

What We Are Learning

Area

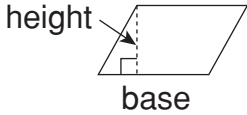
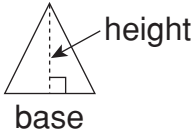
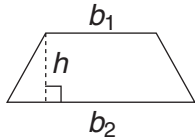
Vocabulary

These are the math words we are learning:

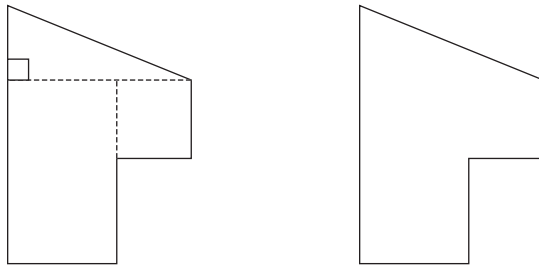
area the number of square units needed to cover a given surface

Dear Family,

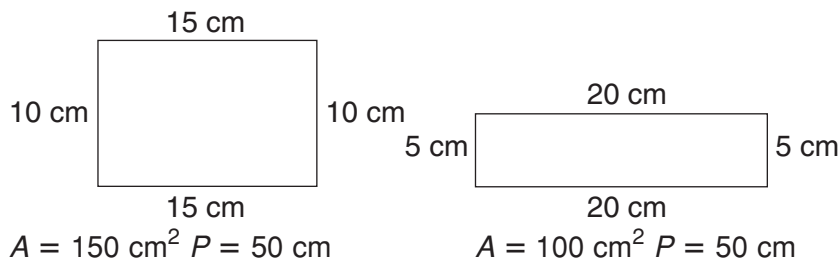
Your child will learn the area formulas for rectangles, triangles, and parallelograms. The **area** of a figure is defined as the number of square units needed to cover a given surface.

Figure	Formula	Words
	$A = bh$	Area equals base times height.
	$A = \frac{1}{2}bh$	Area equals one-half the base times the height.
	$A = \frac{(b_1 + b_2) h}{2}$	Area equals the sum of the lengths of the bases times the height divided by two.

Your child will be able to use these formulas to find the areas of composite figures. For example, the composite figure below can be divided into different groupings of recognizable polygons. You can find the area of each and combine the areas to find the area of the composite figure.

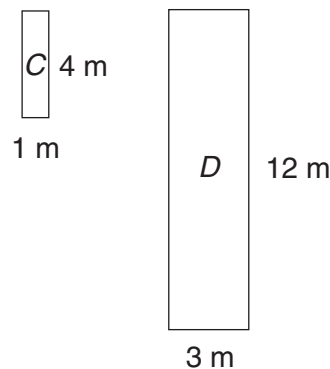


Your child will learn about the relationship between perimeter and area. Some figures can have the same perimeter while having different areas. For example:



Your child may be given a set perimeter and asked to find the largest area that can be contained within it.

Another relationship between the area and perimeter of a figure is shown when enlarging a figure. If the dimensions of a figure are all multiplied by the same number, the area increases to equal the area of the smaller figure multiplied by the square of the dimension multiplier.



For C :

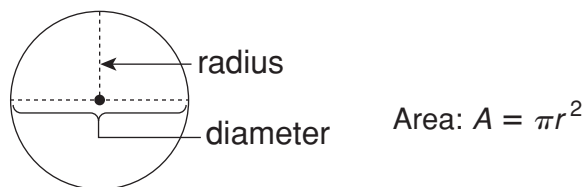
$$A = 4 \text{ m}^2$$

For D :

$$A = 4 \times 3^2 = 4 \times 9 = 36$$

$$A = 3 \times 12 = 36$$

Your child will also find the area of a circle. Your child will need to use this formula to find the area of a circle.



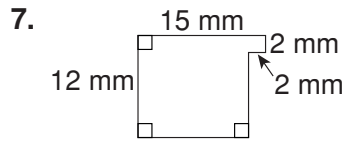
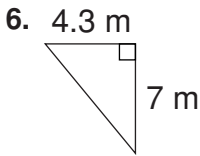
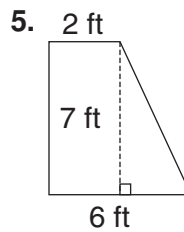
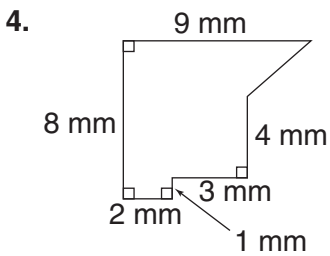
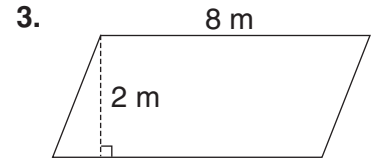
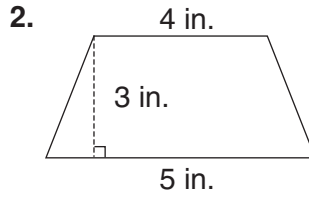
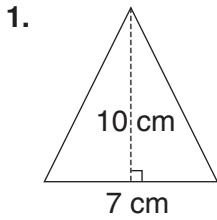
The ratio between the circumference of a circle and the diameter is called *pi*, represented by the symbol π . Your child may use the decimal approximation 3.14 or the fraction $\frac{22}{7}$ as a numeric substitution for *pi*.

Have your child explain the difference between the area, and perimeter or circumference of a figure. He or she will continue to use these formulas throughout most math programs.

Sincerely,

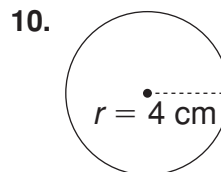
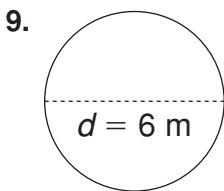
CHAPTER 10 **Family Letter**
Area

Find the area of each polygon.



8. Brenda has a 3 inch \times 5 inch photo of a sunset. If she enlarges this photo so it will fit in a 12 inch \times 20 inch frame, how will its area change?

Find the area and circumference of each circle. Use $\frac{22}{7}$ for π .



Answers: 1. 35 cm^2 2. 13.5 in^2 3. 16 m^2 4. 43 mm^2 5. 28 ft^2 6. 15.05 m^2 7. 160 mm^2 8. It will increase 16 times. 9. 28.29 m^2 ; 18.86 m 10. 50.29 cm^2 ; 25.14 cm

CHAPTER

10

Family Fun

Dimension Creation

Shapes may cover the same area, but have different perimeters. How many different figures can you create with a certain area? Be creative!

Directions

- Cut out the cards. Pick an area card from the pile.
- Draw and label 3 figures with that area.
- Calculate the perimeters of each. You earn 1 point for each perimeter that is correctly calculated.
- You earn 1 point for each quadrilateral, 3 points for each triangle, and 5 points for each circle that covers that particular area.
- The person with the most points is the winner.

Perimeter =	Perimeter =	Perimeter =

24 m²	18 m²	36 m²
100 cm²	42 cm²	12 cm²
56 in²	8 in²	25 in²

What We Are Learning

Volume and Surface Area

Vocabulary

These are the math words we are learning:

base a face of a three-dimensional figure that usually determines the name of the figure

cone a solid figure with a circular base and a curved surface that comes to a point

cylinder a solid figure with two parallel, congruent, circular bases connected by a curved lateral surface

edges the intersection of two faces of a polyhedron

face the flat sides of a polyhedron

net an arrangement of two-dimensional figures that folds to form a polyhedron

polyhedron a solid figure in which all the surfaces or faces are polygons

prism a polyhedron with two congruent, parallel bases, and parallelogram faces

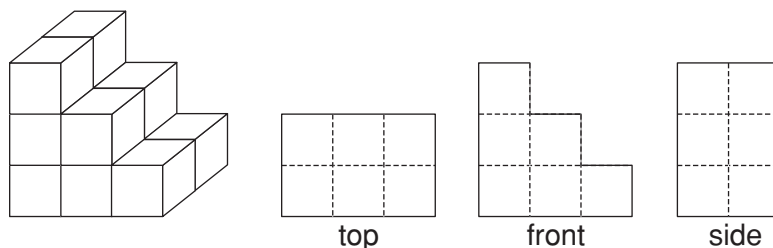
pyramid a polygon-shaped base with triangular faces that come to a point named for the shape of its base

surface area the sum of the areas of the faces of a solid figure

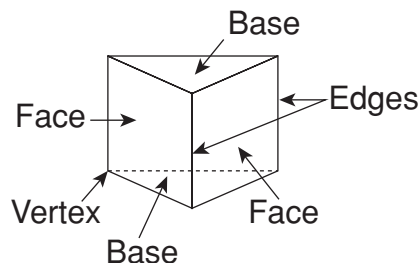
Dear Family,

Your child will continue learning about geometric shapes. In this section, your child will be introduced to solid figures. Solid figures are three-dimensional, which means they have depth, as well as length and height.

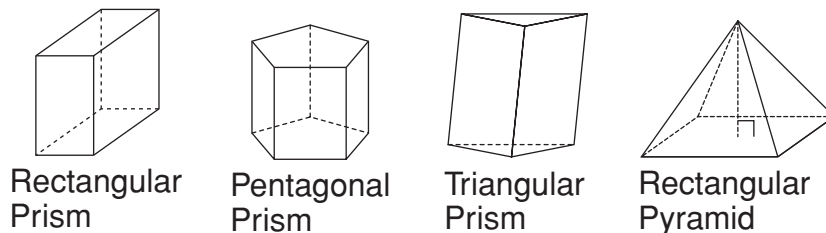
Your child will learn to study three-dimensional figures from different views. When presented with three different views of objects, front, side, and top, your child will be able to visualize and draw the three-dimensional object.



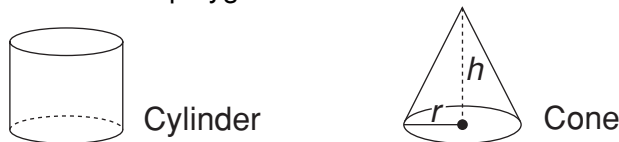
A special type of solid figure is a **polyhedron**. The sides, or **faces**, of a polyhedron are polygons. The **edges** are formed by two faces, and a **vertex** is formed by three or more edges.



A **prism** is a special polyhedron that has two congruent, parallel bases, and parallelogram faces. Prisms are named for the shape of their bases. A **pyramid** has a polygon shaped base, but the other faces are triangles. It is also named for its base.



Cylinders and **cones** are NOT polyhedra because not every surface is a polygon.



vertex the point at which three or more edges of a figure meet

volume the number of cubic units needed to fill a space

Your child will use these volume formulas to find the volume of each solid figure.

Rectangular Prism	Triangular Prism	Cylinder
$V = \ell wh$	$V = Bh$	$V = \pi r^2 h$

Cones and pyramids have the same formula for finding their volumes, which is slightly different from the formulas for other solids. The formula is $V = \frac{1}{3}(Bh)$, where B is the area of the base and h is the height of the pyramid. In the case of a cone, B will be the formula for the area of a circle, whereas in a pyramid, B will be the formula for the area of whatever type of base the pyramid has.

Your child will also learn to find the **surface area** of many solid figures. To find the surface area of a prism, your child can use a net. A **net** is the pattern made when the solid is laid out flat showing each face of the solid. To find the surface area, add the areas of each face.

Your child will use these formulas to find the surface area of a pyramid and a cylinder.

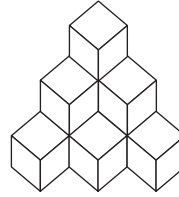
Pyramid	Cylinder
$S = s^2 + 4\left(\frac{1}{2}bh\right)$	$S = h(2\pi r) + 2(\pi r^2)$

Your child will use these formulas in most math classes. These formulas are also used in many real-life situations.

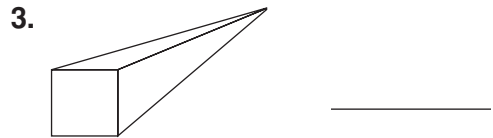
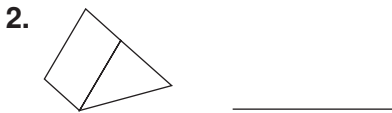
Sincerely,

CHAPTER 10 **Family Letter**
Volume and Surface Area

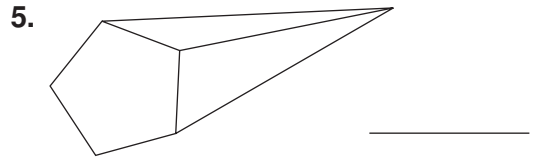
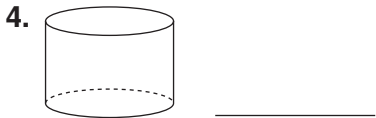
1. Draw top, side, and front views of the solid.



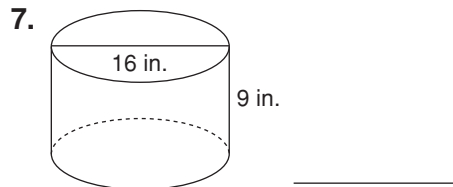
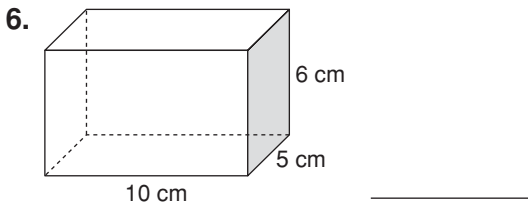
Identify the number of faces, edges, and vertices in each solid figure.



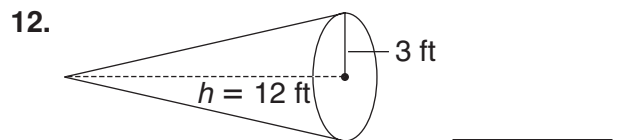
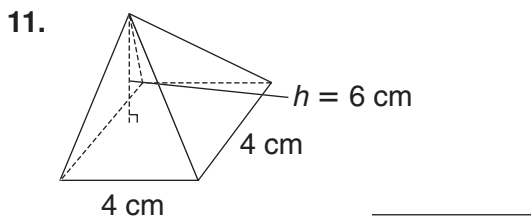
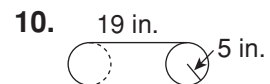
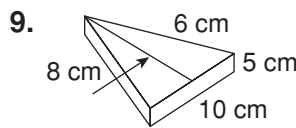
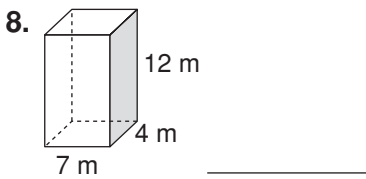
Tell whether each figure is a polyhedron and name the solid.



Find the surface area of each figure.



Find the volume of each solid.



Answers: 1. top side front
2. 5 faces 9 edges 6 vertices 3. 5 faces 8 edges 5 vertices 4. no; cylinder
5. yes; pentagonal pyramid 6. 280 cm² 7. 854.1 in² 8. 336 m³ 9. 200 cm³ 10. 1,491.5 in³ 11. 32 cm³ 12. 113.04 ft³

CHAPTER

Family Fun

10

Word Find

Directions

Unscramble the vocabulary words in the box.

Find those words hidden in the puzzle.

enco	derlcyin	cefa	smipr	xeevtr	eegd
oornehylpd	yrmdiap	tne	frsucea aare	mlveou	seba

S O E I I S B C N M P R
 F U E M K P Y W S Y O C
 U P R F U L J I D N L C
 D U T F I L R R F X Y M
 S O Z N A P O S A E H Y
 K C D T O C S V C T E Y
 C E B A S E E H E R D W
 R O V P D L V A P E R O
 C T N G T E N R R V O F
 W I E E M K M I F E N D
 D I M A R Y P V U L A W
 T C O S T O D J B F Q R

Answer: cone, cylinder, face, prism, vertex, edge, pyramid, pyramid, net, surface area, volume, base