Pure substances and mixtures

S8P1b. Describe the difference between pure substances (elements and compounds) and mixtures.

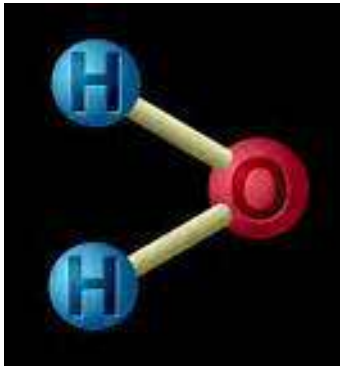
Pure substance

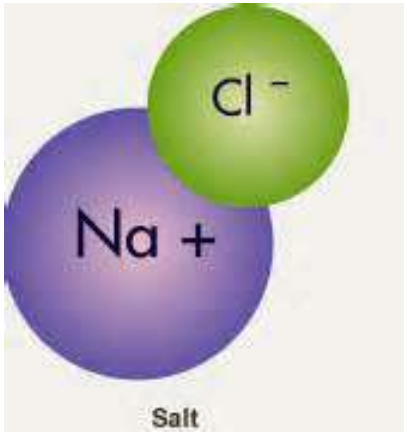
- Is matter that as uniform and unchangeable composition
- Examples include: pure water (H_2O is uniform always having 2 hydrogen atoms and one oxygen atom) vs. sea water (not uniform, its composition differs from place to place)

Pure Substances

- Uniform and Unchanging
- Element – a pure substance that contains only one type of atom and cannot be broken down into simpler substances (hydrogen, iron, and argon are elements)
- Compound – made up of atoms of 2 or more elements (Water is H_2O, Salt is NaCl)

Pure Substances





Heterogeneous mixtures	Homogeneous mixture
• 2 or more substances mixed but not evenly distributed • Examples: granite, chocolate chip cookie, salad	• also called solutions; 2 or more substances mixed with uniform distribution • Examples: salt water, soft drinks, air, metal alloys like brass and 14-carat gold

Mixtures: 2 or more pure substances combined together

S8P1d.

Distinguish between physical and chemical properties of matter as physical (i.e., density, melting point, boiling point) or chemical (i.e., reactivity, combustibility).

Physical Properties

- Physical properties are used to identify, describe and classify matter.
  - Characteristic of a substance that can be observed (using your senses) without changing the substance into something else.

Hardness	Texture	Color
Odor	Taste	Temperature

More Examples of Physical Properties

- size, shape, freezing point, boiling point, melting point, magnetism, viscosity, density, luster and many more.
  - Viscosity - The resistance of a liquid to flowing.
  - Examples:
  - Low viscosity-water, rubbing alcohol
  - High viscosity-honey

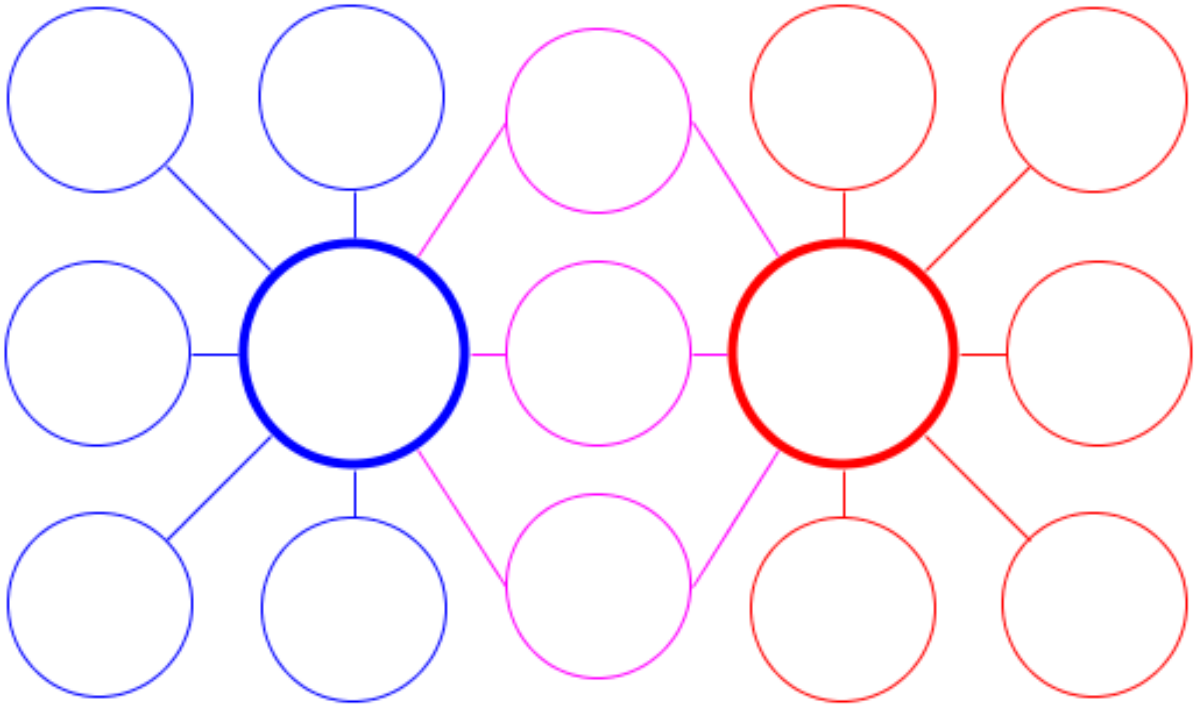
Chemical Properties

- Chemical properties are characteristics involved when a substance interacts with another substance to **change** its chemical make-up.

Flammability	Rusting	Creating gas bubbles
Creating a new chemical product	Reactivity with water	pH

Alike and Different

- Draw a double bubble map in your notes to compare and contrast physical and chemical properties.



http://www.youtube.com/watch?v=uJOGy0dgmUU

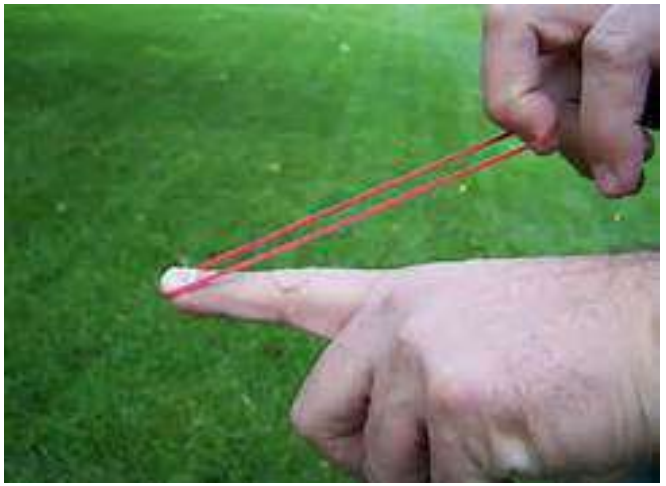
S8P1e.

Distinguish between changes in matter as physical (i.e., physical change) or chemical (development of a gas, formation of precipitate, and change in color).

Physical Change

- **Physical changes** occur when matter changes its property but not its chemical nature.
- Physical property changes could include a change in: texture, shape, size, color, odor, volume, mass, weight, and density.

Physical Change



Chemical Change

- **Chemical changes** are changes matter undergoes when it becomes new or different matter.
- To identify a chemical change look for signs such as color change, bubbling and fizzing, light production, smoke, and presence of heat.

Chemical Change

- A chemical change occurs when fireworks are used. Fireworks are made of metals such as magnesium and copper. These change chemically as they light up the sky.

Physical or Chemical Change?

- Sugar dissolving in tea?

Physical or Chemical Change?

- Logs burning?

Physical or Chemical Change?

- Cutting paper?

Physical or Chemical Change?

- Crushing an aspirin?

Physical or Chemical Change?

- Metal rusting?

Physical or Chemical Change?

- Lighter fluid burning?

Physical or Chemical Change?

- An egg rotting?

Physical or Chemical Change?

- An egg breaking?

http://www.youtube.com/watch?v=qqqmFFCwd7k