

## Properties and Changes of Materials

### Science - Pentecost 1

#### Examples of Materials:



wood



metal



fabric



leather



paper



brick



plastic



glass

#### Can materials be changed?

There are two types of changes: reversible and irreversible changes.

Reversible changes can be reversed or changed back to recover the original materials. They are physical changes, which means no new materials are formed, and recovered materials are the same, even if they look or feel different. Reversible changes happen between the three main states of matter: solids, liquids and gases. Melting, freezing, evaporation, condensation and dissolving are all reversible changes.

Irreversible changes cannot be reversed or changed back to recover the original materials. They are chemical changes that form new materials. Several processes cause irreversible changes, including cooking, burning, rusting, decaying and chemical reactions. Signs of irreversible changes include the production of a gas, a sound, a smell or light. The temperature, colour and smell can also change.



burning

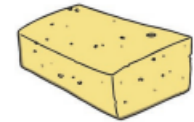


rusting

#### Properties of Materials:



magnetic



absorbent



transparent



bendy



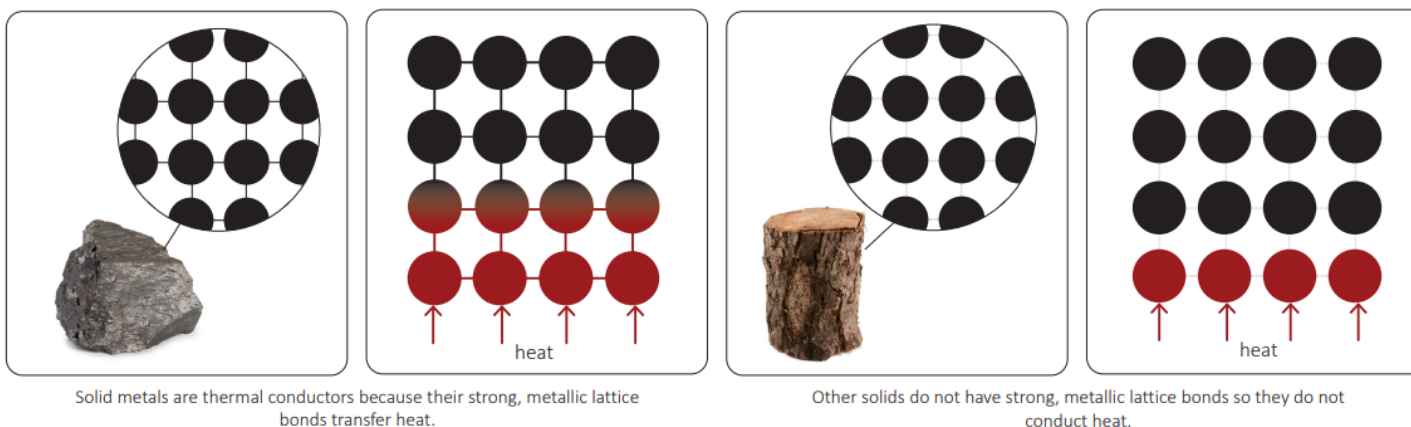
dissolvable



conductive

## Thermal Conductors

Thermal conductivity is a measure of a material's ability to conduct heat. Materials can be thermally conductive or thermally non-conductive. Thermally conductive materials allow heat to pass through them. Thermally non-conductive materials do not allow heat to pass through them. Whether a material is thermally conductive or thermally non-conductive depends on its state of matter and how its particles are arranged. Solid metals are good thermal conductors because their particles are closely packed and they have strong, lattice metallic bonds. When heat is applied to a metal, the particles vibrate and the bonds transfer heat energy to adjacent particles. Other solids, such as plastic, wood and glass, do not have these strong metallic bonds so they do not conduct heat. They are thermal insulators. Liquids and gases are thermally non-conductive because their particles are far apart.



## Glossary

conductivity      the rate at which heat passes through a specified material

solubility      solubility is a measure of a material's ability to dissolve

particle      a particle is an extremely tiny piece of matter, and scientists believe that everything in the universe is made up of particles