

Week 1- Introduction to Pipetting and Dilutions

Made by Ana Gomez, 2026 | HTGAA- Spring 2026

Exercise 1

1. Concentration of 5M stock solution:

Calculation

$$5 \frac{\text{mol}}{\text{L}} \times 532 \frac{\text{g}}{\text{mol}} = 2660 \frac{\text{g}}{\text{L}}$$

$$2660 \frac{\text{g}}{\text{L}} = 2.66 \frac{\text{g}}{\text{mL}}$$

Answer: 2.66 g/mL

2. Serial Dilution from 5M to 100 μM

Steps:

Stage	Description
Step 1	Dilute 5M to 10 mM (10,000 μM) - Add 2 μL of 5M - Add the rest to complete 1000 μL (998 μL of $d\text{H}_2\text{O}$) <i>Dilution 1:500</i>
Step 2	Dilute 10.000 μM to 100 μM - Add 10 μL from previous step - Add 990 μL of $d\text{H}_2\text{O}$ <i>Dilution 1:1000</i>
Tubes & Pipettes	- Use 1,5 mL microcentrifuge tubes - P20 pipette for 2-20 μL transfers - P1000 pipette for 990-998 μL additions

3. Reaction setup 60 μL total

Using

$$C_1V_1 = C_2V_2$$

Dye:

$$(6X)(V_1) = (1X)(60)$$

$$V_1 = 10 \mu\text{L}$$

Mystery substance (MS)

$$(100)(V1) = (40)(60)$$

$$V1 = 24 \mu\text{L}$$

Water:

$$60 - (24 + 10) = 26 \mu\text{L}$$

Summary:

Reagent	Stock concentration	Desired concentration	Volume
Loading dye	6X	1X	10 μL
MS	100 μM	40 μM	24 μL
dH ₂ O	n/a	n/a	26 μL