

Lesson 15: Real-World Application with Rational Numbers

Warm-Up

Directions: Solve the following problems.

1. $-4.5 + 2.6 =$ _____

2. $\frac{4}{5} \cdot 3 =$ _____

3. 45% of 178 = _____

4. $95.6 + 124.72 - 85.29 =$ _____

5. $3(2.6 - 9.4) + 10.2 =$ _____

6. $1\frac{3}{5} \cdot \frac{7}{10} =$ _____

7. $9 \div ^{-}3.6 =$ _____

8. 27 is 60% of what number?

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Directions: Complete the following SOLVE problem with your partner.

Laurie is making 2 different types of cookies. She needs $\frac{3}{4}$ of a cup of sugar for each type of cookie. She wants to make frosting for both types of cookies and needs $\frac{1}{3}$ of a cup of sugar for each batch of frosting. How much sugar will she need for the cookies and frosting?

S Underline the question.

The problem is asking me to find _____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

Lesson 15: Real-World Application with Rational Numbers

Directions: Complete this page with your teacher and partner.

Fraction and Decimal Relationships		
1. What fractions were part of the SOLVE problem on S188?		
2. What are some situations in real-life problems where it may be better to use a different form of a number such as a decimal or a percent?		
3. Explain why it may be beneficial to convert a fraction to a decimal to solve a problem.		
4. What do you notice about the denominator for $\frac{1}{3}$?		
5. What do you notice about the denominator for $\frac{3}{4}$?		
6. What operation does the fraction bar represent?		
7. How can you write any fraction as a division problem?		
8. Explain how the fraction $\frac{3}{4}$ would be written as a division problem. Model the division.		
9. What do you notice about the division problem in Question 8?		
10. What is another word that can be used to describe when something stops?		
11. What is the decimal equivalent of $\frac{3}{4}$?		

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Directions: Complete this page with your teacher and partner.

<p>12. Explain how the fraction $\frac{1}{3}$ would be written as a division problem. Model the division.</p>	
<p>13. What do you notice about the division problem?</p>	
<p>14. What is another word that can be used to describe a process or value that happens over and over again?</p>	
<p>15. What is the decimal equivalent of $\frac{1}{3}$?</p>	
<p>16. Create your own definition of a terminating decimal.</p>	
<p>17. Create your own definition of a repeating decimal.</p>	
<p>18. Based on our discussion about decimals, is the decimal form of $\frac{3}{4}$ a terminating or a repeating decimal?</p>	
<p>19. Based on our discussion, is the decimal form of $\frac{1}{3}$ a terminating or a repeating decimal?</p>	
<p>20. Would it have been beneficial to change the fractions in the SOLVE problem on S188 to decimals? Explain why or why not.</p>	

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Directions: Complete this page with your teacher and partner.

Fraction	Decimal	Repeating or Terminating	Prime Factorization of the Denominator
$\frac{3}{4}$			
$\frac{1}{2}$			
$\frac{5}{8}$			
$\frac{2}{5}$			
$\frac{1}{6}$			
$\frac{7}{9}$			
$\frac{9}{10}$			
$\frac{3}{7}$			

1. What do you notice about all of the terminating decimals?
2. What do you notice about the repeating decimals?
3. What numbers are part of the prime factorization of the denominators of the values that have repeating decimals?
4. What generalizations can you make about fractions and whether their equivalent decimals will be terminating or repeating?
5. Any value that can be written as a fraction is called a _____. In decimal form, rational numbers will be either _____ or _____.

Lesson 15: Real-World Application with Rational Numbers

Directions: Complete the following SOLVE problem with your teacher and partner.

Mary and Jenna are working on a fraction project for math class. They have a list of fractions that they need to put in order from least to greatest. Mary wants to use the strategy of finding a common denominator for the fractions, and Jenna wants to convert the list to decimals and then order them from least to greatest. List the values in order from least to greatest as fractions and decimals and determine which method would be the most precise.

$$\frac{1}{2}, \frac{3}{4}, \frac{5}{6}, \frac{2}{3}$$

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- Could we determine the order from least to greatest if the values were in decimal form?
- Explain your thinking.
- Is the decimal form more precise than the fraction form?

Lesson 15: Real-World Application with Rational Numbers

Directions: Complete the following SOLVE problem with your teacher and partner.

Based on your explanation, write the plan for the L Step.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

Lesson 15: Real-World Application with Rational Numbers

Directions: Complete the following SOLVE problem with your teacher and partner.

Alex and Jarod are measuring line segments for a geometry project in math class. The list below shows the line segments that they need to measure in inches. Alex wants to keep all the values as fractions, and Jarod wants to convert the list of values to decimals. Which format would give the most accurate measure of the line segments?

$$\frac{1}{4}, \frac{3}{9}, \frac{5}{8}, \frac{1}{2}$$

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?

- What would the decimal equivalent be for each of these fractions?

- Is the decimal form the most accurate measurement? Explain your thinking.

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Based on your explanation, write the plan for the L Step.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

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Directions: Complete the following SOLVE problem with your partner.

Luke, Sean, Emily, and Madison each chose a piece of string from the scrap basket. The lengths of their strings are $\frac{3}{4}$ of an inch, $\frac{1}{2}$ of an inch, $\frac{1}{4}$ of an inch, and $\frac{1}{3}$ of an inch. For a science experiment, each of the students must have a piece of string with the same length. They decided that they would glue the ends of the pieces together and then cut the long string into four pieces. What will be the length of each piece of string after the long string is cut?

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- Is the decimal form more accurate? Explain your thinking.

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Based on your explanation, write the plan for the L Step.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

Lesson 15: Real-World Application with Rational Numbers

Directions: Complete the following SOLVE problem with your partner.

The price of a specific piece of jewelry is established by analyzing the number of segments. The total length of the chain is $9\frac{7}{8}$ inches. A segment is considered to be $\frac{3}{8}$ of an inch long. If the cost per segment is \$5.50, what is the total cost of the piece of jewelry? (Note: The company is not permitted to charge for partial segments.)

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- Could we solve the problem if the values are in decimal form?
- Explain your thinking.

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Based on your explanation, write the plan for the L Step.

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Write your answer in a complete sentence.

Lesson 15: Real-World Application with Rational Numbers

Directions: Complete the following SOLVE problem with your partner.

Brian, Lisa, and Wendy each surveyed 48 students to identify how many of the students are the only child in their family. Brian recorded that $\frac{1}{16}$ of the students he surveyed are the only child in the family. Lisa recorded that 12.5% of the students she surveyed were only children, and Wendy recorded that 0.083 of the students she surveyed were the only child in their family. Who surveyed the group with the most students that are the only child in their family? Explain.

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- Could we determine the greatest value if the values were in decimal form?
- Explain your thinking.

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Based on your explanation, write the plan for the L Step.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

Is your answer accurate? (Check your work.)

Write your answer in a complete sentence.

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Directions: Complete the following SOLVE problem with your partner.

Julie earns \$14.50 per hour, and her boss informs her that she will be receiving a 16% raise. Matt makes \$15.00 per hour, and his boss offers him a raise of $\frac{1}{10}$ of his hourly wage. Who will make more money per hour? What is the difference in their hourly wages?

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- Could we solve the problems if the values were in decimal form?
- Explain your thinking.

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Directions: Complete the following SOLVE problem with your partner.

Levi works for a bakery. He bakes a total of 550 cupcakes in a week. He is told that he needs to take $\frac{3}{10}$ of the total cupcakes and frost them with blue frosting. He then must take 20% of the blue frosted cupcakes and place them in a box for the elementary class that ordered them. How many blue frosted cupcakes are left after the school delivery?

S Underline the question.

The problem is asking me to find _____
_____.

O Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- For this problem, can we use the decimal form?
- Explain your thinking.

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Directions: Complete the following SOLVE problem with your partner.

Based on your explanation, write the plan for the L Step.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.

Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

Is your answer reasonable? (Compare your answer to the estimate.)

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Homework

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Name _____ Date _____**Directions:** Complete the SOLVE problem.

Art gets paid a biweekly salary of \$1,200.00. His first paycheck of the month is used to pay for rent which costs \$675 and bills which are $\frac{1}{3}$ of that check. He then takes 75% of his second paycheck and places it into savings. Any money left over from each paycheck may be used for spending. Which paycheck will leave Art with more money to spend? How much more money?

S Underline the question.The problem is asking me to find _____
_____.**O** Identify the facts.

Eliminate the unnecessary facts.

List the necessary facts.

Stop!

- What form are the rational numbers in for this SOLVE problem?

Discuss:

- What is the problem asking me to find?
- What would the decimal equivalent be for each of these fractions?
- For this problem, would it be more accurate to use the decimal form?
- Explain your thinking.

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Homework

.....
Name _____ **Date** _____

Based on your explanation, write the plan for the L Step.

L Write in words what your plan of action will be.

Choose an operation or operations.

V Estimate your answer.
Carry out your plan.

E Does your answer make sense? (Compare your answer to the question.)

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Write your answer in a complete sentence.