

Reflecting on the Activity and the Challenge

In this activity, you investigated the two types of changes in matter. A physical change is a change in the appearance of the material without creating a new substance. The result is the creation of a solution or homogenous mixture. You also learned that solutions are commonly described in terms of concentration, which is the ratio of the quantity of solute to the quantity of solution expressed in molarity (M). The difference between a saturated and supersaturated solution is discussed. A chemical change, on the other hand, does involve the creation of new products from reactants. Chemical reactions are characterized by a color change or the formation of a precipitate or gas. You further investigated a type of physical reaction by testing the absorbency of a diaper made of sodium polyacrylate, a type of polymer. You can now use this knowledge of chemical and physical changes to amaze the fourth- and fifth-grade students.

Chem to Go

- Which of the following are chemical changes and why?
 - Toast turns black after being in the toaster too long.
 - Water condenses on the outside of a glass of iced tea.
 - Green leaves turn orange, yellow, and red in the fall.
 - Green bananas become yellow.
 - Milk becomes sour if left at room temperature.
 - Butter melts on a hot summer day.
- Think back to a recent lunch or dinner. Describe two physical and two chemical changes that were involved in preparing and consuming the meal and explain why you think each was a physical or chemical change.
- Write a paragraph describing the process of making a cake or driving a car. Indicate the physical changes and chemical changes taking place within the activity.
- The following information is obtained for the element aluminum. Identify which are physical and which are chemical properties.

Aluminum is a shiny silver metal and melts at 660°C . When a strip of aluminum is placed in hydrochloric acid, hydrogen gas is released. The density of aluminum is 2.70 g/cm^3 . When polished aluminum is exposed to oxygen over a period of time it forms aluminum oxide (Al_2O_3) on the surface of the metal.
- How would you determine whether a clear liquid in a beaker is saturated sugar water or just water? Remember, you do not taste samples in the laboratory.
- The decomposition of water is shown in the following equation:
$$2\text{H}_2\text{O}(\text{l}) + \text{energy} \rightarrow 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$$
What type of process is this, physical or chemical? Explain!
- Preparing for the Chapter Challenge**

Describe how you would demonstrate the difference between a physical and a chemical change in a “cool” way.