# 6th Grade Math
# Week 5

Name: _____ Date: _____ Period: _____

Student Notes

# 3-Dimenseniol Figures and their Nets

**A 2-D figure is a flat figure that has only two dimensions such as length and width.**

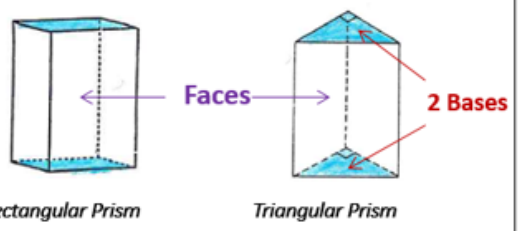
**A 3-D figure is a solid figure that has three dimensions such as length, width, and height.**

**3D-Figures composed of rectangles and triangles can be classified as a Prism or a Pyramid.**

## Section 1: Prisms

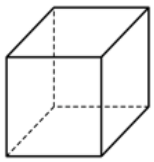
### Prisms

- Two parallel congruent bases
- Remaining faces are rectangles
- Prisms are named by the shape of their two bases.




### Cube

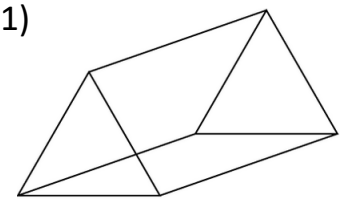
- It's a special kind of prism called a cube or square prism.
- All faces are squares!



*Cube*

**Guided Practice:**

1)

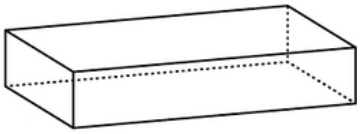


Rectangular faces and two parallel bases, so I'm a _____.

What kind of Prism am I? _____ PRISM

---

2)

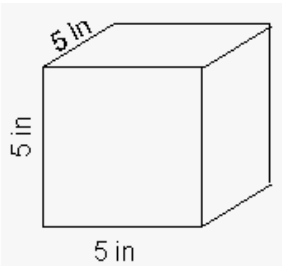


Rectangular faces and two parallel bases, so I'm a _____.

What kind of Prism am I? _____ PRISM

---

3)



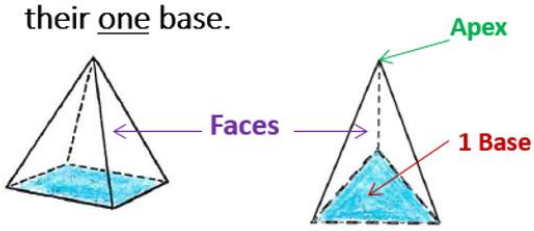

What shape am I?

_____ PRISM that is also called a _____.

## Section 2: Pyramids

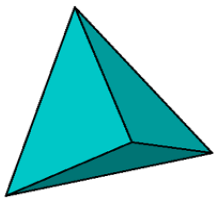
### Pyramids

- One base
- Remaining faces are triangles
- Pyramids are named by the shape of their one base.




*Rectangular Pyramid* *Triangular Pyramid*

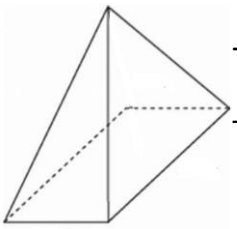
**Guided Practice:**

1) 

Triangular faces and one base, so I'm a _____.

What kind of Pyramid am I?

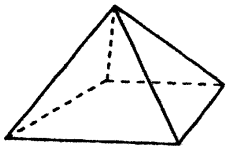
_____ PYRAMID

2) 

Triangular faces and one base, so I'm a _____.

What kind of Pyramid am I?

_____ PYRAMID

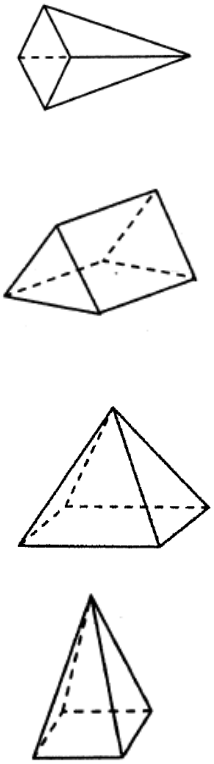
3) 

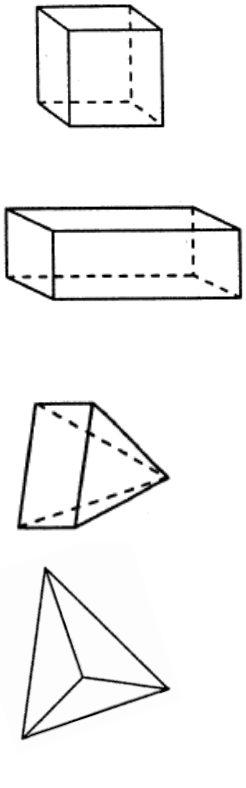
Triangular faces and one base, so I'm a _____.

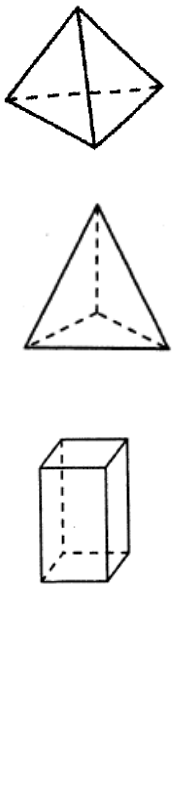
My base is a square. Name my shape.

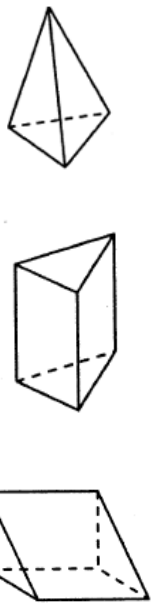
_____ _____

**YOU TRY! Directions: Shade the base(s), and then name the 3D figure.**









## Section 3: Nets of 3D-Figures

**A Net is a 2-dimensional pattern that you can fold to form a 3-dimensional figure.**

**A 3D-Figure can have more than one net. In fact, a cube has 11 different nets! Two are shown below.**

Cube

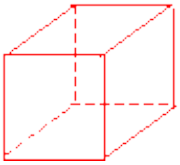


Figure 1

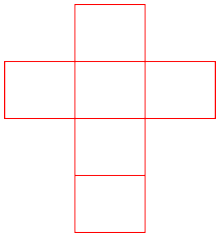
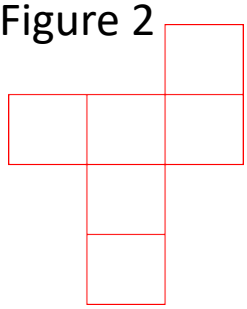


Figure 2

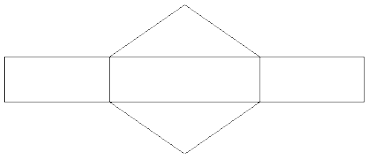


**Use what you learned from section 1 and section 2 to identify each net.**

**1)** Prism or Pyramid?

What kind of Prism or Pyramid am I?

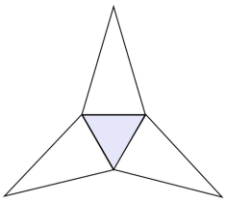
_____



**2)** Prism or Pyramid?

What kind of Prism or Pyramid am I?

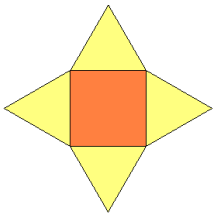
_____



**3)** Prism or Pyramid?

What kind of Prism or Pyramid am I?

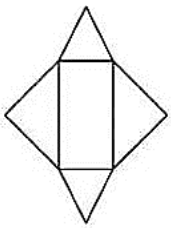
_____



**4)** Prism or Pyramid?

What kind of Prism or Pyramid am I?

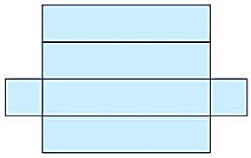
_____



**5)** Prism or Pyramid?

What kind of Prism or Pyramid am I?

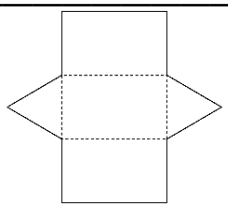
_____



**6)** Prism or Pyramid?

What kind of Prism or Pyramid am I?

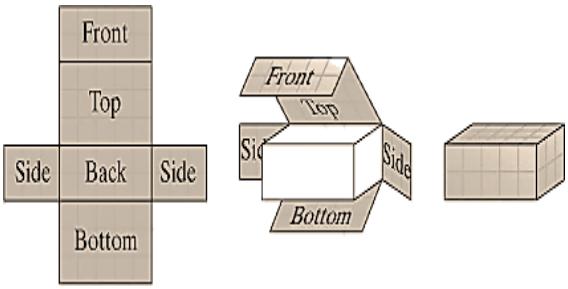
_____



# 6.G.4 (ALT 2) – Surface Area

**Student Notes**

- ❑ **Surface Area is the measurement of the <u>outside</u> of a 3-Dimentional object.**
- ❑ **Surface "Area" is measured in <u>square units</u>, just like regular "Area". Example: in², cm²**

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**We can use our knowledge of nets to calculate Surface Area…**

**Step 1:** **Use the net of the 3-D figure and find the AREA of each shape using formulas previously learned.**

- **Rectangles and Squares: A = lw**
- **Triangles: A = $\frac{1}{2}$bh**

**Step 2:** **Add all of the areas together to get the total "surface" area.**

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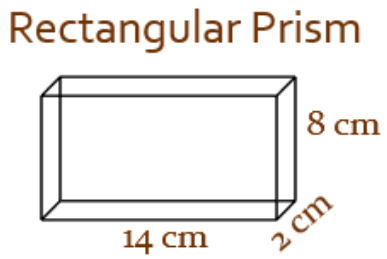
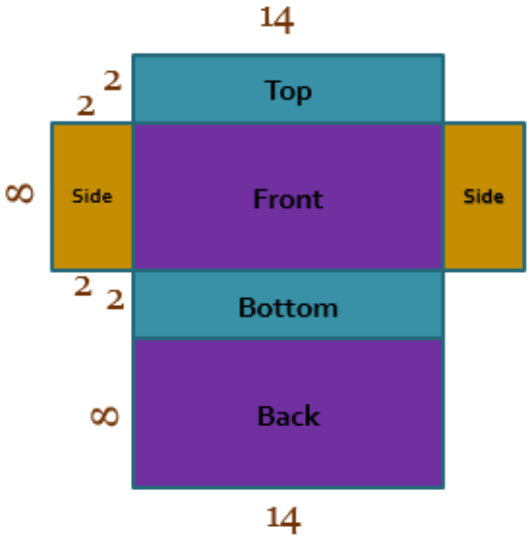
## <u>Example 1</u>



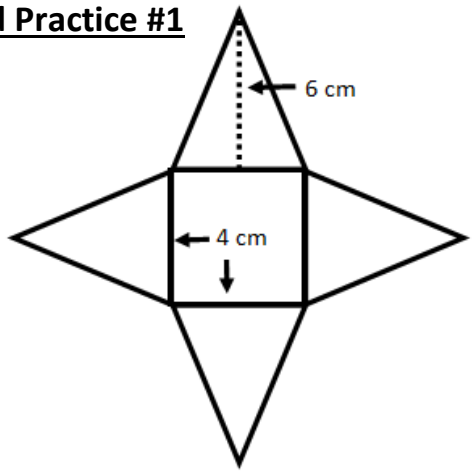

| | | |
|---|---|---|
| Top: | 2 × 14 = | 28 |
| Bottom: | 2 × 14 = | 28 |
| Front: | 8 × 14 = | 112 |
| Back: | 8 × 14 = | 112 |
| Side: | 2 × 8 = | 16 |
| Side: | 2 × 8 = | + 16 |

**312 cm²**

## <u>Example 2</u>

<u>https://www.youtube.com/watch?v=mtMNvnm71Z0</u>

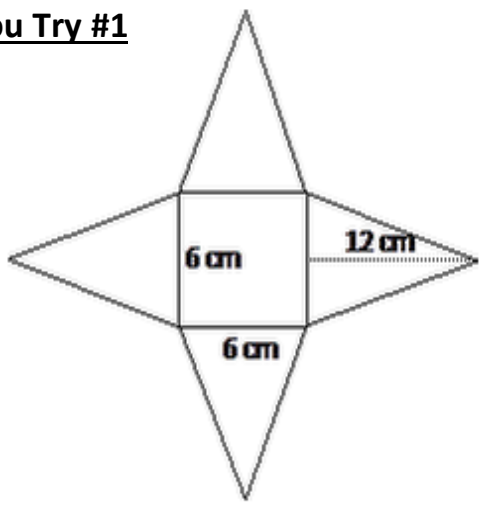
**Guided Practice #1**




**Name the 3-D solid that the net would form:**

**Find the surface area:**

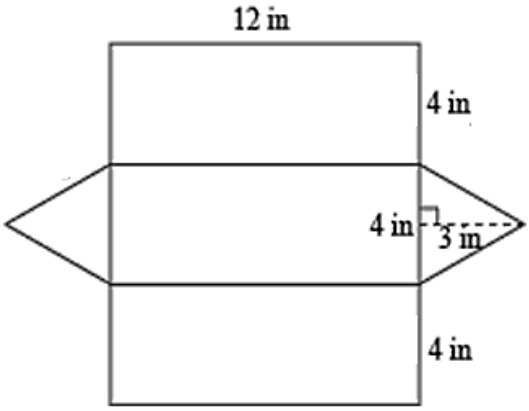
**You Try #1**




**Name the 3-D solid that the net would form:**

**Find the surface area:**

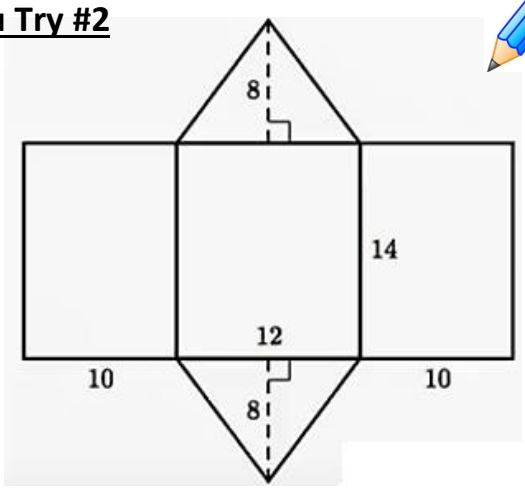
**Guided Practice #2**




**Name the 3-D solid that the net would form:**

**Find the surface area:**

**You Try #2**



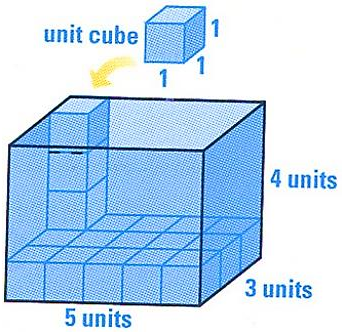

**Name the 3-D solid that the net would form:**

**Find the surface area:**

**Student Notes**

## Section 1: Volume of Right Rectangular Prisms

**<u>Volume</u> is the number of unit cubes that fit into a 3-dimensional figure. It is how much a container will hold! Because volume is the number of unit cubes that fit into the figure, we measure it in cubic units (in³, ft³, cm³).**




### Formula for the Volume of a Rectangular Prism:

$V = lwh$ <u>or</u> $V = Bh$ **(where $B$ is the area of the base)**

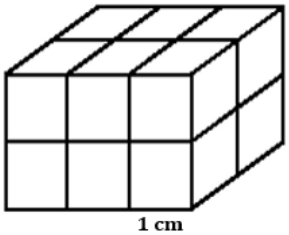
**1)**

**V = lwh**

**V = ___ • ___ • ___**

**V = _____ meters³**

**2)**



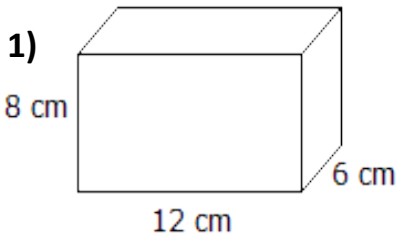

**V = lwh**

**V = ___ • ___ • ___**

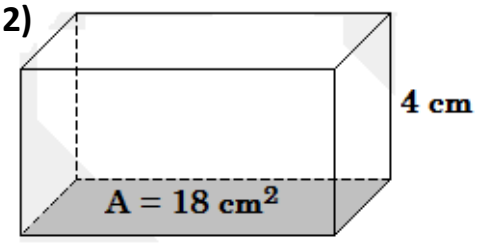
**V = _____ centimeters³**

**<u>Guided Practice</u>**

**1)**

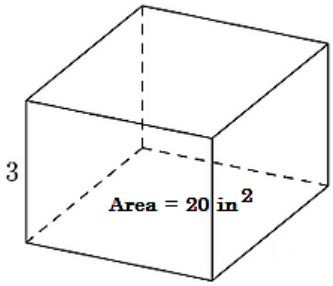



**2)**

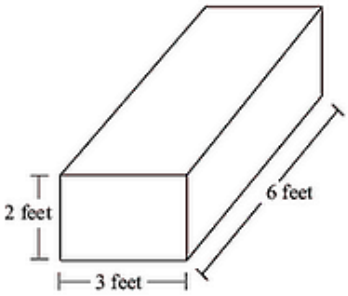



**<u>You Try</u>**

**1)**



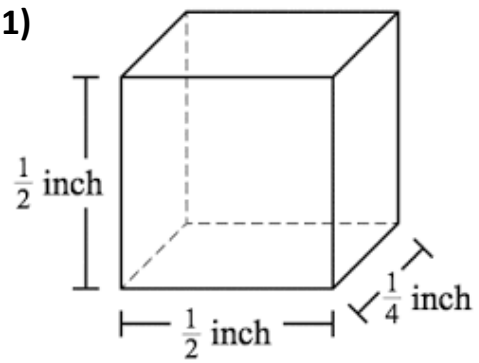

**2)**



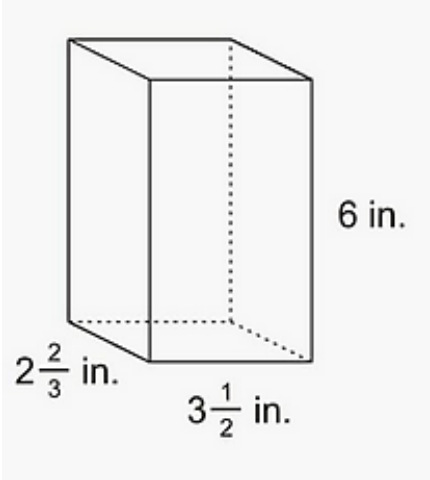
## Section 2: Volume with Fractional Edges

### Guided Practice

**1)**

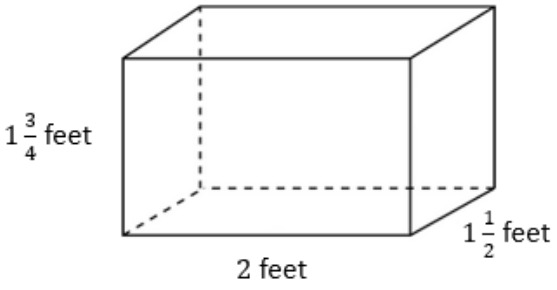



**2)**

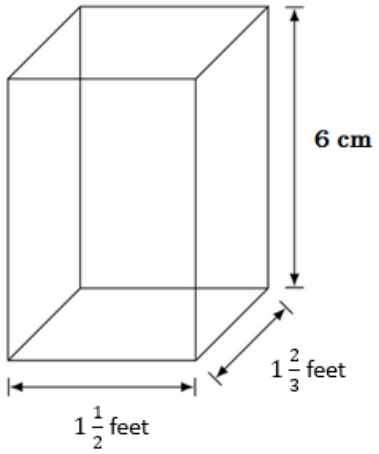



### You Try

**1)**




**2)**

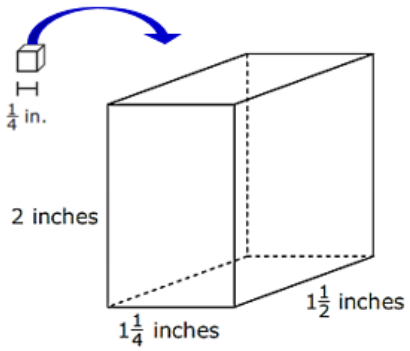


**Section 3: Volume involving small cubes and large rectangular prisms.**

| Step 1: Find the **volume** of the large rectangular prism. | ⇨ | Step 2: Find the **volume** of the small cube. | ⇨ | Step 3: Divide |
|---|---|---|---|---|

## Guided Practice

**Small cubes with edge lengths of $\frac{1}{4}$ inch will be packed into the right rectangular prism shown. How many small cubes are needed to completely fill the container?**

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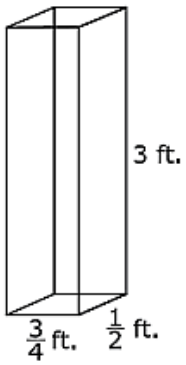
## You Try

**1)** A rectangular prism is shown.

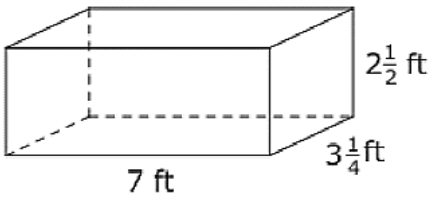



How many $\frac{1}{4}$-foot cubes would fill the inside of the prism?

Write the answer in the box.

☐ cubes

**2) Small cubes with edge lengths of $\frac{1}{2}$ inch will be packed into the right rectangular prism shown. How many small cubes are needed to completely fill the container?**



**Section 4: More problems dealing with volume of small cubes and large rectangular prisms.**

WATCH VIDEO https://www.youtube.com/watch?v=tVDslyeLefU

## Guided Practice

A girl builds a rectangular prism out of wooden cubes. She uses 50 cubes that measure $\frac{1}{2}$ inch on each edge. What is the volume, in cubic inches, of the rectangular prism she builds?

A. $3\frac{1}{8}$ cubic inches

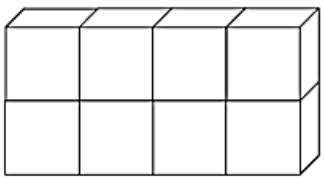
B. $6\frac{1}{4}$ cubic inches

C. $8\frac{1}{3}$ cubic inches

D. $12\frac{1}{2}$ cubic inches

## You Try

The right rectangular prism below is made up of 8 cubes. Each cube has an edge length of $\frac{1}{2}$ inch.



What is the volume of this prism?

A 1 cubic inch

B 2 cubic inches

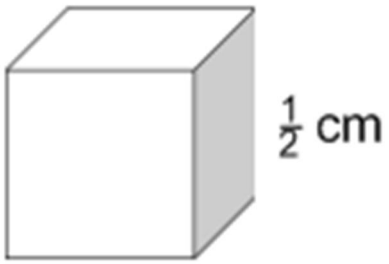
C 4 cubic inches

D 8 cubic inches

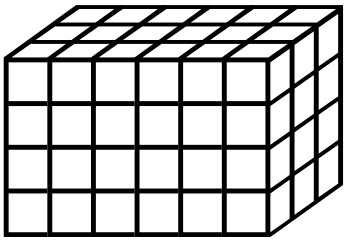
# 6.G.2 Volume With Fractional Edges Exit Slip

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

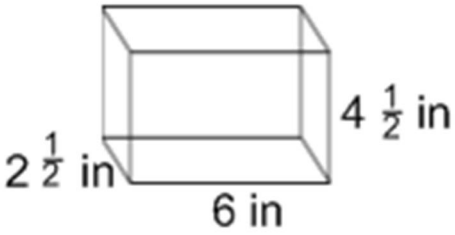
2. What is the volume of the cube shown?



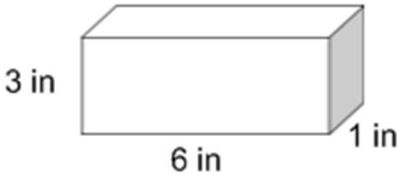

3. If the edge of each cube is ½ of an inch, what is the volume of the rectangular prism?



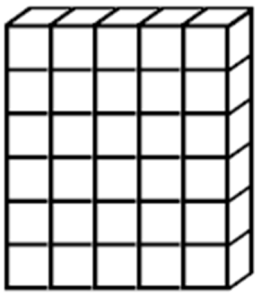
4. How many cubed shaped boxes with an edge length of ½ in. can be packed into the larger box shown?




5. If the edge of each cube is ½ of an inch, what is the volume of the rectangular prism?




6. How many cubes with a side length of ½ in. will fit inside the rectangular prism?



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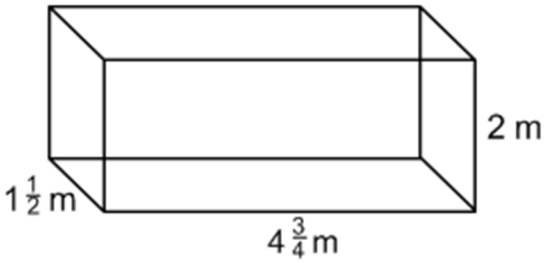
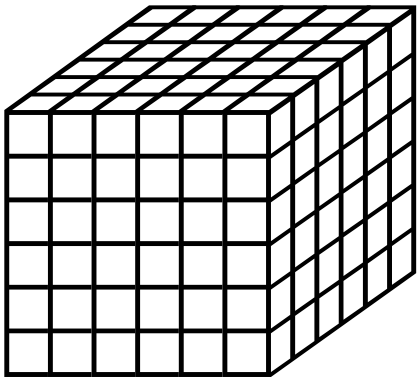
# 6.G.2 Volume With Fractional Edges Homework

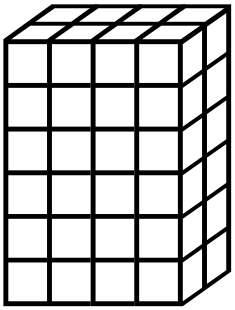
1. What is the volume of the rectangular prism shown?



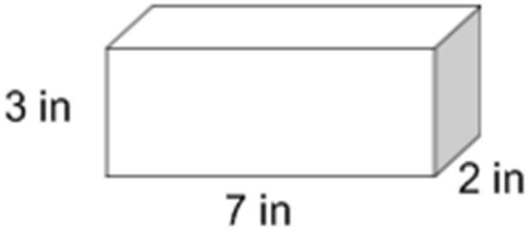

2. What is the volume of the cube shown?



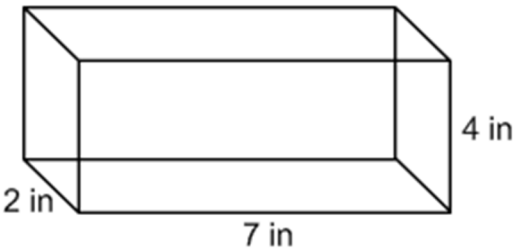
3. If the edge of each cube is ½ of an inch, what is the volume of the rectangular prism?



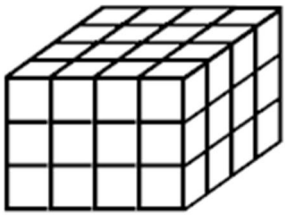
4. What is the volume of the rectangular prism?




5. If the edge of each cube is ½ of an inch, what is the volume of the rectangular prism?




6. How many cubes with a side length of ½ in. will fit inside the rectangular prism?



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