

Objectives: List and identify known physical and chemical properties of an object; describe, contrast, and identify physical and chemical changes.

Physical changes affect the physical properties of an object.

How earth looks today is not how earth looked when it first formed—or even 100,000 years ago. Earth is constantly undergoing change. We will examine how this change occurs in this unit. One way the Earth changes is through physical change. A physical change is a change to an object's _____ properties. Physical properties are properties of an object that can be observed without changing the _____ composition of the object.

Think of a basketball. What are some ways you can describe it? If you were to change those properties, would the basketball still be chemically the same? Examples include the ball's _____, _____, _____, _____, _____, _____, and so on.

Think of that same basketball. What could you do to it to change its properties but still have it be the same chemical basketball? There are three common physical changes:

1. _____. Dying a substance can change its color, but the object still is the same chemically.
2. _____. If you snap something in two pieces, cut it apart, etc. it is still the same substance.
3. _____. If melt something into a liquid, or heat it up into a gas, it is still the same substance, it just exists in a different state of matter. For example, what is the chemical formula of water? Of ice? Of water vapor? Chemically, they are all the same!

Chemical changes reveal the chemical properties of an object and change the physical properties of an object.

What happens when we take an object and start it on fire? Is it the same chemically? No, it's not. _____ and _____ are an examples of a chemical property. The only way we know it is by seeing if the object starts on fire. Chemical properties of an object can only be observed when the substance's

_____ changes. Another example of a chemical property is _____.

A chemical change is the change of one substance into _____ substance. A chemical change affects the substances involved in the change. During a chemical change, combinations of _____ in the original substance are _____ to make a new substance. This is known as a chemical _____. Typically, two or more substances are combined to cause a reaction. Examples of chemical changes include:

1. _____ forming on a piece of iron. Oxygen in the air reacts with the iron to form rust.
2. _____ tarnishing is the result of oxidation of a metal such as copper or silver.
3. Substances _____ producing a new substance.

Not all chemical changes are destructive. Adding heat to some substance causes chemical changes (such as cooking an egg or making a cake, yea! Cake!)

It is possible to identify a chemical change through observations

The one and only true indication of a chemical change is: _____
_____. However, there are other signs that **may** (but DO NOT guarantee) a chemical change has occurred.

1. _____ can be produced by some chemical changes. This is usually the result of a chemical reaction.
2. _____ change can occur during chemical reactions. This means that energy is being used ("lost" or "gained") which is done when atoms rearrange. If it is _____, the object will feel cooler. If it is _____, the object will feel warmer.
3. _____ change is often an indication of a chemical change. For example, fruit darkens when it ripens, a result of a chemical change.
4. _____ often occurs when gasses are produced during a chemical reaction.
5. _____ can occur when two liquids are combined.

The reason not all of these are trustworthy is because you can cause these to occur without a chemical reaction. Again, the only true way to tell if a chemical change has occurred is to find out if the chemical makeup has _____ OR if a new _____ is formed as a result.