Name_____ Date_____

Write the decimal as a fraction.

1. 0.26

2. 0.79

3. 0.571

4. 0.846

Write the fraction as a decimal.

5. $\dfrac{3}{8}$

6. $\dfrac{4}{10}$

7. $\dfrac{11}{16}$

8. $\dfrac{17}{20}$

9. A quarterback completed 0.6 of his passes during a game. Write the decimal as a fraction.

Name _____ Date _____

Evaluate the expression.

10. $\dfrac{1}{8} + \dfrac{1}{9}$

11. $\dfrac{2}{3} + \dfrac{9}{10}$

12. $\dfrac{7}{12} - \dfrac{1}{4}$

13. $\dfrac{6}{7} - \dfrac{4}{5}$

14. $\dfrac{5}{9} \cdot \dfrac{1}{3}$

15. $\dfrac{8}{15} \cdot \dfrac{3}{4}$

16. $\dfrac{7}{8} \div \dfrac{11}{16}$

17. $\dfrac{3}{10} \div \dfrac{2}{5}$

18. You have 8 cups of flour. A recipe calls for $\dfrac{2}{3}$ cup of flour. Another recipe calls for $\dfrac{1}{4}$ cup of flour. How much flour do you have left after making the recipes?

Name_____ Date_____

Rational Numbers
For use with Activity 2.1

Essential Question How can you use a number line to order rational numbers?

A **rational number** is a number that can be written as a ratio of two integers.
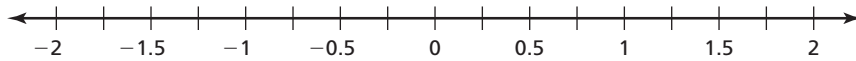
$$2 = \frac{2}{1} \qquad -3 = \frac{-3}{1} \qquad -\frac{1}{2} = \frac{-1}{2} \qquad 0.25 = \frac{1}{4}$$

1 **ACTIVITY:** Ordering Rational Numbers

Work in groups of five. Order the numbers from least to greatest.

- Use masking tape and a marker to make a number line on the floor similar to the one shown.

- Write the numbers on pieces of paper. Then each person should choose one piece of paper.

- Stand on the location of your number on the number line.

- Use your positions to order the numbers from least to greatest.

  The numbers from least to greatest are

  _____, _____, _____, _____, and _____.

a. $-0.5, 1.25, -\frac{1}{3}, 0.5, -\frac{5}{3}$

b. $-\frac{7}{4}, 1.1, \frac{1}{2}, -\frac{1}{10}, -1.3$

c. $-1.4, -\frac{3}{5}, \frac{9}{2}, \frac{1}{4}, 0.9$

d. $\frac{5}{4}, 0.75, -\frac{5}{4}, -0.8, -1.1$

Name _____ Date _____

2 **ACTIVITY:** The Game of Math Card War

Preparation:

- Cut index cards to make 40 playing cards.*

- Write each number in the table on a card.

$-\dfrac{3}{2}$	$\dfrac{3}{10}$	$-\dfrac{3}{4}$	-0.6	1.25	-0.15	$\dfrac{5}{4}$	$\dfrac{3}{5}$	-1.6	-0.3
$\dfrac{3}{20}$	$\dfrac{8}{5}$	-1.2	$\dfrac{19}{10}$	0.75	-1.5	$-\dfrac{6}{5}$	$-\dfrac{3}{5}$	1.2	0.3
1.5	1.9	-0.75	-0.4	$\dfrac{3}{4}$	$-\dfrac{5}{4}$	-1.9	$\dfrac{2}{5}$	$-\dfrac{3}{20}$	$-\dfrac{19}{10}$
$\dfrac{6}{5}$	$-\dfrac{3}{10}$	1.6	$-\dfrac{2}{5}$	0.6	0.15	$\dfrac{3}{2}$	-1.25	0.4	$-\dfrac{8}{5}$

To Play:

- Play with a partner.

- Deal 20 cards to each player facedown.

- Each player turns one card faceup. The player with the greater number wins. The winner collects both cards and places them at the bottom of his or her cards.

- Suppose there is a tie. Each player lays three cards facedown, then a new card faceup. The player with the greater of these new cards wins. The winner collects all ten cards and places them at the bottom of his or her cards.

- Continue playing until one player has all the cards. This player wins the game.

*Cut-outs are available in the back of the Record and Practice Journal.

2.1 **Rational Numbers** (continued)

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you use a number line to order rational numbers? Give an example.

The numbers are in order from least to greatest. Fill in the blank spaces with rational numbers.

4. $-\dfrac{1}{2}$, ⬜ , $\dfrac{1}{3}$, ⬜ , $\dfrac{7}{5}$, ⬜

5. $-\dfrac{5}{2}$, ⬜ , -1.9, ⬜ , $-\dfrac{2}{3}$, ⬜

6. $-\dfrac{1}{3}$, ⬜ , -0.1, ⬜ , $\dfrac{4}{5}$, ⬜

7. -3.4, ⬜ , -1.5, ⬜ , 2.2, ⬜

Name _____ Date _____

<table>
<tr><td>**2.1**</td><td>**Practice**
For use after Lesson 2.1</td></tr>
</table>

Write the rational number as a decimal.

1. $-\dfrac{9}{10}$ **2.** $-4\dfrac{2}{3}$ **3.** $1\dfrac{7}{16}$

Write the decimal as a fraction or mixed number in simplest form.

4. -0.84 **5.** 5.22 **6.** -1.716

Order the numbers from least to greatest.

7. $\dfrac{1}{5}, 0.1, -\dfrac{1}{2}, -0.25, 0.3$ **8.** $-1.6, \dfrac{5}{2}, -\dfrac{7}{8}, 0.9, -\dfrac{6}{5}$ **9.** $-\dfrac{2}{3}, \dfrac{5}{9}, 0.5, -1.3, -\dfrac{10}{3}$

10. The table shows the position of each runner relative to when the first place finisher crossed the finish line. Who finished in second place? Who finished in fifth place?

Runner	A	B	C	D	E	F
Meters	-1.264	$-\dfrac{5}{4}$	-1.015	-0.480	$-\dfrac{14}{25}$	$-\dfrac{13}{8}$

Name_____ Date_____

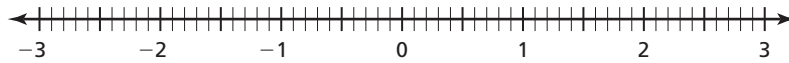## 2.2 Adding Rational Numbers
For use with Activity 2.2

Essential Question How can you use what you know about adding integers to add rational numbers?
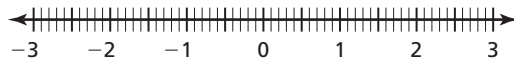
1 ACTIVITY: Adding Rational Numbers

Work with a partner. Use a number line to find the sum.

a. $2.7 + (-3.4)$

$2.7 + (-3.4) =$ _____

b. $1.3 + (-1.5)$

c. $-2.1 + 0.8$

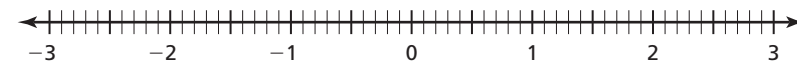d. $-1\dfrac{1}{4} + \dfrac{3}{4}$

e. $\dfrac{3}{10} + \left(-\dfrac{3}{10}\right)$

2 ACTIVITY: Adding Rational Numbers

Work with a partner. Use a number line to find the sum.

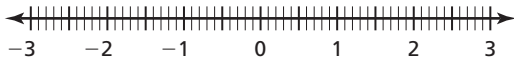a. $-1\dfrac{2}{5} + \left(-\dfrac{4}{5}\right)$

$-1\dfrac{2}{5} + \left(-\dfrac{4}{5}\right) =$ _____
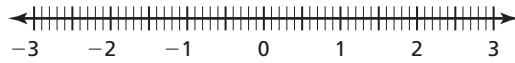
Name _____ Date _____

b. $-\dfrac{7}{10} + \left(-1\dfrac{7}{10}\right)$

c. $-1\dfrac{2}{3} + \left(-1\dfrac{1}{3}\right)$

d. $-0.4 + (-1.9)$

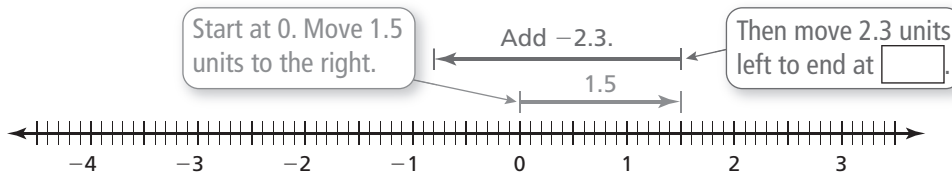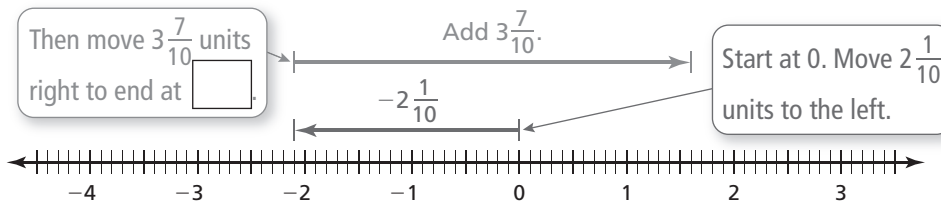**e.** $-2.3 + (-0.6)$

3 **ACTIVITY:** Writing Expressions

Work with a partner. Write the addition expression shown. Then find the sum.

a.

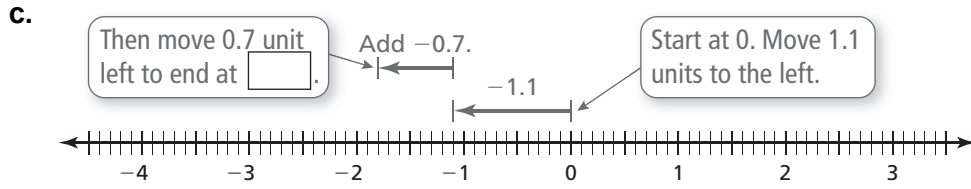Start at 0. Move 1.5 units to the right.

Add -2.3.

Then move 2.3 units left to end at ☐.

1.5

b.

Then move $3\dfrac{7}{10}$ units right to end at ☐.

Add $3\dfrac{7}{10}$.

Start at 0. Move $2\dfrac{1}{10}$ units to the left.

$-2\dfrac{1}{10}$

2.2 **Adding Rational Numbers** (continued)

c.

Then move 0.7 unit left to end at [ ].

Add −0.7.

Start at 0. Move 1.1 units to the left.

−1.1

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you use what you know about adding integers to add rational numbers?

PUZZLE **Find a path through the table so that the numbers add up to the sum. You can move horizontally or vertically.**

5. Sum: $\dfrac{3}{4}$

Start →

$\dfrac{1}{2}$	$\dfrac{2}{3}$	$-\dfrac{5}{7}$
$-\dfrac{1}{8}$	$-\dfrac{3}{4}$	$\dfrac{1}{3}$

← End

6. Sum: −0.07

Start →

2.43	1.75	−0.98
−1.09	3.47	−4.88

← End

Name _____ Date _____

Add. Write fractions in simplest form.

1. $-\dfrac{4}{5} + \dfrac{3}{20}$

2. $-8 + \left(-\dfrac{6}{7}\right)$

3. $1\dfrac{2}{15} + \left(-3\dfrac{1}{2}\right)$

4. $-\dfrac{1}{6} + \left(-\dfrac{5}{12}\right)$

5. $\dfrac{9}{10} + (-3)$

6. $-5\dfrac{3}{4} + \left(-4\dfrac{5}{6}\right)$

7. $0.46 + (-0.642)$

8. $0.13 + (-5.7)$

9. $-2.57 + (-3.48)$

10. Before a race, you start $4\dfrac{5}{8}$ feet behind your friend. At the halfway point, you are $3\dfrac{2}{3}$ feet ahead of your friend. What is the change in distance between you and your friend from the beginning of the race?

Name_____ Date_____

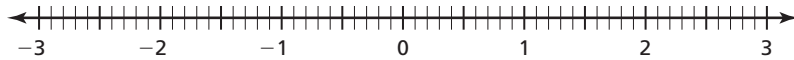## 2.3 Subtracting Rational Numbers
For use with Activity 2.3

Essential Question How can you use what you know about subtracting integers to subtract rational numbers?

1 ACTIVITY: Subtracting Rational Numbers

Work with a partner. Use a number line to find the difference.
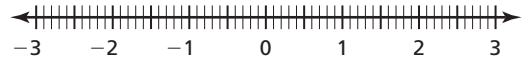
a. $-1\dfrac{1}{2} - \dfrac{1}{2}$

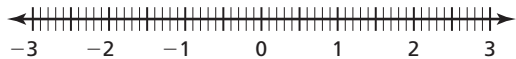$-1\dfrac{1}{1} - \dfrac{1}{2} =$ _____

b. $\dfrac{6}{10} - 1\dfrac{3}{10}$
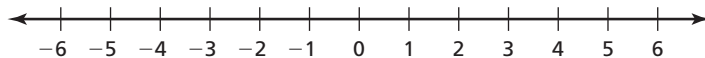
c. $-1\dfrac{1}{4} - 1\dfrac{3}{4}$

d. $-1.9 - 0.8$

e. $0.2 - 0.7$

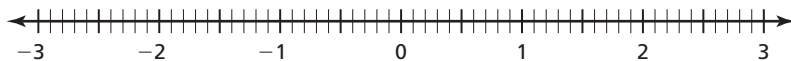**2 ACTIVITY:** Finding Distances on a Number Line

Work with a partner.

a. Plot -3 and 2 on the number line. Then find $-3 - 2$ and $2 - (-3)$. What do you notice about your results?

Name _____ Date _____

b. Plot $\dfrac{3}{4}$ and 1 on the number line. Then find $\dfrac{3}{4} - 1$ and $1 - \dfrac{3}{4}$. What do you notice about your results?

c. Choose any two points a and b on a number line. Find the values of $a - b$ and $b - a$. What do the absolute values of these differences represent? Is this true for any pair of rational numbers? Explain.

3 **ACTIVITY: Financial Literacy**

Work with a partner. The table shows the balance in a checkbook.

- Deposits and interest are amounts added to the account.

- Amounts shown in parentheses are taken from the account.

Date	Check #	Transaction	Amount	Balance
--	--	Previous Balance	--	100.00
1/02/2013	124	Groceries	(34.57)	
1/07/2013		Check deposit	875.50	
1/11/2013		ATM withdrawal	(40.00)	
1/14/2013	125	Electric company	(78.43)	
1/17/2013		Music store	(10.55)	
1/18/2013	126	Shoes	(47.21)	
1/22/2013		Check deposit	125.00	
1/24/2013		Interest	2.12	
1/25/2013	127	Cell phone	(59.99)	
1/26/2013	128	Clothes	(65.54)	
1/30/2013	129	Cable company	(75.00)	

2.3 **Subtracting Rational Numbers** (continued)

You can find the balance in the second row two different ways.

$$100.00 - 34.57 = 65.43$$ Subtract 34.57 from 100.00.

$$100.00 + (-34.57) = 65.43$$ Add –34.57 to 100.00.

  a. Complete the balance column of the table on the previous page.

  b. How did you find the balance in the twelfth row?

  c. Use a different way to find the balance in part (b).

What Is Your Answer?

  4. **IN YOUR OWN WORDS** How can you use what you know about subtracting integers to subtract rational numbers?

  5. Give two real-life examples of subtracting rational numbers that are not integers.

Name _____ Date _____

2.3 Practice
For use after Lesson 2.3

Subtract. Write fractions in simplest form.

1. $\dfrac{4}{9} - \left(-\dfrac{2}{9}\right)$

2. $-2\dfrac{3}{7} - 1\dfrac{2}{3}$

3. $-2.35 - (-1.27)$

Find the distance between the two numbers on a number line.

4. $-3\dfrac{1}{4}, \ -6\dfrac{1}{2}$

5. $-1.5, \ 2.8$

6. $-4, \ -7\dfrac{1}{3}$

Evaluate.

7. $2\dfrac{1}{2} + \left(-\dfrac{7}{6}\right) - 1\dfrac{3}{4}$

8. $2.37 - (-1.55) - 2.48$

9. Your friend drinks $\dfrac{2}{3}$ of a bottle of water. You drink $\dfrac{5}{7}$ of a bottle of water. Find the difference of the amounts of water left in each bottle.

Name_____ Date_____

2.4 Multiplying and Dividing Rational Numbers
For use with Activity 2.4

Essential Question Why is the product of two negative rational numbers positive?

> **1 ACTIVITY:** Showing $(-1)(-1) = 1$

Work with a partner. How can you show that $(-1)(-1) = 1$?

To begin, assume that $(-1)(-1) = 1$ is a true statement. From the Additive Inverse Property, you know that $1 + (-1) = 0$. So, substitute $(-1)(-1)$ for 1 to get $(-1)(-1) + (-1) = 0$. If you can show that $(-1)(-1) + (-1) = 0$ is true, then you have shown that $(-1)(-1) = 1$.

Justify each step.

$$(-1)(-1) + (-1) = (-1)(-1) + 1(-1) \qquad \text{_____}$$
$$= (-1)\big[(-1) + 1\big] \qquad \text{_____}$$
$$= (-1)0 \qquad \text{_____}$$
$$= 0 \qquad \text{_____}$$
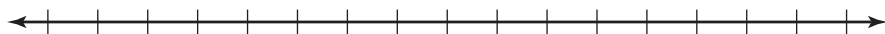
$(-1)(-1) =$ _____

> **2 ACTIVITY:** Multiplying by -1

Work with a partner.

a. Graph each number below on three different number lines. Then multiply each number by -1 and graph the product on the appropriate number line.
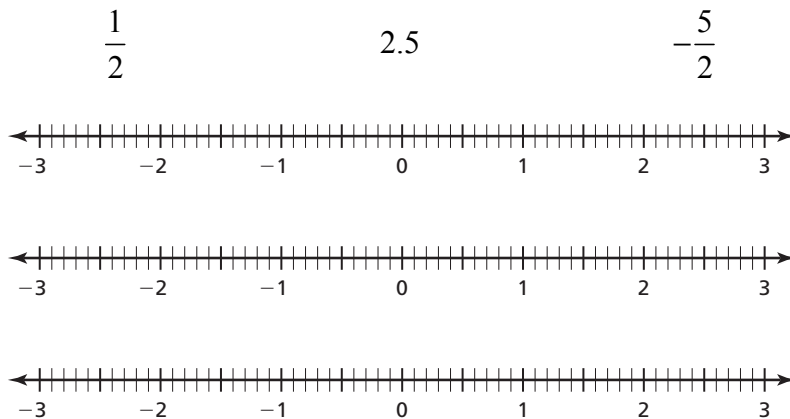
$$2 \qquad\qquad 8 \qquad\qquad -1$$

2.4 **Multiplying and Dividing Rational Numbers** (continued)

b. How does multiplying by −1 change the location of the points in part (a)? What is the relationship between the number and the product?

c. Graph each number below on three different number lines. Where do you think the points will be after multiplying by −1? Plot the points. Explain your reasoning.

$$\frac{1}{2} \qquad\qquad 2.5 \qquad\qquad -\frac{5}{2}$$

d. What is the relationship between a rational number −a and the product −1(a)? Explain your reasoning.

3 **ACTIVITY:** Understanding the product of Rational Numbers

Work with a partner. Let a and b be positive rational numbers.

a. Because a and b are positive, what do you know about $-a$ and $-b$?

b. Justify each step.

$(-a)(-b) = (-1)(a)(-1)(b)$ _____

$ = (-1)(-1)(a)(b)$ _____

$ = (1)(a)(b)$ _____

$ = ab$ _____

c. Because a and b are positive, what do you know about the product ab?

Name_____ Date_____

2.4 **Multiplying and Dividing Rational Numbers** (continued)

d. What does this tell you about products of rational numbers? Explain.

4 **ACTIVITY:** Writing a Story

Work with a partner. Write a story that uses addition, subtraction, multiplication, or division of rational numbers.

- At least one of the numbers in the story has to be negative and *not* an integer.
- Draw pictures to help illustrate what is happening in the story.
- Include the solution of the problem in the story.

If you are having trouble thinking of a story, here are some common uses of negative numbers:

- A profit of −$15 is a loss of $15.
- An elevation of −100 feet is a depth of 100 feet below sea level.
- A gain of −5 yards in football is a loss of 5 yards.
- A score of −4 in golf is 4 strokes under par.

What Is Your Answer?

5. IN YOUR OWN WORDS Why is the product of two negative rational numbers positive?

6. PRECISION Show that $(-2)(-3) = 6$.

7. How can you show that the product of a negative rational number and a positive rational number is negative?

Name _____ Date _____

Multiply or divide. Write fractions in simplest form.

1. $-\dfrac{8}{9}\left(-\dfrac{18}{25}\right)$

2. $-4\left(\dfrac{9}{16}\right)$

3. $-3\dfrac{3}{7} \times 2\dfrac{1}{2}$

4. $-\dfrac{2}{3} \div \dfrac{5}{9}$

5. $\dfrac{7}{13} \div (-2)$

6. $-5\dfrac{5}{8} \div \left(-4\dfrac{7}{12}\right)$

7. $-1.39 \times (-6.8)$

8. $-10 \div 0.22$

9. $-12.166 \div (-1.54)$

10. In a game of tug of war, your team changes $-1\dfrac{3}{10}$ feet in position every 10 seconds. What is your change in position after 30 seconds?