Grade Level	Seventh 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 previously mastered working with negative integers in all four operations. In prior grades scholars performed operations with positive rational numbers including decimals and fractions and worked with data analysis measures including average/mean.		
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.*	**7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers. (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)		
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 Rules for Triple Triumph game		

* ***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 apply the rules for operations with integers to positive and negative rational numbers. **Anticipatory Set:** Teacher poses question: Your cell phone bill is automatically deducting $32 from your bank account every month. How much will the deductions total for the year? After scholars have time to work, teacher leads discussion of strategies for solving and extends using different, non-integer amounts like $25.75. **Direct Instruction/Guided Practice:** Teacher explains that the rules scholars have learned for solving problems with negative integers will also apply when the numbers are fractions and/or decimals. Teacher provides example problems to be solved together as a whole class, using number sentences and models as appropriate: • Samantha owes her father $7. She just got paid $5.50 for babysitting. If she gives that money to her dad, how much will she still owe him? -7 + 5.50 = -1.50 She still owes him $1.50. • At the start of a trip, a car's tank has 12 gallons of gas. During the trip, the car consumes 10 1/8 gallons. How much gas is left in the tank? 12 + (-10 1/8) or 12 – 10 1/8 = 1 7/8 gallons left • In one year, Adam's parents spend $2,640.90 on cable and internet service. If they spend the same amount each month, what is the resulting monthly change in the family's budget? -2640.90 / 12 = -220.075 or about -$220.08 change **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.	**Anticipatory Set:** Scholars work individually to answer the question and support their reasoning. Scholars participate in class discussion of strategies used to solve the problem and work on extension questions. **Direct Instruction/Guided Practice:** Scholars take notes of example problems and instruction in interactive math journals. Scholars respond to teacher questioning during checks for understanding. **Independent Practice:** Scholars work on practice problems and be prepared to share and support their conclusions with the whole group.

Use the fundraiser chart to help answer the questions that follow.

Grimes Middle School Flower Fundraiser

Customer	Plant Type	Number of Plants	Price per Plant	Total	Paid? Yes or No
Tamara Jones	tulip	2	$4.25	$8.50	No
Mrs. Wolff	daisy	1	$3.75	$3.75	Yes
Mr. Clark	geranium	5	$2.25	$11.25	Yes
Susie (Jeremy's sister)	violet	1	$2.50	$2.50	Yes
Nana and Pop (Jeremy's grandparents)	daisy	4	$3.75	$15.00	No

Jeremy is selling plants for the school's fundraiser, and listed above is a chart from his fundraiser order form. Use the information in the chart to answer the following questions. Show your work and represent the answer as a rational number; then, explain your answer in the context of the situation.

$-4.25 \times 2 = -8.50$

Numerical Answer: -8.50

Explanation: *Tamara Jones will need to deduct $8.50 from her checking account balance.*

b. Mr. Clark wants to pay for his order with a $20 bill, but Jeremy does not have change. Jeremy tells Mr. Clark he will give him the change later. How will this affect the total amount of money Jeremy collects? Explain. What rational number represents the change that must be made to the money Jeremy collects?

$2.25 \times 5 = 11.25 \qquad 20.00 - 11.25 = 8.75$

Numerical Answer: -8.75

Explanation: *Jeremy collects too much money. He owes Mr. Clark $8.75. The adjustment Jeremy needs to make is $-$8.75.*

c. Jeremy's sister, Susie, borrowed the money from their mom to pay for her order. Their mother has agreed to deduct an equal amount of money from Susie's allowance each week for the next five weeks to repay the loan. What is the weekly change in Susie's allowance?

$-2.50 \div 5 = -0.50$

Numerical Answer: -0.50

Explanation: *Susie will lose $0.50 of her allowance each week.*

Closure/Exit Ticket: Teacher assesses scholar understanding based on exit ticket answers and adjusts instruction accordingly.
1. When answering word problems today about the Grimes Middle School Flower Fundraiser, how did you know what operation to use?
2. How did you know whether to express your answer as a positive or negative number?
3. In general, how does the context of a word problem indicate whether you should multiply or divide rational numbers, and how will your answer be stated?

d. Jeremy's grandparents want to change their order. They want to order three daisies and one geranium, instead of four daisies. How does this change affect the amount of their order? Explain how you arrived at your answer.

Original Order: $3.75 \times 4 = 15.00$

New Order: $3.75 \times 3 + 2.25 = 11.25 + 2.25 = 13.50$

$15.00 - 13.50 = 1.50$

Numerical Answer: 1.50

Explanation: Jeremy's grandparents will get back $1.50, since the change in their order made it cheaper. I got my answer by first calculating the cost of the original order. Second I calculated the cost of the new order. Finally, I subtracted the two order totals to determine the difference in cost.

e. Jeremy approaches three people who do not want to buy any plants; however, they wish to donate some money for the fundraiser when Jeremy delivers the plants one week later. If the people promise to donate a total of $14.40, what will be the average cash donation?

$14.40 \div 3 = 4.80$

Numerical Answer: 4.80

Explanation: The average cash donation will be $4.80 per person.

f. Jeremy spends one week collecting orders. If 22 people purchase plants totaling $270, what is the average amount of Jeremy's sale?

Numerical Answer: 12.27

Explanation: The average sale is about $12.27.

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      12.272
22)270.000
   -22
    50
   - 44
     60
   - 44
     160
   - 154
       60
     - 44
       16
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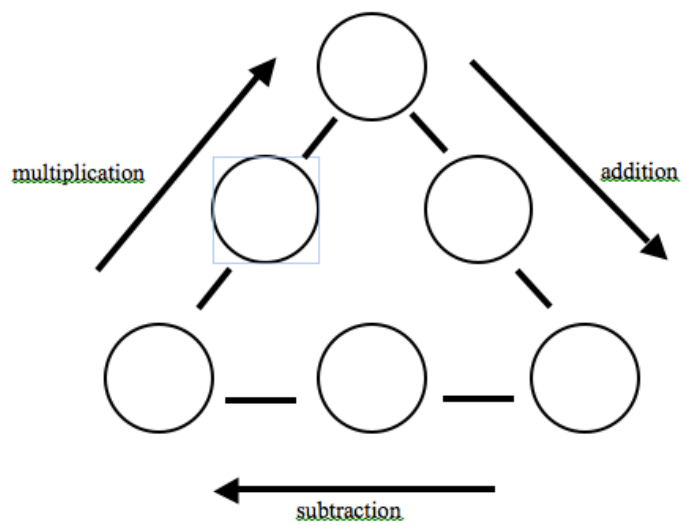
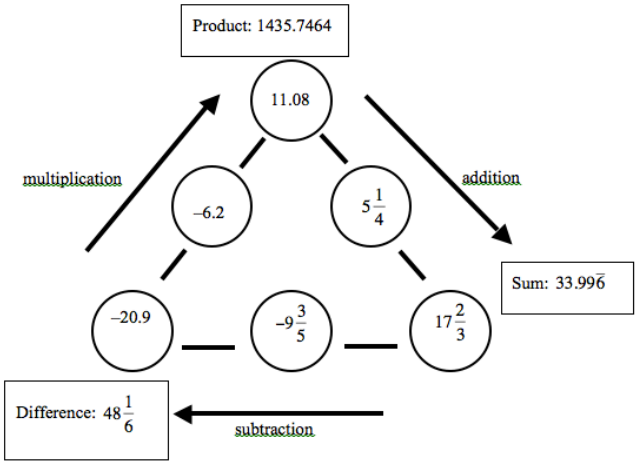
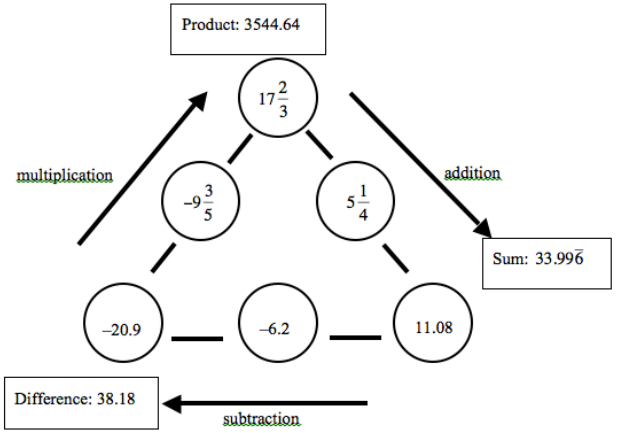
Closure/Exit Ticket: Scholars complete exit ticket to demonstrate mastery.

2	**Objective**: Scholars use rational numbers to solve mathematical problems. **Anticipatory Set:** Teacher poses problem for scholars to solve in small groups: At the last school fundraiser $500 was earned by the junior high for selling the most items. A total of 2,450 items were sold: 6th grade sold 857, 7th grade sold 1,072, and 8th grade sold 521. How should the three grade levels divide the money so that each grade gets the same fraction of the prize money as the fraction of the items they sold? Teacher gives groups time to solve and then share their solutions with the class. Discussion of strategies and answers follows. **Direct Instruction/Guided Practice:** Teacher describes the rules for the strategy game Triple Triumph. Place the six numbers listed in the number bank on a spot of the triangle. Numbers can only be used once and cannot repeat. The triangle sides show the three operations to be used. The goal is to come up with the largest sum, difference and product. The arrows indicate the direction of the operation. A smaller scale version of the game with only three circles and the numbers -4, 8, and -32 is used as guided practice and done as a whole class modeling activity. Number Bank: $5\frac{1}{4}$, -6.2, 11.08, $-9\frac{3}{5}$, -20.9, $17\frac{2}{3}$	**Anticipatory Set:** Scholars work in small groups to answer the question and support their reasoning. Scholars participate in class discussion of strategies used to solve the problem and come to a consensus of a correct answer. **Direct Instruction/Guided Practice:** Scholars listen to explanation of the game and ask questions for clarification if needed. Scholars participate in the model, smaller version of the game to learn how to play. 

	Independent Practice: Teacher provides scholars will time to perform the task, walking around room to observe strategies. After an appropriate amount of time, teacher has scholars share with a partner the strategy they used to complete the task. Teacher invites several scholars to share their strategies with the whole class. Solution #2: *This answer produces the largest sum and difference.*  **Closure/Exit Ticket:** Teacher assesses scholar understanding based on the follow-up questions: 1. What strategy did you use when placing your numbers? 2. What properties of the numbers influenced your placement? 3. Were there any numbers that were more difficult to place than others? If so, which one(s)? 4. If you were to reverse the direction of the arrows, would it change the arrangement of the numbers? If so, why?	**Independent Practice:** Scholars work on practice problems and be prepared to share and support their conclusions with the whole group. Solution #1: *This answer produces the largest product and sum.*  **Closure/Exit Ticket:** Scholars answer follow-up questions to show understanding.
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.*	Scholars complete the summative assessment items independently. Level of mastery is assessed based on the included answer key and rubric.

Summative Assessment Item #1:

1. Every month, Ms. Thomas pays her car loan through automatic payments (withdrawals) from her savings account. She pays the same amount on her car loan each month. At the end of the year, her savings account balance changed by -$2,931 from payments made on her car loan.

a. What is the change in Ms. Thomas' savings account balance each month due to her car payment?

b. Describe the total change to Ms. Thomas' savings account balance after making six monthly payments on her car loan.

A score of three out of four points (see rubric) is necessary to show mastery (75%)

Summative Assessment Item #2:

2. Michael's father bought him a 16-foot board to cut into shelves for his bedroom. Michael plans to cut the board into 11 equal size lengths for his shelves.

a. The saw blade that Michael will use to cut the board will change the length of the board by -0.125 inches for each cut. How will this affect the total length of the board?

b. After making his cuts, what will the exact length of each shelf be?

A score of three out of four points (see rubric) is necessary to show mastery (75%)

Summative Assessment Item #3:

3. The three seventh grade classes at Sunview Middle School collected the most box tops for a fundraiser, and so they won a $600 prize to share among them. Mr. Aceves' class collected 3,760 box tops, Mrs. Baca's class collected 2,301, and Mr. Canyon's class collected 1,855. How should they divide the money so that each class gets the same fraction of the prize money as the fraction of the box tops that they collected?

A score of three out of four points (see rubric) is necessary to show mastery (75%)

Summative Assessment Item #4:

4. Darlene needs to make sandwiches for a theater club cast party. Her friends brought over all the ingredients except mayonnaise. Darlene looked in her refrigerator and found four partial jars of mayo. One jar had 7/8 of a cup. The second had 1 2/3 cups. The third had 5/6 of a cup. The fourth had 1 ¼ cups. If each sandwich requires 2 tablespoons of mayo (16 tablespoons = 1 cup), how many sandwiches can Darlene make with the mayo she has?

Answer Key:

1a) Her monthly payment is $244.25, so her account balance changes each month by -$244.25 when her payment is made.

1b) Ms. Thomas' car loan changed her savings account balance by -$1465.50 after 6 monthly payments.

2a) The 10 cuts take away 1.25 inches of the total length of the board. The usable length of the board is 1.25 inches shorter than 16 feet.

2b) The board begins at 192 inches long. 192 - 1.25 = 190.75. The length of the board that can be used with the blade widths removed is 190.75 inches. Divide 190.75 by 11, but there will be a repeating remainder of 1. Therefore, the lengths of the shelves should be exactly $17.34\overline{09}$ inches.

3) All together, the students collected 7,916 box tops. Aceves: 3760/7916 x 600 or about $284.99; Baca: 2301/7916 x 600 or about $174.41; Canyon: 1855/7916 x 600 or about $140.60.

4) The common denominator is 48, so the jars contain: 1) 7/8 = 42/48 cups; 2) 1 2/3 = 80/48 cups; 3) 5/6 = 40/48 cups; 4) 1 ¼ = 60/48 cups. Added together, Darlene has 222/48 cups of mayo, or 4 30/48 = 4 5/8. Each sandwich requires 1/8 cup, so Darlene can make 37 sandwiches.

Summative Assessment Scoring: *A score of three out of four points is necessary to show mastery (75%) on each: Summative Assessment 1, Summative Assessment 2, and Summative Assessment 3.*

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)**
Assessment Item 1 **7.NS.A.3**	Scholar answer is incorrect or missing. Scholar shows little or no work and understanding of either part of the problem.	Scholar answer is incorrect, but scholar demonstrates an understanding of the task involved by beginning at least part of the problem correctly.	Scholar correctly states the monthly change in account balance for part (a), but does not correctly give the total change after 6 months for part (b).	Scholar correctly answers parts (a) and (b) and shows long division used for par (a) and multiplication or repeated addition to support part (b).
Assessment Item 2 **7.NS.A.3**	Scholar answer is incorrect or missing. Scholar shows little or no work and understanding of either part of the problem.	Scholar answer is incorrect, but scholar demonstrates an understanding of the task involved by beginning at least part of the problem correctly.	Scholar correctly states the amount the board would be shortened in part (a) but does not take that into account when calculating part (b) or makes some error in correctly identifying the repeating portion of the decimal for part (b).	Scholar correctly answers parts (a) and (b) and shows correct calculations to fully support answer, including the use of a repeating decimal to answer part (b)
Assessment Item 3 **7.NS.A.3**	Scholar answer is incorrect or missing. Scholar shows little or no work and understanding of either part of the problem.	Scholar answer is incorrect, but scholar demonstrates an understanding of the task involved by beginning at least part of the problem correctly.	Scholar correctly identifies the fractional portion each class contributed but makes an error in calculation or reasoning that doesn't result in the correct dollar amounts.	Scholar correctly identifies the approximate amount each class should receive and shows all work supporting the answers.

A Progression Toward Mastery				
Assessment Item 4 7.NS.A.3	Scholar answer is incorrect or missing. Scholar shows little or no work and understanding of the problem.	Scholar answer is incorrect, but scholar demonstrates an understanding of the task involved by beginning at least part of the problem correctly.	Scholar finds the common denominator; adds, multiplies, and divides fractions correctly, makes all conversions, and shows all work supporting the answer, but makes an error in calculation or reasoning that doesn't result in the correct answer.	Scholar accurately finds the common denominator; adds, multiplies, and divides fractions correctly, makes all conversions, and ends up with the correct answer, showing all work supporting the answer.