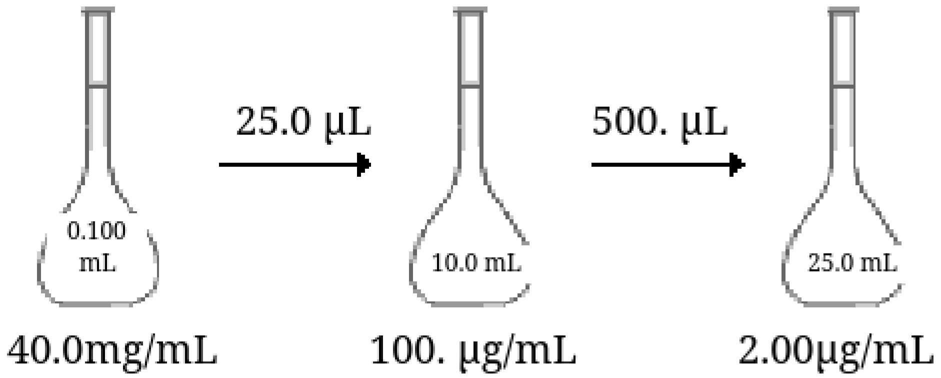
Prelab 2

1.

Reagent Name	Reqd. PPE	Critical Safety Hazards	Reactivity	Disposal
FD&C Red 40	Standard PPE (gloves, eyewear, lab coat)	None	Nonreactive	Can be disposed of in sink since it is food-safe

2. **Dilution Procedure**



$$40.0 \text{ mg/mL} \times \frac{25.0\mu L}{10.0 \text{ mL}} \times \frac{500.\mu L}{25.0 \text{ mL}} = 2.00 \times 10^3 \text{ mg/mL} \times \left(\frac{\mu L}{\text{mL}}\right)^2 \times \left(\frac{1 \text{ mL}}{1000\mu L}\right)^2 \times \frac{10^6 \text{ ng}}{1 \text{ mg}} = 2.00 \times 10^3 \text{ ng/mL}$$

1. Fill a 50 mL beaker with around 40 mL of DI water; set aside.
2. Using a P50 micropipette, dispense 25.0 µL of the 40.0 mg/mL food coloring solution into a 10.0 mL volumetric flask.
3. Using the DI water from Step 1, fill that volumetric flask to the mark. A transfer pipette should be used when approaching the mark for finer control to avoid overshooting.
4. Cap the volumetric flask and invert 20 times to mix.
5. Using the P1000 micropipette, transfer 500 µL from the volumetric flask into a new 25.0 mL volumetric flask. Using the DI water from Step 1, fill that volumetric flask to the mark, using a transfer pipette when approaching the mark to avoid overshooting.
6. Cap the volumetric flask and invert 20 times to mix.
7. Three cuvettes should be prepared for UV-Vis by wiping the clear sides of the cuvette with a KimWipe and ensuring that only the frosted sides are touched from that point until retrieval from the UV-Vis machines.
8. Use a transfer pipette to fill each cuvette with about 3 mL (3 cm) of solution.
9. Use the UV-Vis machine to record the absorption for each cuvette at 503 nm.

3. $A_\lambda = c\varepsilon_\lambda l$
$A_{503 \text{ nm}} = (2.00 \times 10^3 \text{ ng/mL})(2.59 \times 10^4 \text{ L mol}^{-1} \text{ cm}^{-1})(1.0 \text{ cm})$
$A_{503 \text{ nm}} = (2.00 \times 10^3 \text{ ng/mL})(10^{-9} \text{ g/ng})(10^3\text{mL/L})(2.59 \times 10^4 \text{ L mol}^{-1} \text{ cm}^{-1})(1.0 \text{ cm})$
$A_{503 \text{ nm}} = (2.00 \times 10^{-3} \text{ g/L})(2.59 \times 10^4 \text{ L mol}^{-1} \text{ cm}^{-1})(1.0 \text{ cm})$
$A_{503 \text{ nm}} = (20.0 \text{ g})(2.59 \text{ mol}^{-1})(1.0)$
$A_{503 \text{ nm}} = (20.0 \text{ g})(2.59 \text{ mol}^{-1})(1.0)\frac{1 \text{ mol}}{496.42 \text{ g}}$
$A_{503 \text{ nm}} = 0.10$
4. The final solution of my SOP has a concentration of 2×10^3 ng/mL. This is the same as in Problem 3. Therefore, I expect the solution to have an absorbance of 0.10.
5. My answers are the same because the questions are the same.