Carlos is helping Rick with the pouring of the cement for the patio in the *Changing Dimensions: Area* video. In that video, Rick found the area of the new patio. When they got back to the office, they also calculated the volume of the new patio, since volume tells Rick how much cement to order. In the Area video, you saw when area dimensions are multiplied by a scale factor the area is multiplied by the scale factor squared. Do you know how changing linear dimensions affects volume?

The original patio was 10 feet wide by 12 feet long by $\frac{1}{4}$ foot deep and had a volume of 30 cubic feet. The homeowner wants to double the length, the width, and the depth, so the new patio will be 20 feet by 24 feet by $\frac{1}{2}$ foot, making the volume 240 cubic feet.

Problem 1: The length, width, and depth of the patio were doubled but the new volume isn't doubled, it is eight times as large. How can that be?

Problem 2: What happens to the volume of a rectangular region when the length, width, and height are tripled? Quadrupled? Describe what happens to the volume when the dimensions are made n times bigger, where n represents any number.

MakingSense