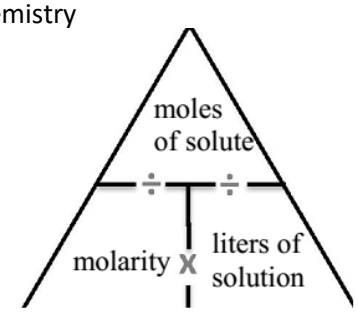
Honors Chemistry
Ms. Ye

Name _____
Date _____Block_____



Molarity Practice Problems:

$$\text{molarity} = \frac{\text{moles of solute}}{\text{liter of solution}}$$

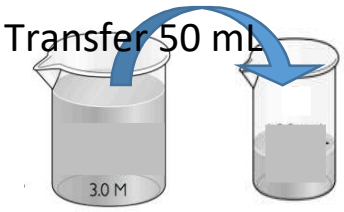
Given Question	**Conversions and Calculations** Remember your units must be in MOLES, LITERS, and MOLARITY (M)	**Final Ans w/ Units**
How many moles of solute are contained in 3.0 L of a 1.5 M solution?		**4.5 mol**
Determine the molarity of 500. mL of a solution with 0.35 mol of dissolved solute.		**0.70 M**
How many moles of $MgSO_4$ are contained in 50. mL of a 3.0 M solution?		**0.15 mol**
How many liters of water are needed to make a 4 M solution using 100 grams of LiBr?		**0.29 L**
How many grams of KNO_3 are needed to prepare 25 mL of a 2.0 M solution?		**5.1 g**

Given Question	**Conversions and Calculations** Remember your units must be in MOLES, LITERS, and MOLARITY (M)	**Final Ans w/ Units**
A 200. mL sample of a solution contains 4.0 g of NaOH. What is its molarity?		**0.50 M**
How many liters of solvent are required to make a 0.88 M solution using 25.5 grams of LiF?		**1.12 L**
How many grams of $CaCl_2$ are dissolved in 80.0 mL of a 0.75 M solution?		**6.7 g**
What is the molarity of 5.0 L of a solution containing 200. g of dissolved $CaCO_3$?		**0.40 M**
How many grams of NaCl are needed to prepare 500. mL of a 0.400 M solution?		**11.7 g**

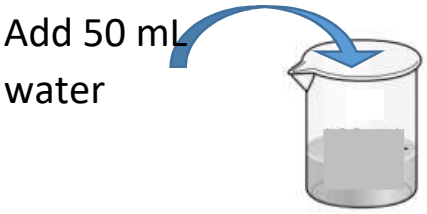
Solutions and Dilutions Demo

1. Place 2-3 drops of food coloring into a beaker with 200 mL of water. Stir until the food coloring is evenly dissolved in the water. Assume this makes a 3.0 M solution (your "stock solution")

2. Measure out 50 mL of your stock solution and pour it into a separate beaker. Does this 50 mL solution have the same molarity (concentration) as the stock solution? Explain.



3. Measure out 50 mL of water and add it to your 50 mL solution (from #2). Does this new 100 mL solution have the same molarity (concentration) as your stock solution? If not, how would the molarity be different and why?



4. The process in the step above is known as a dilution. Explain what it means to dilute a solution.

Making Dilutions: **M = Molarity of Solution** **V = volume of solution**

$$M_1V_1 = M_2V_2$$

*since volume (V) is on both sides of the equation, you need to make sure they are both in the same units! They can both be in L or both in mL…just as long as V_1 and V_2 are in the same unit!

Consider your stock solution from above (concentration of 3.0 M). You need to take your stock solution and dilute it to make 50.00 mL of a 1.2 M solution.

1. Using the dilution formula above, calculate the volume of your stock solution that you would need to make the diluted solution.

2. Measure out the volume of stock solution needed to make your diluted solution and pour it into the 50.00 mL volumetric flask.

3. Do you have 50 mL of solution? How much more water do you need to add to make a 50 mL solution?

DILUTIONS PRACTICE PROBLEMS

1. What concentration can be made when 50.0 mL of 4.6 M carbonic acid is diluted to 350.0 mL?

2. If I have 340 mL of a 0.50 M NaBr solution, what will the concentration be if I made a new solution with the total volume is 560 mL?

3. If I dilute 250 mL of 0.10 M lithium acetate solution to a volume of 750 mL, what will the concentration of this solution be?

4. 52.5mL of a 0.500 M solution was used to make 500.0 mL of a diluted solution. What is the new concentration of this solution?

5. A stock solution of 10.0 M NaOH is prepared. From this solution, you need to make 250.0 mL of 0.375 M solution. How many mL will be required?

6. 2.00 L of 0.800 M $NaNO_3$ must be prepared from a solution known to be 1.50 M in concentration. How many Liters are required?