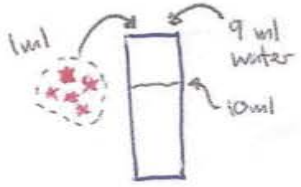
Dilutions

- Dilutions is to add solvent to solution to reduce the concentration
- "Stock solution" is the original solution with original concentration



$\equiv$ Concentration $= \frac{1\text{ ml solute}}{10\text{ ml solution}} = 1:9 = 0.1\text{X}$

remember add the parts for total volume

remember the denominator = total volume

this is just the fraction in decimal form which is the dilution

- The Equation

$$C_1V_1 = C_2V_2$$

This is just $m_1 = m_2$

$$C_2 = C_1\left(\frac{V_1}{V_2}\right) = \text{concentration after dilution} = \left(\begin{matrix}\text{stock}\\ \text{concentration}\end{matrix}\right)(\text{Dilution})$$

$$\text{dilution} = \frac{\text{solute}}{\text{total/final}}$$

* Expressed as the ratio. The inverse as a number x is the dilution factor.

i.e.

$$DF = \frac{\text{total/final volume}}{\text{solute volume}}$$

Example:

You have a 10X solution A and want a volume of 10 µl of 1X solution A.

$$C_1V_1 = C_2V_2$$

$$(10\text{X})(V_1) = (1\text{X})(10\,\mu\text{L}) \Rightarrow V_1 = \frac{(1\text{X})(10\,\mu\text{L})}{(10\text{X})} = 1\,\mu\text{L}$$

$$\text{dilution} = \frac{1\,\mu\text{L}}{10\,\mu\text{L}}$$

$$DF = 10$$