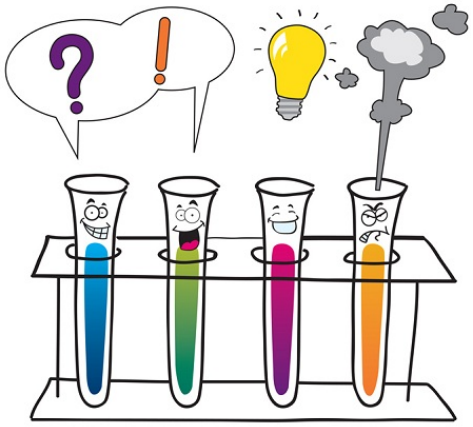
Name : _____Period: ____
Date:__
Lab Group Number _____

Lab 5 : The Mystery Powders Lab: Physical and Chemical Changes Inquiry



Background Information: *Remember a* ***physical change*** ***involves a change in a physical property but the substance does not change its identity. When a*** ***chemical change*** ***occurs a new substance is produced.*** *There are hints like a color change or fizzing (a gas) that indicate a chemical change has taken place because a new substance is produced.*

Write the Objective on your Lab Report :

PART I Objective: To determine the identity of four mystery powders which are similar in appearance by *observing a physical property (solubility) and a chemical property (reactivity).* You will also determine whether mixing these "mystery powders" with water, acetic acid or iodine causes a physical or chemical *change.*

Write this PART II : Safety :

1. Goggles will be worn. Aprons may be worn to protect clothes

2. **No food or drinks allowed in the lab.**
3. **Wash any chemicals which contact your skin, report any contact with chemicals**
4. **Do not taste any chemicals.**
5. **Do not mix any chemicals without direction in the procedure.**

Write this : PART III. Materials: (List the materials Needed on your Lab Report)

Write This PART IV : Procedure: See Web Page (You do NOT need to write the procedure , DO READ IT!) The full procedure is below.

1. Before starting, get a good size piece of paper towel to use to clean the stirring rod in between stirring

2. MAKE the Data Table 1 (on paper) : Observations . Use sentences to describe your observations.

Write This:Part V Results:

TABLE 1: OBSERVATIONS

SUBSTANCE	POWDER "A"	POWDER "B"	POWDER "C"	POWDER "D"
UNMIXED	White Powder	White Powder	White Powder	White Powder
MIXED WITH WATER				
MIXED WITH Acetic Acid				
Mixed with Iodine				

3 . MAKE the Data Table 2(on paper) : Results

TABLE 2: RESULTS

***Directions :* Put These in the chart :**

PROPERTY: Write SOLUBLE OR REACTIVE (Does it dissolve or does it react chemically?)
CHANGE: Write PHYSICAL OR CHEMICAL (Dissolving is a physical change, reacting is a chemical change)

Table 2 : Results Analysis

SUBSTANCE		A	B	C	D
MIXED WITH WATER	**PROPERTY**	(soluble or reactive)			
	CHANGE	(Physical or Chemical)			
MIXED WITH Acetic Acid	**PROPERTY**				
	CHANGE				
MIXED WITH IODINE	**PROPERTY**				
	CHANGE				

PART IV: Procedure : Inquiry (You are NOT required to write the procedure)

General directions :

AVOID CONTAMINATION

Test **ONE powder at a time.** Put **ONE POWDER** in the specific well as instructed. See the diagram below.

1. Get a "spot Plate" . LOOK at to The diagram A for the set up .Find the sample labeled **"A"**. Using the scoop up a **very small** amount of **Powder "A"** and place it in **well #1**. The powder should just cover the bottom.

2. Place the same amount of **Powder "A"** in **well #5** and **well #9**. Follow the procedure for # 6 , adding water to the first well. After recording your observations in the data tables. **Rinse the samples out of the spot plate and wipe with a paper towel.**

3. Find the sample labeled **"B**" for and place the same amount of **Powder "B"** in **well # 2, 6, and 10**.

4. Find the sample labeled **"C"** and place the same amount of **Powder "C"** in **wells # 3,7,and 11**.

5. Find the sample labeled **"D".** Place **Powder "D"** in wells **# 4,8,and 12.**

6. Usea DI squirt bottle (or Get a beaker with some water. Use an eyedropper) to place **water** into the well **#1 so that it fills most of the well.** DO NOT touch the powder with the dropper. Use a glass rod to stir the mixture. **RECORD YOUR OBSERVATIONS IN THE DATA TABLE.**

7. **Clean the stirring rod with a paper towel.**

8. Use the dropper in the Acetic Acid (**vinegar)** bottle to add **10 drops** of vinegar to the **powder** in **well # 5.** Stir with a rod and **record observations.**

9. Use the dropper in the **iodine** bottle to add 5 drops of iodine to well **#9. BE CAREFUL BECAUSE IODINE WILL STAIN**. Stir with the glass rod. **Record observations and WIPE THE glass rod CLEAN WITH A PAPER TOWEL.**

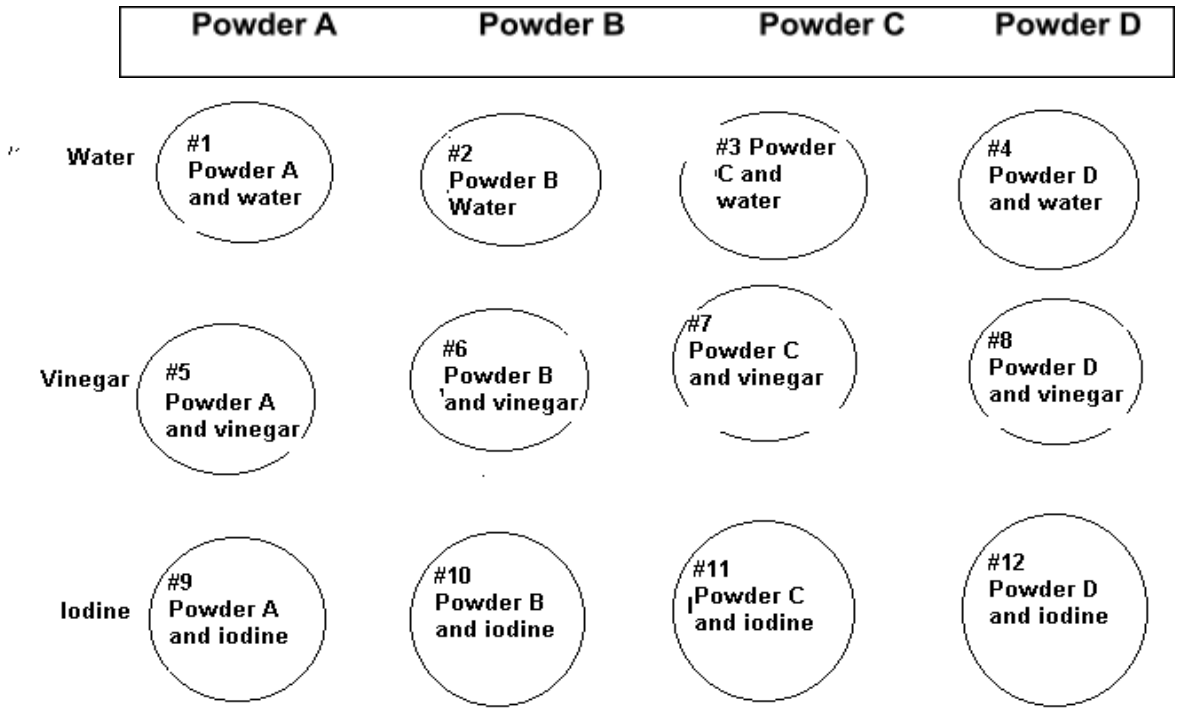
10. Repeat the same process with the **Powder "B" (#2,6,10**), **Powder "C" (#3,7,11)** and the **Powder "D"(#4,8,12)**

11. **Always clean the glass rod after stirring.**
12. **RECORD ALL OBSERVATIONS.**

CLEAN UP: 1. Rinse spot plate with water in the sink. Dry with paper towel.
2. Place all materials in box.

SET UP DATA

Diagram A



Part VI Conclusions: Analyze Results
LAB QUESTIONS

Write out the answers on your lab report paper with the proper labeling and in order. Answer in complete sentences. You do not need to write the questions.

1. How were all of the **unmixed** “mystery powders” similar to each other in terms of their physical properties? Provide evidence from the lab.

2. What was the only **physical property** that you tested? What is the definition of this physical property?

3. What was one **chemical property** you tested? What is the definition of this chemical property?

4. Describe the difference between a physical change and a chemical change.

5. What clues did you see that indicated a chemical change?

6. What does fizzing indicate the formation of?

7. What does a color change indicate the formation of?

8. Explain how you could identify the mystery powders.

9. Explain why it was important to clean the glass rod after you stirred each powder in a liquid.

10. **Inquiry Question : (20 points)**

Find the chemical formula for Baking Soda, Baking Powder, Cornstarch and Table `Sugar (The chemical names will help you, Google them.) List the names of the elements that are found in each in a table.

Find the chemical formula for water, acetic acid, and iodine. List the elements that are found in each. Which mystery powder is a combination of two of the other powders? Name the two powders that make it up and explain why you think this is true.