BLACKLINE MASTERS

HOUGHTON MIFFLIN HARCOURT

Response to Intervention

FOR THE COMMON CORE STATE STANDARDS FOR MATHEMATICS

GRADE 5

PROVIDES Tier 1 Intervention for Every Common Core Standard

HOUGHTON MIFFLIN HARCOURT

Measurement and Data

Name _____

LESSON 78

Customary Length

OBJECTIVE Compare, contrast, and convert customary units of length.

CC.5.MD.1

You can convert one customary unit of length to another customary unit of length by multiplying or dividing.

Multiply to change from larger to smaller units of length.

Divide to change from smaller to larger units of length.

Customary Units of Length

1 foot (ft) = 12 inches (in.)
1 yard (yd) = 3 feet
1 mile (mi) = 5,280 feet
1 mile = 1,760 yards

Convert 3 feet to inches.

Step 1
Decide:
(Multiply) or Divide

feet → inches
larger → smaller

Step 2
Think:

1 ft = 12 in., so

3 ft = (3 × 12) in.

Step 3
Multiply.

3 × 12 = 36

So, 3 feet = 36 inches.

Convert 363 feet to yards.

Step 1
Decide:
Multiply or (Divide)

feet → yards
smaller → larger

Step 2
Think:

3 ft = 1 yd,

so 363 ft = (363 ÷ 3) yd.

Step 3
Divide.

363 ÷ 3 = 121

So, 363 feet = 121 yards.

Convert.

1. 33 yd = _____ ft

2. 300 mi = _____ yd

3. 46 in. = _____ ft _____ in.

4. 96 yd = _____ ft

5. 48 ft = _____ yd

6. 2 mi 20 yd = _____ yd

Compare. Write <, >, or =.

7. 2 yd ◯ 7 ft

8. 67 mi ◯ 117,920 yd

9. 250 yd ◯ 800 ft

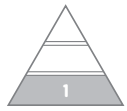
10. 14 yd 2 ft ◯ 16 ft

11. 34 ft 10 in. ◯ 518 in.

12. 5 mi 8 ft ◯ 8,800 yd

Name _____

Customary Length



CC.5.MD.1

Convert.

1. 12 yd = 36 ft **2.** 5 ft = _____ in. **3.** 5 mi = _____ ft

total yards × feet in 1 yard = total feet

12 × 3 = 36

12 yards = 36 feet

4. 240 in. = _____ ft **5.** 100 yd = _____ ft **6.** 10 ft = _____ in.

7. 150 in. = ____ ft ____in. **8.** 7 yd 2 ft = _____ ft **9.** 10 mi = _____ ft

Compare. Write <, >, or =.

10. 23 in. ◯ 2 ft **11.** 25 yd ◯ 75 ft **12.** 6,200 ft ◯ 1 mi 900 ft

13. 100 in. ◯ 3 yd 1 ft **14.** 1,000 ft ◯ 300 yd **15.** 500 in. ◯ 40 ft

Problem Solving

16. Marita orders 12 yards of material to make banners. If she needs 1 foot of fabric for each banner, how many banners can she make?

_____

_____

17. Christy bought an 8-foot piece of lumber to trim a bookshelf. Altogether, she needs 100 inches of lumber for the trim. Did Christy buy enough lumber? Explain.

_____

_____

Name _____

LESSON 79

Customary Capacity

OBJECTIVE Compare, contrast, and convert customary units of capacity.

CC.5.MD.1

You can convert one unit of customary capacity to another by multiplying or dividing.

Multiply to change from larger to smaller units.

Divide to change from smaller to larger units.

Customary Units of Capacity

1 cup (c) = 8 fluid ounces (fl oz)
1 pint (pt) = 2 cups
1 quart (qt) = 2 pints
1 quart = 4 cups
1 gallon (gal) = 4 quarts

Convert 8 cups to quarts.

Step 1
Decide:
Multiply or Divide

cups → quarts
smaller → larger

Step 2
Think:

4 c = 1 qt,

so 8 c = (8 ÷ 4) qt.

Step 3
Divide.

8 ÷ 4 = 2

So, 8 cups = 2 quarts.

Convert 19 gallons to quarts.

Step 1
Decide:
Multiply or Divide

gallons → quarts
larger → smaller

Step 2
Think:

1 gal = 4 qt,

so 19 gal = (19 × 4) qt.

Step 3
Multiply.

19 × 4 = 76

So, 19 gallons = 76 quarts.

Convert.

1. 14 pt = _____ qt

2. 32 qt = _____ c

3. 7 c = _____ fl oz

4. 28 c = _____ pt

5. 9 gal = _____ qt

6. 16 c = _____ qt

Compare. Write <, >, or =.

7. 16 qt ◯ 60 c

8. 88 fl oz ◯ 11 c

9. 3 gal ◯ 10 qt

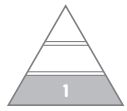
10. 36 qt ◯ 54 c

11. 66 fl oz ◯ 9 c

12. 16 gal ◯ 64 qt

Name _____

Customary Capacity



CC.5.MD.1

Convert.

1. 5 gal = 40 pt **2.** 192 fl oz = _____ pt **3.** 15 pt = _____ c

Think: 1 gallon = 4 quarts
1 quart = 2 pints

4. 240 fl oz = _____ c **5.** 32 qt = _____ gal **6.** 10 qt = _____ c

7. 48 c = _____ qt **8.** 72 pt = _____ gal **9.** 128 fl oz = _____ pt

Compare. Write <, >, or =.

10. 17 qt ◯ 4 gal **11.** 96 fl oz ◯ 8 pt **12.** 400 pt ◯ 100 gal

13. 100 fl oz ◯ 16 pt **14.** 74 fl oz ◯ 8 c **15.** 12 c ◯ 3 qt

Problem Solving

16. Vickie made a recipe for 144 fluid ounces of scented candle wax. How many 1-cup candle molds can she fill with the recipe?

_____

17. A recipe calls for 32 fluid ounces of heavy cream. How many 1-pint containers of heavy cream are needed to make the recipe?

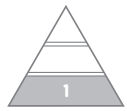
_____

Name _____

LESSON 80

Weight

OBJECTIVE Compare, contrast, and convert customary units of weight.



CC.5.MD.1

You can convert one customary unit of weight to another by multiplying or dividing.

Multiply to change from larger to smaller units.

Divide to change from smaller to larger units.

Customary Units of Weight
1 pound (lb) = 16 ounces (oz)
1 ton (T) = 2,000 pounds

Convert 96 ounces to pounds.

Step 1

Decide:
Multiply or (Divide)

ounces → pounds
smaller → larger

Step 2

Think:

16 oz = 1 lb

so 96 oz = (96 ÷ 16) lb.

Step 3

Divide.

96 ÷ 16 = 6

So, 96 ounces = 6 pounds.

Convert 4 pounds to ounces.

Step 1

Decide:
(Multiply) or Divide

pounds → ounces
larger → smaller

Step 2

Think:

1 lb = 16 oz,

so 4 lb = (4 × 16) oz.

Step 3

Multiply.

4 × 16 = 64

So, 4 pounds = 64 ounces.

Convert.

1. 14 lb = _____ oz

2. 12,000 lb = _____ T

3. 2 T = _____ lb

4. 7 lb = _____ oz

5. 22 lb = _____ oz

6. 16 oz = _____ lb

Compare. Write <, >, or =.

7. 1 T ◯ 3,000 lb

8. 3 lb ◯ 43 oz

9. 5 T ◯ 10,000 lb

10. 3 T ◯ 6,000 lb

11. 6 lb ◯ 96 oz

12. 16 T ◯ 6,400 lb

Name _____

Weight

CC.5.MD.1

Convert.

1. 96 oz = 6 lb

total oz → 96 ÷ oz in 1 lb → 16 = total lb → 6

2. 6 T = _____ lb

3. 18 lb = _____ oz

4. 3,200 oz = _____ lb

5. 12 T = _____ lb

6. 9 lb = _____ oz

7. 5 lb = _____ oz

8. 100 lb = _____ oz

9. 60,000 lb = _____ T

Compare. Write <, >, or =.

10. 40 oz ◯ 4 lb

11. 80 oz ◯ 5 lb

12. 5,000 lb ◯ 5 T

13. 18,000 lb ◯ 9 T

14. 25 lb ◯ 350 oz

15. 27 oz ◯ 2 lb

Problem Solving

16. Mr. Fields ordered 3 tons of gravel for a driveway at a factory. How many pounds of gravel did he order?

_____

17. Sara can take no more than 22 pounds of luggage on a trip. Her suitcase weighs 112 ounces. How many more pounds can she pack without going over the limit?

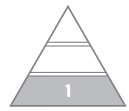
_____

Name _____

LESSON 81

Multistep Measurement Problems

OBJECTIVE Convert measurement units to solve multistep problems.



CC.5.MD.1

An ice cream parlor donated 6 containers of ice cream to a local elementary school. Each container holds 3 gallons of ice cream. If each student is served 1 cup of ice cream, how many students can be served?

Step 1 Record the information you are given.

There are 6 containers of ice cream.

Each container holds 3 gallons of ice cream.

Step 2 Find the total amount of ice cream in the 6 containers.

6×3 gallons $=$ 18 gallons of ice cream

Step 3 Convert from gallons to cups.

There are 4 quarts in 1 gallon, so 18 gallons $=$ 72 quarts.

There are 2 pints in 1 quart, so 72 quarts $=$ 144 pints.

There are 2 cups in 1 pint, so 144 pints $=$ 288 cups.

So, 288 students can be served 1 cup of ice cream.

Solve.

1. A cargo truck weighs 8,750 pounds. The weight limit for a certain bridge is 5 tons. How many pounds of cargo can be added to the truck before it exceeds the weight limit for the bridge?

_____

2. A plumber uses 16 inches of tubing to connect each washing machine in a laundry to the water source. He wants to install 18 washing machines. How many yards of tubing will he need?

_____

3. Larry has 9 gallons of paint. He uses 10 quarts to paint his kitchen and 3 gallons to paint his living room. How many pints of paint will be left?

_____

4. Ketisha is practicing for a marathon by running around a track that is 440 yards long. Yesterday she ran around the track 20 times. How many miles did she run?

_____

Name _____

Multistep Measurement Problems

CC.5.MD.1

Solve.

1. A cable company has 5 miles of cable to install. How many 100-yard lengths of cable can be cut?

Think: 1,760 yards = 1 mile.
So the cable company has 5 × 1,760, or 8,800 yards of cable.

Divide. 8,800 ÷ 100 = 88

88 lengths

2. Afton made a chicken dish for dinner. She added a 10-ounce package of vegetables and a 14-ounce package of rice to 40 ounces of chicken. What was the total weight of the chicken dish in pounds?

3. A jar contains 26 fluid ounces of spaghetti sauce. How many cups of spaghetti sauce do 4 jars contain?

4. Coach Kent brings 3 quarts of sports drink to soccer practice. He gives the same amount of the drink to each of his 16 players. How many ounces of the drink does each player get?

5. Leslie needs 324 inches of fringe to put around the edge of a tablecloth. The fringe comes in lengths of 10 yards. If Leslie buys 1 package of fringe, how many feet of fringe will she have left over?

6. Darnell rented a moving truck. The weight of the empty truck was 7,860 pounds. When Darnell filled the truck with his items, it weighed 6 tons. What was the weight in pounds of the items that Darnell placed in the truck?

Problem Solving

7. A pitcher contains 40 fluid ounces of iced tea. Shelby pours 3 cups of iced tea. How many pints of iced tea are left in the pitcher?

8. Olivia ties 2.5 feet of ribbon onto one balloon. How many yards of ribbon does Olivia need for 18 balloons?

Name _____

LESSON 82

Metric Measures

OBJECTIVE Compare, contrast, and convert metric units.

1

CC.5.MD.1

The metric system is based on place value. To convert between units, you multiply or divide by a power of 10. You **multiply** to change larger units to smaller units, such as liters to centiliters. You **divide** to change smaller units to larger units, such as meters to kilometers.

Convert 566 millimeters to decimeters.

- Think about how the two units are related.

  1 decimeter = 100 millimeters

- **Think:** Should I multiply or divide?

  Millimeters are smaller than decimeters.

  So divide, or move the decimal point left for each power of 10.

566 ÷ 100 = 5.66

millimeters *mm in 1 dm* *total decimeters*

So, 566 mm = 5.66 dm.

Metric Units of Length
1 centimeter (cm) = 10 millimeters (mm)
1 decimeter (dm) = 10 centimeters (cm)
1 meter (m) = 1,000 millimeters (mm)
1 kilometer (km) = 1,000 meters (m)

				5	6	6
kilo- (k)	hecto- (h)	deka- (da)	meter liter gram	deci- (d)	centi- (c)	milli- (m)

Complete the equation to show the conversion.

1. 115 km ◯ 10 = _____ hm

115 km ◯ 100 = _____ dam

115 km ◯ 1,000 = _____ m

2. 418 cL ◯ 10 = _____ dL

418 cL ◯ 100 = _____ L

418 cL ◯ 1,000 = _____ daL

Convert.

3. 40 cm = _____ mm

4. 500 mL = _____ dL

5. 56 kg = _____ g

6. 5,000 cL = _____ L

7. 4 kg = _____ hg

8. 200 mm = _____ cm

Name _____

Metric Measures

CC.5.MD.1

Convert.

1. 16 m = 16,000 mm

number of meters → 16 × millimeters in 1 meter → 1,000 = number of millimeters → 16,000

16 m = 16,000 mm

2. 6,500 cL = _____ L

3. 15 cm = _____ mm

4. 3,200 g = _____ kg

5. 12 L = _____ mL

6. 200 cm = _____ m

7. 70,000 g = _____ kg

8. 100 dL = _____ L

9. 60 m = _____ mm

Compare. Write <, >, or =.

10. 900 cm ◯ 9,000 mm

11. 600 km ◯ 5 m

12. 5,000 cm ◯ 5 m

13. 18,000 g ◯ 10 kg

14. 8,456 mL ◯ 9 L

15. 2 m ◯ 275 cm

Problem Solving

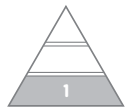
16. Bria ordered 145 centimeters of fabric. Jayleen ordered 1.5 meters of fabric. Who ordered more fabric?

_____

17. Ed fills his sports bottle with 1.2 liters of water. After his bike ride, he drinks 200 milliliters of the water. How much water is left in Ed's sports bottle?

_____

Name _____



CC.5.MD.1

LESSON 83

Problem Solving • Customary and Metric Conversions

OBJECTIVE Solve problems about customary and metric conversions using the strategy *make a table*.

You can use the strategy *make a table* to help you solve problems about customary and metric conversions.

Jon's faucet is dripping at the rate of 24 centiliters in a day. How many milliliters of water will have dripped from Jon's faucet in 24 hours?

Read the Problem

What do I need to find?

I need to find how many milliliters of water will have dripped from Jon's faucet in 24 hours.

What information do I need to use?

I need to use the number of cL that have dripped in 24 hr and the number of mL in a cL.

How will I use the information?

I will make a table to show the relationship between the number of centiliters and the number of milliliters.

Solve the Problem

Conversion Table				
	L	dL	cL	mL
1 L	1	10	100	1,000
1 dL	$\frac{1}{10}$	1	10	100
1 cL	$\frac{1}{100}$	$\frac{1}{10}$	1	10
1 mL	$\frac{1}{1,000}$	$\frac{1}{100}$	$\frac{1}{10}$	1

I can use the Conversion Table to find the number of milliliters in 1 centiliter.

There are 10 milliliters in 1 centiliter.

cL	1	2	4	24
mL	10	20	40	240

So, 240 milliliters of water will have dripped from Jon's faucet in 24 hours.

Make a table to help you solve the problems.

1. Fernando has a bucket that holds 3 gallons of water. He is filling the bucket using a 1-pint container. How many times will he have to fill the pint container in order to fill the bucket?

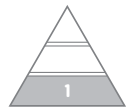
_____

2. Lexi has a roll of shelf paper that is 800 cm long. She wants to cut the paper into 1-m strips to line the shelves in her pantry. How many 1-meter strips can she cut?

_____

Name _____

Problem Solving • Customary and Metric Conversions



CC.5.MD.1

Solve each problem by making a table.

1. Thomas is making soup. His soup pot holds 8 quarts of soup. How many 1-cup servings of soup will Thomas make?

32 1-cup servings

Number of Quarts	1	2	3	4	8
Number of Cups	4	8	12	16	32

2. Paulina works out with a 2.5-kilogram mass. What is the mass of the 2.5-kilogram mass in grams?

_____

3. Alex lives 500 yards from the park. How many inches does Alex live from the park?

_____

4. Emma uses a 250-meter roll of crepe paper to make streamers. How many dekameters of crepe paper does Emma use?

_____

5. A flatbed truck is loaded with 7,000 pounds of bricks. How many tons of brick are on the truck?

_____

Name _____

LESSON 84

Elapsed Time

OBJECTIVE Convert units of time to solve elapsed time problems.

CC.5.MD.1

You can solve elapsed time problems by converting units of time.

Units of Time
60 seconds (s) = 1 minute (min)
60 minutes = 1 hour (hr)
24 hours = 1 day (d)
7 days = 1 week (wk)
52 weeks = 1 year (yr)
12 months (mo) = 1 year
365 days = 1 year

Starting at 4:20 P.M., Connie practiced piano for 90 minutes. At what time did Connie stop practicing piano?

Convert 90 minutes to hours and minutes. Then find the end time.

Step 1 To convert minutes to hours, divide.

90 ÷ 60 is 1 with a remainder of 30

90 min = 1 hr 30 min

Step 2 Count forward by hours until you reach 1 hour.

4:20 → 5:20 = 1 hour

Step 3 Count forward by minutes until you reach 30 minutes.

5:20 → 5:30 = 1 hour 10 minutes
5:30 → 5:40 = 1 hour 20 minutes
5:40 → 5:50 = 1 hour 30 minutes

Connie stops practicing piano at 5:50 P.M.

Convert.

1. 480 min = _____ hr

2. 4 d = _____ hr

3. 125 hr = ____ d ____ hr

Find the start, elapsed, or end time.

4. Start time: 7:15 A.M.

Elapsed time: 2 hr 20 min

End time: _____

5. Start time: 6:28 A.M.

Elapsed time: _____

End time: 10:08 A.M.

6. Start time: _____

Elapsed time: 5 hr 50 min

End time: 7:55 P.M.

7. Start time: 5:24 P.M.

Elapsed time: 6 hr

End time: _____

Name _____

Elapsed Time

CC.5.MD.1

Convert.

1. 5 days = 120 hr **2.** 8 hr = _____ min **3.** 30 min = _____ s

Think: 1 day = 24 hours
$5 \times 24 = 120$

4. 15 hr = _____ min **5.** 5 yr = _____ d **6.** 7 d = _____ hr

7. 24 hr = _____ min **8.** 600 s = _____ min **9.** 60,000 min = _____ hr

Find the start, elapsed, or end time.

10. Start time: 11:00 A.M.

Elapsed time: 4 hours 5 minutes

End time: _____

11. Start time: 6:30 P.M.

Elapsed time: 2 hours 18 minutes

End time: _____

12. Start time: _____

Elapsed time: $9\frac{3}{4}$ hours

End time: 6:00 P.M.

13. Start time: 2:00 P.M.

Elapsed time: _____

End time: 8:30 P.M.

Problem Solving

14. Kiera's dance class starts at 4:30 P.M. and ends at 6:15 P.M. How long is her dance class?

_____

15. Julio watched a movie that started at 11:30 A.M. and ended at 2:12 P.M. How long was the movie?

_____

Name _____

LESSON 85

Line Plots

OBJECTIVE Make and use line plots with fractions to solve problems.

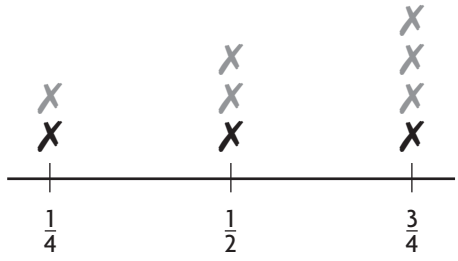
CC.5.MD.2

A **line plot** is a graph that shows the shape of a data set by placing ✗s above each data value on a number line. You can make a line plot to represent a data set and then use the line plot to answer questions about the data set.

Students measure the lengths of several seeds.
The length of each seed is listed below.

$\frac{1}{2}$ inch, $\frac{3}{4}$ inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, $\frac{3}{4}$ inch, $\frac{3}{4}$ inch, $\frac{3}{4}$ inch, $\frac{1}{4}$ inch, $\frac{1}{2}$ inch

What is the combined length of the seeds that are $\frac{1}{4}$ inch long?



Length of Seeds (in inches)

Step 1 To represent the different lengths of the seeds, draw and label a line plot with the data values $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$. Then use an ✗ to represent each seed. The line plot has been started for you.

Step 2 There are 2 ✗s above $\frac{1}{4}$ on the line plot.

Multiply to find the combined length of the seeds:

2 × $\frac{1}{4}$ = $\frac{2}{4}$, or $\frac{1}{2}$ inch

The combined length of the seeds that are $\frac{1}{4}$ inch long is $\frac{1}{2}$ inch.

You can use the same process to find the combined lengths of the seeds that are $\frac{1}{2}$ inch long and $\frac{3}{4}$ inch long.

Use the data and the line plot above to answer the questions.

1. What is the total length of all the seeds that the students measured?

_____

2. What is the average length of one of the seeds that the students measured?

_____

Name _____

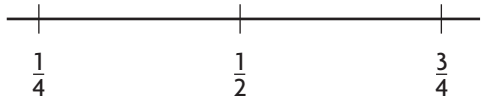
Line Plots

CC.5.MD.2

Use the data to complete the line plot. Then answer the questions.

A clerk in a health food store makes bags of trail mix. The amount of trail mix in each bag is listed below.

$\frac{1}{4}$ lb, $\frac{1}{4}$ lb, $\frac{3}{4}$ lb, $\frac{1}{2}$ lb, $\frac{1}{4}$ lb, $\frac{3}{4}$ lb,
$\frac{3}{4}$ lb, $\frac{3}{4}$ lb, $\frac{1}{2}$ lb, $\frac{1}{4}$ lb, $\frac{1}{2}$ lb, $\frac{1}{2}$ lb



Weight of Trail Mix (in pounds)

1. What is the combined weight of the $\frac{1}{4}$-lb bags? 1 lb

Think: There are four $\frac{1}{4}$-pound bags.

2. What is the combined weight of the $\frac{1}{2}$-lb bags? _____

3. What is the combined weight of the $\frac{3}{4}$-lb bags? _____

4. What is the total weight of the trail mix used in all the bags? _____

5. What is the average amount of trail mix in each bag? _____

Julie uses crystals to make a bracelet. The lengths of the crystals are shown below.

$\frac{1}{2}$ in., $\frac{5}{8}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in.,
$\frac{3}{8}$ in., $\frac{3}{4}$ in., $\frac{5}{8}$ in., $\frac{1}{2}$ in., $\frac{3}{8}$ in., $\frac{5}{8}$ in., $\frac{3}{4}$ in.

Lengths of Crystals (in inches)

6. What is the combined length of the $\frac{1}{2}$-in. crystals? _____

7. What is the combined length of the $\frac{5}{8}$-in. crystals? _____

8. What is the total length of all the crystals in the bracelet? _____

9. What is the average length of each crystal in the bracelet? _____

Name _____

LESSON 86

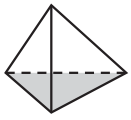
Three-Dimensional Figures

OBJECTIVE Identify, describe, and classify three-dimensional figures.

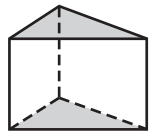
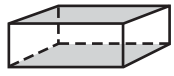
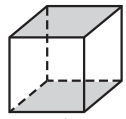
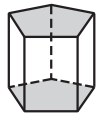
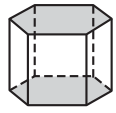
CC.5.MD.3

A **polyhedron** is a solid figure with faces that are polygons.
You can identify a polyhedron by the shape of its faces.

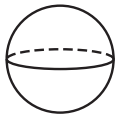
A **pyramid** is a polyhedron with one polygon base. The lateral faces of a pyramid are triangles that meet at a common vertex.

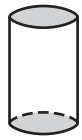
triangular pyramid	The base and faces are triangles.	
rectangular pyramid	The base is a rectangle.	
square pyramid	The base is a square.	
pentagonal pyramid	The base is a pentagon.	
hexagonal pyramid	The base is a hexagon.	

A **prism** is a polyhedron with two congruent polygons as bases. The lateral faces of a prism are rectangles.

triangular prism	The two bases are triangles.	
rectangular prism	All faces are rectangles.	
square prism or cube	All faces are squares.	
pentagonal prism	The two bases are pentagons.	
hexagonal prism	The two bases are hexagons.	

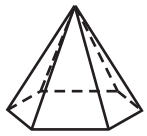
A solid figure with curved surfaces is **not a polyhedron**.

cone	The one base is a circle.	
sphere	There is no base.	

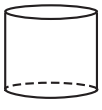
cylinder	The two bases are circles.	

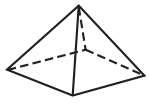
Classify the solid figure. Write *prism, pyramid, cone, cylinder,* or *sphere.*

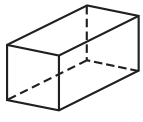
The solid figure has one base.
The rest of its faces are triangles.
So, the solid figure is a pyramid.

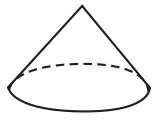


Classify each solid figure. Write *prism*, *pyramid*, *cone*, *cylinder*, or *sphere*.

1. 

2. 

3. 

4. 

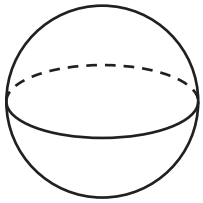
Name _____

Three-Dimensional Figures

CC.5.MD.3

Classify the solid figure. Write *prism*, *pyramid*, *cone*, *cylinder*, or *sphere*.

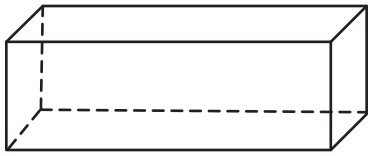
1.



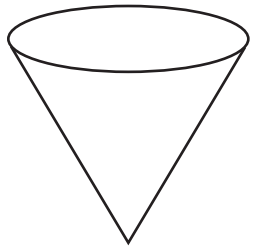
There are no bases. There is 1 curved surface. It is a

sphere

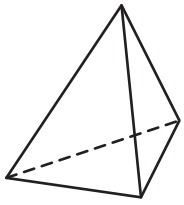
2.



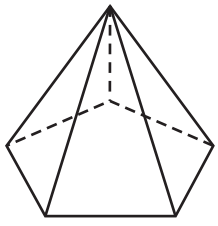
3.



4.

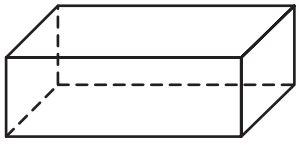


5.

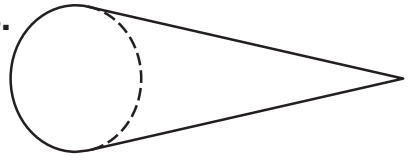


6.

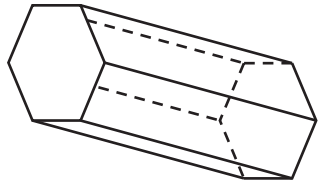
7.



8.



9.



Problem Solving

10. Darrien is making a solid figure out of folded paper. His solid figure has six congruent faces that are all squares. What solid figure did Darrien make?

11. Nanako said she drew a square pyramid and that all of the faces are triangles. Is this possible? Explain.

Name _____

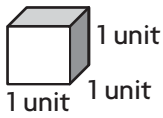
LESSON 87

Unit Cubes and Solid Figures

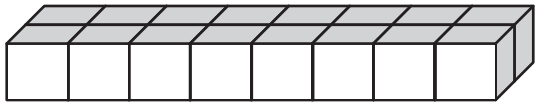
OBJECTIVE Understand unit cubes and how they can be used to build a solid figure.

CC.5.MD.3a

A **unit cube** is a cube that has a length, width, and height of 1 unit. You can use unit cubes to build a rectangular prism.



Count the number of cubes used to build the rectangular prism.



The length of the prism is made up of 8 unit cubes.

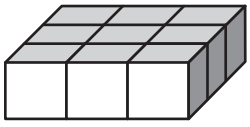
The width of the prism is made up of 2 unit cubes.

The height of the prism is made up of 1 unit cube.

The number of unit cubes used to build the rectangular prism is 16.

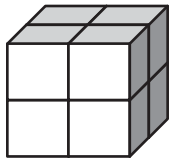
Count the number of unit cubes used to build each solid figure.

1.



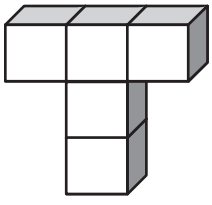
_____ unit cubes

2.



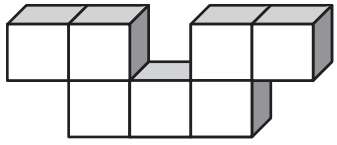
_____ unit cubes

3.



_____ unit cubes

4.



_____ unit cubes

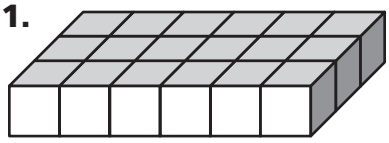
Name _____

Unit Cubes and Solid Figures

CC.5.MD.3a

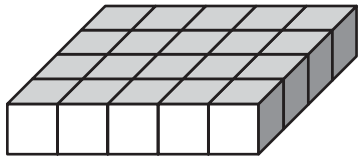
Count the number of cubes used to build each solid figure.

1.



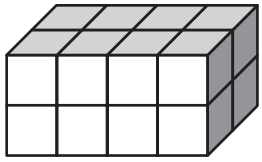
18 unit cubes

2.



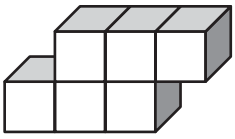
_____ unit cubes

3.



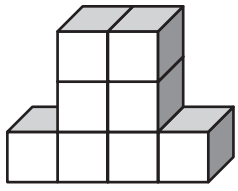
_____ unit cubes

4.



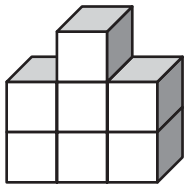
_____ unit cubes

5.



_____ unit cubes

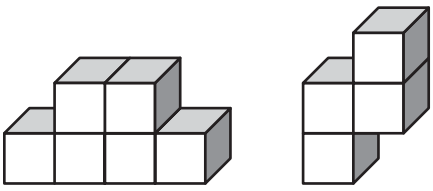
6.



_____ unit cubes

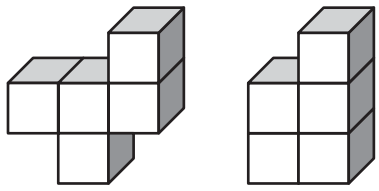
Compare the number of unit cubes in each solid figure. Use $<$, $>$, or $=$.

7.



_____ unit cubes ◯ _____ unit cubes

8.



_____ unit cubes ◯ _____ unit cubes

Problem Solving

9. A carton can hold 1,000 unit cubes that measure 1 inch by 1 inch by 1 inch. Describe the dimensions of the carton using unit cubes.

_____

_____

_____

10. Peter uses unit cubes to build a figure in the shape of the letter X. What is the fewest unit cubes that Peter can use to build the figure?

_____

Name _____

LESSON 88

Understand Volume

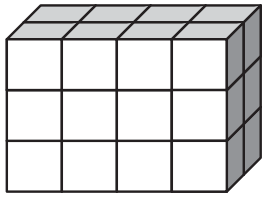
OBJECTIVE Count unit cubes that fill a solid figure to find volume.

1

CC.5.MD.3b

The **volume** of a rectangular prism is equal to the number of unit cubes that make up the prism. Each unit cube has a volume of 1 cubic unit.

Find the volume of the prism. 1 unit cube = 1 cubic inch



Step 1 Count the number of unit cubes in the bottom layer of the prism.

There are 4 unit cubes that make up the length of the first layer.

There are 2 unit cubes that make up the width of the first layer.

There is 1 unit cube that makes up the height of the first layer.

So, altogether, there are 8 unit cubes that make up the bottom layer of the prism.

Step 2 Count the number of layers of cubes that make up the prism.

The prism is made up of 3 layers of unit cubes.

Step 3 Find the total number of cubes that fill the prism.

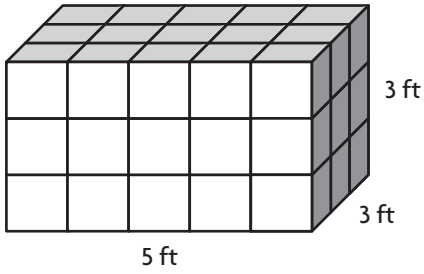
Multiply the number of layers by the number of cubes in each layer.

$3 \times 8 =$ 24 unit cubes

Each unit cube has a volume of 1 cubic inch. So, the volume of the prism is 24×1, or 24 cubic inches.

Use the unit given. Find the volume.

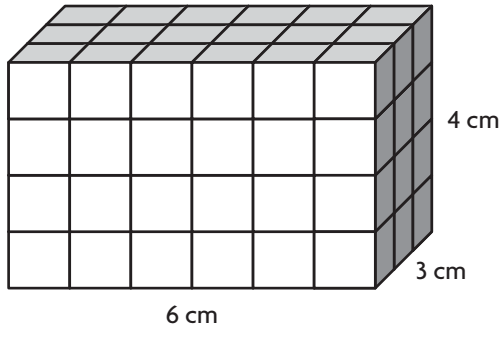
1.



Each cube = 1 cu ft

Volume = _____ cu _____

2.



Each cube = 1 cu cm

Volume = _____ cu _____

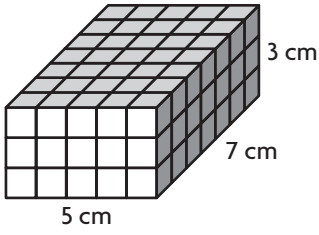
Name _____

Understand Volume

CC.5.MD.3b

Use the unit given. Find the volume.

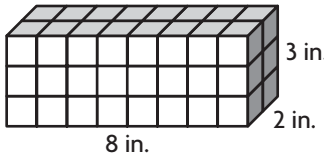
1.



Each cube = 1 cu cm

Volume = 105 cu cm

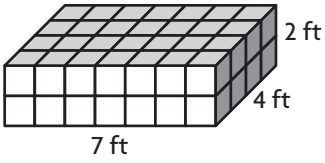
2.



Each cube = 1 cu in.

Volume = _____ cu _____

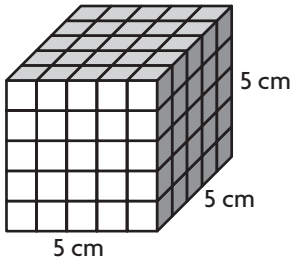
3.



Each cube = 1 cu ft

Volume = _____ cu _____

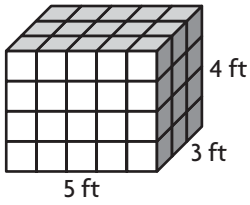
4.



Each cube = 1 cu cm

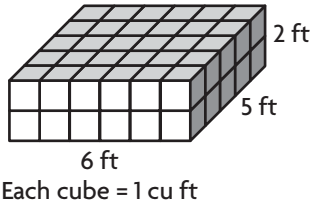
Volume = _____ cu _____

5. Compare the volumes. Write <, >, or =.



Each cube = 1 cu ft

_____ cu ft ◯ _____ cu ft



Each cube = 1 cu ft

Problem Solving

6. A manufacturer ships its product in boxes with edges of 4 inches. If 12 boxes are put in a carton and completely fill the carton, what is the volume of the carton?

7. Matt and Mindy each built a rectangular prism that has a length of 5 units, a width of 2 units, and a height of 4 units. Matt used cubes that are 1 cm on each side. Mindy used cubes that are 1 in. on each side. What is the volume of each prism?

Name _____

LESSON 89

Estimate Volume

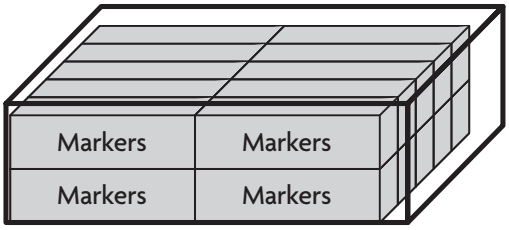
OBJECTIVE Estimate the volume of a rectangular prism.

1

CC.5.MD.4

You can estimate the volume of a larger box by filling it with smaller boxes.

Mario packs boxes of markers into a large box. The volume of each box of markers is 15 cubic inches. Estimate the volume of the large box.



The volume of one box of markers is 15 cubic inches.

Use the box of markers to estimate the volume of the large box.

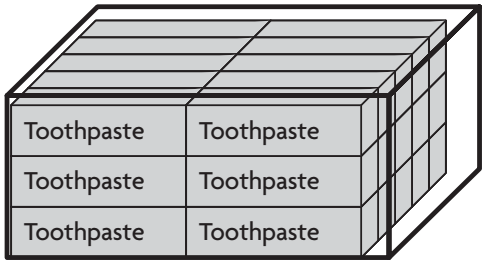
- The large box holds 2 layers of boxes of markers, a top layer and a bottom layer. Each layer contains 10 boxes of markers. So, the large box holds about 2 × 10, or 20 boxes of markers.
- Multiply the volume of 1 box of markers by the estimated number of boxes of markers that fit in the large box.

  20 × 15 = 300

So, the volume of the large box is about 300 cubic inches.

Estimate the volume.

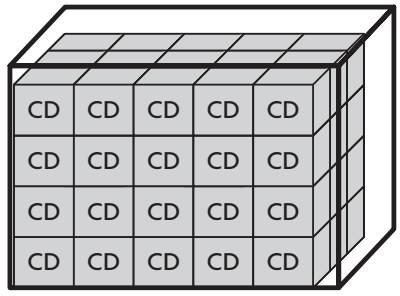
1. Each box of toothpaste has a volume of 25 cubic inches.



There are _____ boxes of toothpaste in the large box.

The estimated volume of the large box is _____ × 25 = _____ cubic inches.

2. Volume of CD case: 80 cu cm



Volume of large box: _____

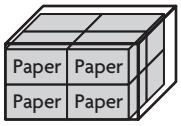
Name _____

Estimate Volume

1
CC.5.MD.4

Estimate the volume.

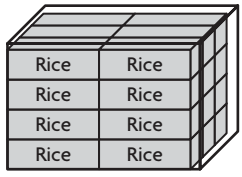
1. Volume of package of paper: 200 cu in.



Think: Each package of paper has a volume of 200 cu in. There are 8 packages of paper in the larger box.
So, the volume of the large box is about 8 × 200, or 1,600 cubic inches.

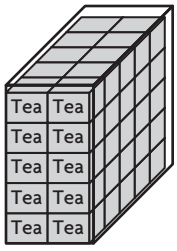
Volume of large box: 1,600 cu in.

2. Volume of rice box: 500 cu cm



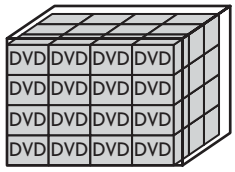
Volume of large box: _____

3. Volume of tea box: 40 cu in.



Volume of large box: _____

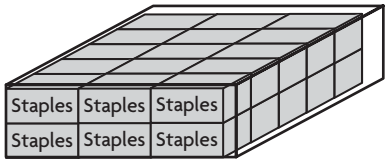
4. Volume of DVD case: 20 cu in.



Volume of large box: _____

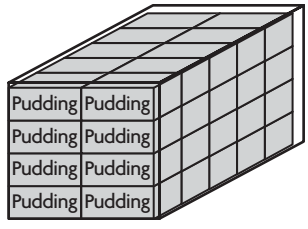
Problem Solving

5. Theo fills a large box with boxes of staples. The volume of each box of staples is 120 cu cm. Estimate the volume of the large box.



_____

6. Lisa uses pudding boxes to estimate the volume of the box below. The volume of each pudding box is 150 cu in. Estimate the volume of the large box.



_____

Name _____

LESSON 90

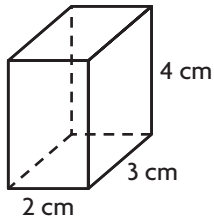
Volume of Rectangular Prisms

OBJECTIVE Find the volume of rectangular prisms.

1

CC.5.MD.5a

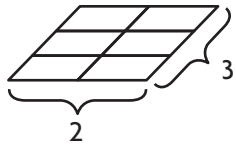
Jorge wants to find the volume of this rectangular prism. He can use cubes that measure 1 centimeter on each side to find the volume.



Step 1 The base has a length of 2 centimeters and a width of 3 centimeters. Multiply to find the area of the base.

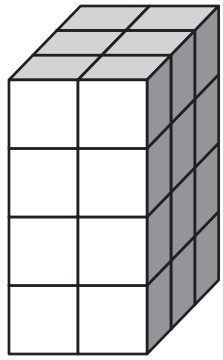
Base = 2 × 3

Base = 6 cm²



Step 2 The height of the prism is 4 centimeters. Add the number of cubes in each layer to find the volume.

Remember: Each layer has 6 cubes.



Step 3 Count the cubes. 24 cubes

Multiply the base and the height to check your answer.

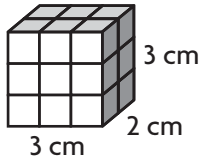
Volume = 6 × 4

Volume = 24 cubic centimeters

So, the volume of Jorge's rectangular prism is 24 cubic centimeters.

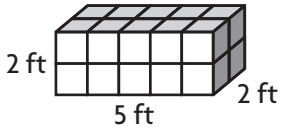
Find the volume.

1.



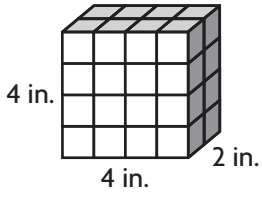
Volume: _____

2.



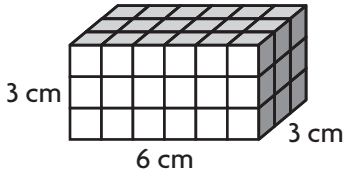
Volume: _____

3.



Volume: _____

4.



Volume: _____

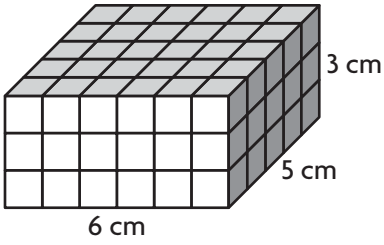
Name _____

Volume of Rectangular Prisms

CC.5.MD.5a

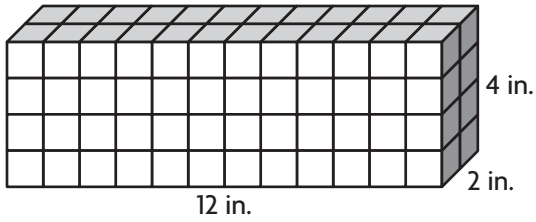
Find the volume.

1.



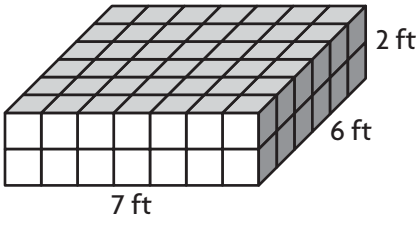
Volume: 90 cm³

2.



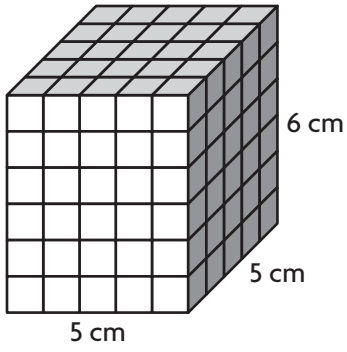
Volume: _____

3.



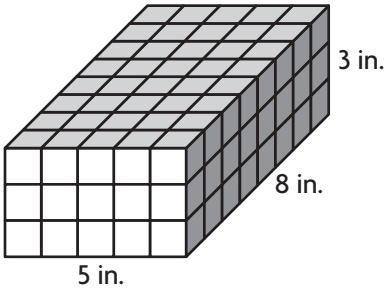
Volume: _____

4.



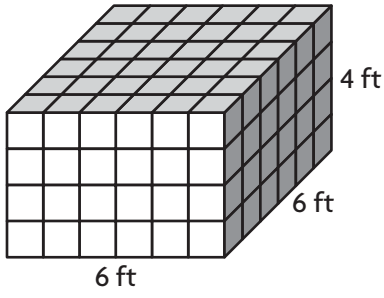
Volume: _____

5.



Volume: _____

6.



Volume: _____

Problem Solving

7. Aaron keeps his baseball cards in a cardboard box that is 12 inches long, 8 inches wide, and 3 inches high. What is the volume of this box?

_____

8. Amanda's jewelry box is in the shape of a cube that has 6-inch edges. What is the volume of Amanda's jewelry box?

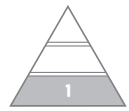
_____

Name _____

LESSON 91

Algebra • Apply Volume Formulas

OBJECTIVE Use a formula to find the volume of a rectangular prism.

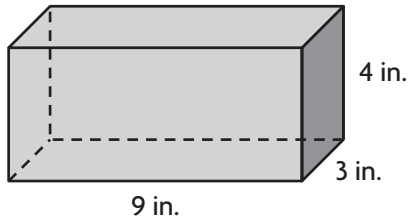


CC.5.MD.5b

You can use a formula to find the volume of a rectangular prism.

$$Volume = length \times width \times height$$
$$V = (l \times w) \times h$$

Find the volume of the rectangular prism.



Step 1 Identify the length, width, and height of the rectangular prism.

length = 9 in. width = 3 in. height = 4 in.

Step 2 Substitute the values of the length, width, and height into the formula.

$V = (l \times w) \times h$

$V = (\ 9\ \times\ 3\ ) \times\ 4$

Step 3 Multiply the length by the width.

$V = (9 \times 3) \times 4$

$V = 27 \times 4$

Step 4 Multiply the product of the length and width by the height.

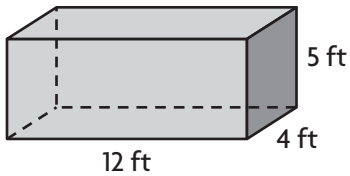
$V = 27 \times 4$

$= 108$

So, the volume of the rectangular prism is 108 cubic inches.

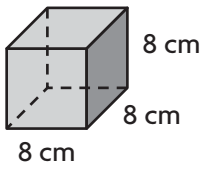
Find the volume.

1.



$V =$ _____

2.



$V =$ _____

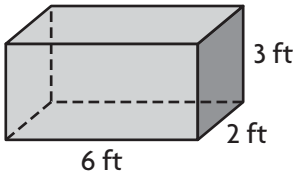
Name _____

Apply Volume Formulas

CC.5.MD.5b

Find the volume.

1.

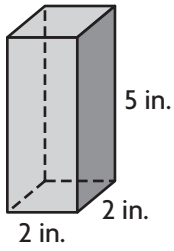


$V =$ ___*l*___ $\times$ ___*w*___ $\times$ ___*h*___

$V =$ ___6___ $\times$ ___2___ $\times$ ___3___

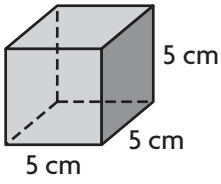
$V =$ ___36 ft³___

2.



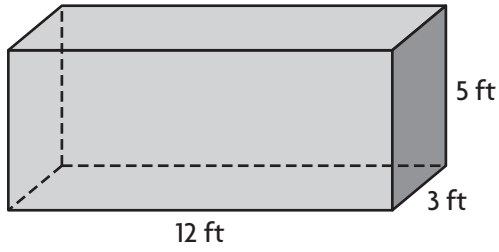
$V =$ _____

3.



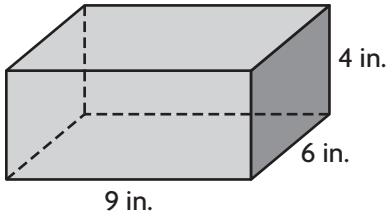
$V =$ _____

4.



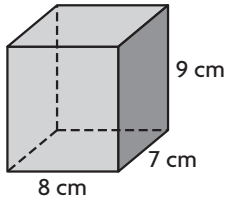
$V =$ _____

5.



$V =$ _____

6.



$V =$ _____

Problem Solving

7. A construction company is digging a hole for a swimming pool. The hole will be 12 yards long, 7 yards wide, and 3 yards deep. How many cubic yards of dirt will the company need to remove?

_____

8. Amy rents a storage room that is 15 feet long, 5 feet wide, and 8 feet high. What is the volume of the storage room?

_____

Name _____

LESSON 92

Problem Solving • Compare Volumes

OBJECTIVE Use the strategy *make a table* to compare volumes.

1

CC.5.MD.5b

A company makes aquariums that come in three sizes of rectangular prisms. The length of each aquarium is three times its width and depth. The depths of the aquariums are 1 foot, 2 feet, and 3 feet. What is the volume of each aquarium?

Read the Problem

What do I need to find?

I need to find the volume of each aquarium.

What information do I need to use?

I can use the formula for volume, $V = l \times w \times h$, or $V = B \times h$. I can use 1 ft, 2 ft, and 3 ft as the depths.

I can use the clues the length is three times the width and depth.

How will I use the information?

I will use the volume formula and a table to list all of the possible combinations of lengths, widths, and depths.

Solve the Problem

Think: The depth of an aquarium is the same as the height of the prism formed by the aquarium.

Length (ft)	Width (ft)	Depth, or Height (ft)	Volume (cu ft)
3	1	1	3
6	2	2	24
9	3	3	81

So, the volumes of the aquariums are 3 cubic feet, 24 cubic feet, and 81 cubic feet.

1. Jamie needs a bin for her school supplies. A blue bin has a length of 12 inches, a width of 5 inches, and a height of 4 inches. A green bin has a length of 10 inches, a width of 6 inches, and a height of 5 inches. What is the volume of the bin with the greatest volume?

_____

2. Suppose the blue bin that Jamie found had a length of 5 inches, a width of 5 inches, and a height of 12 inches. Would one bin have a greater volume than the other? **Explain.**

_____

_____

Name _____

Problem Solving • Compare Volumes

CC.5.MD.5b

Make a table to help you solve each problem.

1. Amita wants to make a mold for a candle. She wants the shape of the candle to be a rectangular prism with a volume of exactly 28 cubic centimeters. She wants the sides to be in whole centimeters. How many different molds can she make?

10 molds

2. Amita decides that she wants the molds to have a square base. How many of the possible molds can she use?

_____

3. Raymond wants to make a box that has a volume of 360 cubic inches. He wants the height to be 10 inches and the other two dimensions to be whole numbers of inches. How many different-sized boxes can he make?

_____

4. Jeff put a small box that is 12 inches long, 8 inches wide, and 4 inches tall inside a box that is 20 inches long, 15 inches wide, and 9 inches high. How much space is left in the larger box?

_____

5. Mrs. Nelson has a rectangular flower box that is 5 feet long and 2 feet tall. She wants the width of the box to be no more than 5 feet. If the width is a whole number, what are the possible volumes for the flower box?

_____

6. Sophina bought 3 yards of trim to put around a rectangular scarf. She wants the width of the scarf to be a whole number that is at least 6 inches and at most 12 inches. If she uses all the trim, what are the possible dimensions of her scarf? Write your answers in inches.

_____

Name _____

LESSON 93

Find Volume of Composed Figures

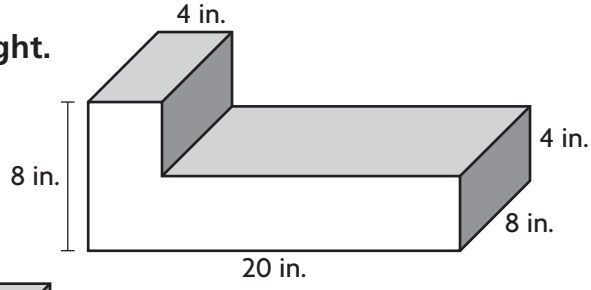
OBJECTIVE Find the volume of combined rectangular prisms.

1

CC.5.MD.5c

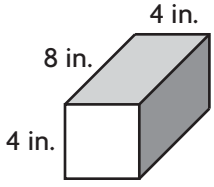
A composite figure is a solid made up of two or more solids. To find the volume of a composite figure, first find the volume of each solid that makes up the figure. Then find the sum of the volumes of the figures.

Find the volume of the composite figure at right.

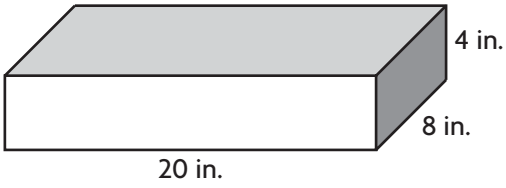


Step 1 Break apart the composite figure into two rectangular prisms. Label the dimensions of each prism.

Prism 1



Prism 2



Step 2 Find the volume of each prism.

Prism 1

$V = (l \times w) \times h$

$V =$ 4 $\times$ 8 $\times$ 4

$V = 128$ in.^{3}

Prism 2

$V = (l \times w) \times h$

$V =$ 20 $\times$ 8 $\times$ 4

$V = 640$ in.^{3}

Step 3 Find the sum of the volumes of the two prisms.

Volume of Prism 1 + Volume of Prism 2 = Volume of Composite Figure

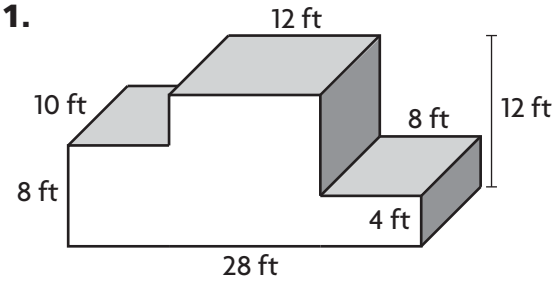
128 + 640 = Volume of Composite Figure

768 = Volume of Composite Figure

So, the volume of the composite figure is 768 in.^{3}

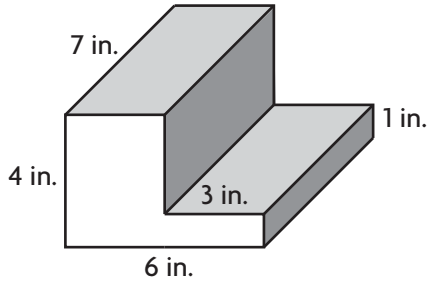
Find the volume of the composite figure.

1.



$V =$ _____

2.



$V =$ _____

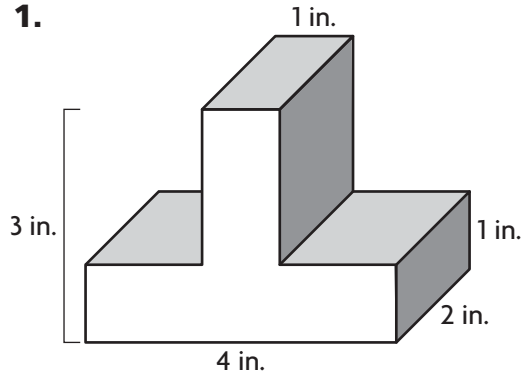
Name _____

Find Volume of Composed Figures

CC.5.MD.5c

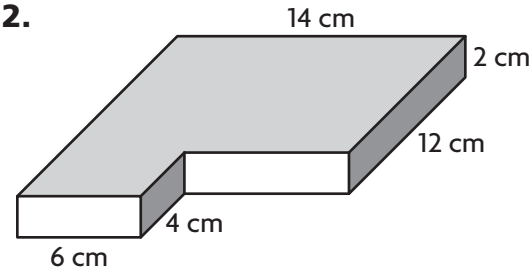
Find the volume of the composite figure.

1.



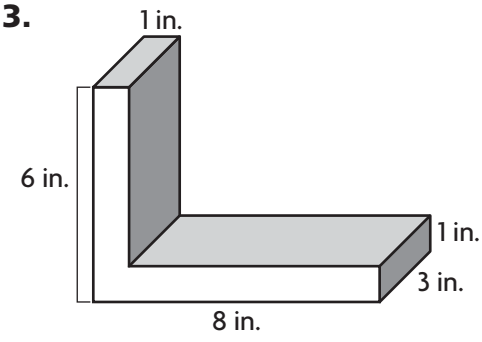
$V =$ _____

2.



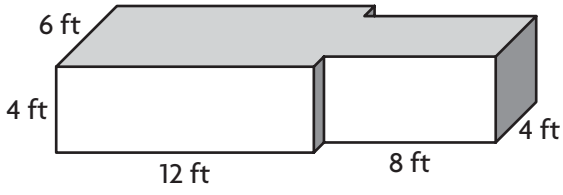
$V =$ _____

3.



$V =$ _____

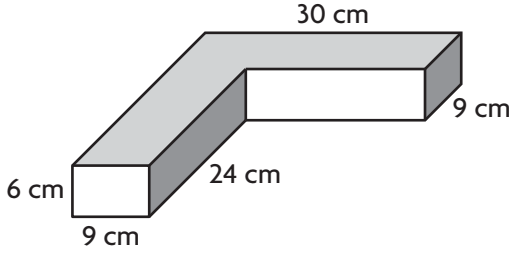
4.



$V =$ _____

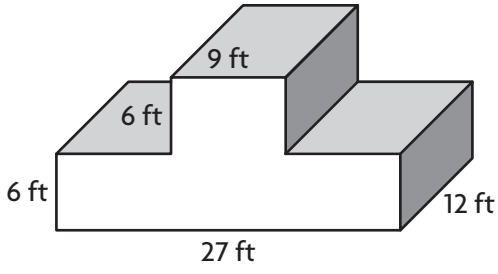
Problem Solving

5. As part of her shop class, Jules made the figure below out of pieces of wood. How much space does the figure she made take up?



_____

6. What is the volume of the composite figure below?



_____