

Evidence of Physical or Chemical Changes - Lab

Note: Safety goggles must be worn at all times during this lab because some of the chemicals used in this lab may be harmful to the eyes.

Information: All matter has physical and chemical properties that can be used to classify it. The physical properties useful to the scientist are color, odor, density, hardness, solubility, phase of matter (solid, liquid, or gas), melting point and boiling point.

Chemical properties are determined by the reaction of the substance with other substances. Examples of chemical properties are combinations with acids and bases, reactions with oxygen and other active gases, and the reactions of the substance with other compounds.

Changes in which the physical or chemical properties of a substance are changed are considered physical or chemical changes.

To tell if a change is a chemical change or a physical change, ask yourself this question: **Does the change alter the type of substance?** If the shape, size, or physical state is changed but the chemical composition, or type of matter remains the same, the change is a physical change.

In a chemical change, which is also called a chemical reaction, the atoms of a substance are rearranged. A chemical change requires that the new substance has a chemical composition that is different from the composition of the original substance.

Some signs of chemical changes are: color change or rust formation, bubbling and fizzing (a gas is produced), light or heat production (the release of energy), and the formation of a solid (called a precipitate).

Mass is not destroyed or created during any chemical change. The Law of Conservation of Mass states that the mass of all substances present before a chemical change is equal to the mass of all substances after the chemical change. The total mass stays the same.

Procedure:

1. At each station there is a task card with instructions for what to do at the station. Read each task card carefully and follow the instructions with the given materials. **Do NOT mix anything** that you are not instructed to.
2. Record your observations in the data table below.
3. Materials should be put back to the way you found them. Wait for the teacher to move you to the next station.

Data:

Substance	Physical Properties	Observed Changes
1 Baking Soda		
Vinegar		
2 Cornstarch		
Water		
Iodine		
3 Epsom Salts		
Washing Soda		
Water		
4 Copper Penny		
Salt		
Vinegar		
5 Sugar		
Water		
6 Steel Wool		
Vinegar		

Conclusion: Use notes and information on lab to answer questions below.

1. List four ways to tell (evidence) that a chemical change has taken place:
2. For each station, state whether a chemical or physical change occurred, and describe the evidence used to determine that change.

Station	Physical or Chemical Change?	Evidence
Baking Soda & Vinegar		
Cornstarch, Iodine, & Water		
Epsom Salt, Washing Soda, & Water		
Penny, Salt, & Vinegar		
Sugar & Water		
Steel wool & Vinegar		

3. What is a physical change?
4. What is a chemical change?
5. A chemical change can also be called a chemical _____.
6. During a chemical change, the mass of the substance is the same / different *after* the change as it is before the chemical change.
7. The Law of Conservation of Mass states...
8. Iodine is an indicator for starch. If starch is present in a substance then it will turn black when mixed with iodine. Which substance contains starch? _____
9. A physical property of sugar that describes its ability to dissolve in water is called _____
_____. Bonus: What phase/state of matter is the sugar before mixing? _____

MATTER: CHANGES & INTERACTIONS

Name _____

Date _____



Things are changing all around Professor Radon's world. Some changes are physical changes. Others are chemical changes. The professor knows the difference. Do you? Label each change **P** (physical) or **C** (chemical).

- _____ 1. This morning, Dr. Radon notices that his wife bleached her hair.
- _____ 2. Leaving the house, he sees that his son's bicycle is rusting badly.
- _____ 3. At the lab, Dr. Radon dropped a glass beaker. It shatters.
- _____ 4. He builds a fire in the fireplace. Soon the wood is crackling as it burns.
- _____ 5. The ficus plant in the corner of the lab is busy photosynthesizing.
- _____ 6. The wax that melted in an experiment is now hardening.
- _____ 7. Dr. Radon uses a sieve to separate the sand from gravel in a dirt mixture.
- _____ 8. Dr. Radon mixes up a potion of salt water to gargle for his sore throat.
- _____ 9. Oops! His lunch was left out of the refrigerator. The sandwich has spoiled.
- _____ 10. Since the sandwich is inedible, the professor fries an egg for lunch.
- _____ 11. He also dissolves some powder in milk to make hot chocolate.
- _____ 12. The steamy hot chocolate leads to a misty fog on the windows of the lab.
- _____ 13. Absent-minded Professor Radon forgot to watch his toast. It has burned black.
- _____ 14. The professor's lunch is digesting in his stomach.