

## Conversions & Graphing and Analyzing Data Homework

### Section 1: Conversions

Part A: Convert the following measurements into scientific notation.

1) 0.0008 m

$8 \times 10^{-4} \text{ m}$

2) 1,000,000. M

$1 \times 10^6 \text{ M}$

Part B: Convert the following measurements into standard notation.

3)  $2.2 \times 10^5 \text{ m}$

~~220,000 m~~  
220,000 m

4)  $2.2 \times 10^{-5} \text{ m}$

~~0.000022 m~~  
0.000022 m

Part C: Convert the following measured quantities into the indicated unit.

5)  $5.2 \text{ cm}$  to 52  $\text{mm}$   $10^{-2}$  Bigger  $10^{-3}$  Bigger gets even Bigger (move 1x to Right)

6)  $3 \text{ kL}$  to 3000  $\text{L}$   $10^3$  Bigger  $10^0$  (move 3x to Right)

7)  $1.60 \text{ mL}$  to 1600  $\mu\text{L}$   $10^{-3}$  Bigger  $10^{-6}$  (move 3x to Right)

8)  $12.75 \text{ Mm}$  to 12750  $\text{km}$   $10^6$  Bigger  $10^3$  (move 3x to Right)

9)  $1\,210\,002 \text{ ng}$  to 1.210002  $\text{kg}$   $10^{-9}$  Smaller  $10^{-3}$  Smaller gets even Smaller (move 6x to left)

10)  $151 \text{ mg}$  to 0.151  $\text{g}$   $10^{-3}$  Smaller  $10^0$  (move 3x to Right)

## Section 2: Graphing and Analyzing Data

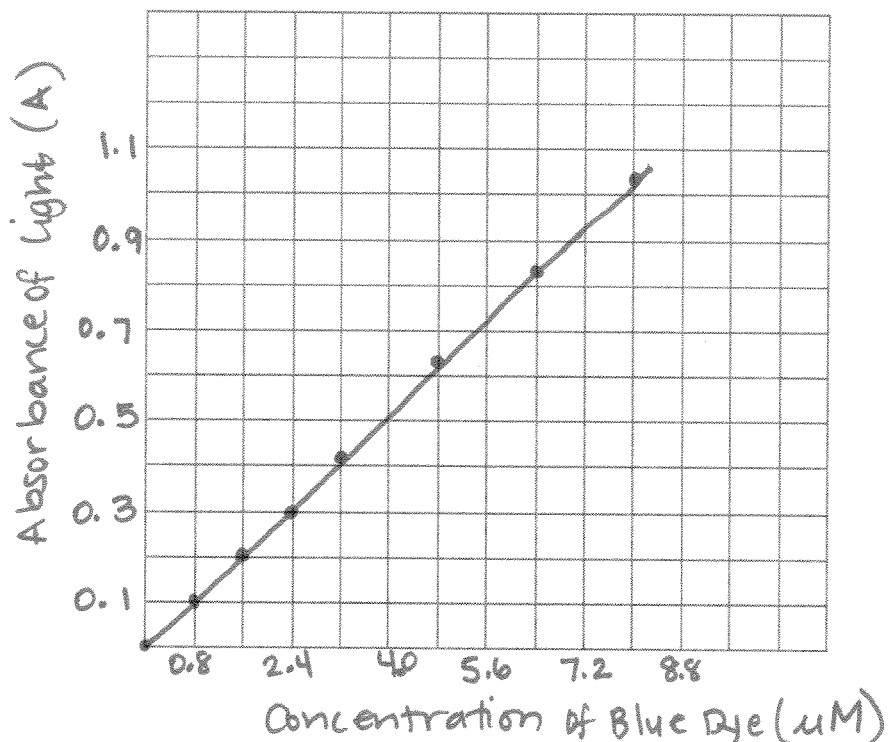
Albert pours two drinks: a glass of water and a glass of blue Gatorade into identical cups. He notices that when he shines a flashlight on the side of each glass more light passes through the water than the blue Gatorade. Albert thinks that the blue dye in the Gatorade absorbs some light causing less light to exit the solution. He hypothesizes that if the blue dye concentration (amount) is increased then the amount of light absorbed by the solution will increase. Albert designs an experiment to test his hypothesis by creating different mixtures of water and blue dye. Each mixture is placed into identical test tubes and has a total volume of 10 mL, but a different concentration (amount) of blue dye. He then uses a flashlight to shine light through each solution and measures the amount of light that is absorbed by each solution. His results are in the data table shown below. Note: the unit to measure concentration (amount) is " $\mu\text{M}$ " and absorbance is "A".

### Part A: Experimental Design

1. Identify the independent variable of the experiment. *Concentration of Blue Dye*
2. Identify the dependent variable of the experiment. *Absorbance of Light*
3. Identify the controls of the experiment. *volume, test tube, flashlight*

Data Table:

Concentration of Blue Dye ( $\mu\text{M}$ )	Absorbance of Light (A)
0.00	0.00
0.80	0.10
1.60	0.20
2.40	0.30
3.20	0.41
4.80	0.61
6.40	0.82
8.00	1.02



### Part B: Data Analysis

4. Using the data in the table, **GRAPH** the data to show the relationship between concentration and absorbance.
5. Are concentration and absorbance directly or inversely proportional? Explain your reasoning.

*directly proportional, when concentration increased absorbance increased*

6. Should Albert accept or reject his hypothesis? Justify your answer with the analysis of data obtained from the experiment.

*Accept his hypothesis, his data showed that as he increased the amount of blue dye the solution absorbed more light*