Unit 3, Lesson 23

Making and Measuring Boxes

Let's use what we know about decimals to make and measure boxes.

23.1 Folding Paper Boxes

Your group will receive 3 or more sheets of square paper. Each person in your group will make 1 open-top box by folding a sheet of paper. Before you begin folding:

1. Measure the side length of each sheet of paper to the nearest tenth of a centimeter. Then record the lengths, from the smallest to the largest.

	side length of paper (cm)
Box 1	
Box 2	
Box 3	

2. Compare the side lengths of the square sheets of paper. Be prepared to explain how you know.
   a. The side length of the paper for Box 2 is _____ times the side length of the paper for Box 1.
   b. The side length of the paper for Box 3 is _____ times the side length of the paper for Box 1.

3. Make some predictions about the measurements of the three boxes your group will make:
   a. The surface area of Box 3 will be _____ times as large as that of Box 1.
   b. Box 2 will be _____ times as tall as Box 1.
   c. Box 3 will be _____ times as tall as Box 1.

Now you are ready to fold your paper into a box!

23.2 Sizing up Paper Boxes

Work with your group to complete the tables and answer the questions.

1. Measure the length and height of each box to the nearest tenth of a centimeter. Record the measurements in the table.

	side length of paper (cm)	length of box (cm)	height of box (cm)	surface area (sq cm)
Box 1				
Box 2				
Box 3				

2. Calculate the surface area of each box, and record it in the table. Show your reasoning.

23.3 Comparing Paper Boxes

Look at the measurements for Box 1, Box 2, and Box 3 in the table you completed earlier.

1. Divide each measurement of Box 2 by the corresponding measurement of Box 1 to find out how many times as large the former is compared to the latter. Complete each statement.
   a. The length of Box 2 is _____ times the length of Box 1.
   b. The height of Box 2 is _____ times the height of Box 1.
   c. The surface area of Box 2 is _____ times the surface area of Box 1.

2. Divide each measurement of Box 3 by the corresponding measurement of Box 1 to compare them. Complete each statement.
   a. The length of Box 3 is _____ times the length of Box 1.
   b. The height of Box 3 is _____ times the height of Box 1.
   c. The surface area of Box 3 is _____ times the surface area of Box 1.

3. Record your results in the table.

	side length of paper	length of box	height of box	surface area
Box 2 compared to Box 1				
Box 3 compared to Box 1				

4. Discuss with your group: How accurate were the predictions you made earlier? Were they close to the results you found by performing calculations?