is set at 3 points out of 4.

Summative Assessment Item 2:

Using the given information and chart, solve: Mary manages a company that has been hired to flatten a plot of land. She took several elevation samples from the land and recorded those elevations in a table:

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

Question: Explain what your inequality statement tells Mary about the samples' elevations in relationship to the road.

Answer: Sample K is the lowest elevation. Samples K, L, & H are below the road while samples J, I, and G are above the road. Sample G is the highest elevation.

There are four points possible for this answer (see rubric). Mastery is set at 3 points out of 4.

Summative Assessment Item 3:

Using the given information and chart, solve: Mary manages a company that has been hired to flatten a plot of land. She took several elevation samples from the land and recorded those elevations in a table:

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

Question: Indicate which of the values from the table is farthest from the elevation of the road. Use absolute value to explain your answer.

Answer: |-4.5| = 4.5 so Sample K is the farthest from the road's elevation. All the other absolute values have smaller magnitudes.

There are four points possible for this answer (see rubric). Mastery is set at 3 points out of 4.

Summative Assessment Scoring

A Progression Toward Mastery				
Standards Assessed	**STEP 1** **Little evidence of reasoning without a correct answer.** **(1 Point)**	**STEP 2** **Evidence of some reasoning without a correct answer.** **(2 Points)**	**STEP 3** **Evidence of some reasoning with a generally correct answer.** **(3 Points)**	**STEP 4** **Evidence of solid reasoning with a correct answer.** **(4 Points)**
Question 1 **6.NS.C.7b**	Scholar response shows little or no evidence of understanding. Scholar may place the negative values left of the positive values but made several errors in order.	Scholar response shows some evidence of understanding. Scholar correctly orders four of the six values from least to greatest.	Scholar correctly orders all six values from least to greatest but copies one of the values incorrectly.	Scholar correctly orders and writes all six values from least to greatest (i.e., $-4.5 < -0.9 < -0.5 < 1.3 < 2.2 < 3.1$

A Progression Toward Mastery				
Question 2 **6.NS.C.7b**	Scholar correctly describes none or 1 of the 4: • the lowest elevation • the highest elevation • that negative numbers indicate the samples are below the road's elevation • that positive numbers show the samples are above the road's elevation	Scholar correctly describes 2 of the 4: • the lowest elevation • the highest elevation • that negative numbers indicate the samples are below the road's elevation • that positive numbers show the samples are above the road's elevation	Scholar correctly describes 3 of the 4: • the lowest elevation • the highest elevation • that negative numbers indicate the samples are below the road's elevation • that positive numbers show the samples are above the road's elevation	Scholar correctly describes all 4: • the lowest elevation • the highest elevation • that negative numbers indicate the samples are below the road's elevation • that positive numbers show the samples are above the road's elevation
Question 3 **6.NS.C.7c**	Scholar indicates sample K but does not provide any further detail. OR Scholar states a different sample such as G and justifies the choice using clear reasoning but does not address absolute value.	Scholar indicates sample K and provides a valid explanation but does not address absolute value in the explanation. OR Scholar incorrectly states sample G and justifies the choice by addressing the order of the positive numbers.	Scholar correctly states sample K and justifies the statement using absolute value correctly in the explanation, but the explanation is not complete. OR Scholar incorrectly states sample G and justifies the choice using absolute value in a correct manner but without considering the absolute value of −4.5 for sample K.	Scholar correctly states sample K is the farthest from the elevation of the road and justifies the statement by comparing the absolute values of the samples from the table using the order of rational numbers to reach the answer.