	RELATIONSHIPS USED $\frac{11.5\text{ g } C_{12}H_{22}O_{11}}{100\text{ g solution}}$ (given mass percent, written as a fraction) $\frac{1.04\text{ g}}{\text{mL}}$ (given density of solution)
SOLVE Follow the solution map to solve the problem.	**SOLUTION** $85.2\text{ g } C_{12}H_{22}O_{11} \times \frac{100\text{ g solution}}{11.5\text{ g } C_{12}H_{22}O_{11}} \times \frac{1\text{ mL}}{1.04\text{ g}} = 712\text{ mL solution}$
CHECK Check your answer. Are the units correct? Does the answer make physical sense?	The units (mL solution) are correct. The magnitude of the answer makes sense because each 100 mL of solution contains 11.5 g sucrose; therefore 712 mL should contain a bit more than 77 g, which is close to the given amount of 85.2 g.

▶**SKILLBUILDER 13.2 | Using Mass Percent in Calculations**

How much sucrose ($C_{12}H_{22}O_{11}$) in grams is contained in 355 mL (12 oz) of the soft drink in Example 13.2?

▶**FOR MORE PRACTICE** Example 13.12; Problems 47, 48, 49, 50, 51, 52.

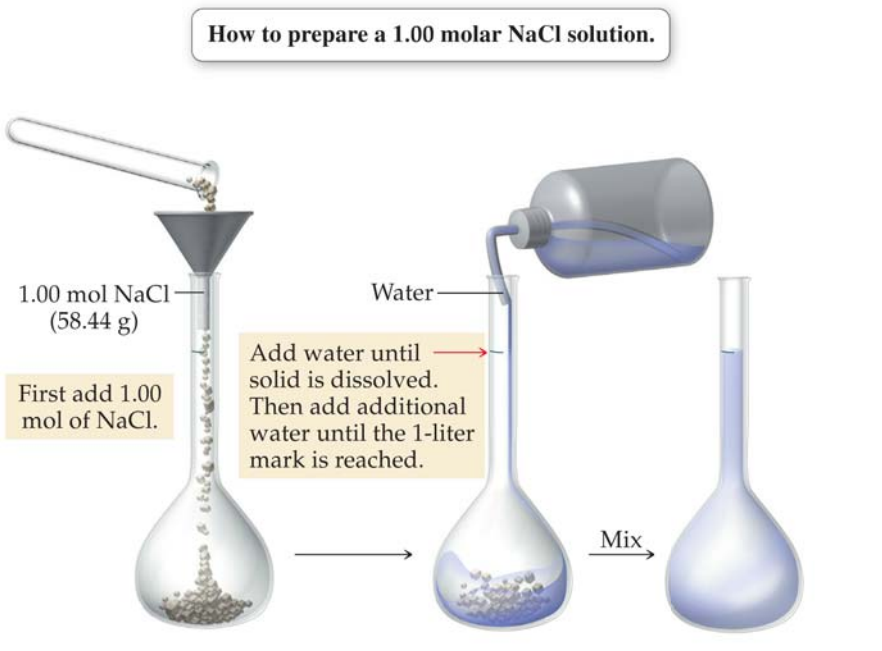
13.6 Specifying Solution Concentration: Molarity

Note that molarity is abbreviated with a capital M.

A second way to express solution concentration is **molarity** (M), defined as the number of moles of solute per liter of solution. We calculate the molarity of a solution as follows:

$$\textbf{Molarity (M)} = \frac{\text{Moles solute}}{\text{Liters solution}}$$

Note that molarity is moles of solute per liter of *solution*, not per liter of solvent. To make a solution of a specified molarity, you usually put the solute into a flask and then add water to the desired volume of solution. For example, to make 1.00 L of a 1.00 M NaCl solution, you add 1.00 mol of NaCl to a flask and then add water to make 1.00 L of solution (◀ Figure 13.7). You *do not* combine 1.00 mol of NaCl with 1.00 L of water because that would result in a total volume exceeding 1.00 L and therefore a molarity of less than 1.00 M.



◀ **FIGURE 13.7 Making a solution of specific molarity** To make 1.00 L of a 1.00 M NaCl solution, you add 1.00 mol (58.44 g) of sodium chloride to a flask and then dilute to 1.00 L of total volume. **Question:** What would happen if you added 1 L of water to 1 mol of sodium chloride? Would the resulting solution be 1 M?