



# 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<br>of paper (cm) | length of<br>box (cm) | height of<br>box (cm) | surface area<br>(sq cm) |
|--------------|------------------------------|-----------------------|-----------------------|-------------------------|
| <b>Box 1</b> |                              |                       |                       |                         |
| <b>Box 2</b> |                              |                       |                       |                         |
| <b>Box 3</b> |                              |                       |                       |                         |

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?