

**Pre-lab Exercise KEY**  
**Observations of Substances & Their Changes**

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1. List the three physical states in which matter commonly occurs.

**Gas, Liquid, Solid**

2. List some specific examples of physical properties.

**Many answers are possible: color (red, green, etc); physical state (see above);  
melting point; boiling point; odor; density; malleability**

3. Explain how a chemical change is different from a physical change.

**In a chemical change, a totally new substance is formed.**

**Example: The elements oxygen (O<sub>2</sub>) and hydrogen (H<sub>2</sub>) combine to form water (H<sub>2</sub>O).**

**In a physical change, the same substance exists before and after the change takes place. It has changed simply in terms of its physical state.**

**Example: Liquid water [H<sub>2</sub>O(*liquid*)] boils and becomes steam [H<sub>2</sub>O(*gas*)].**

4. List 4 observational evidences that a chemical change or reaction has occurred. You will be looking for such changes in lab this week.

**Formation of a precipitate  
Formation of a gas (bubbles)  
Signs of Fire (flame, smoke, charring)  
Color Change**

5. Classify each of the following as a physical or a chemical change or neither.

- (a) water boiling      \_\_\_\_\_ **physical** \_\_\_\_\_
- (b) paper burning      \_\_\_\_\_ **chemical** \_\_\_\_\_
- (c) making ice cubes      \_\_\_\_\_ **physical** \_\_\_\_\_
- (d) milk souring      \_\_\_\_\_ **chemical** \_\_\_\_\_
- (e) soda pop fizzing      \_\_\_\_\_ **physical** \_\_\_\_\_
- (f) iron melting      \_\_\_\_\_ **physical** \_\_\_\_\_
- (g) sugar dissolving in water      \_\_\_\_\_ **physical** \_\_\_\_\_
- (h) glass shattering      \_\_\_\_\_ **physical** \_\_\_\_\_

6. Do you or your instructor perform any part of this week's experiment in a fume hood? **YES**

What will you do in the fume hood? **HEAT ammonium chloride**

Why would one use the fume hood for this chemical? **Harmful and unwanted vapors/fumes emitted.**

7. How will you avoid cross-contamination of chemicals in this lab?

**Do not put the tip of the dropper inside of the test tube! Always put the dropper back into the proper container.**