Representing Cubic Units

Objectives: To develop an understanding of the meaning of cubic units.
              To develop concrete models that approximate cubic units.

Materials: 1-inch cubes
              1-centimeter cubes (The units cubes in Base 10 sets are 1-cm cubes.)
              1-decimeter cubes (The thousands cubes in Base 10 sets are 1-dm cubes.)
              1-foot rulers (12 per group)
              yardsticks (12 per group)
              meter sticks (12 per group)
              duct tape or masking tape
              scissors

Procedure:

Part 1

1. Place students in pairs.

2. Give each pair of students the following:
    - 1-inch cube
    - 1-centimeter cube
    - ruler with both metric and customary units

3. Have student pairs measure each edge of the cubic centimeter using the metric side of the ruler.

4. Have pairs share their findings with the class.

5. Explain that since this cube is 1 centimeter on each edge, it is called a cubic centimeter.

6. Have student pairs measure each edge of the cubic inch using the customary side of the ruler.

7. Have pairs share their findings with the class.

8. Explain that since this cube is 1 inch on each edge, it is called a cubic inch.

9. Have student pairs measure each edge of the cubic decimeter using the metric side of the ruler.

10. Have pairs share their findings with the class.

11. Explain that since this cube is 1 decimeter on each edge, it is called a cubic decimeter.

Part 2

1. Place students in groups of 3 or 4.

2. Give:
    - some of the groups 12 rulers
    - some of the groups 12 meter sticks
    - some of the groups 12 yardsticks
    - scissors to each group
    - 1 role of duct tape (or masking tape) to each group

3. As a class, discuss what a cubic foot would look like, what a cubic meter would look like and then what a cubic yard would look like.

4. Have the groups use their materials to build a cubic foot, cubic meter, or cubic yard

5. Have groups share their figures with the class.

Part 3

1. As a class, compare the sizes of the cubic centimeter, cubic inch, cubic foot, cubic meter, and cubic yard.

2. Have the class discuss:
    - Which would take up more room – 9 cubic feet or 9 cubic meters?
    - Which would take up more room – 7 cubic centimeters or 7 cubic inches?
    - Which would take up more room – 4 cubic meters or 4 cubic yards?

3. Have the class discuss why including the unit of measure on their answers is important.