**6th Grade Article**

**Literacy Fusion Article: “Chemical Changes Versus Physical Changes”**

It is important to understand the difference between chemical and physical changes. Some changes are obvious, but there are some basic ideas you should know. Physical changes are usually about states and physical states of states. Chemical changes happen on a molecular level when you have two or more molecules that interact. Chemical changes happen when atomic bonds are broken or created during chemical reactions.

**No Change to Molecules**

When you step on a can and crush it, you have forced a physical change. However, you only changed the shape of the can. It wasn't a change in the state of matter because the energy in the can did not change. Also, since this was a physical change, the molecules in the can are still the same molecules. No chemical bonds were created or broken.

When you melt an ice cube (H2O), you have a physical change because you add energy. In this example, you added enough energy to create a phase change from solid to liquid. Physical actions, such as changing temperature or pressure, can cause physical changes. No chemical changes took place when you melted the ice. The water molecules are still water molecules.

**Changing the Molecules**

These pipes are in the middle of a chemical change as they rust. Chemical changes happen on a much smaller scale. While some experiments show obvious chemical changes, such as a color change, most chemical changes are not visible. The chemical change as hydrogen peroxide (H2O2) becomes water cannot be seen since both liquids are clear. However, behind the scenes, billions of chemical bonds are being created and destroyed. In this example, you may see bubbles of oxygen (O2) gas. Those bubbles are evidence of the chemical changes.

Melting a sugar cube is a physical change because the substance is still sugar. Burning a sugar cube is a chemical change. Fire activates a chemical reaction between sugar and oxygen. The oxygen in the air reacts with the sugar and the chemical bonds are broken. Iron (Fe) rusts when it is exposed to oxygen gas in the air. You can watch the process happen over a long period of time. The molecules change their structure as the iron is oxidized, eventually becoming iron oxide (Fe2O3). Rusty pipes in abandoned buildings are real world examples of the oxidation process.