LEARNING OBJECTIVE: We will multiply and divide rational numbers in the context of real world problems. (G7M2L12)

CONCEPT DEVELOPMENT:
Rules for Dividing (and Multiplying) Integers apply to rational numbers as well:

RULES FOR DIVISION (RATIONAL NUMBERS)	
When you divide rational numbers with the **SAME SIGN**, the result is **POSITIVE**	When you divide rational numbers with **DIFFERENT SIGNS**, the result is **NEGATIVE**
Examples: $$-62.5 \div (-5) = 12.5$$ $$63 \div 7.2 = 8.75$$	*Examples*: $$-52 \div 1.3 = -40$$ $$16 \div -3 = -5.\overline{3}$$

GUIDED PRACTICE:

Steps for Solving Word Problems Requiring Division (or Multiplication)
1. Read the problem carefully and call out the important information.
2. Set up your problem correctly as either a multiplication or division problem.
3. Solve the problem using the rules for multiplying and dividing rational numbers.
4. Interpret your answer.

In one year, Jenni's parents spent $2,640.90 on cable and internet service. If they spend the same amount each month, how much is their bill each month?	Auto insurance bills are due every six months. My last bill reduced the amount of money in my bank account by $742.50. How much am I spending each month on auto insurance?

12 months in a year.

| J | F | M | A | M | J | J | A | S | O | N | D |

220.075
12)2640.90
2400 00
240.90
240.00
0.90
84
60

$220.08 each month

123.75
6)742.50
720.00
22.50
18
4.50
4.20
.30
.30
0

$123.75

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.

a. If Tamara Jones writes a check to pay for the plants, what is the resulting change in her checking account balance?

Numerical Answer: $- 8.50$

Explanation: She has to pay 8.50 and her bank account balance goes down by that amount.

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?

Numerical Answer:
$$\begin{array}{r} 20.00 \\ -11.25 \\ \hline 8.75 \end{array}$$

Explanation:

Jeremy owes Mr. Clark $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?

$$5\overline{)2.50} \quad .50$$

Numerical Answer: $\$- 0.50$

Explanation:

Every week Susie has 50 cents deducted from her allowance.

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.

4 Daisies → 15.00   3 Daisies   11.25
                           1 Geranium   2.25

Their order gets smaller   13.50
by $1.50

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 ÷ 3   4.80
                          3)14.40
                               2

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

                    12.27   R. Division
              22)270.
                 220                      $12.27
                  50.
                  44
                   6.0
                   4.4
                   160
                   154
                    60

Independent Practice:

Solve the following problems:

At lunch time, Ben borrows money from his friends to buy snacks in the school cafeteria. He borrowed $1.75 from Clyde five days last week. How much did Ben borrow from Clyde?	Monica regularly records her favorite shows on her digital video recorder (DVR). Each episode uses 3.5% of the total capacity of her DVR. She has 62% of her total memory free right now. If she records all 7 episodes this week, how much space will be left on her DVR?
I have set a goal of walking 10,000 steps each day. From my classroom to where I parked is exactly 130 steps. If I just walked back and forth, how many round trips (back and forth) would I have to make until I reached my goal?	Alberts, Mueller, Harter, Doyle, Flynn and Standley went to dinner and split the check. If the bill was $76.43, how much did each have to kick in?

Activating Prior Knowledge:
We know how to solve problems involving rational numbers

DIFF. SIGNS → NEG -34.5×4 $$\begin{array}{r} \overset{1}{3}\overset{2}{4}.5 \\ \times \quad 4 \\ \hline -138.0 \end{array}$$ $\boxed{-138}$	SAME SIGN → POSITIVE $-3.2 \times (-5)$ $$\begin{array}{r} \overset{1}{3}.2 \\ \times \quad 5 \\ \hline 16.0 \end{array}$$ $\boxed{16}$

Closure:
Create your own multiplication or division word problem that involves non-integer rational numbers. Solve it, and submit.

Teacher Notes:
Using Example 3 from Lesson 15 Engage NY.
Homework is Khan Multistep Rational Number Word Problems