

What We Are Learning

Perimeter, Circumference, and Area

Vocabulary

These are the math words we are learning:

area the number of unit squares needed to cover a given surface

base the length of one side of a parallelogram

center the point inside a circle that is the same distance from all the points on the circle

circle the set of all points in a plane that are the same distance from a given point called the center

circumference the distance around a circle

composite figure a figure made up of simple geometric shapes

diameter a line segment that passes through the center of the circle and has both endpoints on the circle

height the perpendicular distance from the base to the opposite side of a parallelogram

perimeter the sum of the lengths of the sides of a polygon

π the ratio of the circumference to the diameter of any circle, approximately 3.14

radius a line segment with one endpoint at the center of the circle and the other endpoint on the circle

Dear Family,

The student will use concepts from previous sections to determine the perimeter of figures and the circumference of circles. Simply put, the **perimeter** of a figure is the sum of the lengths of its sides, or the distance around the figure.

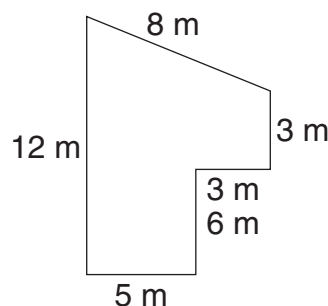
Circumference is the distance around a circle.

The student will use these formulas for finding the perimeter of a parallelogram and the circumference of a circle.

Perimeter of a Parallelogram	Circumference of a Circle
$P = 2\ell + 2w$ $\ell = \text{length}$ $w = \text{width}$	$C = 2\pi r$ or $C = \pi d$ $r = \text{radius}$ $d = \text{diameter}$

The value π is an irrational number that is approximately 3.14 or $\frac{22}{7}$ and is represented by the symbol, π .

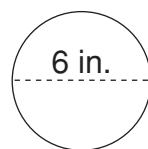
Find the perimeter of the figure.



Add the lengths of the sides.
 $P = 8 + 3 + 3 + 6 + 5 + 12$
 $P = 37$

The perimeter is 37 m.

Find the circumference of the circle to the nearest tenth of an inch. Use 3.14 for π .



$$C = \pi d$$

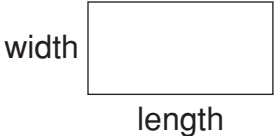
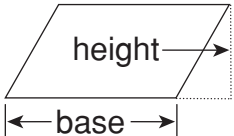
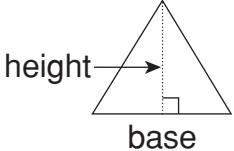
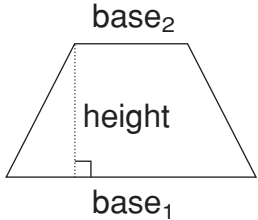
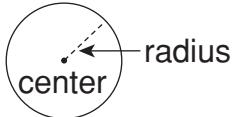
$$C \approx 3.14 \cdot 6$$

$$C \approx 18.84$$

You know the diameter. Substitute 3.14 for π and 6 for d . Multiply.

The circumference of the circle is about 18.8 inches.

The student will also be learning how to find the **area** of different types of figures. He or she will use the following formulas to find the area of these figures.

Area Formulas	
<p>Rectangle</p> 	$A = \ell w$ Area = length · width
<p>Parallelogram</p> 	$A = bh$ Area = base · height
<p>Triangle</p> 	$A = \frac{1}{2}bh$ Area = $\frac{1}{2}$ · base · height
<p>Trapezoid</p> 	$A = \frac{1}{2}h(b_1 + b_2)$ Area = $\frac{1}{2}$ · height · (base ₁ + base ₂)
<p>Circle</p> 	$A = \pi r^2$ Area = π · radius ²

Discuss with the student the difference between finding area and perimeter. To help the student practice these important skills, you may want to provide the student opportunities to calculate the area of different figures in your home.

Sincerely,

What We Are Learning

Volume and Surface Area

Vocabulary

These are the math words we are learning:

base a face by which a three-dimensional figure is classified

cube a polyhedron formed by six congruent square faces

edge the intersection of two faces of a polyhedron

face a flat surface of a polyhedron

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

polyhedron a three-dimensional object in which all the surfaces or faces are polygons

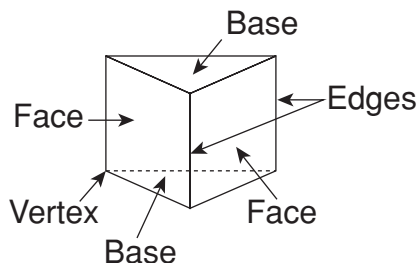
surface area the sum of the areas of the faces of a three-dimensional figure

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

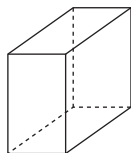
volume the number of cubic units needed to fill a space

Dear Family,

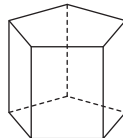
The student will be studying three-dimensional figures. A special type of three-dimensional figure is a **polyhedron**. The sides, or **faces**, of a polyhedron are polygons. The **edges** are formed by two faces, and a **vertex** is formed by three or more edges.



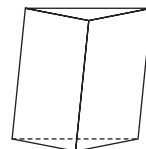
A **prism** is a special polyhedron that has two congruent, parallel bases that are polygons. The remaining faces are rectangles. Prisms are named for the shape of their bases. A **pyramid** has a polygon-shaped base, but the other faces are triangles. A pyramid is also named for its base.



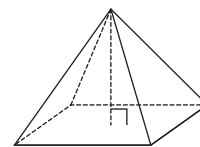
Rectangular Prism



Pentagonal Prism

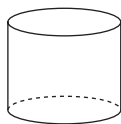


Triangular Prism

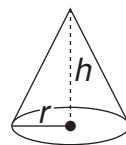


Rectangular Pyramid

Cylinders and **cones** are three-dimensional figures that are NOT polyhedrons because their surfaces are not polygons.



Cylinder

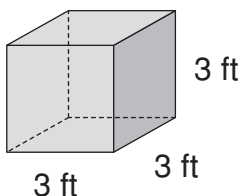


Cone

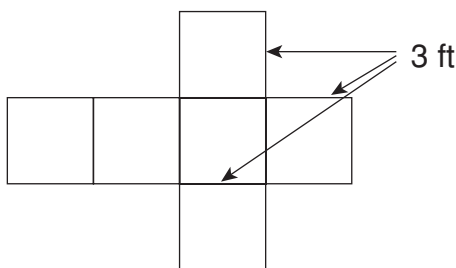
Volume is the number of cubic units needed to fill a space. The student will use the following volume formulas.

Volume Formulas		
Rectangular Prism	Triangular Prism	Cylinder
$V = Bh$, where B = area of the rectangular base, lw	$V = Bh$, where B = area of the triangular base, $\frac{1}{2}bh$	$V = Bh$, where B = area of the circular base, πr^2

The surface area of a three-dimensional figure is the sum of the areas of its surfaces. To find the surface area of a three-dimensional figure, the student can use a net. A **net** is the pattern made when the figure is laid out flat. To find the surface area, add the areas of each face.



The cube can be spread out to form a net.



A cube has six congruent square faces. Find the area of one face, and then multiply by 6 to find the surface area, S .

$$A = s^2$$

$$A = 3^2 = 9$$

$$S = 9 \cdot 6 = 54 \text{ ft}^2$$

The surface area of the 3 ft by 3 ft by 3 ft cube is 54 ft^2 .

The following table will help the student remember how to find surface area of various three-dimensional figures.

Surface Area Formulas		
Rectangular Prism	Square Pyramid	Cylinder
$S = 2(\text{area of front face})$ $+$ $2(\text{area of top face})$ $+$ $2(\text{area of side face})$	$S = \text{area of square base}$ $+$ $(4 \times \text{area of triangular face})$ $=$ $s^2 + (4 \times \frac{1}{2}bh)$	$S = \text{area of curved surface}$ $+$ $(2 \text{ times area of base})$ $=$ $(h \cdot 2\pi r) + (2 \cdot \pi r^2)$

The student will use these formulas in most math classes and in many real-life situations.

Sincerely,