

LESSON
5-3 **Practice A**
Dimensional Analysis

Determine if each conversion will result in a larger or smaller quantity.

1. kilometers to meters 2. ounces to quarts 3. months to days

Find the appropriate factor for each conversion.

4. centimeters to meters 5. pints to quarts 6. hours to days

7. Bethany's dog eats 450 grams of food per day. How many kilograms does the dog eat in a week?

8. Grace runs 3 miles a day. How many feet does she run in a day?

9. Jefferson drinks 10 cups of orange juice a day. How many pints does he drink in a week?

10. Write the 90 ft distance from base to base on a baseball diamond in yards.

11. Julie is a member of her school's bowling team. She uses a 14-pound bowling ball. How many ounces is the bowling ball?

12. In 1945 Richard James invented the Slinky. It was made of 87 feet of flat wire coiled into 3-inch diameter circles. How many inches of coiled flat wire were used to make the original Slinky?

13. The mantis is a long, slender green and brown insect. The Carolina mantis, a native species, can grow to 7.6 centimeters long. How many millimeters is this?

LESSON Practice A
5-3 Dimensional Analysis

Determine if each conversion will result in a larger or smaller quantity.

1. kilometers to meters 2. ounces to quarts 3. months to days

larger smaller larger

Find the appropriate factor for each conversion.

4. centimeters to meters 5. pints to quarts 6. hours to days

$\frac{1 \text{ m}}{100 \text{ cm}}$ $\frac{1 \text{ qt}}{2 \text{ pt}}$ $\frac{1 \text{ day}}{24 \text{ hr}}$

7. Bethany's dog eats 450 grams of food per day. How many kilograms does the dog eat in a week?
3.15 kg

8. Grace runs 3 miles a day. How many feet does she run in a day?
15,840 ft

9. Jefferson drinks 10 cups of orange juice a day. How many pints does he drink in a week?
35 pt

10. Write the 90 ft distance from base to base on a baseball diamond in yards.
30 yd

11. Julie is a member of her school's bowling team. She uses a 14-pound bowling ball. How many ounces is the bowling ball?
224 oz

12. In 1945 Richard James invented the Slinky. It was made of 87 feet of flat wire coiled into 3-inch diameter circles. How many inches of coiled flat wire were used to make the original Slinky?
1044 in.

13. The mantis is a long, slender green and brown insect. The Carolina mantis, a native species, can grow to 7.6 centimeters long. How many millimeters is this?
76 mm

Copyright © by Holt, Rinehart and Winston.
 All rights reserved.

19

Holt Mathematics

LESSON Practice B
5-3 Dimensional Analysis

Find the appropriate factor for each conversion.

1. grams to kilograms 2. quarts to gallons 3. minutes to seconds

$\frac{1 \text{ kg}}{1000 \text{ g}}$ $\frac{1 \text{ gal}}{4 \text{ qt}}$ $\frac{60 \text{ sec}}{1 \text{ min}}$

4. David takes 300 milligrams of medicine every day. How many grams is this?
0.3 g

5. Jody runs the 500-yard dash for his school's track team. How many feet does he run in each 500-yard dash?
1500 ft

6. Sean drinks six 12-ounce cans of soda a week. How many pints of soda does he drink in a week?
4.5 pt

7. A recipe for punch requires diluting the punch concentrate with 7 quarts of water. How many gallons of water are required to dilute the concentrate according to the directions?
1.75 gal

8. Jesse's dog Angel weighs $18\frac{1}{2}$ pounds. How many ounces does Angel weigh?
296 oz

9. A roll of tape contains 32.9 meters of tape. How many millimeters of tape does the roll contain?
32,900 mm

10. There are two types of lifts in the sport of weightlifting, the *snatch* and the *clean and jerk*. Winners are determined by the combined weights of the two type of lifts. In the 2002 Collegiate Weightlifting Competition, Timothy Leancu from the U.S. Naval Academy competed in the 94-kilogram weight class. He lifted 100 kg in the *snatch* and 132.5 kg in the *clean and jerk*. What was the combined weight of his lifts in grams?
232,500 g

Copyright © by Holt, Rinehart and Winston.
 All rights reserved.

20

Holt Mathematics

LESSON Practice C
5-3 Dimensional Analysis

Use conversion factors to find each specified amount.

1. Homework problems solved in 2 hours 30 minutes at a rate of 26 problems an hour
65 problems

2. Ice cream cones sold in the month of March at the rate of 136 a day
4216 cones

3. Miles walked in 1 hour at an average rate of 5.5 feet per second
3.75 miles

4. Fast-food meals eaten in a month at a rate of 72 meals in a year
6 meals

5. Decals produced in 8 hours at a rate of 180 decals per minute
86,400 decals

6. Distance traveled (in feet) after 45 seconds at 60 miles per hour
3960 ft

7. Weight in ounces of 50 tons of metal
1,600,000 oz

8. The giant clam is a sea creature that can weigh up to 227 kg. To the nearest whole number, what is the weight in ounces of the giant clam? (Hint: $2.2046 \text{ lb} \approx 1 \text{ kg}$)
8007 oz

9. The ruby-throated hummingbird is about 4 inches long and is noted for its annual nonstop migration of 500 miles across the Gulf of Mexico, and for the rapid flapping of its wings. Some hummingbirds flap their wings 55 times per second. If the ruby-throated hummingbird is only 4 inches long and migrates 500 miles, how many of the hummingbird's body lengths are equal to the distance of its migration?
7,920,000 body lengths

Copyright © by Holt, Rinehart and Winston.
 All rights reserved.

21

Holt Mathematics

LESSON Reteach
5-3 Dimensional Analysis

A conversion relation gives equivalent units.

1 foot = 12 inches 1 week = 7 days 1 pound = 16 ounces

Complete each conversion relation.

1. 1 gallon = 4 quarts

2. 1 meter = 100 centimeters

3. 1 yard = 3 feet

To change from one unit to another, multiply by a fraction of value 1.

Convert 7 ft to in.

Use 1 foot = 12 inches to write a fraction of value 1.

Put the unit to be changed in the denominator. $\frac{12 \text{ in.}}{1 \text{ ft.}}$

$7 \text{ ft} \times \frac{12 \text{ in.}}{1 \text{ ft}} = (7 \times 12) \text{ in.} = 84 \text{ in.}$

When converting from a larger unit to a smaller, the result is a larger number. When converting from a smaller unit to a larger, the result is a smaller number.

7 ft = 84 in. 84 in. = 7 ft

Complete to convert each unit.

4. 72 inches to feet

$$1 \text{ ft} = \underline{12 \text{ in.}}$$

unit for denominator of fraction is

inches

$$72 \text{ in.} \times \frac{1 \text{ ft}}{12 \text{ in.}} = \underline{6 \text{ ft}}$$

6. 735 meters to centimeters

$$1 \text{ m} = \underline{100 \text{ cm}}$$

unit for denominator of fraction is

meters

$$735 \text{ m} \times \frac{100 \text{ cm}}{1 \text{ m}} = \underline{73,500 \text{ cm}}$$

5. 40 ounces to pounds

$$1 \text{ lb} = \underline{16 \text{ oz}}$$

unit for denominator of fraction is

ounces

$$40 \text{ oz} \times \frac{1 \text{ lb}}{16 \text{ oz}} = \underline{2.5 \text{ lb}}$$

7. 150 pounds to kilograms

$$1 \text{ kg} = 2.2 \text{ lb}$$

unit for denominator of fraction is

pounds

$$150 \text{ lb} \times \frac{1 \text{ kg}}{2.2 \text{ lb}} \approx \underline{68.2 \text{ kg}}$$

Copyright © by Holt, Rinehart and Winston.
 All rights reserved.

22

Holt Mathematics