

LESSON 2

Objective

Identify characteristics of cubes and rectangular prisms.

Common Core State Standards

- **2.G.1** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

Geometry

Building Cubes and Prisms

In grades 1 and 2, children become adept at exploring, describing, and representing the three-dimensional shapes in their environment. They explore three-dimensional shapes through composing and decomposing them, which augments their understanding of the nature of the shapes. Children need to see three-dimensional shapes in a variety of orientations and locations so that their understanding of the shapes encompasses real-life situations. Children also should make connections between two-dimensional shapes as they appear in three-dimensional solids.

Try It! Perform the Try It! activity on the next page.

Talk About It

Discuss the Try It! activity.

- Display the cubes. **Ask:** *What is this shape called? What do we know about all the faces on this shape?*
- **Ask:** *How many faces does a cube have? How many edges and corners? What are some things you see every day that are shaped like cubes?*
- Display two cubes to form a rectangular prism. **Ask:** *What shape do I have? How many faces, edges, and corners does it have? What are some things you see every day that are shaped like rectangular prisms?*
- **Ask:** *What is an easy way to tell the difference between a cube and a rectangular prism? (Cubes have faces that are all squares.) What do you know about the number of faces, edges, and corners of these two shapes? (Both shapes have the same number of faces—6, edges—12, and corners—8.)*

Solve It

With children, reread the problem. Then have children write letters to Mrs. Talbot explaining how cubes and rectangular prisms are alike and different. Encourage children to use key words such as *faces*, *edges*, and *corners*.

More Ideas

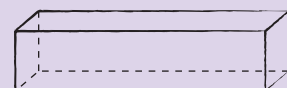
For other ways to teach about rectangular prisms—

- Have children use Snap Cubes® to create two larger cubes with the same dimensions ($2 \times 2 \times 2$). Then guide children to combine the two cubes to form a rectangular prism ($4 \times 2 \times 2$).
- Have children use Color Tiles to create squares or rectangles in a two-dimensional array (2×2 or 2×3). Then have children use Snap Cubes and the dimensions of the tile arrays to create cubes and rectangular prisms having faces with the same dimensions.

Formative Assessment

Have children try the following problem.

How many edges does this figure have?



Try It!

20 minutes | Groups of 3

Here is a problem about cubes and rectangular prisms.

Mrs. Talbot has 20 boxes of books. Each box is square on all sides.

Mrs. Talbot wants to arrange the boxes at the back of the room to make 2 large shapes. She builds a cube using 8 boxes. She builds a rectangular prism with 12 boxes. How many faces, edges, and corners does each shape have?

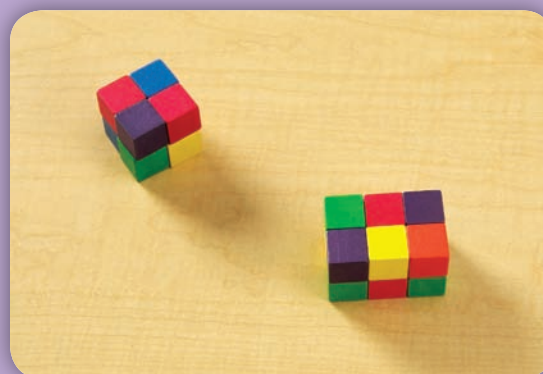
Introduce the problem. Then have children do the activity to solve the problem. Distribute the materials to children. Introduce and define the terms *face*, *edge*, and *corner*. Provide examples of each.

Materials

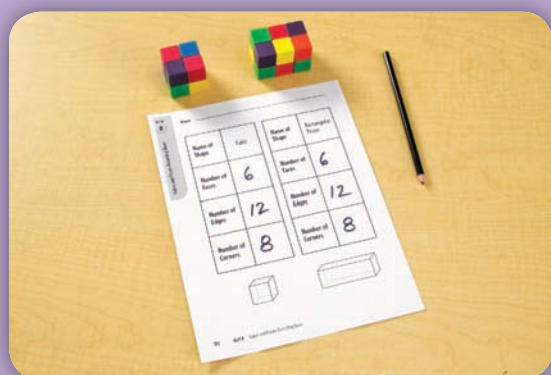
- 2-cm Color Cubes (20 per group)
- Cubes and Prisms Recording Sheet (BLM 16; 1 per child)
- pencils (1 per child)



1. Have children count the faces, edges, and corners on the cube. Establish that a cube is a shape that has square faces on all sides. Challenge children to use 8 cubes to make a large cube, like Mrs. Talbot did ($2 \times 2 \times 2$). Point out the faces, edges, and corners, making sure to concentrate on the attributes of the large cube formed, not each individual cube.



2. Guide children to build a rectangular prism measuring $1 \times 1 \times 2$ using cubes. Discuss the differences between the rectangular prism and the cube shapes they built (concentrate on square faces versus rectangular faces on the two shapes). Challenge children to add the remaining cubes to the rectangular prism to make one that uses 12 cubes, like Mrs. Talbot did ($3 \times 2 \times 2$). Discuss the faces, edges, and corners on the large rectangular prism.



3. Have children complete the recording sheet while using their cube and rectangular prism models to guide them. Discuss the similarities and differences between the data and the way the two shapes look.

Look Out!

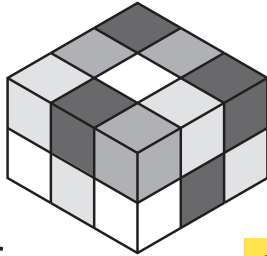
If children cannot count the number of faces (or edges or corners) correctly, ask them to touch each face (or edge or corner) as they count it. Reinforcing the number with a kinesthetic experience should help children count correctly. You might mark a face with tape to ensure it is not recounted. Also watch for children who count the edges of two faces separately, even when they are put together to form one edge.



**Use 2-cm Color Cubes. Build each prism.
Tell the number of faces, edges, and corners.**

(Check students' work.)

1.

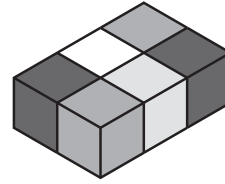


faces 6

edges 12

corners 8

2.



faces 6

edges 12

corners 8

**Use 2-cm Color Cubes. Build each prism.
Draw the prism. Tell the number of faces,
edges, and corners.**

3. 3 cubes long
3 cubes wide
3 cubes tall

faces 6

edges 12

corners 8

4. 2 cubes long
4 cubes wide
3 cubes tall

faces 6

edges 12

corners 8

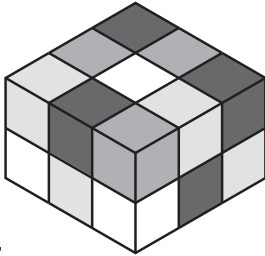
Answer Key

Challenge! Does a solid shape have more faces, corners, or edges? Is that always true?

Challenge: edges; yes

**Use 2-cm Color Cubes. Build each prism.
Tell the number of faces, edges, and corners.**

1.

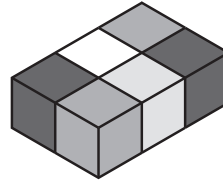


faces _____

edges _____

corners _____

2.



faces _____

edges _____

corners _____

**Use 2-cm Color Cubes. Build each prism.
Draw the prism. Tell the number of faces,
edges, and corners.**

- 3.** 3 cubes long
3 cubes wide
3 cubes tall

faces _____

edges _____

corners _____

- 4.** 2 cubes long
4 cubes wide
3 cubes tall

faces _____

edges _____

corners _____

Name _____

Challenge! Does a solid shape have more faces, corners, or edges? Is that always true?

Name _____

Name of Shape	Cube	Name of Shape	Rectangular Prism
Number of Faces		Number of Faces	
Number of Edges		Number of Edges	
Number of Corners		Number of Corners	

