Chapter 11

School-Home Letter

Dear Family,

Throughout the next few weeks, our math class will be studying two-dimensional and three-dimensional figures. The students will use definitions to identify and describe characteristics of these figures. We will also learn how to find volume of rectangular prisms.

You can expect to see homework that includes identifying types of triangles and quadrilaterals.

Here is a sample of how your child will be taught to classify a triangle by the length of its sides.

Vocabulary

congruent Having the same size and shape

trapezoid A quadrilateral with exactly one pair of parallel sides

polyhedron A three-dimensional figure with faces that are polygons

lateral faces Faces of a polyhedron that connect the bases

MODEL Classify a triangle by the length of its sides.

A triangle has side lengths 3 in., 2 in., and 3 in. What type of triangle is it?

STEP 1

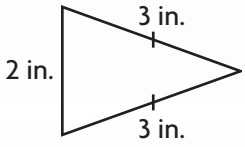
Identify how many sides are congruent.

There are 2 sides with lengths of 3 in.

STEP 2

Determine the correct classification.

A triangle with two congruent sides is isosceles.



Tips

Congruent Figures

Congruent figures are figures that have the same size and shape.

If measurements aren't given and you need to check whether a figure has pairs of congruent sides or angles, trace the figure and cut out the tracing. Then fold the figure to see if the sides or angles match.

Activity

Try to have students commit most of the classifications of triangles, quadrilaterals, and polyhedrons to memory. You can make a series of flash cards with the classifications on one side of the card and definitions and/or sketches of examples on the other side of the card.

Capítulo 11

Carta para la casa

Vocabulario

congruentes Figuras que tienen el mismo tamaño y la misma forma

trapecio Un cuadrilátero que tiene exactamente 1 par de lados paralelos

poliedro Una figura tridimensional con caras que son polígonos

caras laterales Las caras poligonales de un poliedro que conectan las bases

Querida familia

Durante las próximas semanas, en la clase de matemáticas estudiaremos las figuras bidimensionales y tridimensionales. Usaremos las definiciones para identificar y describir las características de esas figuras. También aprenderemos a hallar el volumen de los prismas rectangulares.

Llevaré a la casa tareas con actividades para identificar diferentes tipos de triángulos y cuadriláteros.

Este es un ejemplo de la manera como aprenderemos a clasificar un triángulo por sus lados.

MODELO Clasificar un triángulo por sus lados.

Los lados de un triángulo miden 3 pulg., 2 pulg. y 3 pulg. ¿Qué tipo de triángulo es?

PASO 1

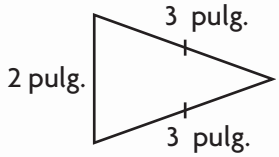
Identifica cuántos lados son iguales.

Hay dos lados que tienen la misma longitud de 3 pulg..

PASO 2

Determina la clasificación correcta.

Un triángulo con dos lados congruentes es isósceles.



Pistas

Figuras congruentes

Las figuras congruentes son figuras que tienen el mismo tamaño y la misma forma. Para comprobar si una figura tiene pares de lados o ángulos congruentes, dibuja la figura y recórtala. Luego dobla la figura para ver si los lados o los ángulos coinciden.

Para estar seguro de que dos figuras son congruentes, haz una lista de todos los lados y ángulos que corresponden uno con el otro y luego verifica que las medidas de cada par sean iguales.

Actividad

Anime a su hijo/a a memorizar las clasificaciones de los triángulos, los cuadriláteros y los poliedros. Puede hacer tarjetas nemotécnicas con las clasificaciones en un lado y las definiciones y/o ejemplos visuales en el otro lado de cada tarjeta.

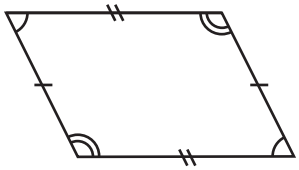
Name _____

Polygons

COMMON CORE STANDARD—5.G.3
Classify two-dimensional figures into categories based on their properties.

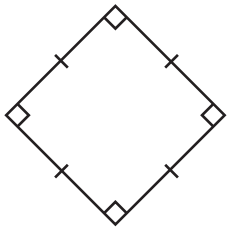
Name each polygon. Then tell whether it is a *regular polygon* or *not a regular polygon.*

1.



4 sides, 4 vertices, 4 angles means it is a quadrilateral. The sides are not all congruent, so it is not regular.

2.



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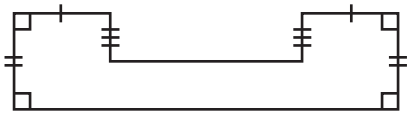
3.



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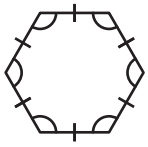

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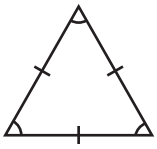
5.



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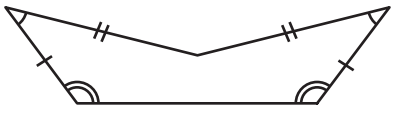
6.



_____

Problem Solving Real World

7. Sketch nine points. Then, connect the points to form a closed plane figure. What kind of polygon did you draw?

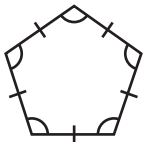
_____

8. Sketch seven points. Then, connect the points to form a closed plane figure. What kind of polygon did you draw?

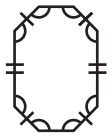
_____

Lesson Check (5.G.3)

1. Name the polygon. Write whether it is regular or not regular.



2. Name the polygon. Write whether it is regular or not regular.



Spiral Review (5.OA.2, 5.NBT.7, 5.MD.1)

3. Ann needs 42 feet of fabric to make a small quilt. How many yards of fabric should she buy?

4. Todd begins piano practice at 4:15 P.M. and ends at 5:50 P.M. How long does he practice?

5. Jenna has 30 barrettes. She is organizing her barrettes into 6 boxes. She puts the same number of barrettes in each box. Write an expression that you can use to find the number of barrettes in each box.

6. Melody had $45. She spent $32.75 on a blouse. Then her mother gave her $15.50. How much money does Melody have now?

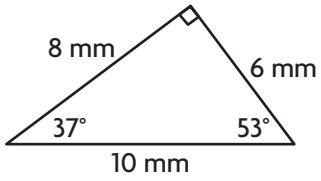
Name _____

Triangles

COMMON CORE STANDARDS—5.G.3, 5.G.4 *Classify two-dimensional figures into categories based on their properties.*

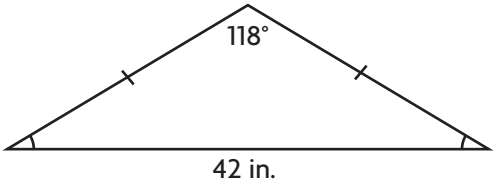
Classify each triangle. Write *isosceles, scalene,* or *equilateral.* Then write *acute, obtuse,* or *right.*

1.



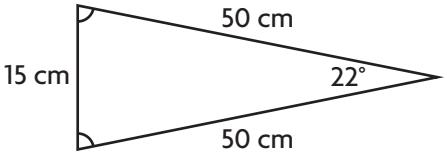
None of the side measures are equal. So, it is scalene. There is a right angle, so it is a right triangle.

2.



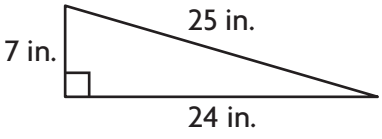
_____ _____

3.



_____ _____

4.



_____ _____

A triangle has sides with the lengths and angle measures given. Classify each triangle. Write *scalene, isosceles,* or *equilateral.* Then write *acute, obtuse,* or *right.*

5. **sides:** 44 mm, 28 mm, 24 mm
angles: 110°, 40°, 30°

_____ _____

6. **sides:** 23 mm, 20 mm, 13 mm
angles: 62°, 72°, 46°

_____ _____

Problem Solving Real World

7. Mary says the pen for her horse is an acute right triangle. Is this possible? **Explain.**

_____

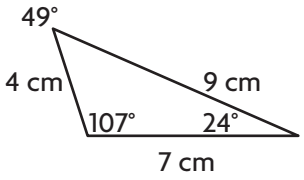
8. Karen says every equilateral triangle is acute. Is this true? **Explain.**

_____

Lesson Check (5.G.3, 5.G.4)

1. If two of a triangle's angles measure 42° and 48°, how would you classify that triangle? Write *acute, obtuse,* or *right*.

2. What is the classification of the following triangle? Write *scalene, isosceles,* or *right*.



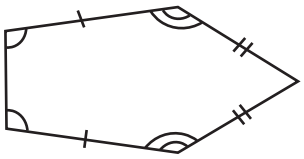
Spiral Review (5.MD.1, 5.G.3)

3. How many tons are equal to 40,000 pounds?

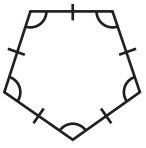
4. Choose a symbol to make the following statement true. Write >, <, or =.

6 kilometers ◯ 600 centimeters

5. What polygon is shown?



6. Name the polygon. Write whether it is regular or not regular.



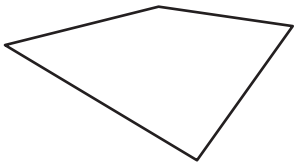
Name _____

Quadrilaterals

COMMON CORE STANDARD—5.G.4
Classify two-dimensional figures into categories based on their properties.

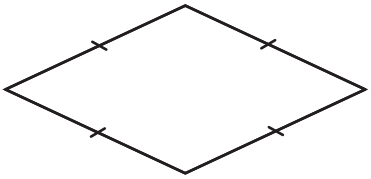
Classify the quadrilateral in as many ways as possible.
Write *quadrilateral, parallelogram, rectangle, rhombus, square,* or *trapezoid.*

1.



It has 4 sides, so it is a quadrilateral.
None of the sides are parallel, so there is no other classification.

2.



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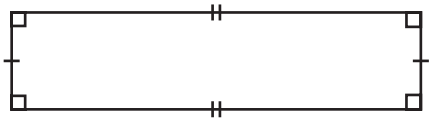

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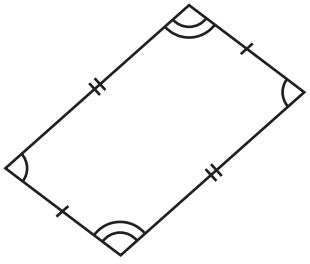

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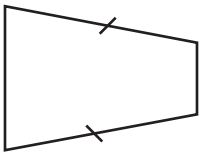

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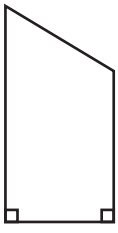


Problem Solving Real World

7. Kevin claims he can draw a trapezoid with three right angles. Is this possible? **Explain.**

8. "If a figure is a square, then it is a regular quadrilateral." Is this true or false? **Explain.**

Lesson Check (5.G.4)

1. What quadrilateral has exactly one pair of parallel sides?

_____

2. Complete the following statement. Write *sometimes, always,* or *never*.

A rhombus _____ has four congruent angles.

Spiral Review (5.NF.3, 5.MD.1, 5.G.3, 5.G.4)

3. How many kilograms are equal to 5,000 grams?

_____

4. The sides of a triangle measure 6 inches, 8 inches, and 10 inches. The triangle has one 90° angle. What type of triangle is it?

_____

5. A warehouse has 355 books to ship. Each shipping carton holds 14 books. How many cartons does the warehouse need to ship all of the books?

_____

6. How many vertices does a heptagon have?

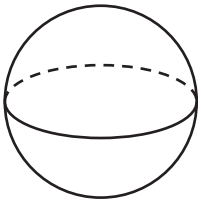
_____

Name _____

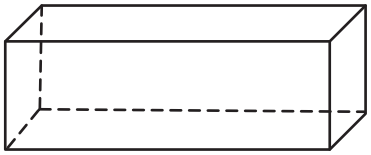
Three-Dimensional Figures

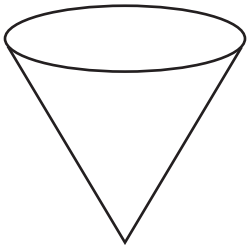
COMMON CORE STANDARD—5.MD.3
Geometric measurements: understand concepts of volume and relate volume to multiplication and to addition.

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

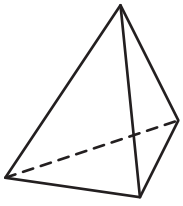
1. 

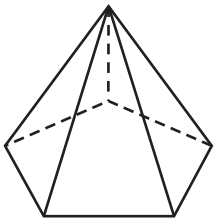
There are no bases. There is 1 curved surface. It is a sphere.

2. 

3. 

Name the solid figure.

4. 

5. 

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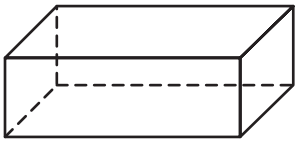
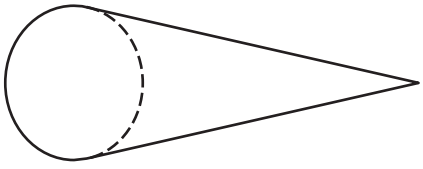
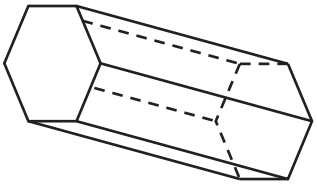
7. 

8. 

9. 

Problem Solving Real World

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.**

Lesson Check (5.MD.3)

1. Luke made a model of a solid figure with 1 circular base and 1 curved surface. What solid figure did he make?

2. How many rectangular faces does a hexagonal pyramid have?

Spiral Review (5.NF.1, 5.MD.1, 5.G.3, 5.G.4)

3. Laura walks $\frac{3}{5}$ mile to school each day. Isaiah's walk to school is 3 times as long as Laura's. How far does Isaiah walk to school each day?

4. James has $4\frac{3}{4}$ feet of rope. He plans to cut off $1\frac{1}{2}$ feet from the rope. How much rope will be left?

5. Latasha made 128 ounces of punch. How many cups of punch did Latasha make?

6. Complete the following statement. Write *sometimes, always,* or *never*.

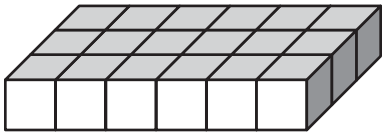
Trapezoids are _____ parallelograms.

Name _____

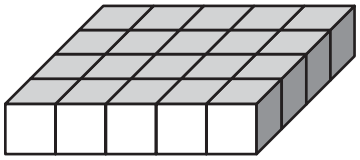
Unit Cubes and Solid Figures

COMMON CORE STANDARD—5.MD.3a
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

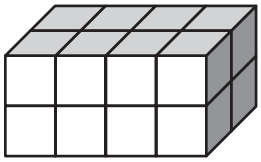
Count the number of cubes used to build each solid figure.

1. 

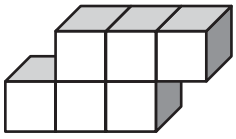
18 unit cubes

2. 

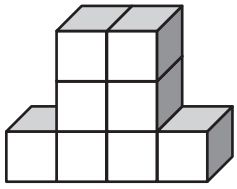
_____ unit cubes

3. 

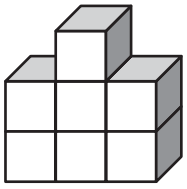
_____ unit cubes

4. 

_____ unit cubes

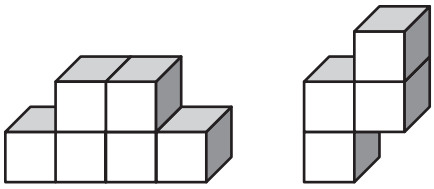
5. 

_____ unit cubes

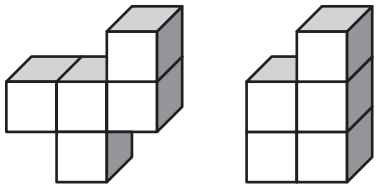
6. 

_____ 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 Real World

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.

_____

_____

_____

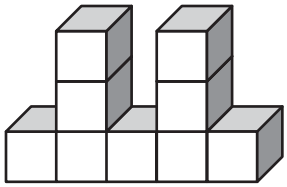
_____

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?

_____

Lesson Check (5.MD.3a)

1. Cala stacked some blocks to make the figure below. How many blocks are in Cala's figure?



2. Quentin has 18 unit cubes. How many different rectangular prisms can he build if he uses all of the cubes?

Spiral Review (5.MD.1, 5.MD.3, 5.G.4)

3. In what shape are the lateral faces of a pyramid?

4. The Arnold family arrived at the beach at 10:30 A.M. They spent $3\frac{3}{4}$ hours there. What time did they leave the beach?

5. Complete the following statement. Write *sometimes, always,* or *never*.

The opposite sides of a parallelogram

are _____ congruent.

6. The tire on Frank's bike moves 75 inches in one rotation. How many rotations will the tire have made after Frank rides 50 feet?

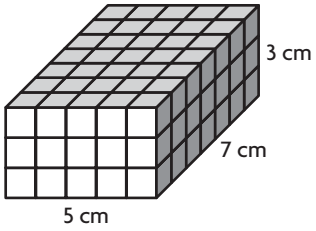
Name _____

Understand Volume

COMMON CORE STANDARDS—5.MD.3b, 5.MD.4 *Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.*

Use the unit given. Find the volume.

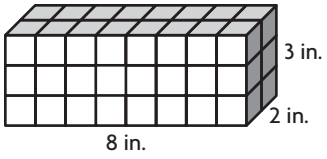
1.



Each cube = 1 cu cm

Volume = 105 cu cm

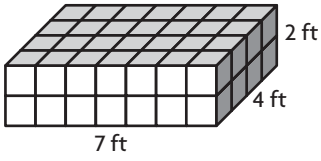
2.



Each cube = 1 cu in.

Volume = _____ cu _____

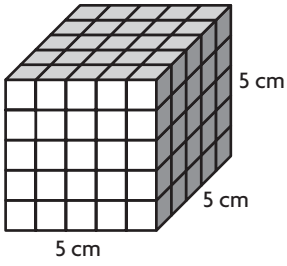
3.



Each cube = 1 cu ft

Volume = _____ cu _____

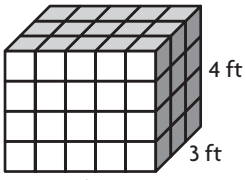
4.



Each cube = 1 cu cm

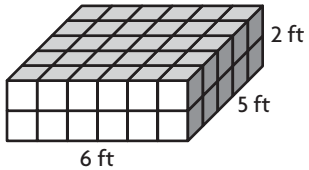
Volume = _____ cu _____

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



Each cube = 1 cu ft

_____ cu ft ◯ _____ cu ft



Each cube = 1 cu ft

Problem Solving Real World

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?

_____

_____

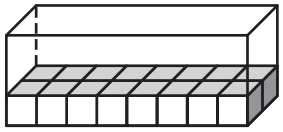
7. Matt and Mindy each built a rectangular prism that has a length of 5 units, a width of 2 units, and a height of 4 units. Matt used cubes that are 1 cm on each side. Mindy used cubes that are 1 in. on each side. What is the volume of each prism?

_____

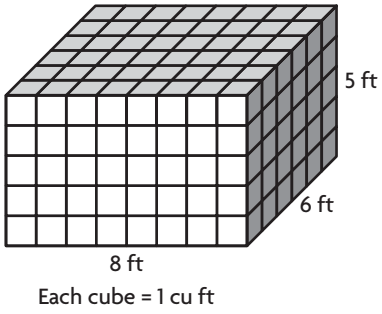
_____

Lesson Check (5.MD.3b, 5.MD.4)

1. Elena packed 48 cubes into this box. Each cube has edges that are 1 centimeter. How many layers of cubes did Elena make?

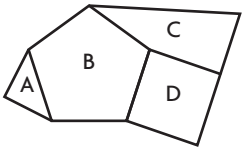


2. What is the volume of the rectangular prism?

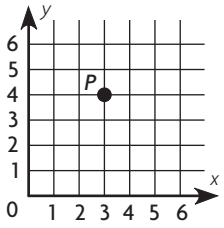


Spiral Review (5.MD.1, 5.G.1, 5.G.3, 5.G.4)

3. Juan made a design with polygons. Which polygon in Juan's design is a pentagon?



4. What ordered pair describes the location of point *P*?



5. What is the least number of acute angles that a triangle can have?

6. Karen bought 3 pounds of cheese to serve at a picnic. How many ounces of cheese did Karen buy?

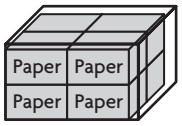
Name _____

Estimate Volume

COMMON CORE STANDARD—5.MD.4
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Estimate the volume.

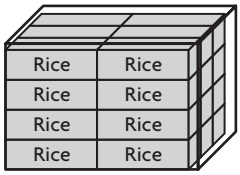
1. Volume of package of paper: 200 cu in.



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.

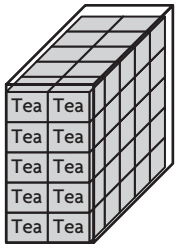
Volume of large box: 1,600 cu in.

2. Volume of rice box: 500 cu cm



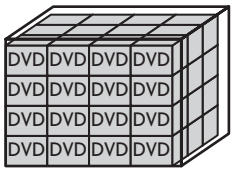
Volume of large box: _____

3. Volume of tea box: 40 cu in.



Volume of large box: _____

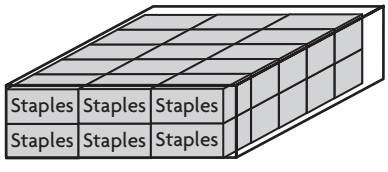
4. Volume of DVD case: 20 cu in.



Volume of large box: _____

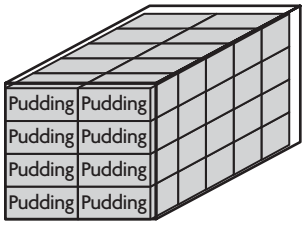
Problem Solving Real World

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.



_____

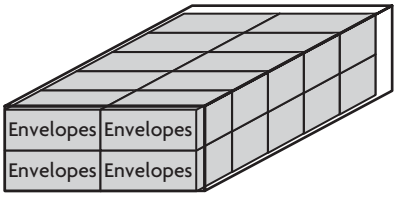
6. Lisa uses pudding boxes to estimate the volume of the box below. The volume of each pudding box is 150 cu in. Estimate the volume of the large box.



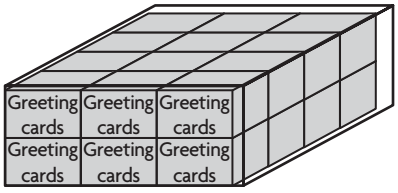
_____

Lesson Check (5.MD.4)

1. Melanie packs boxes of envelopes into a larger box. The volume of each box of envelopes is 1,200 cubic centimeters. What is the approximate volume of the large box?



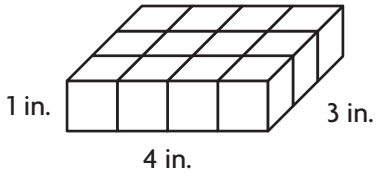
2. Calvin packs boxes of greeting cards into a larger box. The volume of each box of greeting cards is 90 cubic inches. What is the approximate volume of the large box?



Spiral Review (5.MD.1, 5.MD.3a, 5.MD.3b, 5.MD.4)

3. Rosa has 16 unit cubes. How many different rectangular prisms can she build with the cubes?

4. Each cube represents 1 cubic inch. What is the volume of the prism?



5. A certain aquarium holds 20 gallons of water. How many quarts of water does the aquarium hold?

6. Monique ran in a 5-kilometer race. How many meters did Monique run?

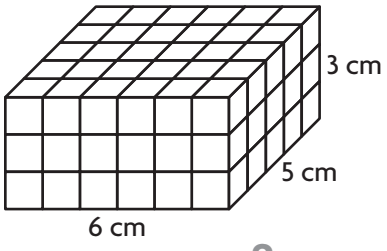
Name _____

Volume of Rectangular Prisms

COMMON CORE STANDARD—5.MD.5a
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

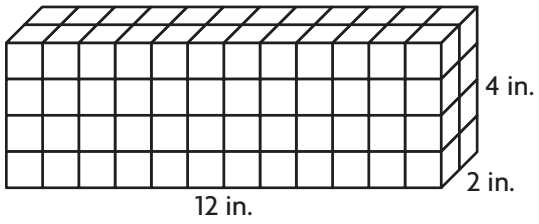
Find the volume.

1.



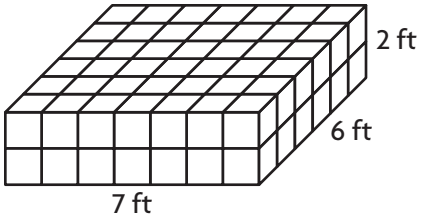
Volume: 90 cm^3

2.



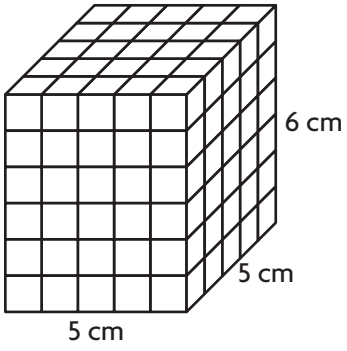
Volume: _____

3.



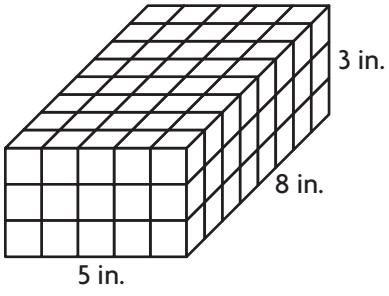
Volume: _____

4.



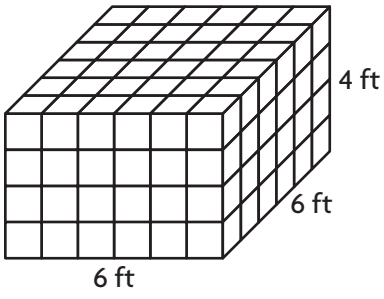
Volume: _____

5.



Volume: _____

6.



Volume: _____

Problem Solving Real World

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?

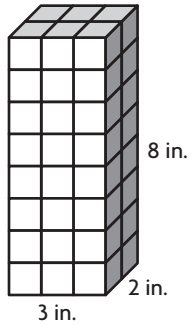
_____

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?

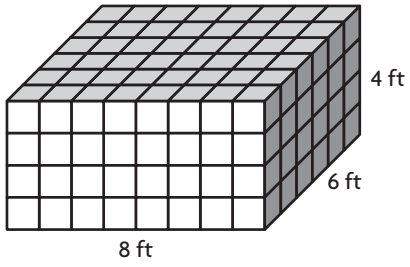
_____

Lesson Check (5.MD.5a)

1. Laini uses 1-inch cubes to build the box shown below. What is the volume of the box?

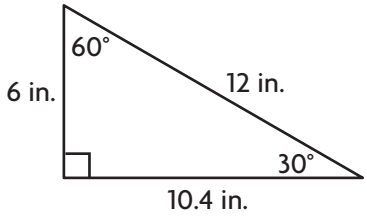


2. Mason stacked 1-foot cube-shaped boxes in a warehouse. What is the volume of the stack of boxes?



Spiral Review (5.MD.1, 5.G.3, 5.G.4)

3. What type of triangle is shown below?



4. What quadrilateral always has 4 congruent angles and opposite sides that are congruent and parallel?

5. Suzanne is 64 inches tall. What is Suzanne's height in feet and inches?

6. Trevor bought 8 gallons of paint to paint his house. He used all but 1 quart. How many quarts of paint did Trevor use?

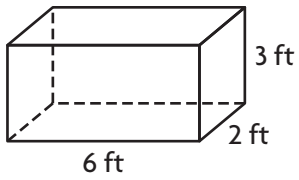
Name _____

Apply Volume Formulas

COMMON CORE STANDARDS—5.MD.5b
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

Find the volume.

1.

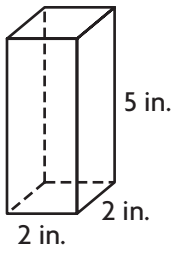


$V = \underline{l} \times \underline{w} \times \underline{h}$

$V = \underline{6} \times \underline{2} \times \underline{3}$

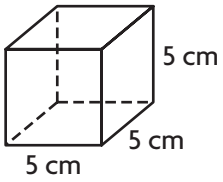
$V = \underline{36 \text{ ft}^3}$

2.



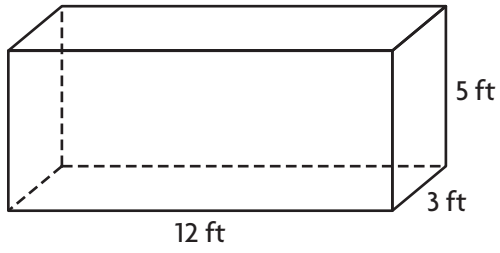
$V =$ _____

3.



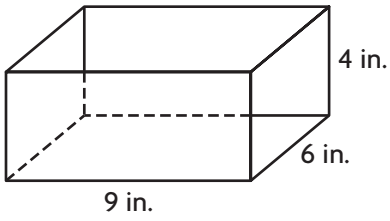
$V =$ _____

4.



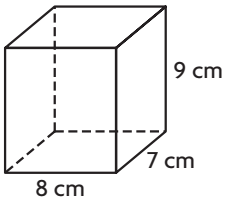
$V =$ _____

5.



$V =$ _____

6.



$V =$ _____

Problem Solving Real World

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. What is the volume of the storage room?

_____

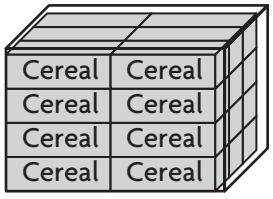
Lesson Check (5.MD.5b)

1. Sayeed is buying a crate for his puppy. The crate is 20 inches long, 13 inches wide, and 16 inches high. What is the volume of the crate?

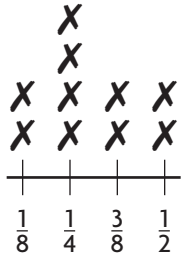
2. Brittany has a gift box in the shape of a cube. Each side of the box measures 15 centimeters. What is volume of the gift box?

Spiral Review (5.MD.1, MD.2, 5.MD.3a, 5.MD.4)

3. Max packs cereal boxes into a larger box. The volume of each cereal box is 175 cubic inches. What is the approximate volume of the large box?



4. In health class, students record the weights of the sandwiches they have for lunch. The weights are shown in the line plot below. What is the average weight of one sandwich?



Weights of Sandwiches (in pounds)

5. Chloe has 20 unit cubes. How many different rectangular prisms can she build with the cubes?

6. Darnell went to the movies with his friends. The movie started at 2:35 P.M. and lasted 1 hour 45 minutes. What time did the movie end?

Name _____

Problem Solving • Compare Volumes

COMMON CORE STANDARD—5.MD.5b
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

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.

_____

Lesson Check (5.MD.5b)

1. Corey bought a container shaped like a rectangular prism to hold his photo collection. If the container's dimensions are 6 in. by 8 in. by 10 in., what is its volume?

2. Aleka has a box for keepsakes that has a volume of 576 cubic inches. The length of the box is 12 inches and the width is 8 inches. What is the height of the box?

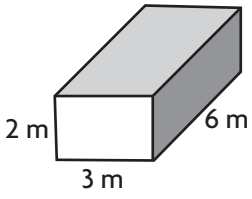
Spiral Review (5.MD.1, 5.MD.3, 5.MD.5a, 5.MD.5b)

3. A movie is 2 hours and 28 minutes long. It starts at 7:50 P.M. At what time will the movie end?

4. How many rectangular faces does a pentagonal pyramid have?

5. An aquarium is in the shape of a rectangular prism. Its length is 24 inches, its width is 12 inches, and its height is 14 inches. How much water can the aquarium hold?

6. What is the volume of the rectangular prism shown?



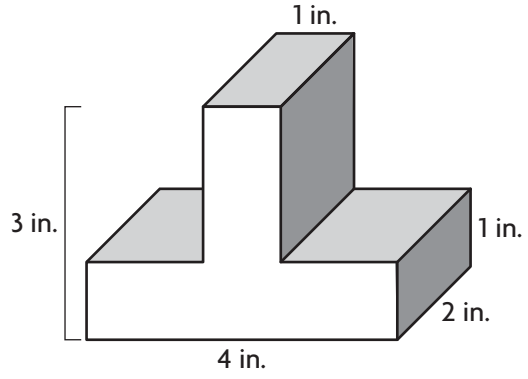
Name _____

Find Volume of Composed Figures

COMMON CORE STANDARD—5.MD.5C
Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

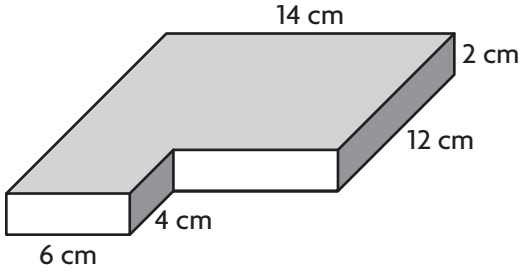
Find the volume of the composite figure.

1.



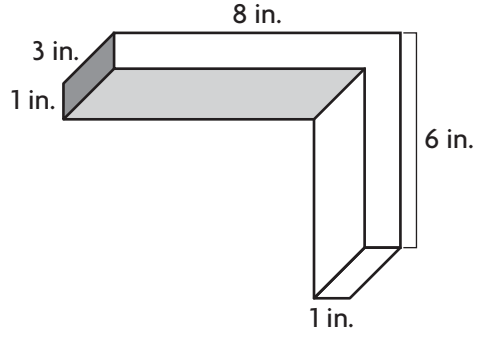
$V =$ _____

2.



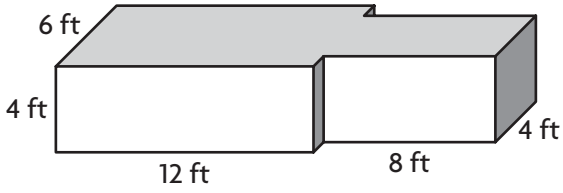
$V =$ _____

3.



$V =$ _____

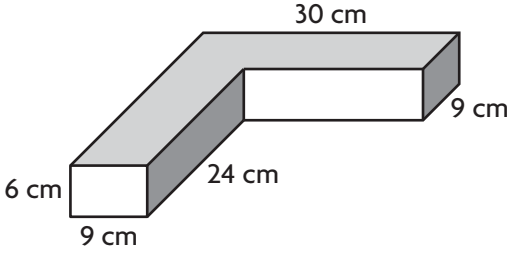
4.



$V =$ _____

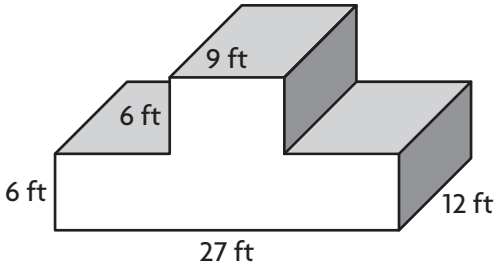
Problem Solving

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?



_____

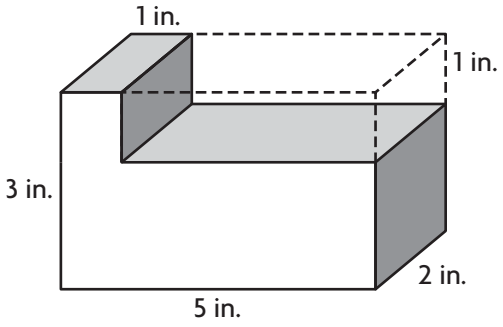
6. What is the volume of the composite figure below?



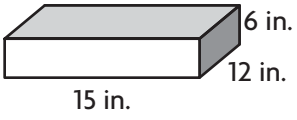
_____

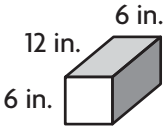
Lesson Check (5.MD.5c)

1. Write an expression to represent the volume of the composite figure.



2. Suppose you take the small prism and stack it on top of the larger prism. What will be the volume of the composite figure?

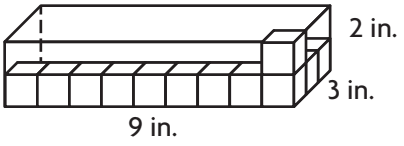




Spiral Review (5.NF.6, 5.NF.7c, 5.MD.5a, 5.MD.5b)

3. Jesse wants to build a wooden chest with a volume of 8,100 cubic inches. The length will be 30 inches and the width will be 15 inches. How tall will Jesse's chest be?

4. What is the volume of the rectangular prism?



5. Adrian's recipe for cranberry relish calls for $1\frac{3}{4}$ cups of sugar. He wants to use $\frac{1}{2}$ that amount. How much sugar should he use?

6. Joanna has a board that is 6 feet long. She cuts it into pieces that are each $\frac{1}{4}$ foot long. Write an equation to represent the number of pieces she cut.