

# Square It, Cube It

## Purpose

Students will construct cubes and rectangular prisms, copy the shapes on graph paper, and develop strategies for measuring the surface area of the objects.

## Materials

*For the teacher:* graph transparency, nets cut out from copy of Black Line Master (BLM) *Flat Shapes*, cereal box [with top and bottom taped shut]

*For each student:* graph paper, copy of BLM *Flat Shapes*, scissors, pencil

## Activity

### A. Introduction

1. Show students the cereal box. Rotate the box and point out that the surface area is the total area of all of the individual *faces* (sides) of the box.
2. Cut the box on its edges so that you have one flat piece. This can be done in a number of ways. The flat piece should be made up of six individual rectangles joined to another rectangle on at least one side.
3. Ask students: "How many rectangles do you see?" [6] Tell the students that this connected arrangement of rectangles is called a *net*. Explain that this net is a pattern that can be folded and connected once again to make the original box.
4. Pass the net around the room for students to view up close.
5. Explain that in order to find the surface area of the box, we need to find the areas of each individual face (rectangle).
6. Have a student measure the length and width of each rectangle while you write the numbers on the board. Have students give each rectangle a name and find the area of each rectangle.
7. Ask students how you would go about finding the surface area of the box. Accept and discuss all responses. Prompt students toward the correct response of adding the six individual areas together.

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## EXTENDING THE ACTIVITY



Have students create a net for a pyramid. Have students experiment with the arrangement for the individual shapes within the net. Have students construct a three-dimensional figure from the net and compute its surface area.

## INCORPORATING TECHNOLOGY



Have students use a drawing program to create several different two-dimensional shapes. Ask students to use these shapes to build a net. Tell students to print the nets and construct three-dimensional objects from them. Have students share the resulting three-dimensional shapes with the class and identify those they have studied by name.

## Standards Link 6.5.1

## Activity (continued)

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### B. Individual Activity





1. Distribute one copy of the BLM *Flat Shapes* to each student and ask the students to cut out the nets.
2. Tell them to trace around the nets on the graph paper.
3. Tell the students that each unit on the grid represents one centimeter.
4. Explain that students may draw their own lines on the graph paper, as many or as few as they like. Tell them that each line drawn should form a square or a rectangle. Explain that they may use these smaller rectangles to find the total surface area of each object.
5. Ask the students to find the surface area of the cube in at least two ways.
6. Discuss the results with the class. Ask students to come to the board and draw the method they used to compute the surface area.
7. Instruct the students to tape the net together to form a cube.
8. Repeat steps 5 through 7 above, this time using the rectangular prism net.
9. Remind students that surface area is expressed in square units.

## Classroom Assessment

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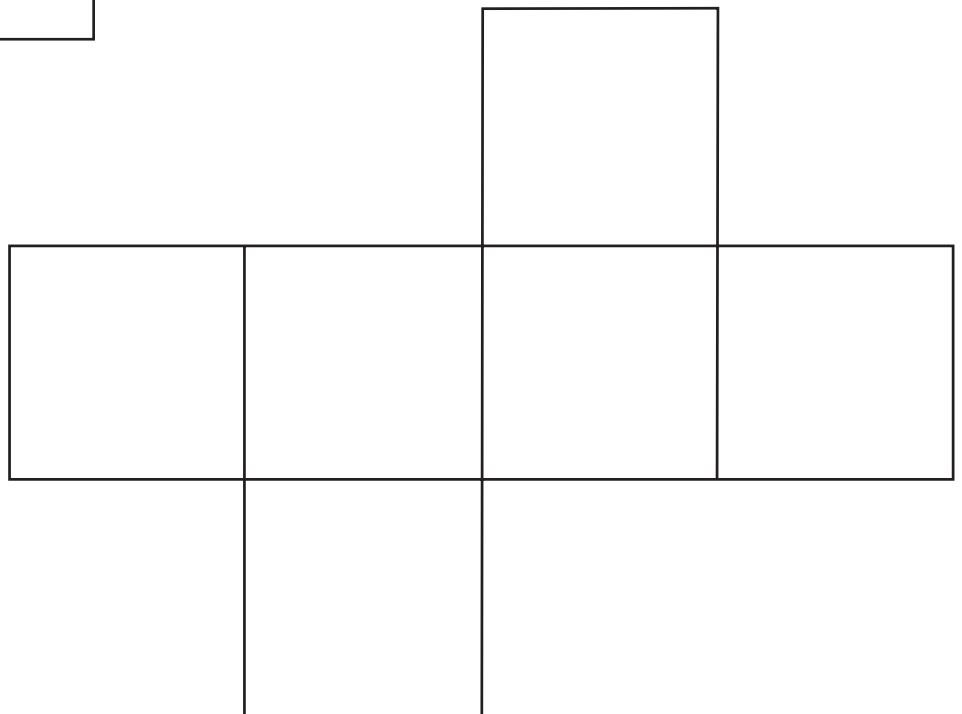
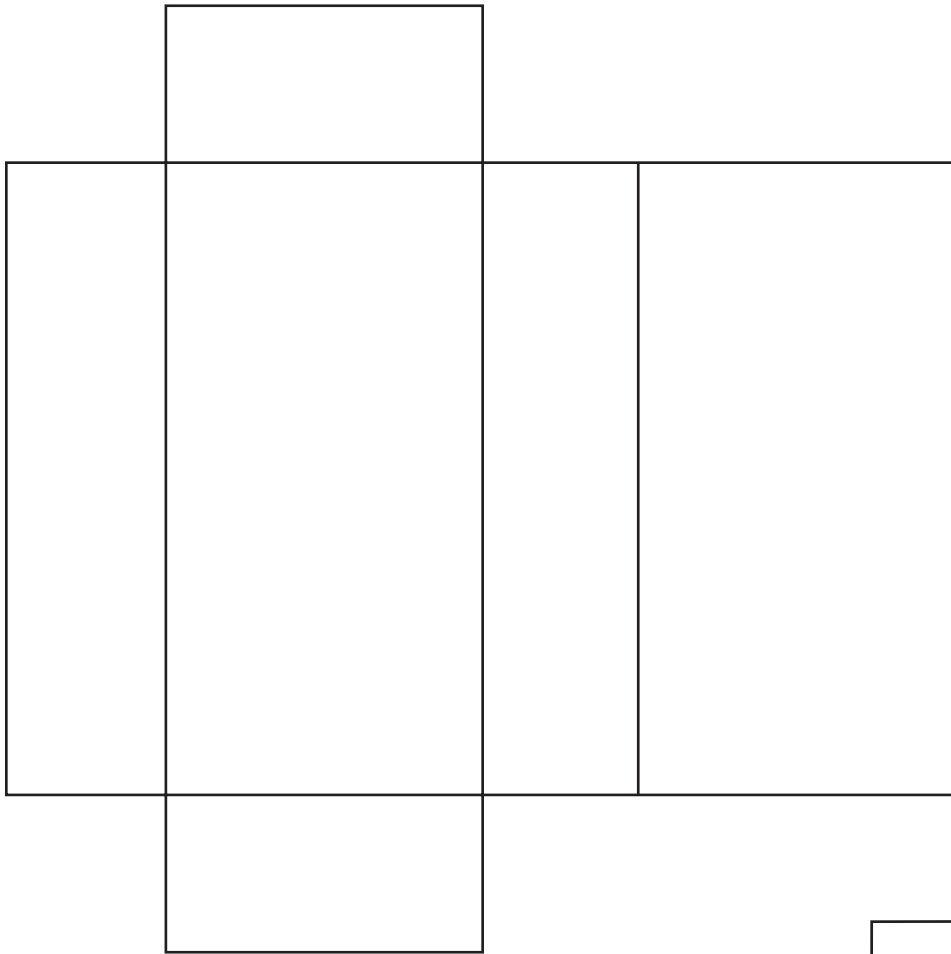
### Basic Concepts and Processes

During the activity and when reviewing the BLM, discuss the following questions with your students to gauge their understanding of the Standard Indicator:

-  How many faces are on a cube?
  -  How would you go about finding the surface area of a cube?
  -  How many faces are on a rectangular prism?
  -  How would you go about finding the surface area of a rectangular prism?
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Name: \_\_\_\_\_

# Flat Shapes



# Flat Shapes

## Teacher Directions

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Distribute a copy of the BLM *Flat Shapes* to each student. Explain directions to students as described in part B of the activity. Remind students to express answers in square units.

## Answer Key

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Answers vary depending on the size of units on the graph paper.