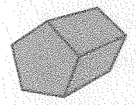
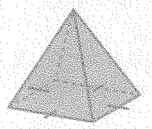
Set A, pages 454–457

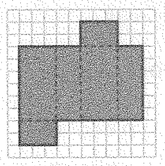
To classify a polyhedron, first determine whether it is a prism or a pyramid. Then use the shape of its base to name it.



This figure has two congruent parallel bases, so it is a prism. The bases are pentagons, so it is a **pentagonal prism**.



This figure has one base, and the edges are joined at a point outside the base, so it is a pyramid. The base is a square and the faces are triangles, so it is a **square pyramid**.

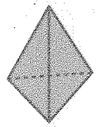


A **net** shows what a polyhedron would look like "unfolded," with all surfaces on the plane. This is a net of a rectangular prism.

Remember that not all solids are polyhedrons. Cylinders, spheres, and cones have curved surfaces and are not polyhedrons.

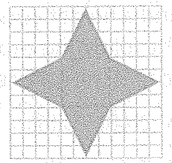
Identify each solid figure in **1** through **3**, and state whether the solid figure is a polyhedron.

1. 

2. 

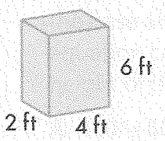
3. 

4. What figure can be made from this net?



Set B, pages 458–460

To find the total surface area (*SA*) of a polyhedron, add the areas of each face. Find the *SA* of the rectangular prism below.



All faces are rectangles. The opposite faces of a rectangular prism have the same area. The prism has a length (ℓ) of 4 feet, a width (w) of 2 feet, and a height (h) of 6 feet.

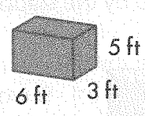
The formula for the area of a rectangle is $\ell \times w$.

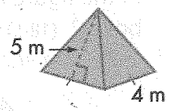
$SA = 2(\ell \times w) + 2(w \times h) + 2(\ell \times h)$
$= 2(4 \times 2) + 2(2 \times 6) + 2(4 \times 6)$
$= 2(8) + 2(12) + 2(24)$
$= 16 + 24 + 48$
$= 88 \text{ ft}^2$

The surface area of the rectangular prism is 88 ft².

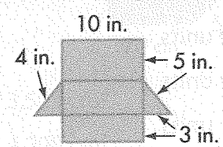
Remember that surface area is always measured in square units, such as in², ft², and m².

Find the surface area of each solid.

1. 

2. 

3. Use the net to find the surface area of the triangular prism.



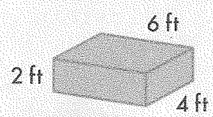
Set C, pages 462–465

To find the volume (V) of a rectangular prism, multiply the area of the base (B) by the height (h) of the figure:

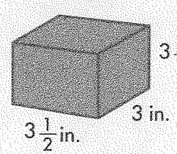
Volume (V) = area of base × height = $B \times h$

Since the area of the base of a rectangular prism is the length (ℓ) multiplied by the width (w) you also can use the formula:

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



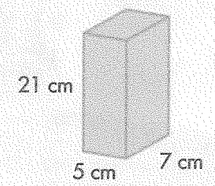
Volume of a rectangular prism:
$B = \ell \times w = 4 \text{ ft} \times 6 \text{ ft} = 24 \text{ ft}^2$
$V = 24 \text{ ft}^2 \times 2 \text{ ft} = 48 \text{ ft}^3$

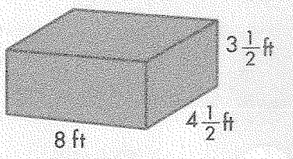


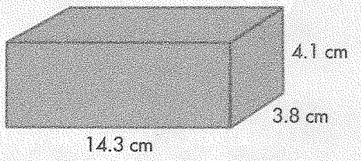
Volume of a rectangular prism with fractional edge lengths:
$V = \ell \times w \times h$
$= 3\frac{1}{2} \text{ in.} \times 3 \text{ in.} \times 3\frac{3}{4} \text{ in.}$
$= 39\frac{3}{8} \text{ in}^3$

Remember that volume is always measured in cubic units, such as in³, ft³, and m³.

Find the volume of each solid.

1. 

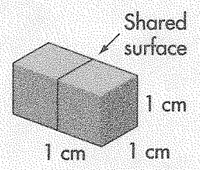
2. 

3. 

Set D, pages 466–468

You can use objects and reasoning to find patterns and solve problems.

The blocks in the figure are 1-centimeter cubes. Find the volume and surface area of the figure.

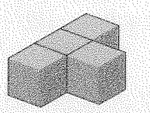


Volume
1 cube is 1 cubic centimeter
2 cubes are 2 cubic centimeters

Surface Area
Area of 1 face: 1 square centimeter
Faces on 1 cube: 6
Shared faces on 2 cubes together: 2
Number of faces you can see: 10
Area of 2 cubes together: 10 square centimeters

Remember that figures made up of the same number of one-unit cubes (same volume) may have different surface areas. When finding the surface area of figures made of the same kind of cubes, do not count surfaces that face each other.

Find the volume and surface area of each figure below. The figures are made of 1-centimeter cubes.

1. 

2.