In this Investigation, you will discover ways to make different kinds of prisms. You will also develop strategies for measuring their surface areas and volumes.

2.1 Folding Paper
Surface Area and Volume of Prisms

You can make models of prisms (with open tops and bottoms) by folding paper. For example, the next sketch shows how to make a triangular prism.

Directions for Making Paper Prisms
(These paper models are open at the top and bottom.)

- Start with four identical sheets of paper.

- Use the shorter dimension as the height for each prism.

- Make a *triangular* prism by marking and folding one of the sheets of paper into three congruent rectangles. Tape the paper into the shape of a triangular prism.
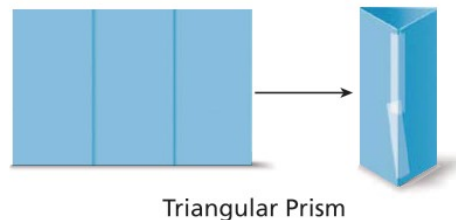
Triangular Prism

- Make a *square* prism by marking, folding, and taping a sheet of paper into four congruent rectangles.

- Make a *pentagonal* prism by marking, folding, and taping a sheet of paper into five congruent rectangles.

- Make a *hexagonal* prism by marking, folding, and taping a sheet of paper into six congruent rectangles.

- Make an *octagonal* prism by marking, folding, and taping a sheet of paper into eight congruent rectangles.

Models like this are very helpful in studying patterns in the surface area and volume of different prisms.

> ? How is finding the surface area of any prism like finding the surface area of a rectangular prism?

2.1 2.2 2.3

Problem 2.1

A Assume the prisms have a top and bottom. Make any measurements needed to find the surface area of each prism you construct.

1. Complete this table:

Surface Areas of Prisms

Prism Type	Area of Sides	Area of Top and Bottom	Total Surface Area
Triangular	■	■	■
Square	■	■	■
Pentagonal	■	■	■
Hexagonal	■	■	■
Octagonal	■	■	■

2. How do the surface areas of the five prisms compare as the number of faces in the prisms increases?

3. Describe a strategy for finding the surface area of a prism.

B How do the volumes of the five prisms compare as the number of faces in a prism increases? Explain.

C
1. How could you use another identical sheet of paper to make a figure whose volume is greater than the volume of any of the polygonal prisms in Question A? What might it look like?

2. How would the surface area of that figure compare to the surface areas of the polygonal prisms in Question A?

Note: Keep your prism models for use later in this Unit.

A C E Homework starts on page 35.

Investigation 2   Polygonal Prisms   **29**