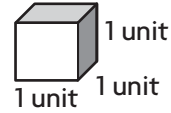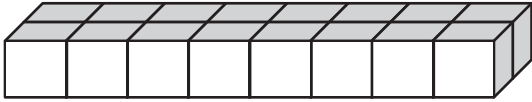# Unit Cubes and Solid Figures

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.

1 unit
1 unit
1 unit

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

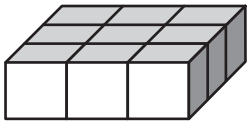The length of the prism is made up of __8__ unit cubes.

The width of the prism is made up of __2__ unit cubes.

The height of the prism is made up of __1__ unit cube.

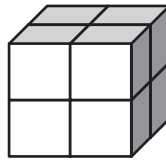The number of unit cubes used to build the rectangular prism is __16__ .

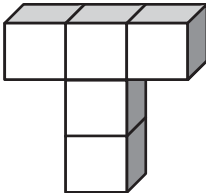**Count the number of unit cubes used to build each solid figure.**
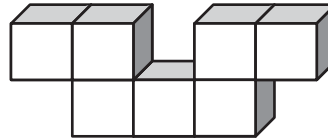
**1.**
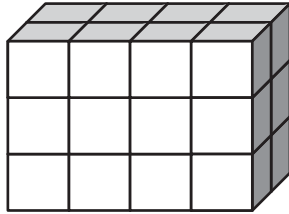
_____ unit cubes

**2.**

_____ unit cubes

**3.**

_____ unit cubes

**4.**

_____ unit cubes

# Understand Volume

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.

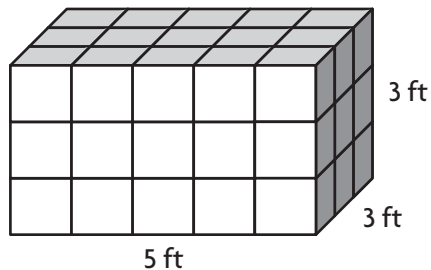**Step 3** Find the total number of cubes that fill the prism.

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 $24 \times 1$, or __24__ cubic inches.
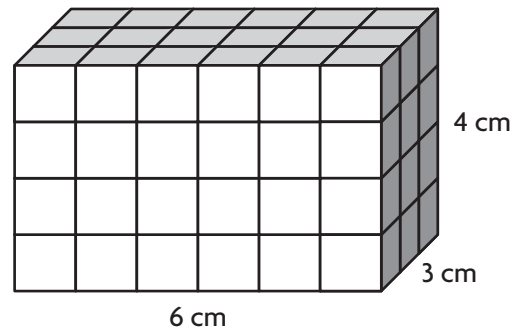
**Use the unit given. Find the volume.**

1.

3 ft
3 ft
5 ft

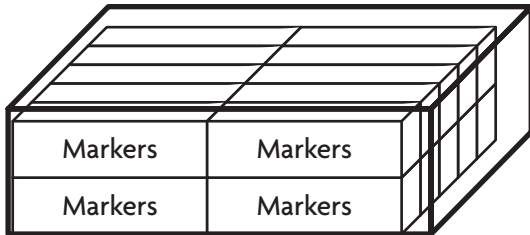Each cube = 1 cu ft

Volume = _____ cu _____

2.

4 cm
3 cm
6 cm

Each cube = 1 cu cm

Volume = _____ cu _____

# Estimate Volume

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.

| Markers | Markers |
|---------|---------|
| Markers | Markers |

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.**

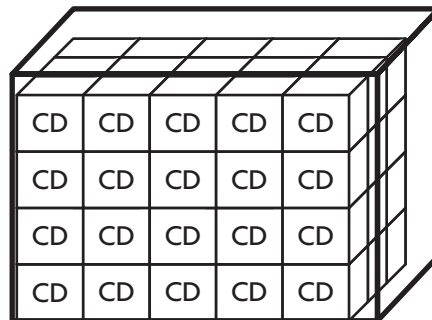**1.** Each box of toothpaste has a volume of 25 cubic inches.

| Toothpaste | Toothpaste |
|------------|------------|
| Toothpaste | Toothpaste |
| Toothpaste | Toothpaste |
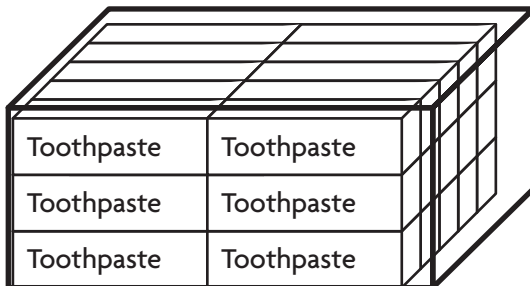
There are _____ boxes of toothpaste in the large box.

The estimated volume of the large box

is _____ × 25 = _____ cubic inches.

**2.** Volume of CD case: 80 cu cm

| CD | CD | CD | CD | CD |
|----|----|----|----|----|
| CD | CD | CD | CD | CD |
| CD | CD | CD | CD | CD |
| CD | CD | CD | CD | CD |

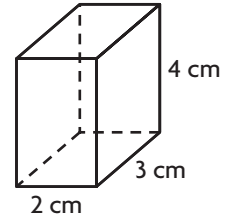Volume of large box: _____

# Volume of Rectangular Prisms

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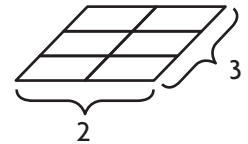to find the volume.



**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.

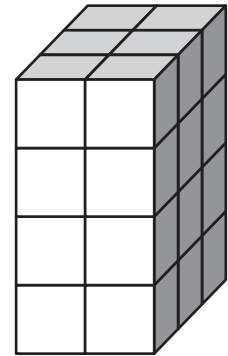**Remember:** Each layer has 6 cubes.

**Step 3** Count the cubes. __24__ cubes
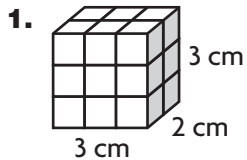Multiply the base and the height to check your answer.
Volume = __6__ × __4__
Volume = __24__ cubic centimeters



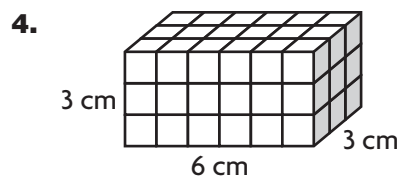So, the volume of Jorge's rectangular prism is __24__ cubic centimeters.

**Find the volume.**

**1.**


3 cm
2 cm
3 cm

Volume: _____

**2.**


2 ft
5 ft
2 ft

Volume: _____

**3.**


4 in.
4 in.
2 in.

Volume: _____

**4.**


3 cm
6 cm
3 cm

Volume: _____