

Name _____

Unit Cubes and Solid Figures

Essential Question What is a unit cube and how can you use it to build a solid figure?



Measurement and Data—
5.MD.3a

MATHEMATICAL PRACTICES
MP.1, MP.5, MP.6

Investigate



You can build rectangular prisms using unit cubes. How many different rectangular prisms can you build with a given number of unit cubes?

Materials ■ centimeter cubes

A **unit cube** is a cube that has a length, width, and height of 1 unit. A cube has _____ square faces. All of its faces are congruent. It has _____ edges. The lengths of all its edges are equal.

A. Build a rectangular prism with 2 unit cubes.

Think: When the 2 cubes are pushed together, the faces and edges that are pushed together make 1 face and 1 edge.

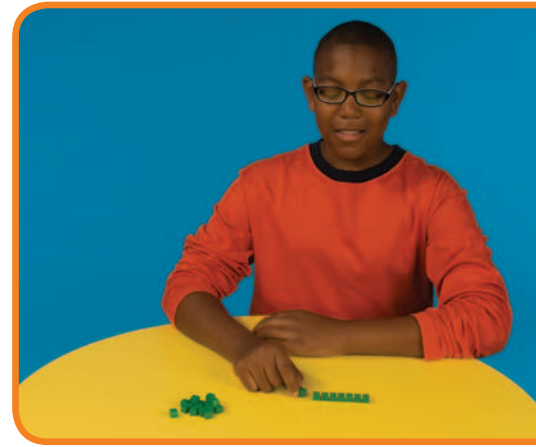
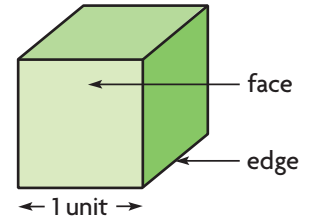
- How many faces does the rectangular prism have? _____
- How many edges does the rectangular prism have? _____

B. Build as many different rectangular prisms as you can with 8 unit cubes.

C. Record in units the dimensions of each rectangular prism you built with 8 cubes.

Dimensions		

So, with 8 unit cubes, I can build _____ different rectangular prisms.



Math Talk

Mathematical Practices

Describe the different rectangular prisms that you can make with 4 unit cubes.

Draw Conclusions

1. Explain why a rectangular prism composed of 2 unit cubes has 6 faces. How do its dimensions compare to a unit cube?

2. **MATHEMATICAL PRACTICE 6** Explain how the number of edges for the rectangular prism compares to the number of edges for the unit cube.

3. **MATHEMATICAL PRACTICE 6** Describe what all of the rectangular prisms you made in Step B have in common.

Make Connections

You can build other solid figures and compare the solid figures by counting the number of unit cubes.

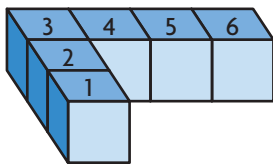


Figure 1

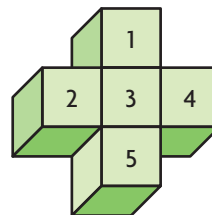


Figure 2

Figure 1 is made up of _____ unit cubes.

Figure 2 is made up of _____ unit cubes.

So, Figure _____ has more unit cubes than Figure _____.

- Use 12 unit cubes to build a solid figure that is not a rectangular prism. Share your model with a partner. Describe how your model is the same and how it is different from your partner's model.

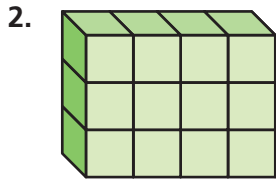
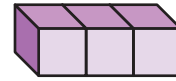
Name _____

Share and Show

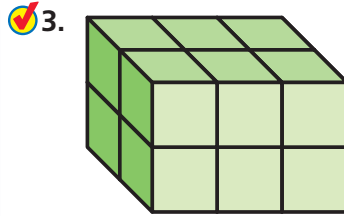


Count the number of cubes used to build each solid figure.

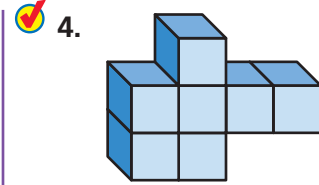
1. The rectangular prism is made up of _____ unit cubes.



_____ unit cubes



_____ unit cubes

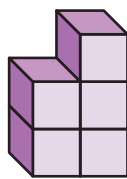
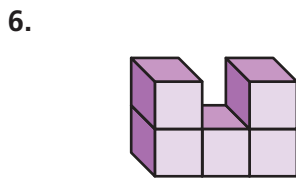


_____ unit cubes

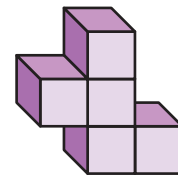
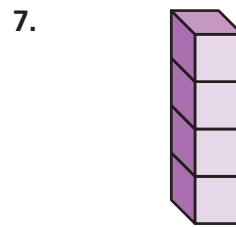
5. **WRITE** *Math* How are the rectangular prisms in Exercises 2–3 related? Can you show a different rectangular prism with the same relationship? Explain.

Problem Solving • Applications

Compare the number of unit cubes in each solid figure. Use $<$, $>$ or $=$.



_____ unit cubes ○ _____ unit cubes



_____ unit cubes ○ _____ unit cubes

8. **MATHEMATICAL PRACTICE 2 Use Reasoning** Melissa makes a solid figure by stacking 1 cube on top of a row of 2 cubes on top of a row of 3 cubes. Then she rearranges the cubes to form a rectangular prism. Describe the arrangement of cubes in the rectangular prism.
