

Introduction

Every day you cause changes in matter. There are many ways to change matter. This unit will discuss what these changes are and how they are different.

Physical Changes in Matter

Matter does not always stay the same. We have learned that matter can change back and forth from a liquid, solid, or a gas. The form of matter can be changed by temperature or **pressure**. Squeeze a ball of clay, break a pencil, or drop a glass. What happens? The clay is still clay, the pencil is still a pencil, and the glass is still glass. The size and shape of each piece has changed. These kinds of changes are called **physical changes**. Any change in the form or phase of matter is only a physical change. There is no change in the **composition** of the matter. No new **substances** are formed. The substances remain the same.

Physical Change

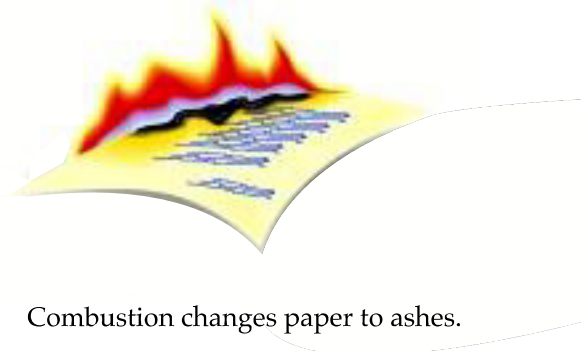


A broken pencil is still a pencil.

Chemical Changes in Matter

What happens when a piece of paper is burned? Heat, light, and smoke are given off. When the burning is complete, we can say that **combustion** is complete. After combustion there is only a pile of ashes left. Where has the paper gone? The appearance has changed, but much more has happened. The composition of the matter has changed. New substances have been formed. **Carbon dioxide**, water vapor, and ashes are produced. In **chemical changes**, energy moves and/or changes form, and a new substance is produced. Sometimes we see this energy as light. At other times, the energy is heat. Combustion is an example of a chemical change that produces heat. Burning wood can warm us. Can you think of a chemical change that takes heat away?

Chemical Change



When food is cooked, chemical changes take place. A piece of broiled meat is chemically different from a raw piece of meat. Did the meat produce heat? No, you had to provide the heat to change it. Cooking food is an example of a chemical change that absorbs heat, or takes heat away.

Remember, during a chemical change, new substances are formed.

Summary

There are two ways to change matter. In physical changes, the phase or shape of the substance is altered. No new substance is produced. In chemical changes, new substances are created. A common way to cause chemical changes is through combustion.