Scene		Full Transcript
1	**Carlos:**	Hey! It's Carlos again. I'm helping with the pouring of a new patio. You might remember it from the *Changing Dimensions Area* video.
	Voice-Over Carlos:	In that video, my buddy, Rick, found the area of the patio. When we got back to the office, we also calculated the volume. The volume tells Rick how much cement to order.
	Carlos:	There's no need to get mixed up when calculating volume. Stick close, and I'll show you how we got another *Problem Solved*.
2	**Voice-Over Carlos:**	In the area video, you saw when linear 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 volume of any rectangular prism is calculated by taking the length times the width times the height. For example, the volume of a rectangular prism measuring 4 feet by 3 feet by 2 feet is 24 cubic feet.
3	**Voice-Over Carlos:**	The old patio we are replacing was 12 feet long by 10 feet wide by 3 inches thick. As you know, 3 inches is equal to ¼ foot. So, the volume is 12 times 10 times ¼, which is 30 cubic feet.
		The owner wanted to double the dimensions of the patio to 24 feet long by 20 feet wide and double the thickness of the cement to 6 inches or ½ foot. The volume of cement needed for the new patio is 240 cubic feet.
4	**Carlos:**	Think about that. Does that make sense? The volume of the old patio was 30 cubic feet, and the volume of the new patio is 240 cubic feet. I'll show you why that's correct.
5	**Voice-Over Carlos:**	The volume of a prism measuring 2 feet by 1 foot by 1 foot is 2 cubic feet. If we double each dimension, the scale factor is 2 and the new prism measures 4 feet by 2 feet by 2 feet. The volume of the new prism is 16 cubic feet, which is 8 times the volume of the original prism, so the volume factor is 8.
		What do you think will happen if we triple the dimensions of the original prism? Well, the dimensions become 6 feet by 3 feet by 3 feet. The volume of the new prism is 54 cubic feet. That's 27 times the original volume, so the volume factor is 27.
		If the scale factor is 4, the volume becomes 64 times the original volume!
6	**Voice-**	Let's put the scale factors and volume factors into a table and look for a

Over Carlos:		pattern. When the scale factor is 2, the volume factor is 8, or 2^3. When the scale factor is 3, the volume factor is 27, or 3^3. When the scale factor is 4, the volume factor is 64, or 4^3. So, when the scale factor is n, the volume factor is n^3.
		There's the pattern. As each of the three linear dimensions of a rectangular prism – length, width and height – is multiplied by the same number, the volume is multiplied by the cube of that number.
7	**Carlos:**	When changing the dimensions of a patio or any prism, it is important to remember the effect on the volume. If you keep that in mind, you'll never get stuck on volume. *Problem Solved*.