

Inferring

Make a list of changes in matter that you observe during a single day. These changes may occur in your environment (such as changes in the weather), as a result of people's activities (such as cooking or driving a car), or in other situations. Try to classify each change on your list as a physical change or a chemical change. Then briefly explain your choice.

Chemical Change

A second kind of change occurs when a substance is transformed into a different substance. A change in matter that produces one or more new substances is a **chemical change**, or a chemical reaction. In some chemical changes, a single substance simply changes to one or more other substances. For example, when hydrogen peroxide is poured on a cut on your skin, it breaks down into water and oxygen gas.

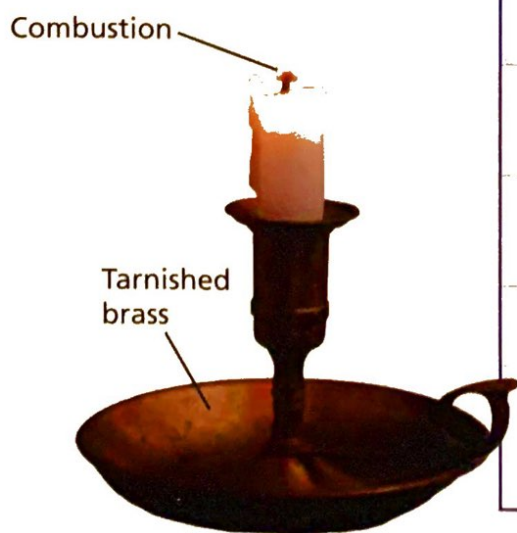
In other chemical changes, two or more substances combine to form different substances. For example, iron metal combines with oxygen from the air to form the substance iron oxide, which you call rust. **Unlike a physical change, a chemical change produces new substances with properties different from those of the original substances.**

Examples of Chemical Change One familiar chemical change is the burning of natural gas on a gas stove. Natural gas is mostly the compound methane, CH_4 . When it burns, methane combines with oxygen in the air and forms new substances. These new substances include carbon dioxide gas, CO_2 , and water vapor, H_2O , which mix with air and are carried away. Both of these new substances can be identified by their properties, which are different from those of the methane. The chemical change that occurs when fuels such as natural gas, wood, candle wax, and gasoline burn in air is called combustion. Other processes that result in chemical change include electrolysis, oxidation, and tarnishing. The table in Figure 17 describes each of these kinds of chemical changes.

FIGURE 17

Four examples of chemical change are listed in the table.

Interpreting Photographs What fuel is undergoing combustion in the photograph?



Examples of Chemical Change		
Chemical Change	Description	Example
Combustion	Rapid combination of a fuel with oxygen; produces heat, light, and new substances	Gas, oil, or coal burning in a furnace
Electrolysis	Use of electricity to break a compound into elements or simpler compounds	Breaking down water into hydrogen and oxygen
Oxidation	Slow combination of a substance with oxygen	Rusting of an iron fence
Tarnishing	Slow combination of a bright metal with sulfur or another substance, producing a dark coating on the metal	Tarnishing of brass