

Physical and Chemical Changes

Physical Change

- During a physical change, the substance remains the same even though it may change state or form (shape).

Physical Properties

- Color
- Texture
- Odor
- Luster
- Clarity
- Taste
- State of matter
- Hardness
- Malleability
- Ductility
- Melting point
- Boiling point
- Crystal form
- Solubility
- Viscosity
- Density

Examples of Physical Changes

- Melting a solid
- Freezing a liquid
- Cutting a piece of paper
- Dissolving sugar in water

Chemical Change

- During a chemical change, the original substance is changed into one or more different substances that have different properties.
- Atoms stay the same but molecules are transformed, so the products are different substances than the reactants.

Chemical Properties

- Combustibility
- Reaction with acids
- Reactivity
- Heat of combustion
- Toxicity
- Chemical stability in a given environment
- Preferred oxidation state(s)
- Preferred types of chemical bonds to form
 - ionic or covalent

Indicators of a Chemical Change

- Color change
- Energy is absorbed or released
 - Temperature increases or decreases
 - Light is given off
- Production of a gas or solid
- Production of a new substance
- Changes that are difficult to reverse

Examples of Chemical Changes

- Burning something
- Metal rusting when exposed to water
- Combining manganese dioxide with hydrogen peroxide
- Combining potassium iodide with lead(II) nitrate
- Combining sugar with sulfuric acid