

Chemical and Physical Change Lab Activity – Student Edition

Chemical or Physical Change?

Background Information:

Physical changes usually involve a change to a substance's state of matter where heat energy is added or removed. The molecular structure of the substance remains the same. For this reason, physical changes can be reversed. Chemical changes, by contrast, occur at the molecular level when two or more molecules are interacting. These changes involve the bonds in the reacting compounds being broken and new bonds being formed as products. Since the reactants are no longer present, a chemical change cannot be easily reversed.

Learning Objectives

By the end of this lab, you will be able to:

- Identify physical and chemical changes.
- Use observations from lab activities as evidence to support your answers.

Pre-lab Questions:

1. Describe three features of a physical change.

2. Describe three features of a chemical change.

Time allowance: 60 mins

Group size: Pairs or groups of three

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Instructions:

1. This lab activity consists of several mini labs. For each activity, follow the instructions and record detailed observations about what happens.
2. Use this information to answer the questions at the end of this activity sheet.

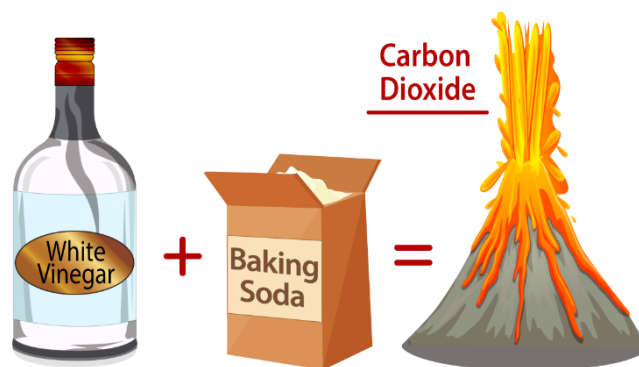
Activity 1: Rainbow Volcano

Equipment:

- Sodium Bicarbonate
- Acetic acid
- Detergent
- Food color/dye (any colors)
- Spatula
- 100ml conical flask
- 100ml beaker
- 100ml measuring cylinder
- Plastic dropper
- Low-sided basin
- Safety glasses
- Gloves

Method:

1. Combine 50ml acetic acid, 5 drops of detergent and 1 drop of food coloring into a conical flask. Swirl gently to combine.
2. Add 3 heaps spatulas of baking soda to the beaker and a small amount of cold water so that it forms a runny paste. Add 1 drop of a different color food dye to the paste and stir.
3. Quickly add the baking soda paste to the conical flask.



Observations:

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Activity 2: Salty Water

Equipment:

- Sodium Chloride solution (saturated)
- 100ml measuring cylinder
- Heating equipment
- Evaporating basin
- Safety glasses

Method:

1. Measure 50ml of saturated sodium chloride solution using a measuring cylinder and carefully pour into an evaporating basin.
2. Set up heating equipment (tripod, Bunsen, gauze mat or clay triangle, heat proof mat)
3. Place the evaporating basin onto the heating equipment and gently heat until almost all liquid has disappeared. Remove dish from heat.



Observations:

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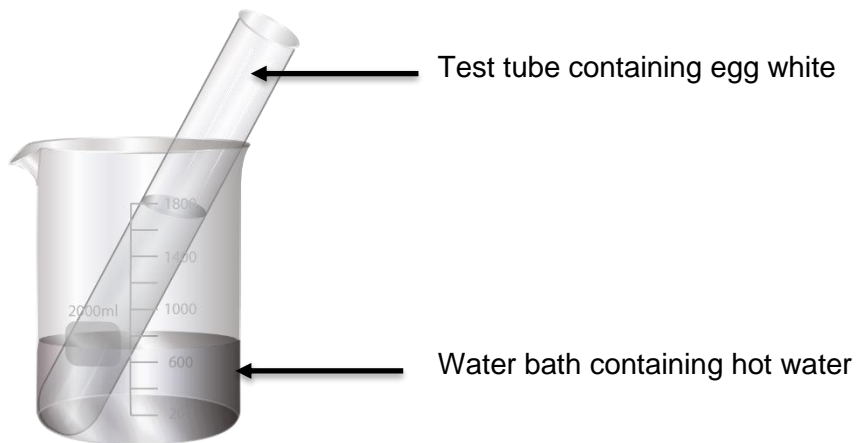
Activity 3: Eggs

Equipment:

- Egg white
- Hot water source (50°C approx)
- Test tube
- Large (250ml) beaker
- Dropper/plastic pipette

Method:

1. Place a dropper-full of egg white into the test tube.
2. Fill the beaker with hot water.
3. Gently place the test tube into the beaker of water.



Observations:

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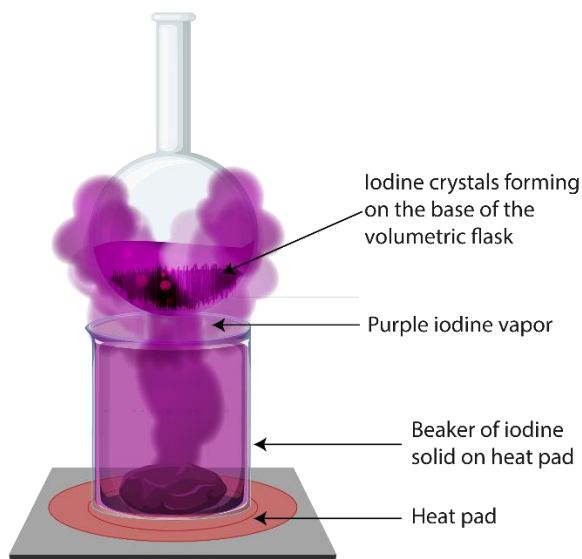
Activity 4: Iodine Clouds

Equipment:

- Iodine crystals
- Beaker
- Heating mat
- Ice cubes
- Round-bottomed flask
- Safety glasses
- Spatula

Method:

1. Add a spatula of iodine to a beaker and place on a heating mat.
2. Heat iodine gently until purple vapor is released.
3. Place a round-bottomed flask containing ice into the opening of the beaker, sealing the opening. Leave the round-bottomed in place and observe.



Observations:

Name: _____ Period: _____ Date: _____

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Post-lab Questions:

1. Which of the above experiments were examples of a physical change?

2. For each of the experiments listed in q1, give a reason for your answer.

3. Which of the above experiments were examples of a chemical change?

4. For each of the experiments listed in q3, give a reason for your answer.
