PHYSICAL AND CHEMICAL CHANGES LAB

Pre-Lab Discussion:

Chemistry is the study of matter and the changes it undergoes. These changes can be divided into 2 classes: physical changes and chemical changes. In a physical change, one or more physical properties of a substance are altered. Examples of such physical properties are: size, shape, color, and state of matter. Grinding, melting, dissolving, and evaporating are all physical changes. No new substance or substances are formed as a result of a physical change.

A chemical change results in the formation of one or more "new" substances. These new substances differ in chemical properties and composition from the original substance. Iron rusting and paper burning are two examples of chemical change.

This experiment will help you understand the differences between physical and chemical changes and to recognize each type of change when it occurs.

The purpose of this lab is to distinguish between physical and chemical changes.

Equipment and Materials:

Goggles	**$CuSO_4 \cdot 5H_2O$**	**NaCl**
Well plates	**Mortar and pestle**	**HCl (0.1 M)**
Evaporating dish	**Water dropper**	**$AgNO_3$ (0.1M)**
Ceramic square	**Paper (5 cm square)**	**Mg ribbon (Mg)**
Micro spatula	**Wire gauze**	**Hot plate**
Candle	**Matches**	**Vinegar**
Tiny test tube with wax already in it	**Test tube clamp**	**Baking soda**
Hot plate		

Procedure:

After completing each step, fill in the information in table 1.

Station1

1. **Place a small amount of candle wax into a tiny test tube that already has wax in it (scrape it off a tile using a micro spatula).**

1. **Cut a small piece of Mg (Magnesium) ribbon.**

2. **Place the piece of Mg in a well in the well plate and add a few drops of HCl (Hydro chloric Acid). Use extreme care when handling acids!**

   CLEANUP: wait until all the Mg has reacted (add more acid if necessary) and then pour down the sink with running water. Rinse well.

Station 5

1. **Use a mortar and pestle to grind a small scoopula of $CuSO_4 \bullet 5H_2O$ (Copper sulfate penta hydrate) (this is one complete substance—the H_2O is attached to the $CuSO_4$) into a powder.**
   CLEANUP: You do NOT need to clean out the mortar or pestle.

2. **Place the ground powder into an evaporating dish and heat gently over a hot plate until it turns white (don't let it turn brown).**

3. **When it cools add a drop of water. Explain what you think is happening on table 1.**
   CLEANUP: When it cools, dump the solid into the trash. Wipe with a paper towel.

Station 6

1. **Add a few drops of vinegar into a well in the well plate. Add 1 micro spatula of baking soda (sodium bicarbonate).**
   CLEANUP: Pour the new product down the sink. Rinse the well plate with water.

Table 1

Reaction	P or C?	Your Observations	New substance formed
Scraping wax with spatula			
Melting Candle Wax			
Burning a Candle			
Tearing Paper			
Burning Paper			
Dissolving NaCl			
Mixing NaCl with $AgNO_3$			
Cutting Mg ribbon			
Mixing HCl with Mg			
Grinding $CuSO_4 \bullet 5H_2O$			
Heating $CuSO_4 \bullet 5H_2O$			
Adding water to $CuSO_4$			
Mixing Vinegar and Sodium bicarbonate (baking soda)			

Discussion Questions: