

Physical and Chemical Properties and Changes



Property

► **Is a description of an object**

The tree
is GREEN



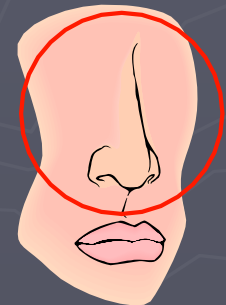
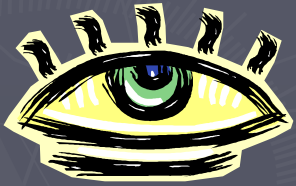
If struck by
lightning, the tree
could catch FIRE
(BURN)



The tree is TALL

Physical Properties

- ▶ Are determined by the use of the five senses.
- ▶ They are a description of an object.



Examples of Physical Properties

Color

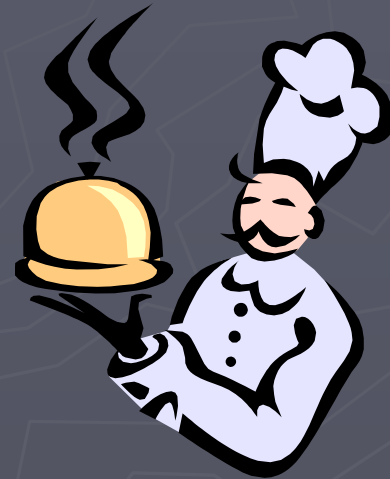
Smell

Taste

Hardness

State of Matter

Boiling, Freezing, or Melting Point



Examples of Physical Properties

Density

Mass

Volume

Malleability (the ability to be molded)

Solubility (the ability to be dissolved)



Chemical Properties

- ▶ **Are determined by a substance's ability to react with other substances.**



Examples of Chemical Properties

- The ability to react with air
 - rust
 - tarnish
 - corrode
 - rot
- The ability to react with water/acids
- The ability to catch fire (flammability)

Physical or Chemical Property?

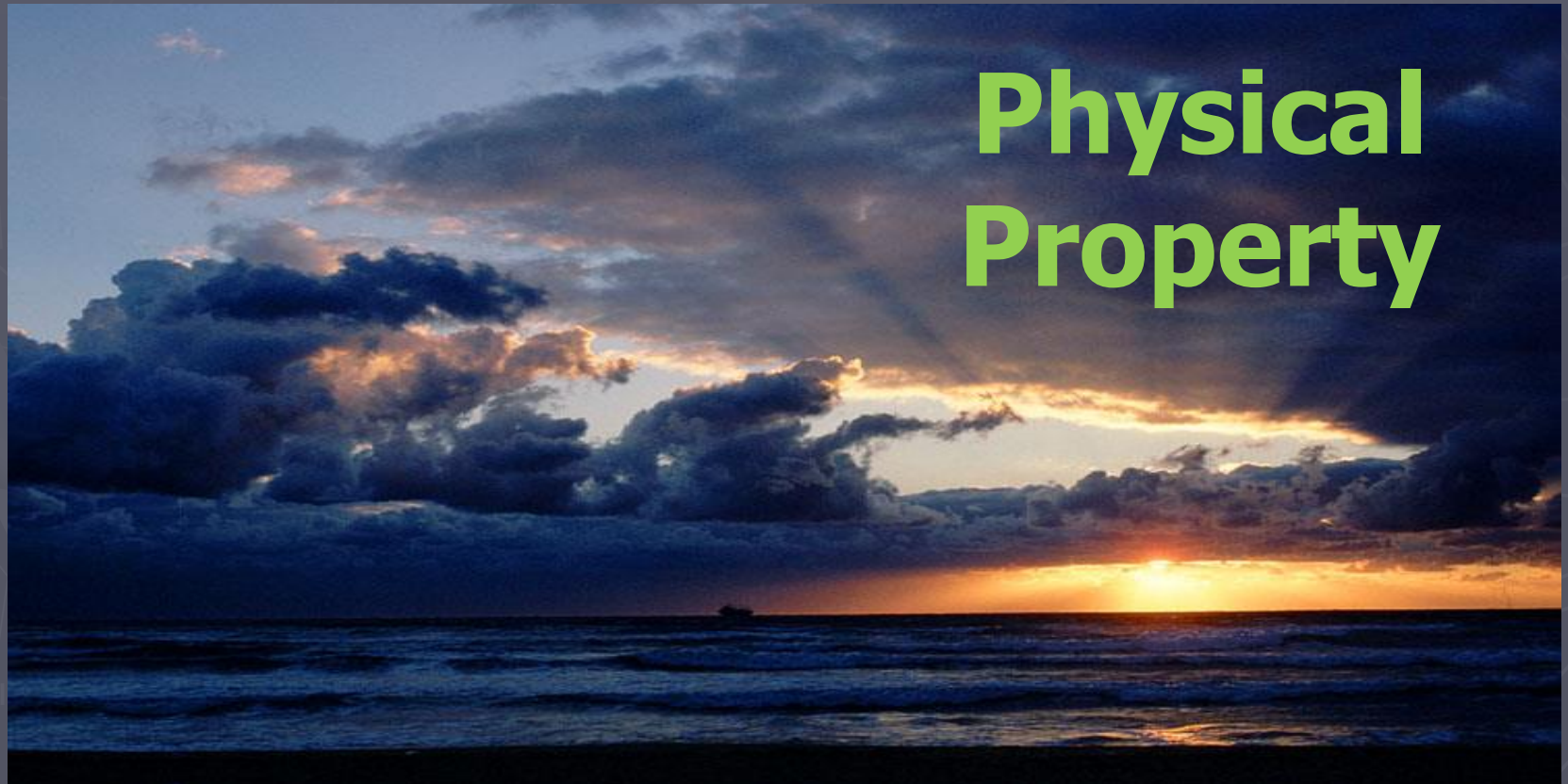
- Ability of gun powder and fire to explode.

**Chemical
Property**



Physical or Chemical Property?

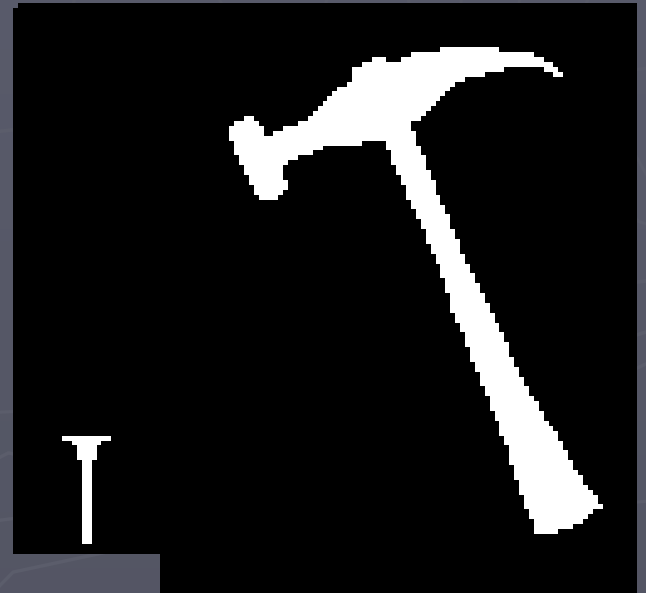
- The color of a sunset.



Physical or Chemical Property?

- The ability of a nail to rust.

**Chemical
Property**



Physical or Chemical Property?

- The shape of a leaf.

**Physical
Property**



© Bob Atkins

Physical or Chemical Property?

- The ability of wood to burn.



**Chemical
Property**

Physical or Chemical Property?

- ▶ The hardness of a diamond.

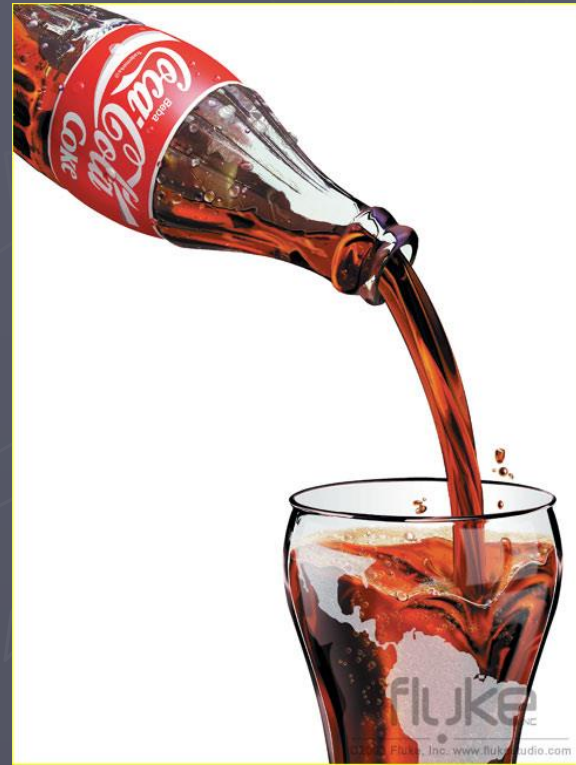
**Physical
Property**



Physical or Chemical Property?

- The volume of your coke.

**Physical
Property**



Physical or Chemical Property?

- The mass of two camels.



**Physical
Property**

Physical Changes

- ▶ a change that occurs without identity changing the of the substance.
- ▶ No new substances are formed.



Examples of Physical Changes

- ▶ Change in size, shape, or color
- ▶ Pencil shavings
- ▶ Torn Paper
- ▶ Crushed ice
- ▶ Sugar dissolved in water
- ▶ Painting a wall

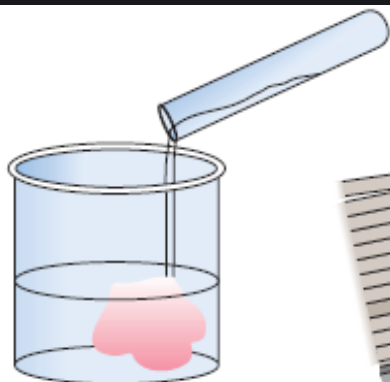


Chemical Changes

- ▶ a change that occurs that causes the identity of a substance to change; something new is formed.
- ▶ New substances with new properties are formed



Evidence of Chemical Change



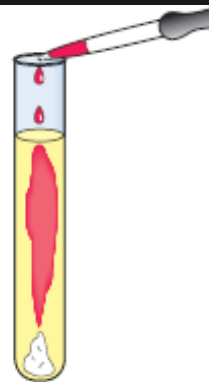
A new colour appears.



Heat, light, or sound is given off (or absorbed).



Bubbles of gas are formed. A new odour may be noticed.



A solid material (called a precipitate) forms in a liquid.



The change is difficult or impossible to reverse.

- New color appears
- Bubbles or fizzing
- Precipitate forms (solid material)
- Heat is produced
- Light is produced
- Sound is given off
- Difficult or impossible to reverse

Reactions with Acid

- ▶ **Vinegar + baking soda = release of Carbon Dioxide Gas**



Reactions with Oxygen

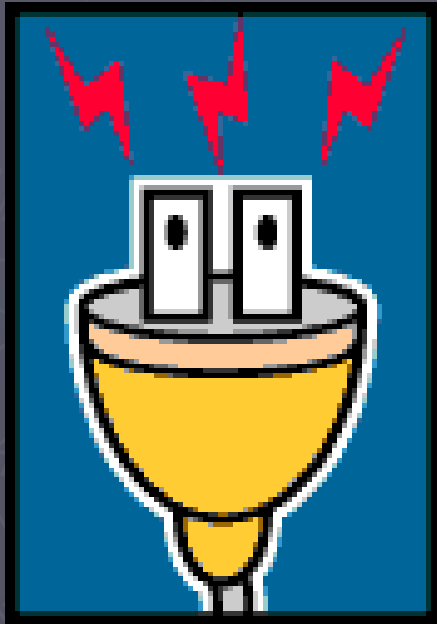
- ▶ **OXIDATION**

- ▶ **Iron + Oxygen = rust**



Reactions with Electricity

► Silver Plating



Reactions between Substances

- ▶ Sodium + chloride = salt
- ▶ Silver + sulfur in the air = tarnish



Other Examples

- ▶ Wood burning
- ▶ Metal rusting
- ▶ Food digesting
- ▶ Gasoline burning
- ▶ Cake baking

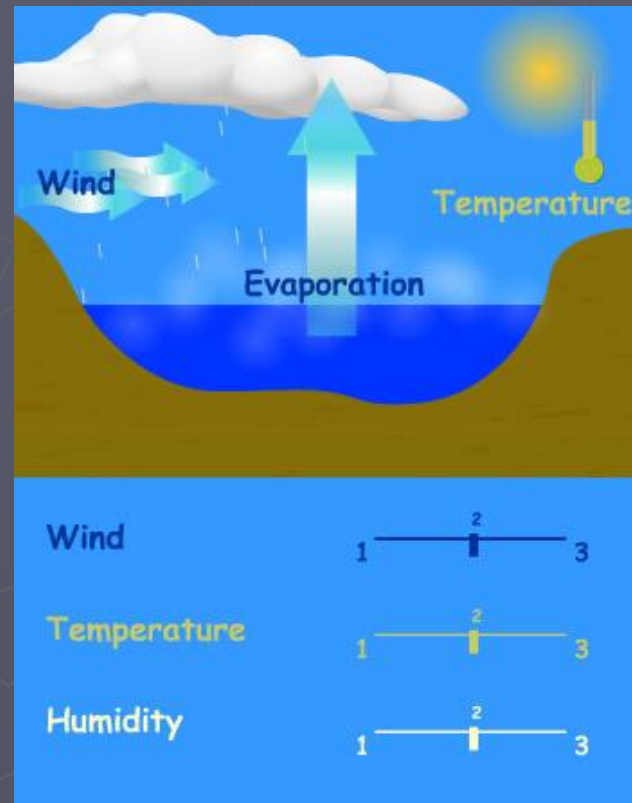


Quiz Time

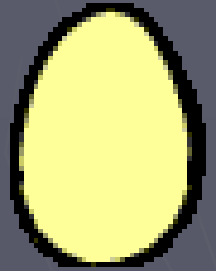


Physical or Chemical Change?

- **Water evaporates from the ocean.**



Physical or Chemical Change?



- The yolk of an egg, which contains sulfur, causes tarnish to form on silver.



Physical or Chemical Change?

- The ice on a lake melts to become water in the lake.



Physical or Chemical Change?

- ▶ **Charcoal in a fire turns to ash after several hours.**



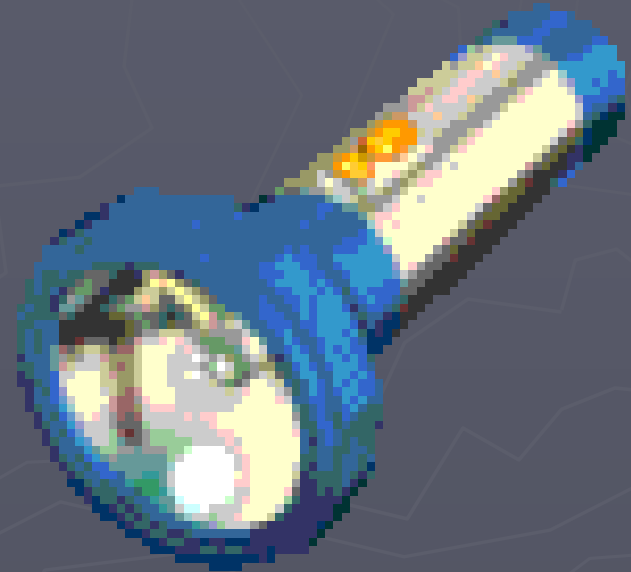
Physical or Chemical Change?

- ▶ A pencil is sharpened in a pencil sharpener, leaving behind shavings.



Physical or Chemical Change?

- ▶ A battery makes electricity to turn on a flashlight.



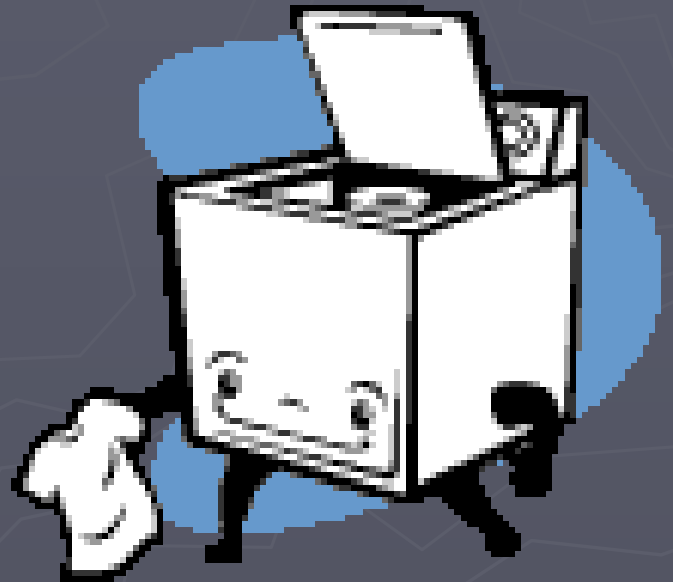
Physical or Chemical Change?

- A bicycle rusts when left in the rain.



Physical or Chemical Change?

- ▶ A shirt is accidentally torn in the washing machine.



Physical or Chemical Change?

- ▶ A log is split in two by an axe.

