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LEARNING GOAL

I will be able to identify physical and chemical properties.

PART 1

PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties

- There are 2 basic types of properties that we can associate with matter.
- These properties are called physical properties and chemical properties.

PHYSICAL PROPERTIES

- A **physical property** describes a characteristic of a substance that can be observed or measured

Do not change what the object is…

Qualitative Physical Properties

- Qualitative properties can be observed using your senses and can be described with words.

Quantitative Physical Properties

- Quantitative properties are measured and recorded using numbers (#'s have units)

Colour

- The light a substance **reflects** gives an object colour.

Luster

- The light an object reflects give an object its luster…
- Is it shiny? Or is it dull?

Odour

- How a substance smells

(odourless, burnt, flowery, putrid, spicy)

Taste

- The flavour of something

(sweet, salty, bitter, sour, spicy)

Texture

- How the surface of a substance feels.

State

- Solid, liquid, or gas at room temperature

Malleability

- A substance that can be pounded or rolled into sheets is said to be malleable.
- Ex. Aluminum foil, gold, tin

Ductility

- Any solid that can be stretched into a long wire is said to be ductile.

Clarity

- The ability of light to pass through an object.

(transparent, translucent, opaque)

Solubility

- How well something **dissolves** in water.

Salt

Sugar

WHICH SOLIDS DISSOLVE IN WATER?

Hardness

- A substances ability to resist being scratched

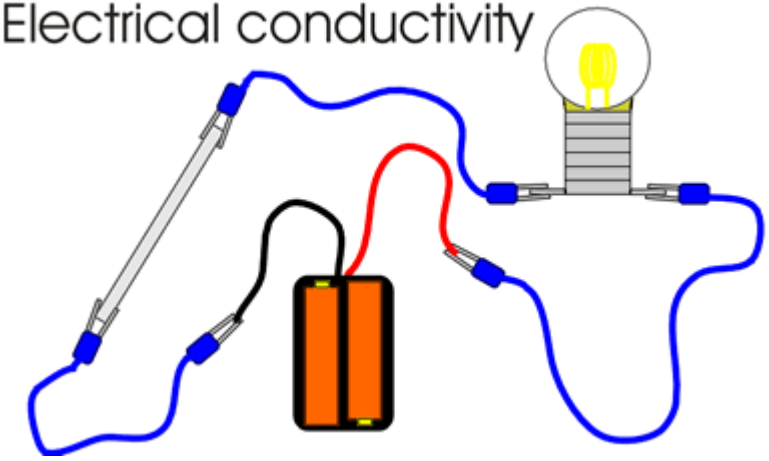
(scale 1 – 10)

Conductivity

- A materials ability to conduct heat or electricity.

Heat conductivity

Electrical conductivity



Brittleness

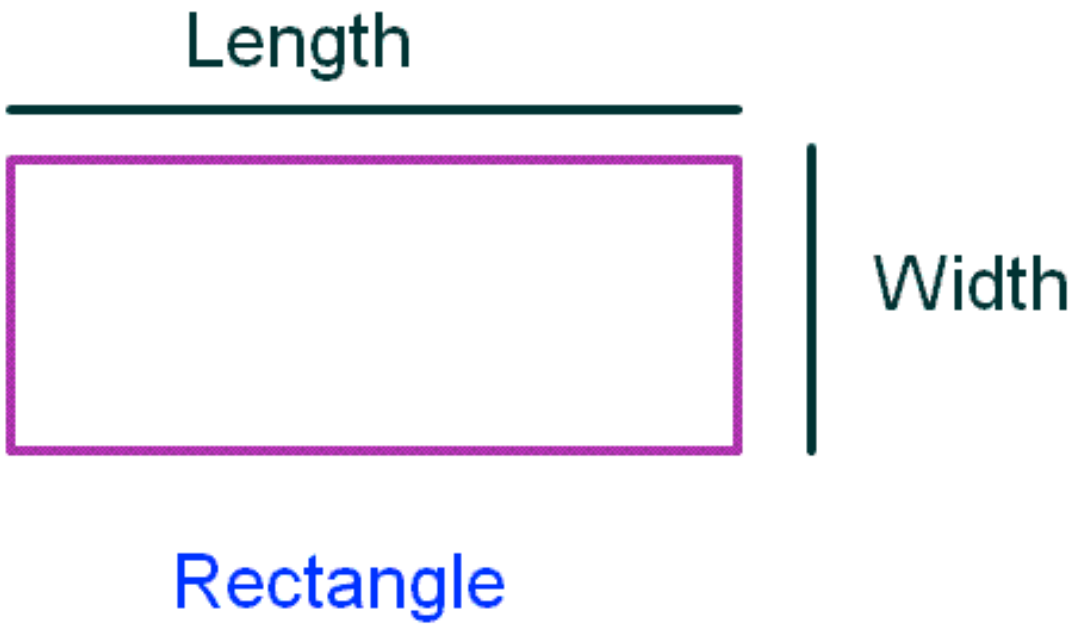
- How easily a substance breaks, cracks, or snaps.

Viscosity

- The thickness / resistance of a fluid to flow.
- Eg. Honey has a high viscosity compared to water.

Length / width

- The longest / shortest dimension of an object.



Melting point

- The temperature at which a solid turns to a liquid.

Boiling point

- The temperature at which a liquid turns to a gas.

Volume

- The amount of 3-D space a substance fills.

Mass

- Amount of matter in an object (kg, g)

Density

- The amount of mass in a given volume of a substance
- Ex. The density of pure water is 1g/ml

Chemical Properties

- A chemical property describes the ability of a substance to change into a new substance(s).
- Can only be observed when a chemical change occurs.

Tells you the types of changes matter can undergo…

Combustibility

A material that will burn but requires a dominant source (eg. More than a spark).

Flammability

A material that catches on fire from a minimal source (eg. A spark).

Flammability vs Combustibility


Corrosion
ability of metal to react with air to produce metal oxides
AKA: RUST

Reaction with Acid

ability of a substance to react with an acid and produce a gas

Reaction with Water

Metals such as lithium, sodium, and potassium react with water to produce hydrogen gas.

Alkali Metals reacting with Water

Physical VS Chemical

Physical property

Malleability Bending an iron nail will change its shape.

State Rubbing alcohol is a clear, colorless liquid at room temperature.

Chemical property

Reactivity with Oxygen An iron nail can react with oxygen in the air to form iron oxide, or rust.

Flammability Rubbing alcohol is able to burn easily.

Physical VS Chemical

The bumper on this car still looks new because it is coated with chromium. Chromium has the chemical property of **nonreactivity with oxygen.**

The iron used in this old car has the chemical property of **reactivity with oxygen.** When iron is exposed to oxygen, the iron rusts.

USEFUL PROPERTIES

- The usefulness of many substances is determined by their physical and chemical properties.

So what is so special about…PAPERCLIPS?

- You and your partner have been given 2 paper clips.
- Make a list of **qualitative** physical properties of your paper clip.
- Beside each physical property…write a sentence describing the qualitative property of your paperclip.

So what is so special about…PAPERCLIPS?

HOW IS A PAPERCLIP USEFUL?

- Think of what a paperclip is used for…how are the properties you listed related to the function of the paperclip?