Chapter 5 Project: If the Shoe Fits

About the Chapter Project

What size shoe do you wear? As you grow, your shoe size can change rapidly. If your foot grows half an inch, does that mean you should get shoes that are a half-size larger?

The scale we use for sizing shoes is from the *duodecimal,* or base 12, number system. For that reason, a size chart could come in handy.

For the chapter project, you will make measurements and calculations that relate women's shoe sizes, men's shoe sizes, and shoe lengths. Your final project will be a convenient comparison chart that you can distribute to your friends and family and to shoe stores.

List of Materials

• A 12-in. ruler

• A pencil

• Several sheets of paper

Activities

Activity 1: Researching

We still use the *duodecimal*, or base 12 system. For example, 12 in. $= 1$ ft. Research some other examples of the duodecimal system. Describe how they appear in your everyday life.

Activity 2: Creating

Shoes come in whole and half sizes. Shoe sizes for men and women are different, however. For shoes of equal length, a woman's shoe is one size larger than a man's shoe. Make a chart that compares men's and women's shoe sizes, including half sizes, from 1 to 15.

Activity 3: Comparing

Measure the length of your shoe to the nearest in. Calculate the size of your shoe, using *L* as the length of your shoe. Compare your calculation to the size on the label of your shoe.

Finding Shoe Sizes
Women's shoe sizes
$3L - 23\frac{3}{4}$
Men's shoe sizes
$3L - 24\frac{3}{4}$

Chapter 5 Project (continued)

Activity 4: Calculating

Extend the shoe-size chart you started in Activity 2 by adding a column for shoe length. Calculate the length in inches of each whole and half size. Use the expression in the table at the right where *s* is the shoe size. Put the results in your chart.

Finding Shoe Lengths
Women's shoe lengths:
$\frac{s}{3} + 7\frac{11}{12}$
Men's shoe lengths:
$\frac{s}{3} + 8\frac{1}{4}$

Finishing the Project

Manufacturers often distribute helpful charts to retailers as a form of advertising. Assume that your comparison chart will be distributed to shoe stores. Your chart should be easy to read and simply presented so anyone can use it.

Reflect and Revise

Ask a friend to review your chart and your calculations. Is your chart accurate? Is it presented attractively? If necessary, make changes to improve your chart.

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