SAMPLE PAGES FOR

THE READY EOG ASSESSMENT

THE COMPETITIVE EDGE

FIFTH GRADE MATHEMATICS

with COMMON CORE STATE STANDARDS

2012 EDITION

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PART I—CONVERTING CUSTOMARY (STANDARD) UNITS

Length

The system of measurement that has been used in the United States for more than two hundred years is called the **U.S. Customary System**. The **inch** (in.), **foot** (ft), **yard** (yd), and **mile** (mi) are basic units used to measure the length of an object.

The unit that you use to measure length depends on the length of the object, and the tools you have to use.

EXAMPLE

A piece of ribbon can be 36 inches long, 3 feet long, or 1 yard long.

➢ To convert from one unit to another unit, you either multiply or divide.

Divide (÷) to change a smaller unit to a larger unit.		**Multiply (×) to change a larger unit to a smaller unit.**	
Conversion	**Operation / Example**	**Conversion**	**Operation / Example**
inches to feet	÷ 12 / 72 in. = 6 ft	feet to inches	× by 12 / 4 ft = 48 in.
inches to yards	÷ by 36 / 108 in. = 3 yd	yards to inches	× by 36 / 5 yd = 180 in.
feet to yards	÷ by 3 / 9 ft = 3 yd	yards to feet	× by 3 / 5 yd = 15 ft
feet to miles	÷ by 5,280 / 10,560 ft = 2 mi	miles to feet	× by 5,280 / 4 mi = 21,120 ft
yards to miles	÷ by 1,760 / 880 yd = 0.5 mi	miles to yards	× by 1,760 / 2 mi = 3,520 yd

EXAMPLES

Joe is 6 feet tall. He wants to write his height in inches on the class height graph. How many inches are in 6 feet?

feet → inches large unit → small unit Multiply.

1 foot = 12 inches

6 × 12 = 72

Joe is 72 inches tall.

Change 2,464 yards to miles.

yards → miles small unit → large unit Divide.

1 mile = 1,760 yd

2,464 ÷ 1,760 = 1.4 mi

2,464 yd = 1.4 mi

Weight

In the customary system, the **pound** (lb), **ounce** (oz), and **ton** (T), are all units of weight, not mass. As with length, you use multiplication and division to convert from one customary unit of weight to another.

Divide (÷) to change a smaller unit to a larger unit.		**Multiply (×) to change a larger unit to a smaller unit.**	
Conversion	**Operation / Example**	**Conversion**	**Operation / Example**
ounces to pounds	÷ by 16 / 80 oz = 5 lb	pounds to ounces	× 16 / 6 lb = 96 oz
pounds to tons	÷ by 2,000 / 6,000 lb = 3 T	tons to pounds	× 2,000 / 4 T = 8,000 lb

EXAMPLE

Convert 49 ounces to pounds.

ounces → pounds small unit → larger unit Divide.

1 pound = 16 ounces

49 ÷ 16 = 3 r 1

This can be written two ways:

49 oz = 3 lb 1 oz

$3\frac{1}{16}$ *lb*

Convert $3\frac{1}{2}$ pounds to ounces.

pounds → ounces large unit → small unit Multiply.

1 pound = 16 ounces

$3\frac{1}{2} \times 16 = 56$

$3\frac{1}{2}$ *lb = 56 oz*

Capacity

The customary system for measuring capacity uses units of **fluid ounces** (fl oz), **cups** (c), **pints** (pt), **quarts** (qt) and **gallons** (gal). As with length and weight, you use multiplication and division to convert from one customary unit of capacity to another.

Divide (÷) to change a smaller unit to a larger unit.		**Multiply (×) to change a larger unit to a smaller unit.**	
Conversion	**Operation / Example**	**Conversion**	**Operation / Example**
fluid ounces to cups	÷ by 8 / 48 fl oz = 6 c	cups to fluid ounces	× by 8 / 3 c = 24 fl oz
cups to pints	÷ by 2 / 6 c = 3 pt	pints to cups	× by 2 / 9 pt = 18 c
pints to quarts	÷ 2 / 14 pt = 7 qt	quarts to pints	× by 2 / 6 qt = 12 pt
quarts to gallons	÷ 4 / 16 qt = 4 gal	gallons to quarts	× by 4 / 5 gal = 20 qt

EXAMPLES

Convert 7 pints to cups.

pints → cups — large unit → small unit — Multiply.
1 pint = 2 cups
7 × 2 = 14

7 pt = 14 c

Change 5 gallons to pints.

gallons → pints — large unit → small unit → smaller unit — Multiply.

This problem takes more than one step to solve.
First convert 5 gallons to quarts.
1 gallon = 4 quarts
5 × 4 = 20
5 gal = 20 qt

Second, convert 20 quarts to pints.
1 quart = 2 pints
20 × 2 = 40

5 gal = 40 pt

PRACTICE

Solve each measurement problem.

1. 11 pints = _____ fluid ounces
2. 8 quarts = _____ pints
3. 6 gallons 2 pints = _____ pints
4. 5 quarts = _____ cups
5. 672 fluid ounces = _____ quarts
6. 10 pounds = _____ ounces
7. 17 tons 896 pounds = _____ pounds
8. 368 ounces = _____ pounds
9. 16,000 pounds = _____ tons
10. 11 feet = _____ inches
11. 10 yards = _____ feet
12. 12 miles = _____ yards
13. 43 inches = _____ ft _____ in.
14. 2 mi 100 ft = _____ ft
15. 500 fl oz = _____ c
16. 6.25 ft = _____ in.
17. $\frac{3}{4}$ ft = _____ yd
18. $5\frac{3}{4}$ yd = _____ ft

19. Len has a rope 5 yards long. He needs 6 pieces of rope 26 inches long cut from this longer rope. Does he have enough rope? Explain your answer.

20. Ron measured the length of his bedroom. It is $16\frac{3}{4}$ ft long. How many inches is this?

21. How many quarts are in 57 pints? Write the answer in two ways: in quarts and pints and in quarts only. Explain how you got your answer.

22. There are 11 pounds of nails available for the carpentry class. How many packages containing 4 ounces of nails can be filled?

23. How many ounces of cheese are in a 3-pound wheel?

24. A jeweler has 1 pound 4 ounces of 14 carat gold, and 12 ounces of 18-carat gold. How many ounces of gold does he have in all? Explain your answer.

25. How many fluid ounces of juice are in $2\frac{1}{2}$ pints?

PART 2—CONVERTING METRIC UNITS

The metric system is an international system of measurement in which units are related by powers of 10.

Length

The **millimeter** (mm), **centimeter** (cm), **meter** (m), and **kilometer** (km) are the units commonly used to measure length in the metric system.

The unit that you use to measure length depends on the length of the object, and the tools you have to use.

EXAMPLE

A piece of rope can be 16 centimeters long, 160 millimeters long, or 0.16 meters long.

➢ To convert from one unit to another unit, you either multiply or divide.

Divide (÷) to change a smaller unit to a larger unit.

Conversion	Operation / Example
millimeters to centimeters	÷ by 10 / 500 mm = 50 cm
millimeters to meters	÷ by 1,000 / 6,000 mm = 6 m
centimeters to meters	÷ by 100 / 400 cm = 4 m
meters to kilometers	÷ by 1,000 / 600 m = 0.6 km

Multiply (×) to change a larger unit to a smaller unit.	
Conversion	**Operation / Example**
centimeters to millimeters	× by 10 / 6 cm = 60 mm
meters to millimeters	× by 1,000 / 70 m = 70,000 mm
meters to centimeters	× by 100 / 45 m = 4,500 cm
kilometers to meters	× by 1,000 / 8 km = 8,000 m

EXAMPLES

The distance between two points on a map is 23 centimeters. Fred is working on a computer program that requires all map distances to be in meters. How many meters is 23 centimeters?

centimeters → meters small unit → large unit Divide.

1 meter = 100 centimeters
23 ÷ 100 = 0.23
23 cm = 0.23 m

The distance between the two points is 0.23 m.

Change 9,000 meters to kilometers.

meters → kilometers small unit → large unit Divide.

1 kilometer = 1,000 meters
9,000 ÷ 1,000 = 9

9,000 m = 9 km

Mass

The **milligram** (mg), **gram** (g), and **kilogram** (kg), are metric system units commonly used to measure mass. As with length, you use multiplication and division to convert from one metric unit of mass to another.

Divide (÷) to change a smaller unit to a larger unit.		Multiply (×) to change a larger unit to a smaller unit.	
Conversion	**Operation / Example**	**Conversion**	**Operation / Example**
milligrams to grams	÷ by 1,000 / 70,000 mg = 70 g	grams to milligrams	× by 1,000 / 4 g = 4,000 mg
grams to kilograms	÷ by 1,000 / 4,000 g = 4 kg	kilograms to grams	× by 1,000 / 50 kg = 50,000 g

EXAMPLES

Convert 2 grams to milligrams.

grams → milligrams large unit → small unit Multiply.
1 gram = 1,000 milligrams
2 × 1,000 = 2,000

2 g = 2,000 mg

A rock specimen weighs 4 kilograms. What is this in milligrams?

kilograms → milligrams large unit → small unit → smaller unit Multiply.

This problem takes more than one step to solve:

First convert kilograms to grams.

1 kilogram = 1,000 grams
4 × 1,000 = 4,000
4 kg = 4,000 g

Last, convert 4,000 g to milligrams.

1 milligram = 1,000 grams
4,000 × 1,000 = 4,000,000
4 kg = 4,000,000 mg

The rock specimen's mass is 4,000,000 mg.

Capacity

The **milliliter** (mL), **liter** (L), and **kiloliter** (kL) are units commonly used to measure capacity in the metric system. As with length and mass, you use multiplication and division to convert from one metric unit of capacity to another.

Divide (÷) to change a smaller unit to a larger unit.		**Multiply (×) to change a larger unit to a smaller unit.**	
Conversion	**Operation / Example**	**Conversion**	**Operation / Example**
milliliters to liters	÷ by 1,000 / 5,000 mL = 5L	liters to milliliters	× by 1,000 / 70 L = 70,000 mL
liters to kiloliters	÷ by 1,000 / 60,000 L = 60 kL	kiloliters to liters	× by 1,000 / 2 kL = 2,000 L

EXAMPLES

A class determined that they needed 7,250 milliliters of milk for lunch. How many liters of milk is this?

milliliters → liters small unit → large unit Divide.

1 liter = 1,000 milliliters
7,250 ÷ 1,000 = 7.25
7,250 mL = 7.25 L

The class needed 7.25 liters of milk.

Change 3 kiloliters to milliliters.

kiloliters → milliliters large unit → small unit → smaller unit Multiply.

This problem takes more than one step to solve.

First, convert kiloliters to liters.

1 kiloliter = 1,000 liters
3 × 1,000 = 3,000
3 kL = 3,000 L

Last convert 3,000 L to milliliters.

1 liter = 1,000 milliliters
3,000 × 1,000 = 3,000,000
3,000 L = 3,000,000 mL

3 kL = 3,000,000 mL

PRACTICE

Solve each problem

1. 1,500 mm = _____ cm	6. 71 L = _____ mL	11. 36,000 cm = _____ km
2. 2 km = _____ m	7. 575 mL = _____ L	12. 4 m = _____ mm
3. 12 m = _____ cm	8. 14,000 mg = _____ kg	13. 525 cm = _____ mm
4. 54 g = _____ mg	9. 3,000 g = _____ kg	14. 5,000 cm = _____ m
5. 2 kg = _____ mg	10. 5 km = _____ m	15. 2.7 kL = _____ L

16. A recipe calls for 150 mL of milk. How many liters is needed?

17. Mr. White drives 6 kilometers to work each day. How many meters does he drive to work?

18. A beef roast and three fish total 8.4 kilograms. How many grams is this?

19. How much longer is a metal strip that measures 1.2 m than one that measures 894 mm? Explain how you got your answer.

20. A rabbit is to be given 20 grams of food a day. How many kilograms of food are needed for 40 days? Explain how you got your answer.

21. A chemist mixed 4.7 L of distilled water with 8 mL of acid. How many milliliters of the mixture does she have? Explain how you got your answer.

22. A punch bowl holds 3 liters of cherry punch. If the punch is served using a ladle that holds 300 milliliters, how many servings can be served from one bowl of punch? Explain your thinking.

REVIEW

1. A jar of molasses weighs 48 ounces. How many pounds is this?
   a. 2 pounds
   b. 3 pounds
   c. 4 pounds
   d. 24 pounds

2. 18 feet is how many yards?
   a. 3 yards
   b. 4 yards
   c. 5 yards
   d. 6 yards

3. How many cups are in 3 quarts?
   a. 3 cups
   b. 6 cups
   c. 12 cups
   d. 24 cups

4. There are 30 members in the [illegible] choir. If each member drinks one cup of soda, how many gallons of soda are needed?
   a. 1 gallon
   b. 2 gallons
   c. 3 gallons
   d. 10 gallons

5. Clarysse needs 95 inches of tinsel to finish the Christmas decorations. How many yards of tinsel will she need to buy?
   a. 2 yards
   b. 3 yards
   c. 4 yards
   d. 5 yards

6. Each meatloaf contains 1 ½ pounds of hamburger. How many ounces are needed for 3?
   a. 24 ounces
   b. 24 ½ ounces
   c. 72 ounces
   d. 89 ounces

7. A small tractor weighs 4 tons. How many pounds does the tractor weigh?
   a. 8 pounds
   b. 80 pounds
   c. 800 pounds
   d. 8,000 pounds

8. How many quarts of grapefruit juice are needed for 16 people if each person receives 1 cup?
   a. 2 quarts
   b. 4 quarts
   c. 6 quarts
   d. 8 quarts

9. Bonita weighs 125 pounds. How many ounces does she weigh?
   a. 250 ounces
   b. 1,000 ounces
   c. 2,000 ounces
   d. 7,500 ounces

10. How many milliliters are there in 10 liters?
    a. 1 mL
    b. 100 mL
    c. 1,000 mL
    d. 10,000 mL

11. How many centimeters are in 60 meters?
    a. 6 cm
    b. 600 cm
    c. 6,000 cm
    d. 60,000 cm

12. 21,000 grams is equal to how many kilograms?
    a. 21 kg
    b. 210 kg
    c. 2,100 kg
    d. 21,000 kg

13. To change from centimeters to meters, _____ .
    a. multiply by 1,000
    b. divide by 1,000
    c. divide by 100
    d. multiply by 100

14. 15 kilometers = _____ meters.
    a. 150
    b. 1,500
    c. 15,000
    d. 150,000

15. 6,000 milligrams = _____ grams.
    a. 6
    b. 60
    c. 600
    d. 600,000

16. To change from kilometers to meters, _____ .
    a. multiply by 1,000
    b. divide by
    c. multiply by
    d. divide by

17. 70 millimeters = _____ centimeters.
    a.
    b. 7
    c.
    d. 7,000

18. Which of these is the same length as 16 km?
    a. 160 m
    b. 1,600 cm
    c. 16,000 m
    d. 160,000 mm

19. Which of these has the same
    as 7,000 grams?
    a. 0.7 kg
    b. 7 kg
    c. 70 kg
    d. 700 mg

20. Which of the following
    the longest?
    a.
    b.
    c.
    d.

21. Which of the following lengths is the shortest?
    a. ¼ mi
    b. 4 ft
    c. 6 yd
    d. 35 in.

22. A train car hauls 15 tons of coal. How many pounds is this?
    a. 150 pounds
    b. 1,500 pounds
    c. 15,000 pounds
    d. 30,000 pounds

23. Which of the following measurements is the least?
    a. 4 L
    b. 16 kL
    c. 200 L
    d. 4,569 mL

24. The mass of a watermelon is 4,500 grams. What is the mass of the watermelon in kilograms?

25. A water cooler holds 5 gallons of water. Marge used 1 quart of water. How many quarts of water are left?

26. Mrs. Sharp's baby weighted 8 lb 12 oz when he was born. How many ounces is that?

27. A wedding party used 800 liters of punch. How many kiloliters did they use?

28. A pan holds 26 cups of water. How many pints does the pan hold?

29. Mrs. White bought 5 pounds of cheese to make cheese biscuits. If she uses 4 ounces of cheese in each biscuit, how many biscuits can she make? Explain how you got your answer.

30. Which is longer: four 1-meter pieces of wood or seven 60-cm pieces of wood? Explain how you got your answer.

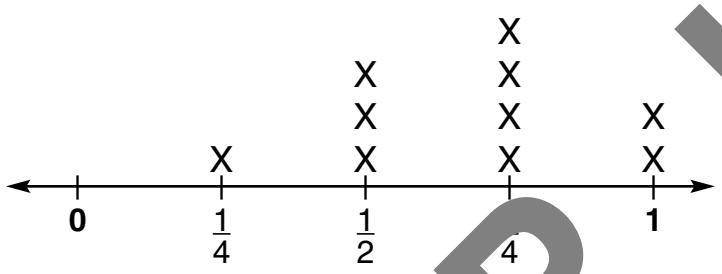
PART 3—LINE PLOTS

A number line with marks above it to show how data is spread over a range is called a **line plot**.

EXAMPLES

This line plot shows the amount of time a group of 5th graders studied for a math test. How many 5th graders studied $\frac{3}{4}$ hour for the test?

Time Studied (in hours)



On this line plot, each X represents a student who studied for the math test. The time the student studied is shown below the X on the number line.

For $\frac{3}{4}$, there are 4 X's.

So, 4 students studied $\frac{3}{4}$ hour for their math test.

How many 5th graders studied at least $\frac{1}{2}$ hour for the math test?

At least means $\frac{1}{2}$ or more.

$\frac{1}{2}$ → 3 x's

$\frac{3}{4}$ → 4 x's

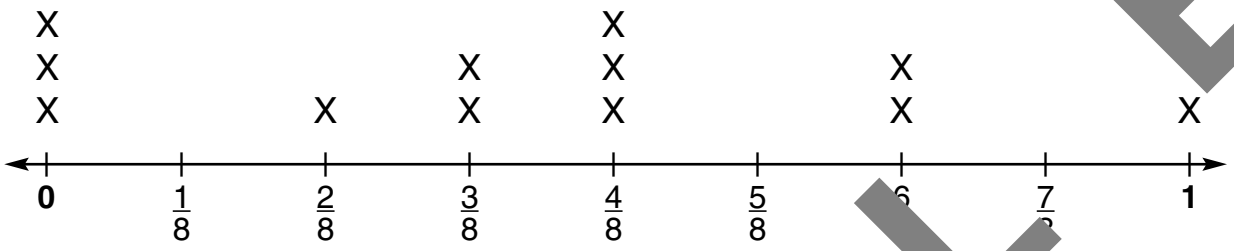
1 → 2 x's

3 + 4 + 2 = 9

There were 9 students that studied at least $\frac{1}{2}$ hour for the math test.

This line plot shows the amount of acid left in 12 identical beakers after a school experiment. The amounts are shown in liters. How much acid was left after all of the science experiments were conducted?

Amount of Acid in Beakers (in liters)



Sometimes, you have to use more than one operation to solve a problem.

First, find the total amount of solution for each amount.

$0 \times 3 = 0$

$\frac{1}{8}$ = none

$\frac{2}{8} \times 1 = \frac{2}{8} \times \frac{1}{1} = \frac{2}{8}$

$\frac{3}{8} \times 2 = \frac{3}{8} \times \frac{2}{1} = \frac{6}{8}$

$\frac{4}{8} \times 3 = \frac{4}{8} \times \frac{3}{1} = \frac{12}{8}$

$\frac{5}{8}$ = none

$\frac{6}{8} \times 2 = \frac{6}{8} \times \frac{2}{1} = \frac{12}{8}$

$\frac{7}{8}$ = none

$1 \times 1 = 1$

Now add the amounts to get the total:

$0 + \frac{2}{8} + \frac{6}{8} + \frac{12}{8} + \frac{12}{8} + 1 = 1\ \frac{32}{8} = 1 + (\frac{32}{8} = 4) = 5$ liters.

There is a total of 5 liters in the beakers.

How much acid would each beaker contain if the teacher took the total amount of acid in all the beakers and distributed it equally in each beaker for the next experiment?

Use the total amount found in the previous problem—5 liters.

12 beakers will be used.

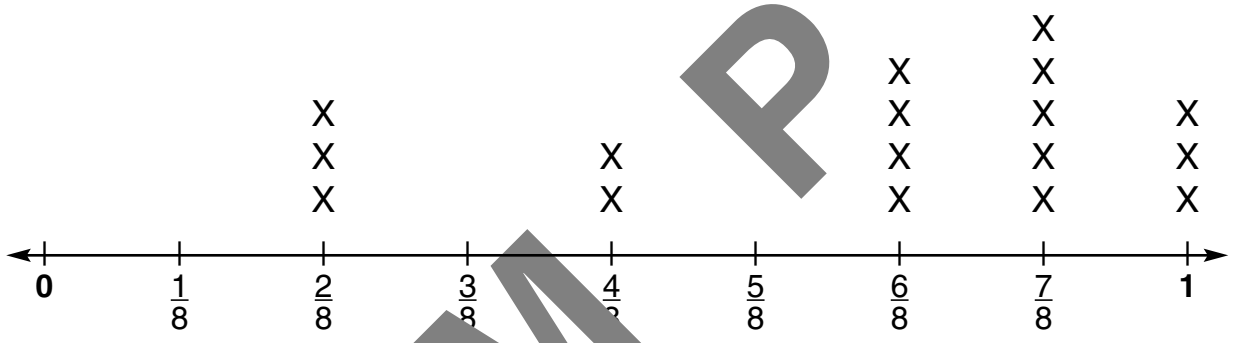
$5 \div 12 = \frac{5}{12}$

Each beaker will contain $\frac{5}{12}$ liter of acid.

PRACTICE

This line plot shows the weights of stones Mrs. Andrews placed in her koi fish pond.

Weight of Stones (in pounds)



1. How many stones weighed $\frac{1}{8}$ pound?

2. Do more stones weight $\frac{1}{4}$ pound or $\frac{3}{4}$ pound? How many more?

3. How many stones did Mrs. Andrews place in her koi pond?

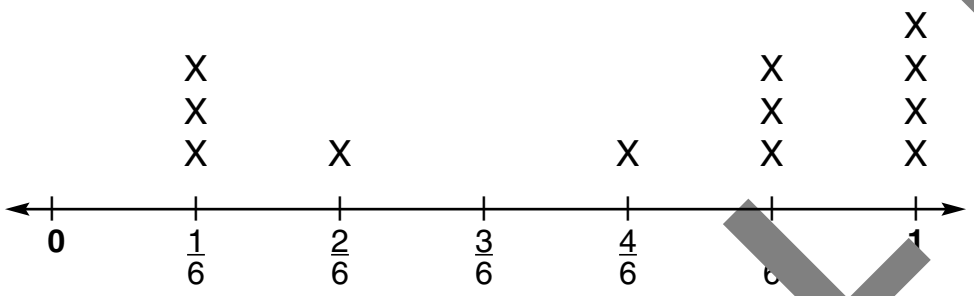
4. How many stones weighed at least $\frac{1}{2}$ pound?

5. How many stones weighed more than $\frac{3}{4}$ pound?

6. How many stones weighed at most $\frac{7}{8}$ pound?

This line plot shows the weights of bags of pecans that were distributed to members of the Women's Club.

Weight of Bagged Pecans (in pounds)



7. How many bags contain more than $\frac{2}{3}$ pound of pecans?

8. How many bags contain at least $\frac{1}{3}$ pound of pecans?

9. Do more bags have $\frac{1}{6}$ pound or $\frac{2}{3}$ pound? How many more?

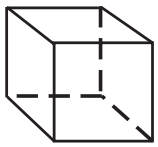
10. How many bags have at most $\frac{5}{6}$ pound of pecans?

11. How many pounds of pecans were distributed to the Women's Club? Explain how you got your answer.

12. If the bags of pecans were collected and the pecans redistributed so that each woman had the same amount of pecans, how many pecans would each woman get? Explain how you got your answer.

PART 4—VOLUME

The **volume** of any solid is the measure of how much space the figure encloses. It is measured in cubic units (1 unit by 1 unit by 1 unit).



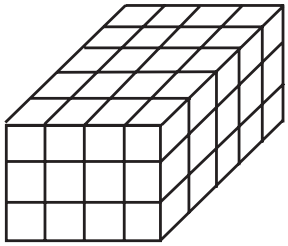
A cube with a side length of 1 unit is called a "unit cube." It is said to have "one cubic unit" of volume and can be used to measure volume. This unit is 1 unit long, 1 unit wide, and 1 unit high.

The volume of a solid figure is measured by the number of cubic units that fit inside it without gaps or overlaps.

Remember: more cubic inches are needed to measure the volume of a solid than cubic feet.

EXAMPLES

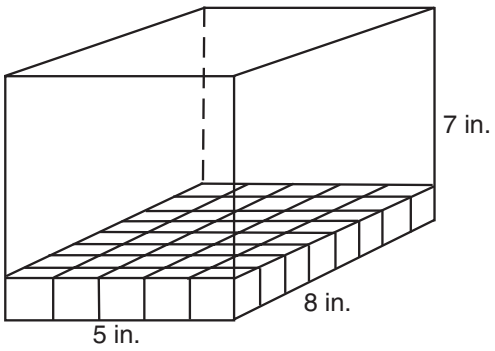
What is the volume of this rectangular prism if each cube is 1 cubic unit?



Count the number of cubic units that make up the prism. Don't forget to count the ones you cannot see.

Volume = 60 cubic units

What is the volume of this rectangular prism?



1 cube = 1 cubic inch

There are 8 rows of 5 "inch" cubes, or 40 cubic inches.

The rectangular prism's height is 7 inches. So, there are 7 layers of 40 cubic inches.

You can find the volume by adding:

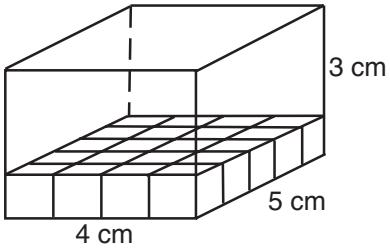
40 + 40 +40 + 40 +40 + 40 +40 = 280 cubic inches

You could have also multiplied:

$7 \times 40 = 280$ cubic inches

The volume of this rectangular prism is 280 cubic inches.

What is the volume of this rectangular prism?



1 cube = 1 cubic centimeter

There are 5 rows of 4 "centimeter" cubes, or 20 cubic centimeters.

The rectangular prism's height is 3 centimeters, so, there are 3 layers of 20 cubic centimeters.

Find the volume.

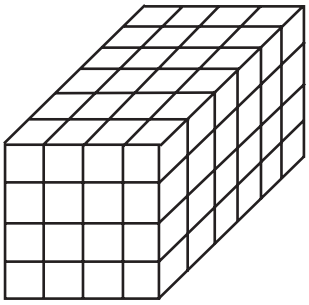
$3 \times 20 = 60$ cubic centimeters

The volume of this rectangular prism is 60 cubic centimeters.

PRACTICE

Find the volume of each rectangular prism in cubic units.

1.



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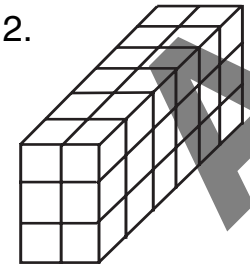

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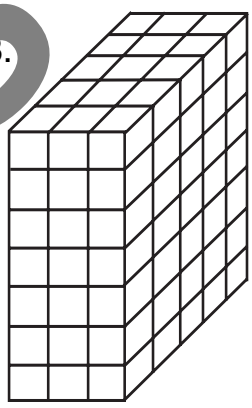

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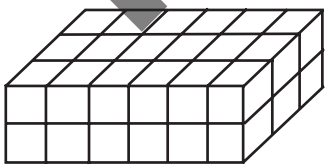

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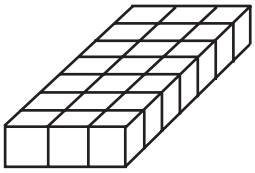
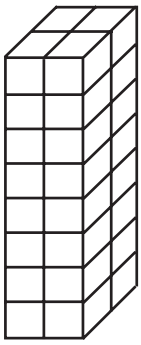
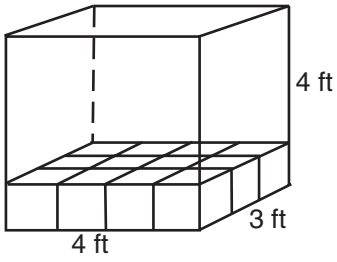


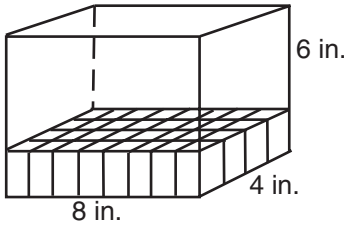
6.



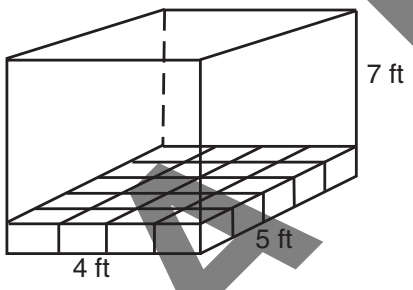
7. Explain how you can find the volume of this rectangular prism in cubic feet.



8. Explain how you can find the volume of this rectangular prism in cubic inches.



9. Explain how you can find the volume of this rectangular prism in cubic feet.



10. 1 unit cube = 1 cubic inch. Explain how to find the volume of this prism.