|  |  |
| --- | --- |
| Student Name: | Teacher Name: |
| Grade: AC6 | Unit #: 2B | Unit Title: Rational Operations |
| 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 describe situations in which opposite quantities combine to make 0. I can represent and explain how a number and its opposite have a sum of 0 and are additive inverses. |
| EXAMPLES:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. On the number line above, the numbers a and b are the same distance from 0. What is the sum of a + b? Explain how you know.
 | Graph th1. Explain the meaning of: *“The opposite of a sum is the sum of its opposites.”* Use a specific math example.

|  |  |  |  |
| --- | --- | --- | --- |
| Rational Number | Rational Number | Sum | Opposite of the Sum |
|   |  |  |  |

|  |  |  |
| --- | --- | --- |
| Opposite Rational Number | Opposite Rational Number | Sum |
|   |  |  |
|  |  |  |

 |
|  A 1. A submarine descends to a depth of 480 meters below sea level. Write an integer to represent this situation. Then find the additive inverse of the integer, and tell what it represents.
 | 1. A football play lost 8 yards. Write an integer to represent the situation. Then find the absolute value of that integer, and describe what it represents in the situation.
 |

 |
| Student Notes/Comments/Questions |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can add, subtract, multiply, and divide rational numbers.  |
| EXAMPLES:

|  |  |
| --- | --- |
| 1.
 | 1.
 |
| 1. Emma and her friends were playing a game. Before her third turn, Emma had −2 points. During her third turn, Emma got 8 points. During her fourth turn, she lost 10 points and during her fifth turn, she got 5 points.

How many points did Emma have at the end of her fifth turn? | 1. A penguin dove to 130 feet below the water's surface. Then it swam up 48 feet toward the water's surface. Which integer represents where the penguin swam to?

A. 82 ft B −48 ft C. −82 ft D. −178 ft  |
| 9. . What is the product of −3 and −12? | 10.  |

 |
| Student Notes/Comments/Questions: |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can represent addition and subtraction using at least one method such as a horizontal/vertical number line or two color counters method. |
| EXAMPLES:

|  |
| --- |
| 1. Show the sum of -10 and 7 on the number line.

 |
| 1. An elevator descends 3 stories. Then, the elevator descends another 2 stories.
2. Write an expression to represent the situation.
3. Draw a number line to represent the situation.
4. Draw a picture to represent the situation.
 |
| 1. Represent 4 + –2 with chips/tiles. Draw your representation and its sum in the space below. Explain your representation.
 | 1. The temperature fell twelve degrees between midnight and 6 a.m. The temperature rose twelve degrees between 6 a.m. and 8 a.m. Draw a representation of this situation.
 |

 |
| Student Notes/Comments/Questions: |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can explain, model, and apply commutative, associative, distributive, identity, and inverse properties to add and subtract rational numbers. |
| EXAMPLES:

|  |
| --- |
| 1. Jamal is completing a math problem and represents the expression $-5\frac{5}{7}+8-3\frac{2}{7}$ with a single rational number as shown in the steps below. Justify each of Jamal’s steps. Then, show another way to solve the problem.

$$=-5\frac{5}{7}+8+\left(-3\frac{2}{7}\right)$$$$=-5\frac{5}{7}+\left(-3\frac{2}{7}\right)+8$$$$=-5+\left(-\frac{5}{7}\right)+\left(-3\right)+\left(-\frac{2}{7}\right)+8$$$$=-5+\left(-\frac{5}{7}\right)+\left(-\frac{2}{7}\right)+\left(-3\right)+8$$$$=-5+\left(-1\right)+\left(-3\right)+8$$$$=-6+\left(-3\right)+8$$$$=\left(-9\right)+8$$$$=-1$$ |
| 1. Simplify the expression. Show your work and identify or explain the properties you used at each step.

 |
| 1. Valerie has a balance of $50 in her checking account. She makes a deposit of $125 and then a withdrawal of $50. Write an expression for this situation and simplify. Identify the properties you used.
 | 1. Solve $-3(5\frac{1}{3} + (-2\frac{3}{4 }))$
 |

 |
| Student Notes/Comments/Questions: |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can apply the principle of absolute value in real-world contexts to describe the distance between two rational numbers on the number line. |
| EXAMPLES:

|  |  |
| --- | --- |
| 1. What is the distance between 1 and -7 on the number line?

 | 1. The distance between a negative number and a positive number is $12\frac{1}{2}$. What are the numbers?
 |
| 1. A hiker starts hiking at the beginning of a trail at a point which is $200$ feet below sea level. He hikes to a location on the trail that is $580$ feet above sea level and stops for lunch.
	1. What is the vertical distance between $200$ feet below sea level and $580$ feet above sea level?
	2. How should we interpret $780$ feet in the context of this problem?
 |
| 1. Find the change in temperature if the temperature rises from $-18$◦F to $15$◦ F (use a vertical number line).
 | 1. Beryl is the first person to finish a $5$K race and is standing $15$ feet beyond the finish line. Another runner, Jeremy, is currently trying to finish the race and has approximately $14$ feet before he reaches the finish line. What is the minimum possible distance between Beryl and Jeremy?
 |

 |
| Student Notes/Comments/Questions: |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can Interpret products of rational numbers in real-life contexts. |
| EXAMPLES

|  |  |
| --- | --- |
| 1. Each time that Samantha rides the commuter train, she spends $\$4$ for her fare. Write an integer that represents the change in Samantha’s money from riding the commuter train to and from work for $13$ days.
 | 1. Explain why$\left(-4\right)×\left(-5\right)=20$. Use patterns, or the properties of operations to support your reasoning.
 |
| 1. Two integers are multiplied, and their product is a positive number. What must be true about the two integers?
 | 1. Use properties to explain why for each integer $a$, $-a=-1×a$. (Hint: What does $(1+(-1))×a$ equal? What is the additive inverse of $a$?)
 |

 |
| Student Notes/Comments/Questions: |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can convert a rational number to a decimal using long division and identify terminating or repeating decimal representations of rational numbers.  |
| EXAMPLES:

|  |  |
| --- | --- |
| 1. Use the long division algorithm to find the decimal value of $-\frac{3}{4}$ .
 | 1. Chandler tells Aubrey that the decimal value of $-\frac{1}{17}$ is not a repeating decimal. Should Aubrey believe him? Explain.
 |
| 1. Convert each rational number into its decimal form:

|  |  |  |
| --- | --- | --- |
|  |  | $\frac{1}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | $\frac{1}{6}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  | $\frac{2}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |  |
| $\frac{1}{3}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | $\frac{2}{6}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | $\frac{3}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |  |
|  |  | $\frac{4}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | $\frac{3}{6}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  | $\frac{5}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |  |
| $\frac{2}{3}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | $\frac{4}{6}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | $\frac{6}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |  |
|  |  | $\frac{7}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | $\frac{5}{6}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  | $\frac{8}{9}=$ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  |  |  |

One of these decimal representations is not like the others. Why? |

 |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can solve real-world and mathematical problems involving the four operations or rational numbers. |
| EXAMPLES:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Below is a transaction log of a business entertainment account. The transactions are completed and the ending balance in the account is $\$525.55$. Determine the beginning balance.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DATE | DESCRIPTION OF TRANSACTION | PAYMENT | DEPOSIT | BALANCE |
|  | Beginning Balance | --- | --- |  |
| 12/1/10 | Bargain Electronic (I-Pod) | $$199.99$$ |  |  |
| 12/5/10 | Lenny’s Drive-Up (Gift Certificate) | $$75.00$$ |  |  |
| 12/7/10 | Check from Customer: Reynolds |  | $$200.00$$ |  |
| 12/15/10 | Pasta House (Dinner) | $$285.00$$ |  |  |
| 12/20/10 | Refund from Clear’s Play House |  | $$150.00$$ |  |
| 12/22/10 | Gaffney’s Tree Nursery | $$65.48$$ |  | $$525.55$$ |

 |
| 1. Monica regularly records her favorite television show. Each episode of the show requires 3.5% of the total capacity of her video recorder. Her recorder currently has 62% of its total memory free. If Monica records all five episodes this week, how much space will be left on her video recorder?
 | 1. At lunch time, Benjamin often borrows money from his friends to buy snacks in the school cafeteria. Benjamin borrowed $0.75 from his friend Clyde five days last week to buy ice cream bars. Represent the amount Benjamin borrowed as the product of two rational numbers; then, determine how much Benjamin owed his friend last week.
 |
| 1. The chess club is selling drinks during the track and field event. The club purchased water, juice boxes, and pouches of lemonade for the event. They spent $\$138.52$ on juice boxes and $\$75.00$ on lemonade. The club purchased three cases of water. Each case of water cost $\$6.80$. What was the total cost of the drinks?
 | 1. The sand pit for the long jump has a width of $2.75$ meters and a length of $9.54 $meters. Just in case it rains, the principal wants to cover the sand pit with a piece of plastic the night before the event. How many square meters of plastic will the principal need to cover the sand pit?
 |

 |
| Student Notes/Comments/Questions: |

|  |  |
| --- | --- |
| *(Initial in Box and & Date in the Space Provided When YOU CAN ☺)*  | I can apply the order of operations to solve problems with rational numbers.  |
| EXAMPLES:

|  |  |
| --- | --- |
| 1. Anh Phu bought 5 yd of wool fabric at $5.49 per yard, a jacket for $48.88, and a pair of mittens for $3.88. She had a coupon that allowed her to deduct $1.00 from the total cost for each item over $10.00. How much did Anh Phu pay in all?
 | 1. $-3(-5+4)$
 |
| 1. $\frac{45 -33}{-2}$ + 16 – (-6)
 | 1. 1 + |-3| $∙$ -3
 |
| 1. 9 $∙$ -1 + |-8| ÷ -4
 | 1. $\left|-2\right|+ 3(-5)$
 |

 |
| Student Notes/Comments/Questions: |