Physical and Chemical Changes

Matter: Properties and Changes

Warm Up

Read, evaluate, and answer the following exercise in their science notebook.

A science teacher mixes calcium chloride and vinegar in a test tube. He passes the test tube around for his students to feel. The students notice that the test tube is hot.

Decide if the mixing of the two chemicals involved a physical or chemical change and justify your answer.

Review

Physical properties is a characteristic of a pure substance that can be observed without changing it into another substance.

- Types of physical properties
  - texture and color
  - flexibility
  - physical state (solid, liquid, or gas)
  - boiling point
  - odor
  - ability to conduct electricity

Review

Chemical property is a characteristic of a pure substance that describe its ability to change into different substances.

- Types of chemical properties
  - flammability
  - burning
  - rust
  - tarnish
  - combustibility

Concept of Change

- Change: the act of altering a substance

Physical Change

- **Physical change**: a change that occurs that does not change the identity of the substance
  - Melting ice
  - Freezing Kool-aid
  - Tearing paper
  - Boiling water

Chemical Changes

- **Chemical change:** a change that occurs causing the identity of the substance to change
  - Burning paper or wood
  - Souring milk
  - Rotting egg
  - Digesting food
  - Electrolysis of water

- *A chemical change is called a chemical reaction*

Chemical Changes Cont'd

- Indicators of a chemical change:
  - Evolution of light
  - Evolution of heat
  - Evolution of a gas
  - Color change
  - Formation of a precipitate

Evidence of Physical Changes

An item is cut.

An item is torn.

An item changed shape.

An item is frozen.

An item melted.

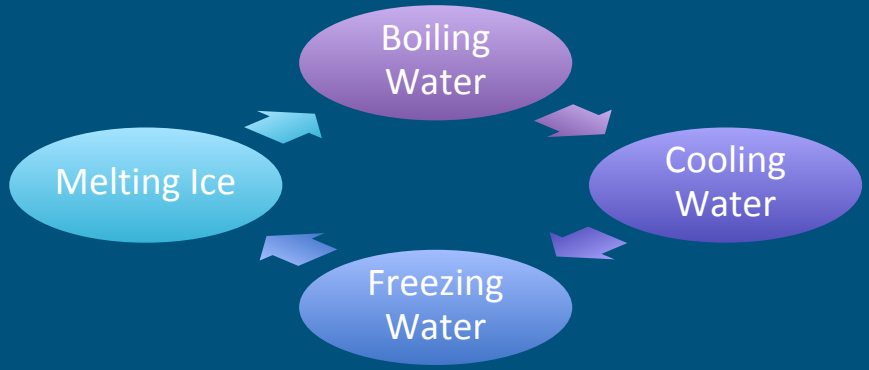
During a physical change, atoms stay the same. No new substances are created.

Evidence of Chemical Changes

- Rusting
- Burning
- Releasing Energy
- Corroding
- Making New Substances

During a chemical change atoms rearrange to create new substances.

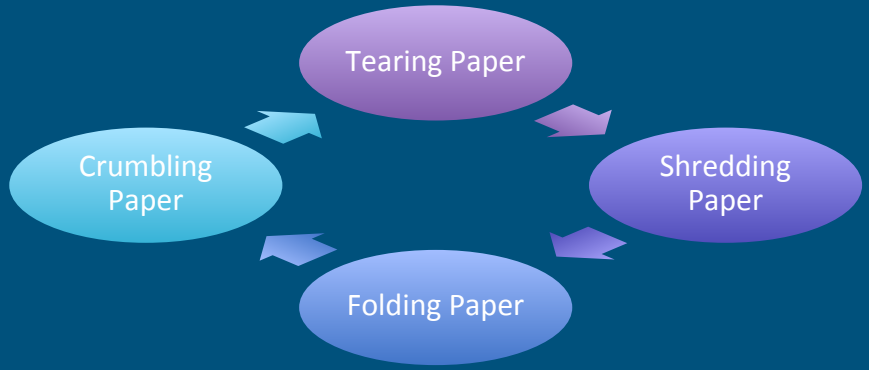
Physical Change of Water



Water boiling, cooling, freezing or melting is still water.

H_20 is still H_20

Physical Change of Paper



If you tear, cut, shred or crumble paper, it does not change the paper.

Chemical Change of a Pencil

Burning the pencil

Turns the Pencil to ash

The pencil is now a different substance. You cannot reverse the reaction physically.

Is it Physical or Chemical?

Change	Physical	Chemical
Melting cheese		
Burning wood		
Milk souring		
Wadding up paper		
Bicycle rusting		

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Physical and Chemical Changes Review

- A **chemical change** is a process where a substance changes its identity. A new substance is formed in all chemical changes.

- A **physical change** is a process where a substance may change state, but it does not change its identity.

Energy

- Any time that matter changes, energy is involve.
- **Energy** is the ability to do work or cause change.
- Every chemical or physical change in matter includes a change in energy.
    - Example - when ice melts, it absorbs energy from the surrounding matter.

Thermal Energy

- **Thermal energy** is the total energy of all the principles in an object.
- Is always move from warm matter to cool matter.
- Thermal energy is the most common form of energy released or absorbed when matter changes.

Endothermic vs Exothermic Change

- **Endothermic change** is a change in which energy is taken in, or absorbed.
  - Example - melting of ice (ice absorbs thermal energy from its surroundings)
- **Exothermic change** is when the energy is release or give off.
  - Example - wood burns, the energy is given up in form of heat and light.

Classwork

- Using the science textbook or presentation, answer the guided reading worksheet

- **Homework**
  - Homework Worksheet for the week (Oct. 6 to Oct. 9). Answer it on a loose leaf paper.