FLINN SCIENTIFIC

Name_____

Preparing and Diluting Solutions Worksheet

Data Table 1. Preparing Serial Dilutions

	Test Tube 1	Test Tube 2	Test Tube 3	Test Tube 4	Test Tube 5
Volume (in mL) of Concentrated Solution Added to this Test Tube (V_1)					
Concentration of Concentrated Solution (M_1)					
Volume (in mL) of Dilute Solution Prepared (V_2)	Same as V_1				
Concentration of Dilute Solution (M_2)	Same as M_1				
Observations—Rank the Color of the Solutions from 1 to 5 (lightest blue = 1, darkest blue = 5)					

Data Table 2. Preparing Dilutions of a Given Molarity

	Test Tube 1	Test Tube 2	Test Tube 3	Test Tube 4	Test Tube 5
Volume (in mL) of Stock Solution Added to this Test Tube (V_1)					
Concentration of Stock Solution (M_1)					
Volume (in mL) of Dilute Solution Prepared (V_2)	Same as V_1				
Concentration of Dilute Solution (M_2)	Same as M_1				
Observations—Rank the Color of the Solutions from 1 to 5 (lightest blue = 1, darkest blue = 5)					

Data Analysis

1. Calculate the concentrations of each of the serial dilutions in Data Table 1 by rearranging equation 4 from the Background section. Show all work. Fill in the cells in Data Table 1.

2. Compare the concentrations of each of the serial dilutions to the color ranking. What is the relationship between concentration and color intensity (depth of color)?

3. Calculate the concentrations of the dilutions in test tubes 2 and 3 in Data Table 2 using equation 4 from the Background section. Show all work. Fill in all of the other empty cells in the Data Table 2 with the values from the *Pre-Lab Exercise*.

4. Compare the concentrations of each of the dilutions in Data Table 2 to the color ranking. What is the relationship between concentration and color intensity (depth of color)?

Additional Practice Calculations

1. Calculate the number of grams of potassium iodide, KI, needed to prepare 500 mL of a 0.250 M solution. Show all work.

2. Calculate the molarity of a solution prepared by dissolving 25 g of magnesium sulfate, $MgSO_4$, in enough water to make a solution with a total volume of 100 mL. Show all work.

3. Nitric acid solutions with a pH of about 5 are often used to simulate acid rain. A nitric acid solution with a pH of 5 has a concentration of 0.00001 M. Describe how to prepare 10 mL of a 0.00001 M solution using a 1 M stock solution and the serial dilution technique. Draw a diagram if helpful.

4. Describe how to prepare 100 mL of a 0.025 M sodium phosphate, Na_3PO_4, solution by diluting a 0.60 M stock solution. Show all work.

5. Consider a dilution where 25 mL of a 0.50 M sodium hydroxide solution was diluted to a total volume of 100 mL. What is the concentration of the diluted solution? Show all work.