# MISSION IMpHOSSIBLE

## I. Objective

How does an indicator measure the amount of an acid or the amount of a base? What gives an acid or base its strength?

## **II. Materials**

- 24 well plate
- 50 mL beaker (for indicator)
- Solutions
  - Water (neutral) Mystery Liquid **Baking Soda**

- Pipette for indicator
- Universal indicator solution

Ammonia	Lemon Juice	Sprite
Milk of Magnesia	Detergent	-
Vinegar	Milk	

## **III.** Procedure

- 1) Before you test any solution... MAKE YOUR PREDICTIONS and record them!!
- 2) In the **data chart #1** predict whether the solutions are acids or bases.
- 3) In data chart #2 fill in blanks (#1, #2, #3) with the following words: acids, bases, neutral. Also, inside the squares provided, write the names of the test solutions in the order you predict from lowest pH (0) to highest pH (14).
- 4) Obtain 50 mL beaker with 2 ml of indicator solution.
- 5) Place 10 drops of each sample solution into the well plate. Keep track of which well has which test solution.
- 6) Using your pipette add 1 drop of indicator into each solution
- 7) Record data for every liquid tested with the indicator solution in Data Chart #1
- 8) Use indicator colors on the pH chart to determine pH of the test solutions and record this data in Data Chart #1.
- 9) In **data chart #3** fill in blanks (#1, #2, #3) with the following words: acids, bases, neutral. Also, inside the squares provided, write the names of the test solutions in the order they actually tested from lowest pH (0) to highest pH (14).

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#### IV. Data

Data Chart #1						
Solution Name	Prediction	Color pH value		Result		
Ammonia						
Baking Soda						
Detergent						
Lemon Juice						
Milk						
Milk of Magnesia						
Mystery Liquid #1						
Mystery Liquid #2						
Sprite						
Vinegar						
Water						

### Data Chart #2 (Predictions)



Note: A box on this chart may contain more than one solution name. Or, a box may contain no solution names.

#### Data Chart #3 (Actual Results)

-	Blank	#1		Blank #2		Blan	< #3
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Note: A box on this chart may contain more than one solution name. Or, a box may contain no solution names.

#### **Final Procedure:**

- 1. Select one solution you determined to be an acid and one you determined to be a base.
- 2. Complete the prediction section of the chart below.
- 3. Place 5 drops of the base you selected into a well on the well plate. Then add five drops of the acid you selected to the same well.
- 4. Complete the chart and answer the Analysis/Conclusion questions.

			<b>1</b>	
Base – pH	Acid – pH	Predicted pH	Actual Color after combining	Actual pH after combining

#### V. Analysis/Conclusion:

- 1. What does pH measure?
- 2. What color did acids turn with the indicator solution?
- 3. What color did bases turn with the indicator solution?
- 4. What was the strongest acid you tested?
- 5. What was the strongest base you tested?
- 6. How can we have strong and a weak acid? Why can't we just call them all acids or bases?
- 7. Draw a picture showing what happens when an **acid** is added to water.
- 8. Draw a picture showing what happens when a **base** is added to water.
- 9. Draw a picture showing what happens when an acid is added to a base. Explain why the pH "changes when you ad an acid to a base