

## Lab Two :.

### **Dilutions:**

For many years, scientists have used a serial dilution method to control sample size. This is important to many diagnostic and enumeration methods.

**Serial dilution** is a common technique used in many immunologic procedures and many laboratory test. A small amount of serum or solute can be serially diluted by transferring aliquots to diluent. One of the most common series doubles the dilution factor with each transfer (1:2, 1:4, 1:8 ...). These dilutions can be done in microtiter plates or test tubes depending on the volumes of sample and diluent used.

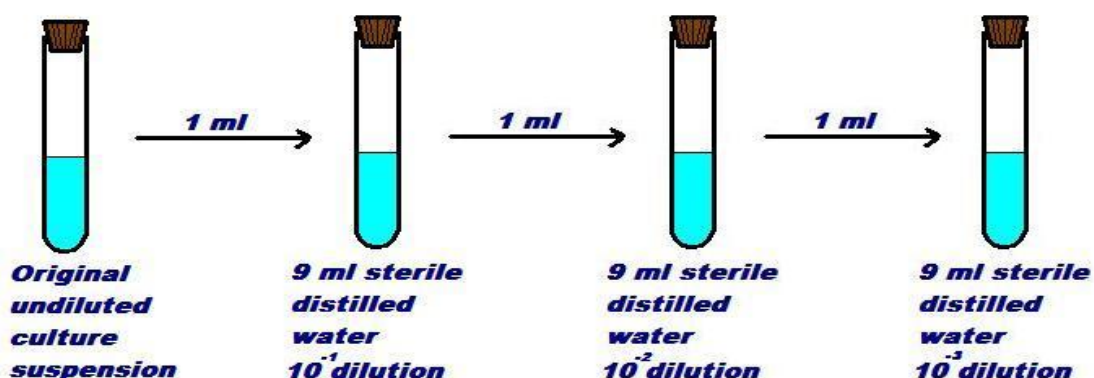
**Sample:** refers to the original liquid that will be tested

**Diluent:** the solution that is mixed with the sample (often-purified water).

**Concentration:** refers to how much of the sample is in a given test. For example, “40 to 1” (1/40) **dilution** means that for every 40 parts of water, there is 1 part of sample.

### **Type of dilutions:**

- 1) **Decimal Dilution Method or One – Ten D.M. :** We transfer 1 ml of the original solution into the tube with 9ml of water, to become one part to 9 part



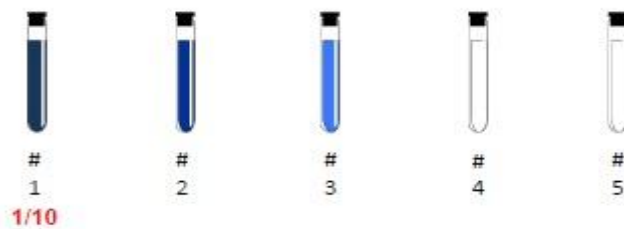
**Serial dilution technique**

Always Remember:

1. Concentration  $\neq$  Volume
2. Follow the formula

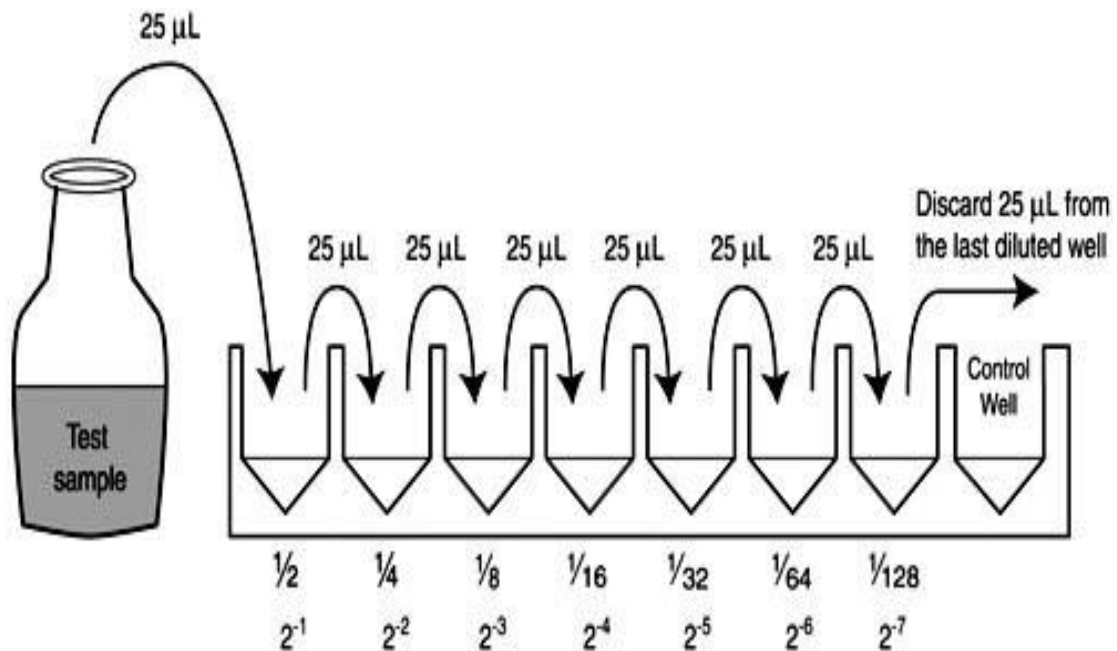
$$\text{Previous concentration} \times \frac{\text{Units transferred}}{\text{Total units}} = \text{New Concentration}$$

What is the concentration in tube #3?



2) **Two – fold Dilution method: it's called One –Two D.M.( 1/2)**

We transfer 1 ml of the original solution into the tube with 1ml of water, to become one part to 2 part.

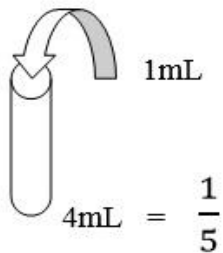


### Times dilution:

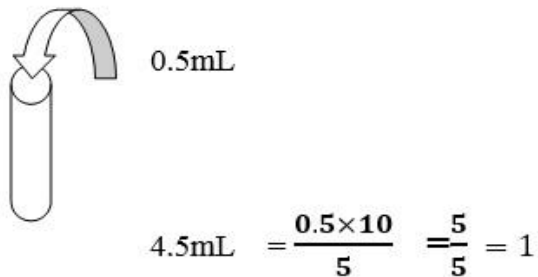
If you want to determine the No. of times dilution of a substance,

1) Dilution 5 times

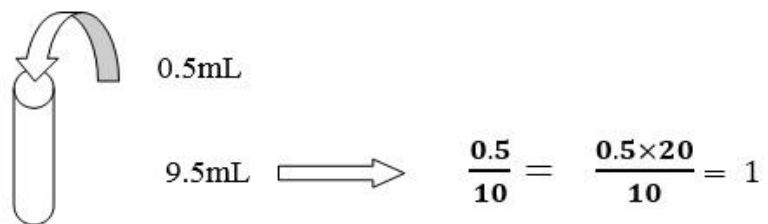
$$\frac{1 \times 5}{5} = 5$$



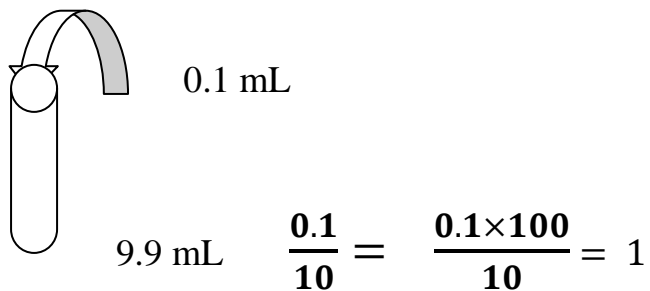
2) Dilution 10 times



3) Dilution 20 times



Sometime do not need the primary dilution, so depend on the double dilution of material or antibiotics Where added 0.1 mL to 9.9 mL from material diluted.



Where dilution = 100 times

- Sometimes use  $C_1V_1 = C_2V_2$  to find different dilutions.
- $\text{Stock} = \frac{W.}{V.}$ 
  - $1\text{g} = 1000\text{mg}$
  - $1\text{mg} = 1000\ \mu\text{g}$
  - $1\text{L} = 1000\text{mL}$
  - $1\text{mL} = 1000\ \mu\text{L}$

**Ex:** prepare antibiotic with concentration  $100\ \mu\text{g}/\text{mL}$  from concentration  $5000\ \mu\text{g}/\text{mL}$  in volume  $10\text{mL}$ .

$$C_1V_1 = C_2V_2$$

$$5000 * V_1 = 100 * 10 = V_1 = \frac{1000}{5000} = 0.2\ \text{mL}$$

**H.W.:** Why we dilution antibiotic??

**H.W.:** Prepare the serial dilution ( $2000, 1000, 700, 100, 25, 10, 2\ \mu\text{g}/\text{mL}$ ) from capsule ampicillin  $250\text{mg}$ .