

**1. How would you make 175 mL of a .75M NaCl solution? Show your work.**

To find the solution to this problem we have to know the following item:  
**to prepare a 1L of 1M NaCl solution we need 58.5 g of NaCl (molar mass of NaCl)**

**Step 1.** Determine the number of grams of NaCl we need to make a 1L of 0.75M solution

$$\begin{array}{l} 58.5 \text{ g} - 1 \text{ M} \\ x \text{ g} - 0.75 \text{ M} \end{array}$$

$$x = (58.5 \times 0.75)/1 = 43.875 \text{ (g)}$$

**Step 2.** Determine the number of grams of NaCl we need to make a 0.175 L (175 ml) of 0.75M solution

$$\begin{array}{l} 43.875 \text{ g} - 1 \text{ L} \\ y \text{ g} - 0.175 \text{ L} \end{array}$$

$$y = (43.875 \times 0.175)/1 = 7.678 \text{ (g)}$$

Thus, you have to add 7.7 g of NaCl to measured cylinder and adjust the volume of the solution to 175 ml with distilled water.

**2. How much stock solution of a 5.0 M sucrose solution would be added to distilled water to make 125 mL of 0.5 M sucrose? Show your work.**

**Step 1.** Determine how many times we have to dilute a stock solution to obtain a 0.5 M solution  
 $5.0 \text{ M} / 0.5 \text{ M} = 10$  times  
We have to dilute a stock solution 1/10

**Step 2.** How much of the concentrated solution do we need?

$$\begin{array}{l} \text{The volume of 5.0 M sucrose: } 125 \text{ ml}/10 = 12.5 \text{ ml} \\ \text{The volume of H}_2\text{O: } 125 - 12.5 = 112.5 \text{ (ml)} \end{array}$$

Thus, in order to obtain a 1/10 dilution we have to mix 12.5 ml of 5.0 M sucrose with 112.5 ml of distilled water.