Name: _____ Packet Due Date: _____

In-Class Workbook

The Number System:

Unit 2: Multiplying & Dividing Rational Numbers

How can we classify different numbers, describe what they represent and their relationship with each other?

Standard	Description
7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a: Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations. b: Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. c: Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.

Packet Completion Rubric				
4	**3**	**2**	**1**	**0**
Workbook demonstrates significant effort. Student utilizes notes to help extend their thinking, writing questions, comments or reactions to the content.	Workbook demonstrates some effort. Student takes notes but could further understanding by questioning and interacting with the material.	Workbook shows little effort. Student takes notes sporadically, and could benefit from greater consistency with the material.	Workbook shows little to no effort. Student does not take notes and must demonstrate future interaction with the material to aid understanding.	Workbook is entirely incomplete or not turned in.

Grading Breakdown: 3.5 - 4 = A 3 - 3.4 = B 2.5 - 2.9 = C 2 - 2.4 = D 0 - 1.9 = F

*I am a person who believes in **asking questions**, in not conforming for the sake of conforming. I am deeply dissatisfied - about so many things, about injustice, about the way the world works - and in some ways, my dissatisfaction drives my storytelling.*

Chimamanda Ngozi Adichie

Add to the mind map below as you develop your understanding of the guiding question.

Unit 2 Guiding Questions:

How is a product or quotient positive, negative, or zero? Why?

How can diagrams and models be used to visualize multiplication and division with rational numbers?

Lesson Objectives	
Lesson After completing a lesson, check the box	**I can…** After completing each lesson, you are on the right track if you can confidently state "I can…"
❑ 1	Multiply rational numbers.
❑ 2	Divide rational numbers.
❑ 3	Interpret products and quotients of rational numbers by describing real-world contexts.
❑ 4	Solve and justify my answer when adding, subtracting multiplying and dividing rational numbers.

DO-NOW	1. Hannah made strawberry jam and raspberry jam. She made enough strawberry jam to fill ½ of a jar. If she made 4 times as much raspberry jam as strawberry jam, how many jars will the raspberry jam fill? 2. Addie bought 9 candy bars and ate ⅓ of them, Fran bought 6 candy bars and ate ⅔ of them. Who ate more candy bars?
Homework Reminder	This is where you will shade in the box if you turned in your homework. There is no homework due today! :) ***"We become what we repeatedly do." - Sam Covey***
Check-In	How are you doing today? What do you remember from learning how to multiply fractions from last year?

What strategies can we use to multiply fractions?

What are the two parts of a fraction? _____

Fractions show a part to whole relationship.

Fractions can also show division: _____

Yesenia wants to know the area of her vegetable garden. What is the area of her garden if it is $1\frac{1}{3}$ yards by $1\frac{1}{2}$ yards?

What is the popcorn method?

How do we simplify fractions?

Practice Problems

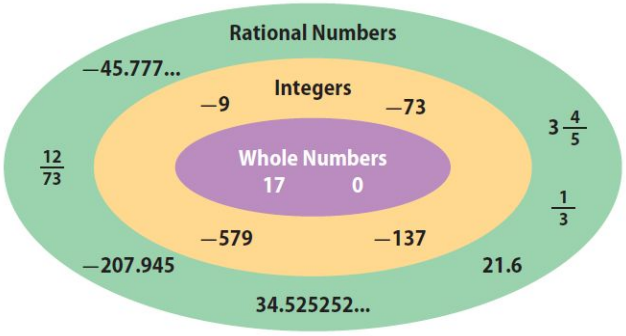
1. $\frac{1}{3} \times \frac{2}{4}$

2. $5\frac{1}{4} \times 2\frac{1}{6}$

3.) 2.4 x 6.8 = _____

4.) 3.56 x 8.9 = _____

Rational Numbers Recap: *What does this diagram mean?*



A rational number is any number that can be _____ as a _____(fraction).

$\frac{1}{3}$ = _____**. This is an example of a** _____ _____**.**

$\frac{1}{4}$ = _____**. This is an example of a** _____ _____**.**

<u>In Summary:</u> Rational numbers always _____ **or** _____ **as decimals.**

You Try! Use long division to determine whether or not these fractions are repeating or terminating decimals. Circle your answer! ***DO NOT USE A CALCULATOR!***

1. $\frac{2}{11}$

2. $\frac{5}{8}$

3. $\frac{7}{9}$

Repeating or Terminating?

Repeating or Terminating?

Repeating or Terminating?

Exploring Multiplication and Rational Numbers

You and your partner are going to have a set of red and yellow tokens. The red side is negative and the yellow side is positive. Together, you will need to solve problems using the tokens to help you represent the values of the numbers. Do your best and be sure to explain your final answer - you need to justify why you think it is correct! If you are stuck, think about what information would help you solve the problem. Feel free to draw a picture to represent your tokens.

Problem 1: 2 x 4 = _____

Explain and Justify:

_____

_____

Problem 2: -3 x 4 = _____

Explain and Justify:

_____

_____

Problem 3: -1 * 8 = _____

Explain and Justify:

_____

_____

Problem 4: -2 x -4 = _____

Explain and Justify:

_____

_____

Problem 5: -1 · -3 = _____

Explain and Justify:

_____

_____

Exploration Recap

What is similar about how these were solved to what you did?

What is different about how these were solved to what you did?

What language (words) are used during this process?

What do you notice about the sign of the numbers that you are multiplying and the sign of the product?

Rules for Multiplying Positive and Negative Numbers

Positive x Positive =

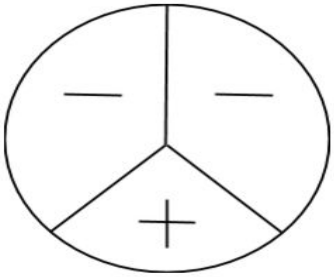
Positive x Negative =

Negative x Negative =

Mini Practice

3 * -6 = _____	- 8 x - 2 = _____	- 7 * 0 = _____	(- 1)(5) = _____
4 x -5 = _____	- 10 (4) = _____	16 * -2 = _____	12 * 1 * -3 = _____

Summary and Recap



Sleepy Man

Same signs answer is _____.

Different signs answer is _____.

Rules for Multiplying AND Dividing		
Sign of 1st Number	**Sign of 2nd Number**	**Sign of Answer**
+	+	
+	-	
-	+	
-	-	

Practice, Practice Practice

Team Member Name 1: _____
Their favorite color: _____

Team Member Name 2: _____
Their favorite color: _____

Team Member Name 3: _____
Their favorite color: _____

Team Member Name 4: _____

Their favorite color: _____

Solve the problems on the following page. Show ALL of your work and justify your answer.

Multiplying Integers

1. (-8) x 7 = _____
2. 1 x 5 = _____
3. (-11) x (-6) = _____
4. (-3) x (-4) = _____
5. (-9) x 13 = _____
6. -12 x (0) = _____

Multiplying Decimals

7. 0.002 x 0.005 = _____
8. -0.2 x (-0.08) = _____
9. 0.011 * (-0.1) = _____
10. -0.2 * 0.8 = _____
11. 0.09 * -1.1 = _____
12. 0.005(-0.2) = _____

Multiplying Fractions

13. $-\frac{3}{6} \bullet \frac{2}{3}$ = _____
14. $-\frac{4}{6}$ x $(-\frac{9}{10})$ = _____
15. $-\frac{10}{12} \bullet (\frac{2}{5})$ = _____
16. $\frac{2}{4} \bullet \frac{11}{4}$ = _____

Multiplying Mixed Numbers

17. $-1\frac{4}{9} \bullet 4\frac{1}{4}$ = _____
18. $-2\frac{7}{10}$ x $(-\frac{9}{10})$ = _____
19. $-\frac{10}{12} \bullet (1\frac{3}{4})$ = _____
20. $-1\frac{2}{3} \bullet -2\frac{5}{6}$ = _____

	collected 2 ¼ times as much clothing as Nate's class. How many pounds of clothing did Tony's class collect? 2. Zach collected 8 pounds of newspaper for the recycling drive. Alexa collected 3 ⅛ times as much newspaper as Zach. How many pounds of newspaper did Alexa collect?
Homework Reminder	Shade in this box if you turned in your homework. ***"We become what we repeatedly do." - Sam Covey***
Check-In	How are you doing today? What does division mean?

Is the quotient of two integers always an integer?

Think Space:

Examples:

- Consider the following:

- However, consider:

Conclusion:

_____

_____

Positive and Negative Numbers…THE RULES!

Rules for Dividing Positive and Negative Numbers

Positive ÷ Positive =

_____

_____

- Ex: _____

Positive ÷ Negative **OR** Negative ÷ Positive =

_____

_____

- Ex: _____

Negative ÷ Negative =

_____

_____

- Ex: _____

Same or Different?

1. - 14 ÷ 7 =
2. 14 ÷ (-7) =
3. - (14 ÷ 7) =

Are the answers to these problems the same or different? Why?

Dividing with Rational Numbers

How to Divide Fractions: Keep - Change - Flip!

_____ ÷ _____ = _____ × _____

Let's try it out!

$\frac{4}{7} \div \frac{7}{2} = ?$
$\frac{3}{5} \div \frac{1}{9} = ?$
$\frac{4}{3} \div \frac{7}{8} = ?$

How do I divide decimals?!

Scoot those decimals over!

Find the quotient.

$55.318 \div 3.4 \longrightarrow 3.4\overline{)55.318}$ Write in standard form.

$3.4\overline{)55.318}$ Move decimal point in divisor and dividend.

$$
\begin{array}{r}
16.27 \\
3.4\overline{)55.318} \\
-34 \\
\hline
213 \\
-204 \\
\hline
91 \\
-68 \\
\hline
238 \\
-238 \\
\hline
0
\end{array}
$$

Keep dividing until quotient repeats or comes out evenly.

Add zeros on right of dividend as needed.

The quotient is 16.27.

Video Notes

Let's Get Some Practice: Take two cards and make a fraction!

1. Fill in your partner's name in the chart below.
2. With your partner, you will each pick two cards from the deck at your table each round. The first card will be the numerator, the second card is the denominator. (J = 11, Q = 12, K = 13, Ace = 1)
   Red = Negative
   Black = Positive

3. Working with your partner, divide fractions (the partner who is oldest will place the dividend). Divide and show all of your work.

4. Once you have solved the problem, compare answers with your partner. If it's correct, write the answer in the final column labelled, "Quotient."

Rounds	Dividend	Divisor	Quotient
1			
2			
3			
4			
5			
6			
7			
8			

Show your work here:

1.	2.	3.	4.
5.	6.	7.	8.

DO-NOW	1. Find a reason why each number doesn't belong.  2. Find the mistake in this person's work and explain what they should do differently. Problem: ¾ ÷ ⅝ Step 1: **¾ * ⅝** Step 2: **15/24** **⅝**
Homework Reminder	Shade in this box if you turned in your homework. ***"We become what we repeatedly do." - Sam Covey***
Check-In	How are you doing today? What mathematical ideas are you wondering about today? What problems are you trying to solve?

Strategies for Solving Word Problems

Solving Steps

- ❑ **Step 1: Understand the problem.**
- ❑ **Step 2: Make a plan.**
- ❑ **Step 3: Solve it.**
- ❑ **Step 4: Check it.**

BUCKS

➔ ***B****ox the main question(s).*

- ➔ ***U****nderline only the parts needed to answer the question(s).*
- ➔ ***C****ircle vocabulary, keywords, and important units.*
- ➔ ***K****nock out irrelevant information.*
- ➔ ***S****olve & CHECK!*

Video Tutorial: As you watch the following video, annotate the word problems using the **BUCKS** strategy and solve the problem in the space provided.

At a shop on Times Square, three "I 💙 NY" t-shirts sell every 10 minutes for $19.95 each. Every 45 minutes one Yankees hat sells for $24.95. The shop is open from 9am to 9pm every day. How many t-shirts are sold in a week?

Larkin's family had a garage sale. Her parents said that she could sell some of her old toys. Larkin decided to sell all of her stuffed animals. She sold 7 big stuffed animals for $2.50 each and 13 small ones for $0.75 each. Larkin took some of the money she made to a garage sale down the street. There were a lot of books at that sale. Hardbacks were $0.50 and paperbacks were just $0.25. Larkin spent $5.75 for 17 books. She also bought a game for $1.50 and 18 pretty marbles for a nickel each. She gave the marbles to her little sister, then they played the new game until dinnertime. How much money did Larkin have left?

Record your answers to each task card here. Show ALL of your work in each box and explain your answer. CIRCLE your final answer!

Task Card # 1	Task Card # 2
Task Card # 3	Task Card # 4
Task Card # 5	Task Card # 6
Task Card # 7	Task Card # 8

DO-NOW	1. -54,432 ÷ -12 2. -48 ÷ (-4) ÷ (-4)
Homework Reminder	Shade in this box if you turned in your homework. ***"We become what we repeatedly do." - Sam Covey***
Check-In	How are you doing today? What has been your favorite math lesson this year?

Questions and Discussion	
1. How do we determine if the product of two signed numbers will be positive or negative?	2. Why does the product of two negative values result in a positive value?
Thoughts:	Thoughts:
Final thought:	Final thought:
Evidence:	Evidence:

Solve with a Partner

Kathleen collected ¼ of a bin of glass bottles to recycle. Garrett collected 7⅜ times as many bins as Kathleen. How many bins of bottles did Garrett collect?

Solve:

Justify and Explain:

Mixed Practice

Adding, subtracting, multiplying and dividing rational numbers

Section 1: Evaluate each expression and circle/highlight your final answer.

1. $(-7)+(-4)+7$
2. $(-4)+8-(-2)$
3. $(-1)-(-4)-(-3)$
4. $(-1)-4+6$

Choose one problem from the set above and EXPLAIN IN DETAIL how you solved it. Feel free to use words **and** pictures to explain it.

_____

_____

_____

_____

_____

_____

Section 2: Find each product and circle/highlight your final answer. Remember: write your answer in simplest form!

1. $7 \cdot -6 \cdot 6$
2. $-10 \cdot -9 \cdot -1$
3. $-7 \cdot 6 \cdot -8$
4. $-3 \cdot 2 \cdot -6$
5. $-\frac{5}{3} \cdot -\frac{3}{4}$
6. $-\frac{7}{4} \cdot 3\frac{1}{2}$

Choose one problem from the set above and EXPLAIN IN DETAIL how you solved it. Feel free to use words **and** pictures to explain it.

_____

_____

_____

_____

_____

Section 3: Find each quotient and circle/highlight your final answer.. Remember: write your answer in simplest form!

1. $7 \div -1$
2. $6 \div 3$
3. $-6 \div 6$

4. $-45 \div 9$

5. $-\frac{3}{4} \div \frac{5}{8}$

6. $-2\frac{1}{5} \div -\frac{-6}{5}$

Choose one problem from the set above and EXPLAIN IN DETAIL how you solved it. Feel free to use words **and** pictures to explain it.

Section 4:Evaluate each expression and circle/highlight your final answer. Remember: write your answer in simplest form!

1. $(-6.3) - (-7.46)$

2. $(-3.4) - 1.5$

3. $\frac{8}{5} - \left(-\frac{4}{5}\right)$

4. $\left(-1\frac{1}{2}\right) + \frac{3}{4}$

5. $(-30 - 10) \div -4 + -5 - 2$

6. $5 \cdot 8 + 2 - (-6 - -5)$

Choose one problem from the set above and EXPLAIN IN DETAIL how you solved it. Feel free to use words **and** pictures to explain it.

Section 5: Solve the following word problems. Remember: write your answer in simplest form!

1. Aidan, a pet store employee, wants to fit two fish tanks on one table. One fish tank is 2 5/6 feet wide and the other fish tank is 2/3 of a foot wide. When placed next to each other, what is the total width of the two fish tanks?

2. Ava sprinted 5/8 of a lap and then took a break by jogging 3/8 of a lap. How much farther did Ava sprint than jog?

3. On Monday a team of beach volunteers cleaned 4 3/5 beaches. Tuesday, the team cleaned 1 1/2 times as many beaches as on Monday. How many beaches did the beach volunteers clean on Tuesday?

4. Bella made 1/2 of a quart of POG. Each mug holds 1/10 of a quart. How many mugs will Bella be able to fill?

Choose one problem from the set above and EXPLAIN IN DETAIL how you solved it. Feel free to use words **and** pictures to explain it.

_____

_____

_____

_____

_____

_____

Compare and Share

Name: _____ Summary:	Name: _____ Summary:
Name: _____ Summary:	Name: _____ Summary:

Workbook Reflection

Answer the question as completely as possible, using evidence from what we have learned this unit. Justify your response with examples and evidence from throughout the packet.

Choose one of the following questions to answer using words or pictures: **Is the product or quotient positive, negative, or zero? Why? How can multiplying and dividing rational numbers help us make real life decisions? How can number lines and diagrams be used to visualize mathematical operations with rational numbers?**

Evaluate your understanding of multiplying and dividing rational numbers on a scale from 0-4 and explain why you feel that way:

What lesson most challenged your thinking?

What was your favorite/least favorite lesson and why?

Flip through your packet, and look to see if you shaded the box every day for turning in your homework. How many days did you shade it in?

Lesson 1	Lesson 2	Lesson 3	Lesson 4

If you didn't finish it each night, consider why →

Would you like to come in during lunch or recess for support?