



TEKS 6.5D *Identify the formation of a new substance by using the evidence of a possible chemical change such as production of a gas, change in temperature, production of a precipitate, or color change.*

TEKS Lesson 6.5D: Chemical Changes

What is a chemical change?

Some changes in matter change the properties of the matter but do not change its chemical composition. Other changes do cause changes in the chemical composition of matter. A change in matter that produces one or more new substances is a **chemical change** (also called a chemical reaction). Burning and rusting are both examples of chemical changes.

In a chemical change, the atoms of substances rearrange, forming one or more new substances. Any new substances that form during a chemical change have different chemical and physical properties from the starting substances. Substances that undergo the chemical changes are called **reactants**. The new substances that form are the **products**.



1. **Define** What is a chemical change?

How can you tell that a chemical change has occurred?

How can you tell when a chemical change has taken place? One way to detect chemical reactions is to observe changes in the physical properties of the materials. Another is to observe changes in energy, usually in the form of heat. A change in temperature indicates a change in energy.

Changes in Properties Changes in properties result when new substances form. For instance, gas production, formation of a precipitate, and a color change are all possible evidence that a chemical reaction has taken place. Many times, physical properties such as texture and hardness may also change in a chemical reaction.

- **Production of a Gas** One observable change is the formation of a gas from solid or liquid reactants. Often, the gas formed can be seen as bubbles.



- **Production of a Precipitate** The mixing of two liquids may form a precipitate. A **precipitate** (pree SIP uh tayt) is a solid that forms from liquids during a chemical reaction. For instance, if you mix milk and lemon juice, the milk will curdle and form solids. These solids are a precipitate.
- **Change in Color** A color change can signal that a new substance has formed. For example, avocados turn brown when they react with oxygen in the air.

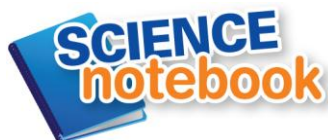
But, a change in matter does not always indicate that a chemical reaction has taken place. Sometimes physical changes give similar results. For example, think about what happens when water boils. Gas bubbles form. But the bubbles you see are made of molecules of water, just as the liquid is. Boiling is a physical change that changes a substance from a liquid to a gas. No new substance is produced. The only sure evidence of a chemical reaction is that one or more new substances are produced.

Temperature Changes Chemical reactions can release energy or absorb energy. Reactions that release energy are called **exothermic reactions**. The reaction between oxygen and a fuel, such as wood or oil, that produces fire releases energy in the form of heat and light. These reactions usually cause an increase in temperature.

Other reactions absorb energy from nearby matter. These reactions are called **endothermic reactions**. When this energy is absorbed, it causes the surrounding area to become cooler. A container in which the reaction occurs often feels cold.



2. Identify What are two ways energy can change in a chemical reaction?



Lesson Check

1. **Identify** What kinds of evidence indicate that a new substance has formed in a chemical change?

2. **Apply Concepts** Give one example of each of the kinds of evidence you listed in question 1.

3. **Relate Evidence and Explanation** Adding food coloring to water causes a color change. Is this evidence of a chemical reaction? Explain.
