Exercise 1.18

How many kernels of corn does it take to fill a 2-L soft drink bottle?

Solution

Imagine the kernel of corn as a cube. Then its volume is length times width times height. Take the side length to be 1 cm.

$$\text{Kernel Volume} = (1\text{ cm})(1\text{ cm})(1\text{ cm}) = 1\text{ cm}^3 = 1\text{ mL}$$

Convert this kernel volume to liters.

$$1\text{ mL} = 1\,\cancel{\text{mL}} \times \frac{1\text{ L}}{1000\,\cancel{\text{mL}}} = 10^{-3}\text{ L}$$

Now divide the volume of the bottle by the volume of a kernel to find how many kernels can fit inside.

$$\frac{2\,\cancel{\text{L}}}{10^{-3}\,\cancel{\text{L}}} = 2 \times 10^3 = 2{,}000$$