Unit 2 NAME

Class Work 10/5/13

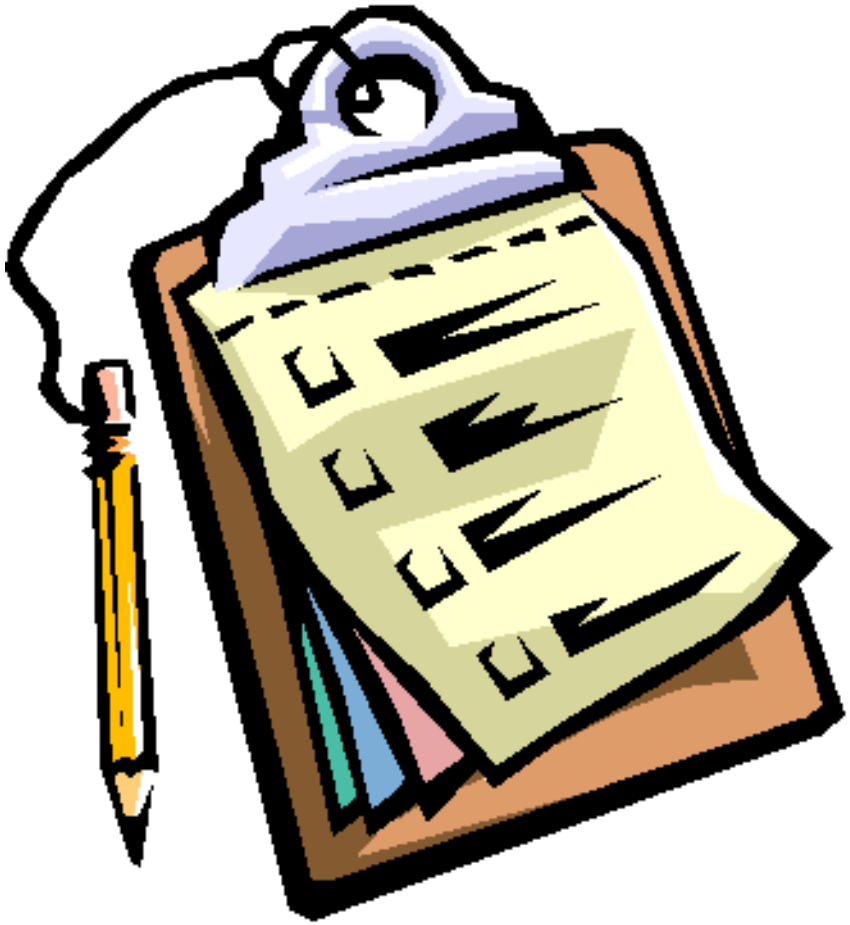
2.1 Physical and Chemical Changes

SPARK

1. What is a chemical?
2. Is air matter? Why or why not?
3. How can you tell a block of aluminum metal from a block of steel metal if both are painted the same color?

Agenda:

- SPARK
- Objective
- Physical and Chemical Properties
- Physical and Chemical Change
- Lab!
- Homework

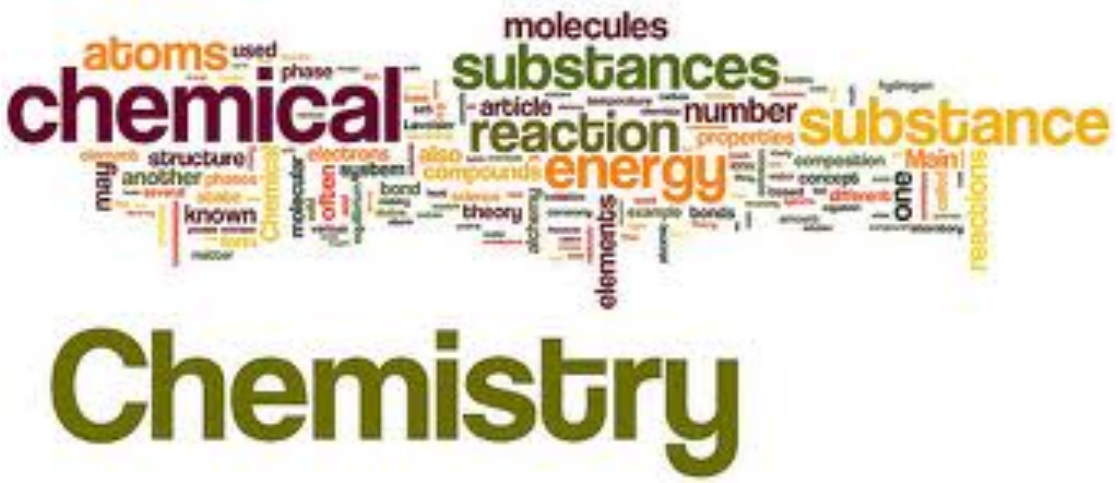


Objectives

SWBAT distinguish between physical and chemical properties of matter and classify changes of matter as physical or chemical.

What is Chemistry exactly?

- Chemistry** is the study of the composition, structure and properties of matter and the changes it undergoes
- Branches of chemistry include: Organic chemistry, Inorganic chemistry, Physical chemistry, Analytical chemistry, Biochemistry and Theoretical chemistry



Matter

- Matter** is anything that has mass and takes up space.
- So… is air matter?

How is matter described?

- Write down your observations about any object on/around your desk (remember the two types of observations!)

How is matter described?

Physical Property**: An observable characteristic that can be measured **without** changing the identity of the substance

Examples:

- *Density*
- *Color*
- *Odor*
- *Hardness*
- *Melting point*
- *Boiling point*

Physical Properties of Common Substances

Substance	Color	State at 25 C	Melting Point (C)	Boiling Point (C)	Density (g/cm^3)
Oxygen	colorless	gas	-218	-183	0.0014
Mercury	silver	liquid	-39	357	13.5
Water	colorless	liquid	0	100	1.00
Sucrose	white	solid	185	decomposes	1.59
Sodium chloride	white	solid	801	1413	2.17

Chemical Properties of Matter

Chemical properties:** Observed only when something changes its **chemical composition**, usually by reacting with another chemical.

Examples:

- *Combustibility, flammability*

Classifying Properties

- Classify each property you listed earlier about your objects as physical or chemical.
- Simply place a “P” next to each physical observation, and a “C” next to each chemical observation.

Properties of Copper

__**PHYSICAL**_ Properties	_**CHEMICAL**__ Properties
reddish brown, shiny	forms green copper carbonate when in contact with moist air
easily shaped in to wires (ductile),	forms new substances when combined with nitric acid
good conductor of heat	forms a deep blue solution when in contact with ammonia
density = 8.92 g/cm^3	
melting point = 1085 deg. C	
boiling point = 2570 deg. C	

STOP and JOT

Is this a physical or chemical property?

1. Water is a liquid at room temperature.
2. Water is not particularly reactive.
3. Water has a density of 1.00 g/cm^3
4. At temperatures greater than 100 deg. C, water is a gas

Properties of Matter

- Extensive property** – depend on the amount of matter (dependent!)
  - Ex. Mass, Volume
- Intensive property** – do not depend on amount of matter (independent!)
  - Ex. Density, melting point, boiling point

THINK-WRITE-PAIR-SHARE

What temperature does water boil at?
What if I have 10 mL? What about 100 mL?

STOP and JOT

Label your answers from before as extensive or intensive!

1. Water is a liquid at room temperature.
2. Water is not particularly reactive.
3. Water has a density of 1.00 g/cm^3
4. At temperatures greater than 100 deg. C, water is a gas

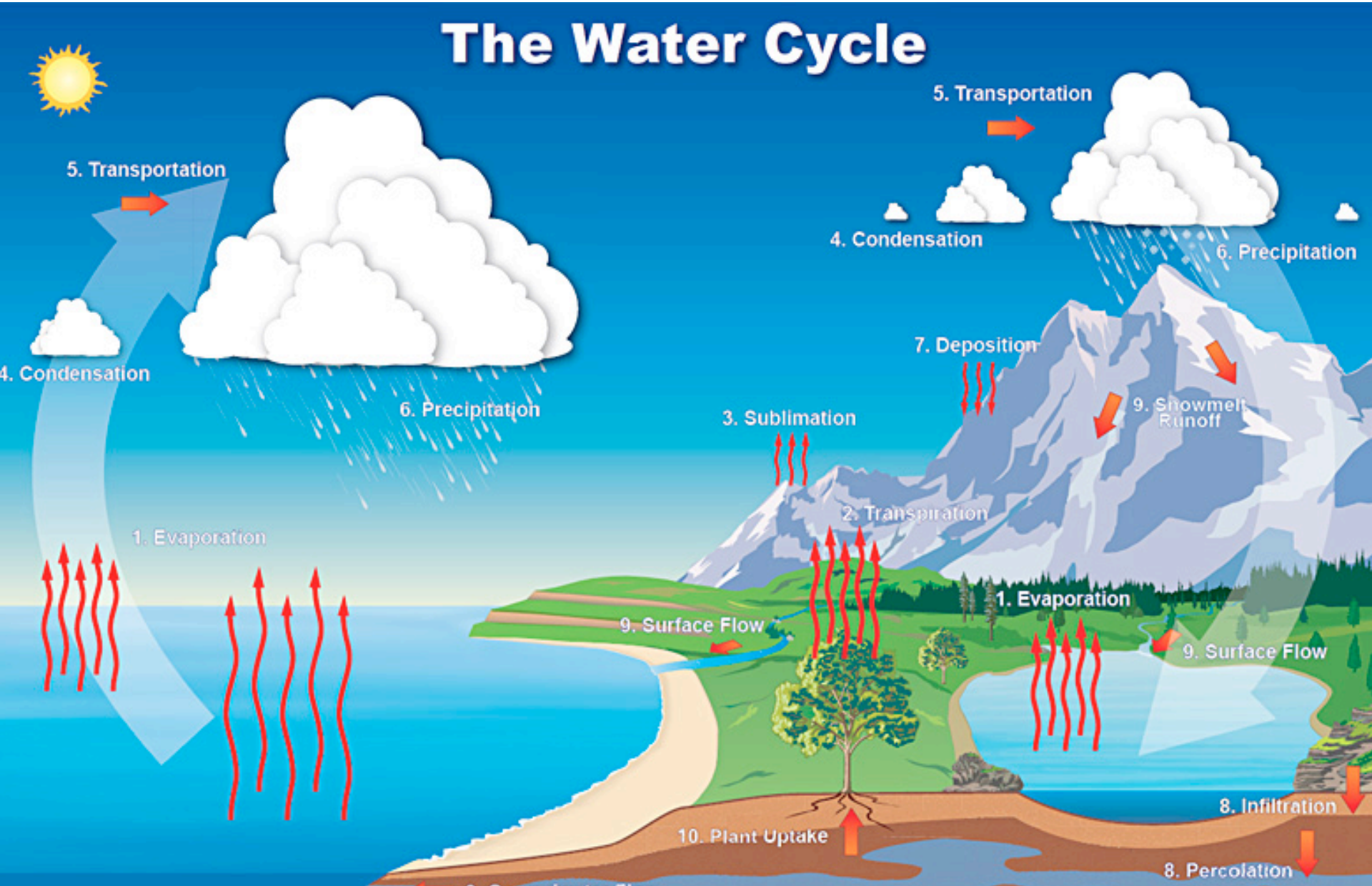
Changes in Matter: Physical Changes

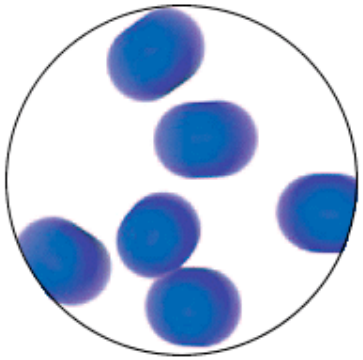
Physical Change: changes that occur in which a substance's identity does NOT change.

Particle arrangement or speed may change

Ex: Sugar dissolving in tea, glass shattering

Physical or Chemical?





gas

sublimation

deposition

evaporation

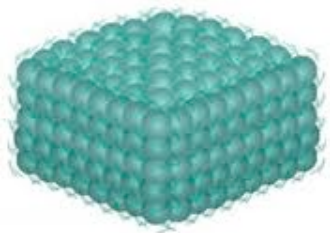
condensation

melting

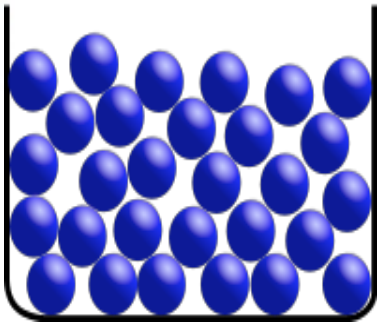
solidification

solid

liquid



Solid



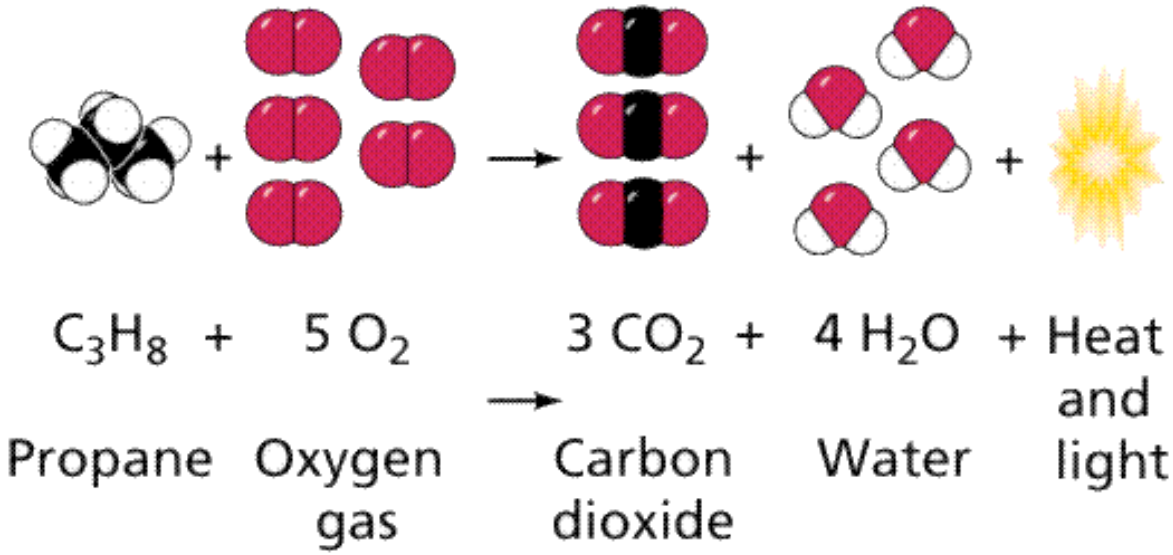
STOP and JOT

- What is an example of a chemical change you are familiar with? (write at least one sentence)

Chemical or physical change?

Chemical Changes

- Chemical change: the identity of the substance changes; new substances are formed
  - e.g. burning wood
- This is a chemical reaction!



Evidence of Chemical Change

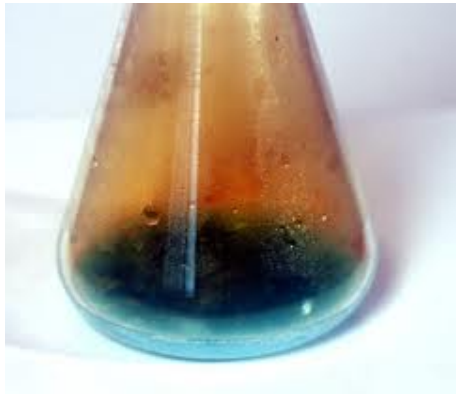
- Gas Production
- Precipitate Formation

  (Precipitate = solid formed from chemical reaction)

- Release or Absorption of Energy

  (Energy aka heat!)

- Color change
- Light, heat or sound given off



Chemical Change Keywords!

- Decompose
- Explode
- Rust
- Oxidize
- Corrode
- Tarnish
- Ferment
- Burn
- Rot

Chemical and Physical Change LAB

Independent Practice

- Complete 2.1 worksheet silently
  - ask for help if you need it!

Distribute textbooks!

HOMEWORK

Finish Chemistry Reference Sheet!

Complete 2.1 worksheet!

Read Page 12 in your new textbook!