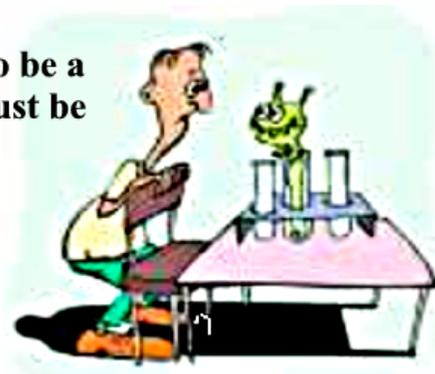


# The Mystery Powders Lab: Physical and Chemical Changes

2 pts ec printing

**Oh no! This seems to be a new substance. It must be a chemical change.**



**Background Information:** You have learned how to describe matter based on its physical and chemical properties. You have also learned some clues that tell you whether a physical change or a chemical change is occurring. 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.

**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, vinegar or iodine causes a physical or chemical change.

**Materials:** Powders A, B, C, D, 4: straws:A, B, C, D Micropipettes: Vinegar, Water, Iodine  
Chemical Wells, Paper Towel, toothpicks

## Procedures:

1. Find the **GREEN** straw. Using the cut end of the straw 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**.
3. Find the **YELLOW** straw. Place the same amount of **Powder “B”** in **well # 2, 6, and 10**.
4. Find the **BLUE** straw. Place the same amount of **Powder “C”** in **wells # 3,7,and 11**.
5. Find the **RED** straw. Place **Powder “D”** in wells # 4,8,and 12.
6. Use an eyedropper to place **water** into the well #1 so that it fills most of the well. Use a spatula to stir the mixture. **RECORD YOUR OBSERVATIONS IN THE DATA TABLE.**
7. **Use ½ of a tooth pick to stir individual wells.**
8. Use the **vinegar** micropipette to add **7 drops** of vinegar to the **powder in well # 5**. Stir with **½ of a tooth pick** and **record observations.**
9. Use the **iodine** micropipette to add **7 drops** of iodine to well #9. **BE CAREFUL BECAUSE IODINE WILL STAIN.** Stir with **½ of a toothpick.** **Record observations.**
10. Repeat the same process with the **Powder “B” (#2,6,10), Powder “C” (#3,7,11) and Powder “D”(#4,8,12)**
11. **Always use a clean ½ tooth pick for every stirring.**
12. **RECORD ALL OBSERVATIONS.**

## SET UP DATA

	Powder A	Powder B	Powder C	Powder D
Water	#1 Powder A and water	#2 Powder B Water	#3 Powder C and water	#4 Powder D and water
Vinegar	#5 Powder A and vinegar	#6 Powder B and vinegar	#7 Powder C and vinegar	#8 Powder D and vinegar
Iodine	#9 Powder A and iodine	#10 Powder B and iodine	#11 Powder C and iodine	#12 Powder D and iodine

### TABLE 1: OBSERVATIONS

SUBSTANCE	POWDER "A"	POWDER "B"	POWDER "C"	POWDER "D"
<b>UNMIXED</b>	White Powder	White Powder	White Powder	White Powder
<b>MIXED WITH WATER</b>				
<b>MIXED WITH VINEGAR</b>				
<b>MIXED WITH IODINE</b>				
<b>NAME OF SUBSTANCE</b>				

**TABLE 2: RESULTS**  
**PROPERTY: SOLUBLE OR REACTIVE    CHANGE: PHYSICAL OR CHEMICAL**

SUBSTANCE		POWDER "A"	POWDER "B"	POWDER "C"	POWDER "D"
MIXED WITH WATER	PROPERTY				
	CHANGE				
MIXED WITH VINEGAR	PROPERTY				
	CHANGE				
MIXED WITH IODINE	PROPERTY				
	CHANGE				

## LAB QUESTIONS

- How were all of the **unmixed** substances (baking powder, baking soda, cornstarch, and sugar) similar to each other in terms of their physical properties?

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

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- What was the only **chemical property** you tested? What is the definition of this chemical property?

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

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

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6. What does fizzing indicate is happening?

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7. What does a color change indicate is happening?

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8. Explain how you were able to identify the mystery powders.

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

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### Mystery Powder Clue Information

Substance	Unmixed	Mixed with water	Mixed with vinegar	Mixed with iodine
<b>Baking Powder</b>	Fine white powder	Fizzing (reactive)	Fizzing (reactive with the water in vinegar)	Color change to greenish-black and fizzing (reactive)
<b>Baking Soda</b>	Fine white powder	Dissolves in water (soluble)	A lot of fizzing (reactive)	Dissolves in iodine (soluble)
<b>Cornstarch</b>	Fine white powder	Does not dissolve in water-forms a white mixture (non-soluble)	Does not dissolve in vinegar- forms a white mixture (non-soluble)	Color change to purplish-black (reactive)
<b>Powdered Sugar</b>	Fine white powder	Dissolves in water (soluble)	Dissolves in vinegar (soluble)	Color change to greenish-brown or yellow (reactive)