

## PHYSICAL CHANGES

A \_\_\_\_\_ **change** is a change in \_\_\_\_\_ only.

A new substance is not created and chemical bonds are not

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Physical changes result when:

- Something changes \_\_\_\_\_
- Something changes \_\_\_\_\_ according to a reaction we would expect (melting ice)
- Something changes \_\_\_\_\_ in a way we would expect (food coloring dissolved in water)
- The \_\_\_\_\_ of an object is reduced in a way we expect

**A physical change results in something that \_\_\_\_\_ but is actually the same!** Physical changes are often not permanent, and can sometimes be \_\_\_\_\_.

Here are some common ways to make a physical change come about:

- \_\_\_\_\_ energy (heat up a substance)
- \_\_\_\_\_ energy (cool a substance)
- Rip, tear, or \_\_\_\_\_ a substance
- Add a \_\_\_\_\_ (dissolve something in a substance)
  - \_\_\_\_\_ and water
  - \_\_\_\_\_ and water
- Change the \_\_\_\_\_ of a substance (change its \_\_\_\_\_)
  - Solid to liquid
  - Liquid to gas ... etc.

**Examples:**

- cutting hair (your hair might be shorter – but the hair is still hair)
- Sharpening pencil (the lead is pointier - but it is still a pencil)
- Boiling water (the state of matter changes, but it is still water)
- putting dry ice in a balloon (the volume might increase, but the balloon is still a balloon and dry ice is still CO<sub>2</sub> as a solid and a gas)



## CHEMICAL CHANGES

\_\_\_\_\_ change: a change in matter that results from \_\_\_\_\_ bonds or \_\_\_\_\_ new bonds, chemical changes result in a change in chemical properties. Chemical changes create something new, with new properties and cannot be easily \_\_\_\_\_. **If you have something \_\_\_\_\_, you have a chemical change!**

### 5 Signs of a Chemical Change

\_\_\_\_\_ : A color change is often a sign that a chemical reaction has occurred. The bright colors of fall leaves result when green chlorophyll in leaves is broken down. At that point, colors of other substances in the leaves become visible.



\_\_\_\_\_ :  
A pH indicator changes color and a substance becomes more or less acidic or basic.

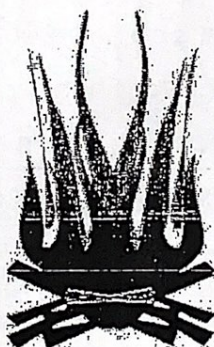


\_\_\_\_\_ :  
Pouring hydrogen peroxide on skin sometimes produces bubbles. This is a chemical reaction.

This is different than evaporation. This is when a **NEW** gas is formed, **NOT** when a liquid evaporates into a gas.

Changes in \_\_\_\_\_ :  
The burning of a campfire can cause a great increase in temperature. This is a chemical change.

This change in temperature must occur because bonds are broken or formed, not because **YOU** heated it up. For example, you putting water on a burner isn't evidence of a chemical change even though the temperature increased. However, if you **BURN** something with fire, it is a chemical change.



\_\_\_\_\_ :  
Two solutions react when mixed, forming a solid called a precipitate. You usually see this when 2 liquids mix to make a solid.

The presence of the precipitate tells you a chemical change has taken place.

