

## Divide Whole Numbers and Unit Fractions

**R 5.3(L)** Divide whole numbers by unit fractions and unit fractions by whole numbers.

### Understand the TEKS

You can divide whole numbers and unit fractions by multiplying the **dividend** (the first number) by the **reciprocal** of the **divisor** (the second number). Write the whole number as a fraction before you multiply. To write a whole number as a fraction, write the whole number as the numerator and 1 as the denominator.

To find the reciprocal of a fraction, switch its numerator and denominator. For example, the reciprocal of  $\frac{1}{3}$  is  $\frac{3}{1}$  or 3. Since 3 is equal to  $\frac{3}{1}$ , the reciprocal of 3 is  $\frac{1}{3}$ . The product of a number and its reciprocal is always 1.



### Did You Know?

#### PROBLEM SOLVING

When multiplying and dividing whole numbers and fractions, begin by writing the whole numbers as fractions.

Sheila is making bags of dog treats to give to the animal shelter. She has 10 pounds of dog treats and each bag is going to contain  $\frac{1}{4}$  pound of treats. How many treat bags will she give to the animal shelter?

**Step 1** Write both numbers as fractions.

$$10 \div \frac{1}{4} = \frac{\quad}{\quad} \div \frac{1}{4}$$

**Step 2** Convert the division problem to a multiplication problem by multiplying the dividend by the reciprocal of the divisor.

$$\frac{10}{1} \div \frac{1}{4} = \frac{10}{1} \times \frac{\quad}{\quad}$$

**Step 3** Multiply.

$$\frac{10}{1} \times \frac{4}{1} = \frac{\quad}{\quad}$$

**Step 4** Simplify.

$$\frac{40}{1} = \frac{\quad}{\quad}$$

How many treat bags will Sheila give to the animal shelter? \_\_\_\_\_

★ Practice

**DIRECTIONS** Read and answer each question carefully.

- 1** Laurie needs several pieces of ribbon for a craft project. She has two 3-foot pieces of ribbon and plans to cut them into  $\frac{1}{6}$ -foot sections.

Which equation can Laurie use to determine the total number of sections she will have?

- (A)  $3 \div \frac{1}{6} = \frac{3}{1} \times \frac{6}{1}$
- (B)  $3 \div \frac{1}{6} = \frac{1}{3} \times \frac{1}{6}$
- (C)  $6 \div \frac{1}{6} = \frac{6}{1} \times \frac{6}{1}$
- (D)  $6 \div \frac{1}{6} = \frac{1}{6} \times \frac{1}{6}$

- 2** A zoo feeds its manatee 4 pounds of vegetables per hour.

How many pounds of food would the manatee eat in  $\frac{1}{4}$  hour?

- (A)  $\frac{1}{4}$  pound
- (B)  $\frac{1}{2}$  pound
- (C) 1 pound
- (D) 2 pounds

- 3** Samantha is trying to evaluate  $\frac{1}{6} \div 8$  but keeps getting the wrong answer.

Which step in her calculations contains an error?

- (A) Step 1:  $\frac{1}{6} \div 8 = \frac{1}{6} \div \frac{8}{1}$
- (B) Step 2:  $\frac{1}{6} \div \frac{8}{1} = \frac{1}{6} \times \frac{1}{8}$
- (C) Step 3:  $\frac{1}{6} \times \frac{1}{8} = \frac{1}{48}$
- (D) Step 4:  $\frac{1}{48} = 48$

- 4** The table shows how many hours Mr. Woods tutored students in three days. It also shows how many hours each student was tutored for each day.

How many students did Mr. Woods tutor each day and altogether?

Write the correct answer in each box. Not all answers will be used.

3	5	6	7	8	15	17
---	---	---	---	---	----	----

**Mr. Woods Tutoring**

Day	Total Time	Time per Student	Number of Students
Monday	2	$\frac{1}{3}$	
Tuesday	4	$\frac{1}{2}$	
Wednesday	1	$\frac{1}{3}$	
Total for Three Days			

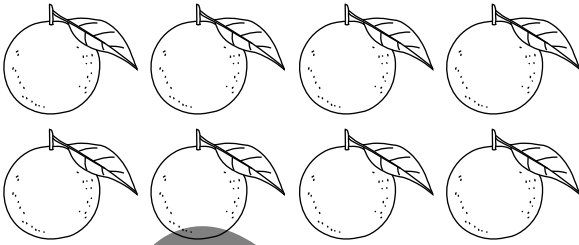
- 5** Each customer at a golf course gets  $\frac{1}{3}$  of a bucket of golf balls. Today, the course needed 9 buckets.

How many customers were at the course today?

- (A) 27, because  $9 \div \frac{1}{3} = 27$
- (B) 27, because  $\frac{1}{3} \div 9 = 27$
- (C) 3, because  $9 \div 3 = 3$
- (D) 3, because  $9 \div \frac{1}{3} = 3$



**6** There are 15 people in Alli’s class.



If she has 8 whole oranges, would she be able to share  $\frac{1}{2}$  an orange with each of her classmates?

- (A) No, because  $8 \div \frac{1}{2} = 4$
- (B) Yes, because  $15 \div 8 = \frac{1}{2}$
- (C) No, because  $15 \div \frac{1}{2} = 8$
- (D) Yes, because  $8 \div \frac{1}{2} = 16$

**7** Masie and Omar are hiking. Omar has  $\frac{1}{5}$  gallon of water.

If Omar shares his water with Masie, how much do they each have?

Circle the correct answer from each drop-down menu to complete the statement.

If Omar and Masie share the water

equally, each person will have

$\frac{1}{10}$
5
10

gallon(s) because

$1 \div \frac{1}{5} = 5$
$\frac{1}{5} \div 2 = \frac{1}{10}$
$2 \div \frac{1}{10} = 5$
$2 \div \frac{1}{5} = 10$

**8** Divide. Use the fraction bars to help you.

1		
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

1		
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$

- (A)  $3 \div \frac{1}{3} = \frac{3}{1} \times \frac{3}{1}$
- (B)  $2 \div \frac{1}{6} = \frac{1}{2} \times \frac{1}{6}$
- (C)  $2 \div \frac{1}{3} = \frac{2}{1} \times \frac{3}{1}$
- (D)  $3 \div \frac{1}{6} = \frac{1}{6} \times 3$

**9** Jeffrey splits  $\frac{1}{4}$  pound of grapes between two friends. Each friend receives an equal share.

How many pounds of grapes did Jeffrey give to each friend?

- (A)  $\frac{1}{8}$  pound, because  $2 \div \frac{1}{4} = \frac{1}{8}$
- (B)  $\frac{1}{8}$  pound, because  $\frac{1}{4} \div 2 = \frac{1}{8}$
- (C) 4, because  $\frac{1}{4} \div 2 = 4$
- (D) 2, because  $2 \div \frac{1}{4} = 2$