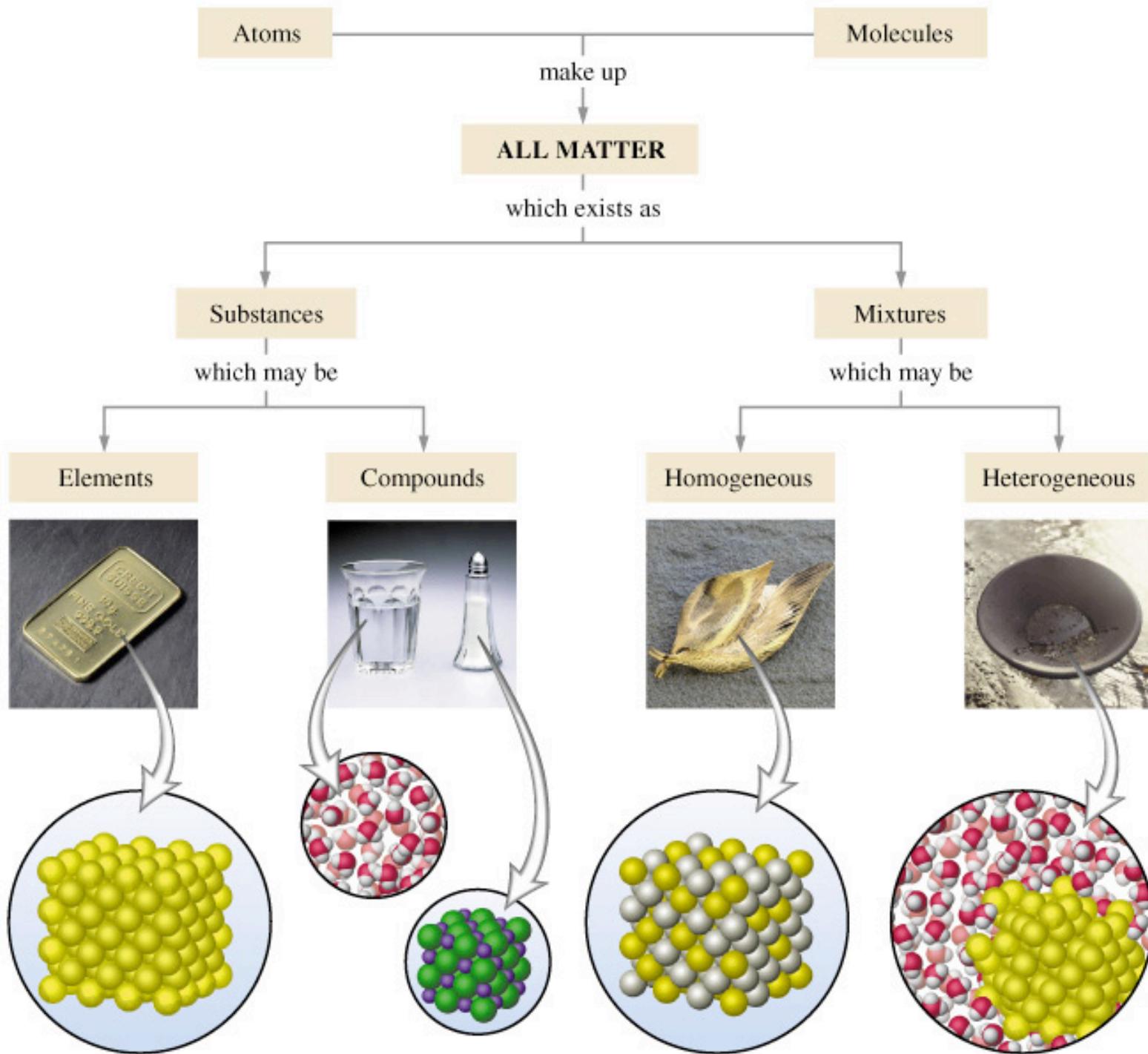


Lesson 2: Matter

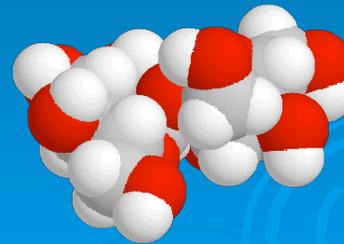
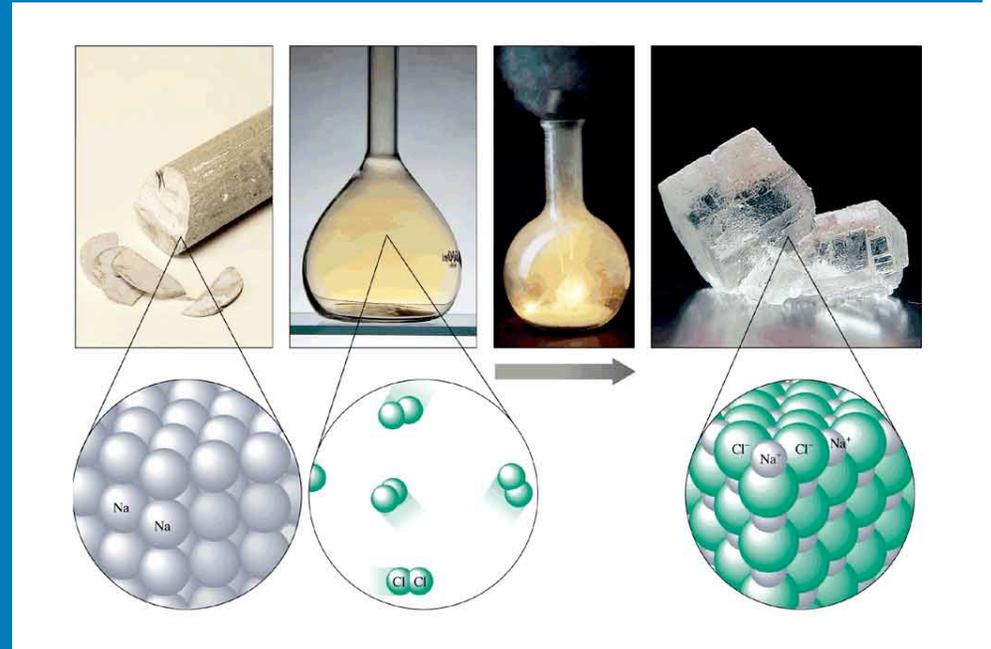
Classification of Matter
and Physical Change vs.
Chemical Reaction





Pure Substances

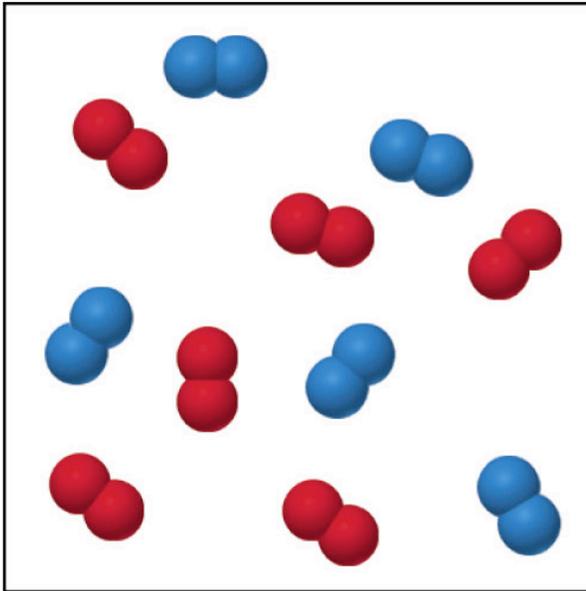
- every sample has same:
 - characteristic properties
 - composition
- are made of:
 - one type of atom: element
 - Ex: iron, gold, oxygen
 - 2 or more types of atoms: compound
 - Ex: salt, sugar, water



Chemical Purity

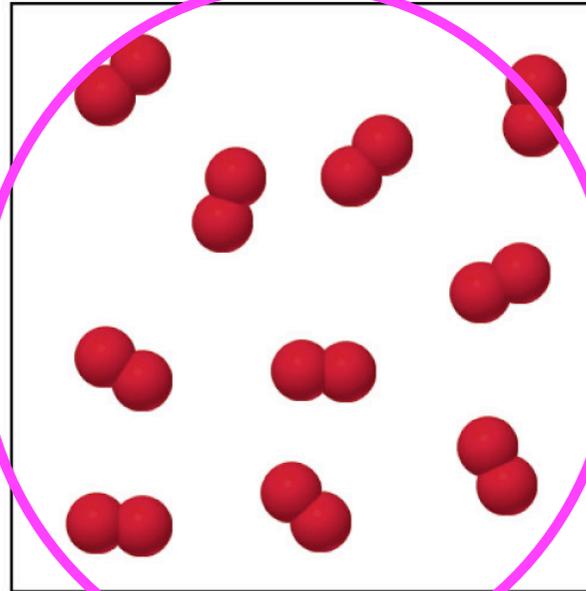
- chemicals in lab are treated as pure
- all chemicals have some level of impurity
- different grades of chemical are used for different purposes

Which are pure substances?



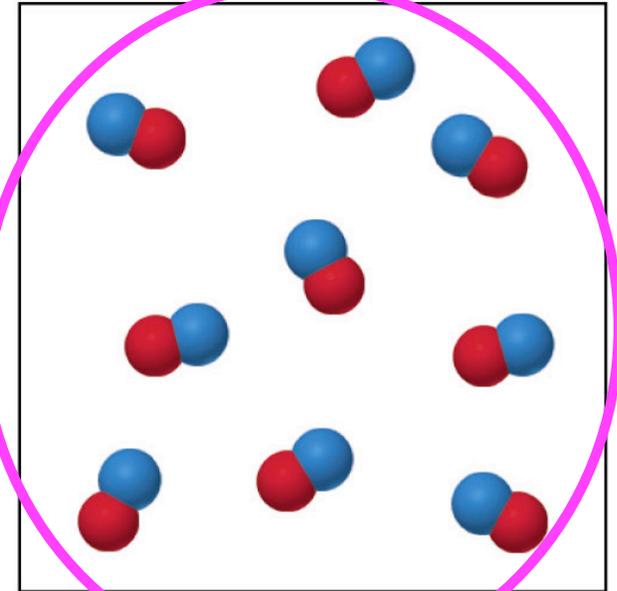
(a)

2 different molecules



(b)

1 type of molecule with same atoms



(c)

1 type of molecule with different atoms

Mixtures

- blend of 2 or more types of matter
- each component keeps its own identity and properties
- the components are only physically mixed
- can be separated using physical means
- properties of the mixture are a combination of the properties of the component's properties

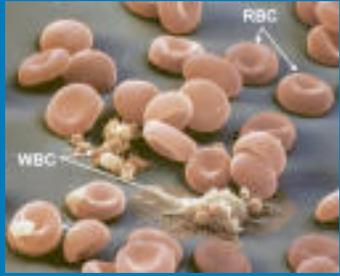
Homogeneous Mixtures

- also called solution
- uniform in composition
- no visible parts

Ex:

- vinegar
- clear air
- salt water
- brass





Heterogeneous Mixtures

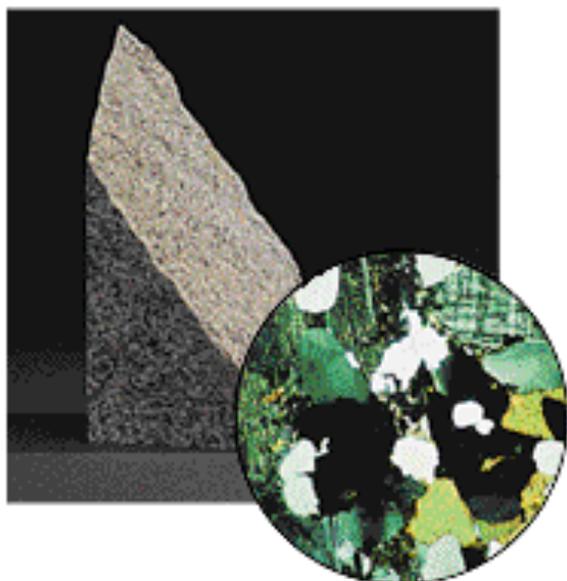
- not uniform in composition
- visible parts

Ex:

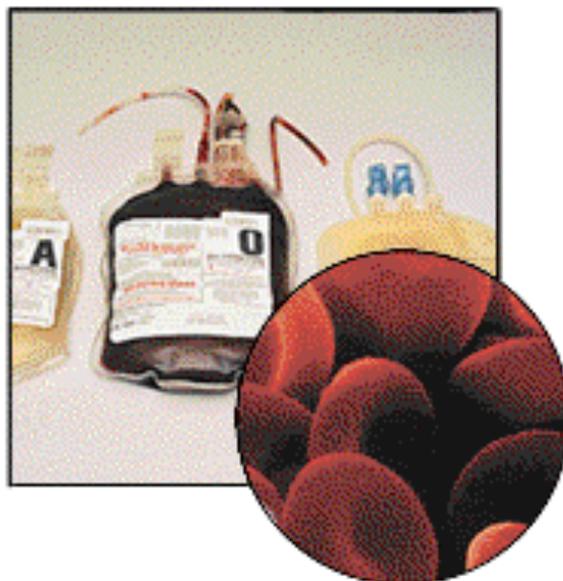
- soil
- concrete
- blood
- chocolate chip cookies
- sand in water
- iced tea with ice



Mixtures



A Granite, a heterogeneous mixture



B Human blood, a heterogeneous mixture



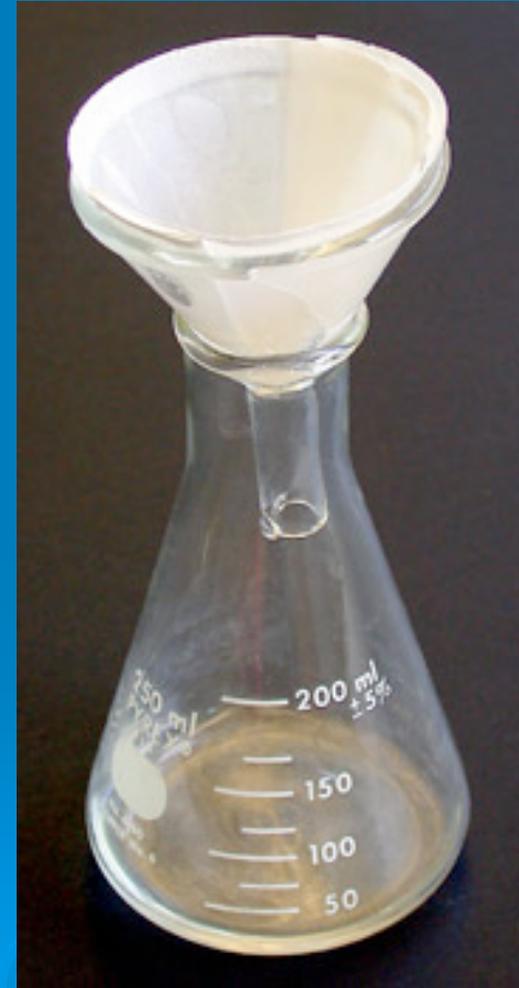
C Copper(II) sulfate (CuSO_4) in water, a homogeneous mixture (solution)

Play Mr. Cat Movie



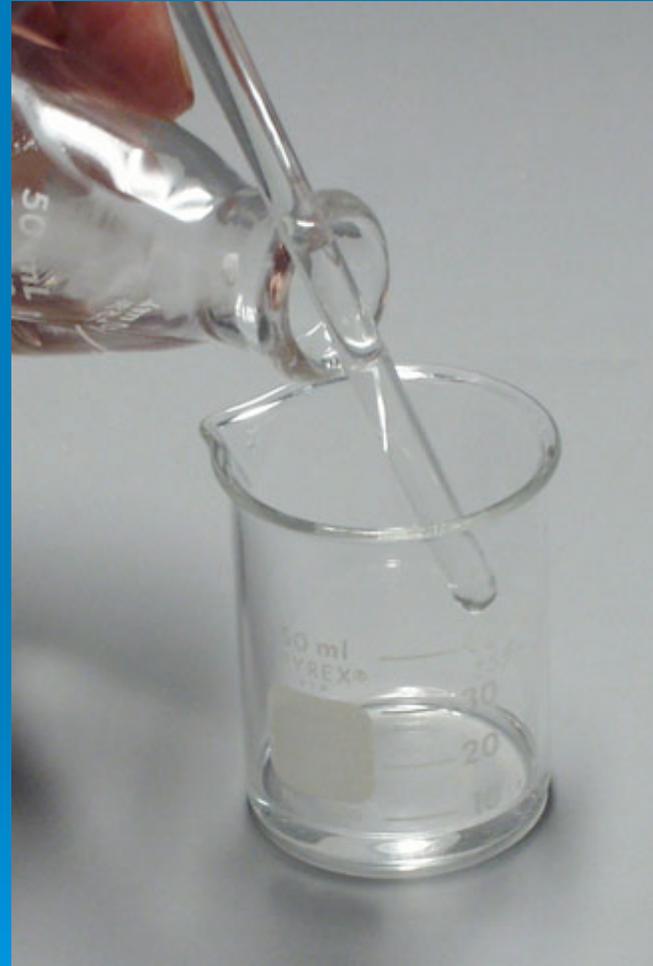
Physical Separation Techniques

- Filtration- solid part is trapped by filter paper and the liquid part runs through the paper
- Vaporization- where the liquid portion is evaporated off to leave solid



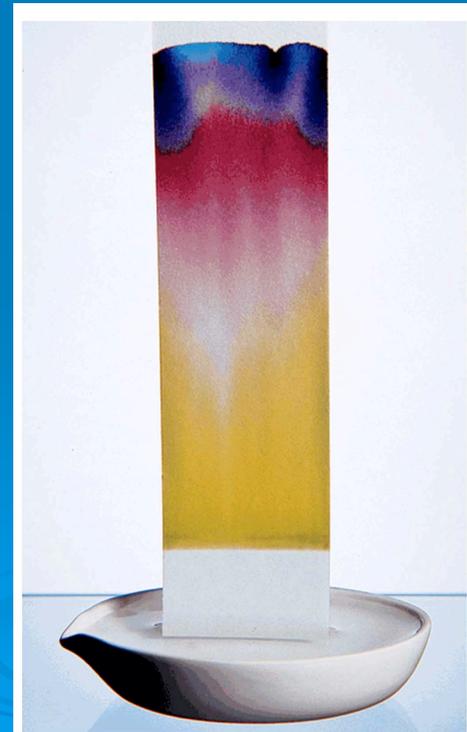
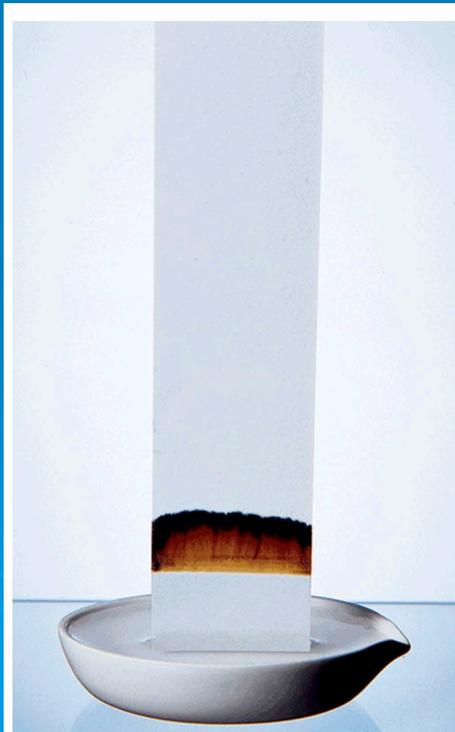
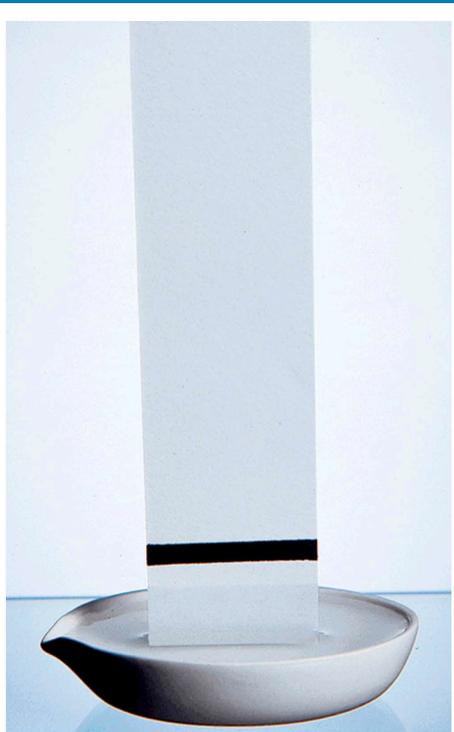
Physical Separation Techniques

- Decanting- when liquid is poured off after solid has settled to bottom
- Centrifuge- machine that spins a sample very quickly so that components with different densities will separate



Physical Separation Techniques

- Paper Chromatography- used to separate mixtures because different parts move quicker on paper than other



Matter

Pure substances

Physical separation

Mixtures

Elements

- Oxygen
- Hydrogen
- Iron

Chemical Reactions

Compounds

- Water
- Table salt
- Ammonia

Homogeneous mixtures (solutions)

- Salt water
- Mouthwash
- All alloys

Heterogeneous mixtures

- Pizza
- Italian salad dressing
- Solid waste dump

Practice

Determine whether each of the following is element, compound, homogeneous mixture or heterogeneous mixture.

- air
- wood
- chlorine
- granite
- aluminum
- sugar in water
- blood
- sucrose
- stainless steel
- sodium chloride
- brass
- whole milk
- apple
- table salt
- soft drinks
- vinegar
- concrete
- sodium
- baking soda (NaHCO_3)
- gravel

Chemical Reactions

A Chemical reaction is a process that occurs when a substance or substances react to create a different substance or substances. The new substance may have different properties.

A Physical change is a process where a substance is changed but that it retains its properties.

Recognizing Chemical Reactions

Evidence of chemical reactions are:

1. formation of a new substance with its own properties, state, melting point, colour or density
 2. phase change to gas, liquid or a solid
 3. creation of heat or absorption of heat
- 



Melting Ice

Identify if the following is a Chemical Reaction or Physical Change. Explain Why?

Metal Rusting



Frying an Egg



Assignment:

Read pgs 12 - 17

Questions 1 to 9 pg 17.

Review physical and
chemical properties on page
13.

