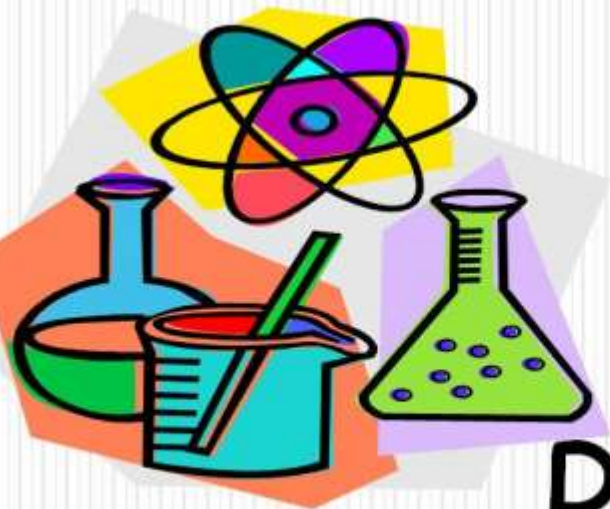


A Matter of Fact



Mixtures
and
Pure Substances

Mixtures and Pure Substances

- Scientists like to classify things.
- One way that scientists classify matter is by its composition.
- Ultimately, all matter can be classified as mixtures, elements and compounds.

- **Mixtures** - two or more substances that are not chemically combined with each other and can be separated by physical means.
- **Solutions** - a special kind of mixture where one substance dissolves in another.

Homogeneous Mixtures

- A mixture that appears to be the same throughout.
- It is "well mixed."
- The particles that make up the mixture are very small and not easily recognizable.

Examples of homogeneous mixtures



Milk, toothpaste, and mayonnaise are homogeneous mixtures. They are also colloids.

Colloids

- In a colloid the particles are mixed together but not dissolved.
- The particles are relatively large and are kept permanently suspended.



Colloids



- A colloid will not separate upon standing.
- The particles are constantly colliding, and this allows a colloid to scatter light - thus colloids often seem cloudy.

Pure Substances

- A sample of matter that has definite chemical and physical properties.

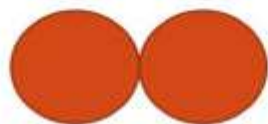
Elements



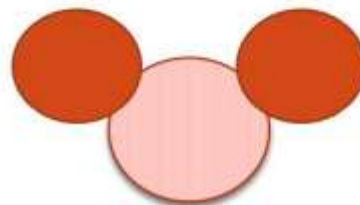
Atoms



Molecules



Compounds



Elements

- **simplest form** of pure substance
- cannot be broken into anything else by physical or chemical means

Compounds

- **union of two or more** elements
- can be broken into simpler substances by chemical means

Elements

- pure substance that cannot be separated into simpler substance by physical or chemical means.

Periodic Table of the Elements

1	IA																				O	
1	H																					He
2	IIA												IIIA	IVA	VA	VIA	VIIA	O				
2	Li	Be											B	C	N	O	F	Ne				
3													Al	Si	P	S	Cl	Ar				
3	Na	Mg	IIIB	IVB	VB	VIB	VIIB	VII			IB	IIB	Al	Si	P	S	Cl	Ar				
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
6	Cs	Ba	*La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
7	Fr	Ra	+Ac	Rf	Ha	Sg	Ns	Hs	Mt	110	111	112	113									

* Lanthanide Series	58	59	60	61	62	63	64	65	66	67	68	69	70	71
	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
+ Actinide Series	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Compounds

Pure substance composed of two or more *different elements joined by chemical bonds.*



- Made of elements in a specific ratio that is always the same
- Has a chemical formula
- Can only be separated by chemical means, not physically



Can you identify the following?

You will be shown a series of photos. Tell if each photo represents an item composed of an element, compound, or mixture.

Review:

- An **element** contains just one type of atom.
- A **compound** contains two or more different atoms joined together.
- A **mixture** contains two or more different substances that are only physically joined together, not chemically.
 - A mixture can contain both elements and compounds.

Element, Compound, or Mixture?

Rocks



Element, Compound, or **Mixture**?

Rocks



Element, Compound, or Mixture?

Copper



Element, Compound, or Mixture?

Copper

Cu



Element, Compound, or Mixture?

Jelly Beans



Element, Compound, or **Mixture**?

Jelly Beans



Element, Compound, or Mixture?

Table Sugar



Element, **Compound**, or Mixture?

Table Sugar



Element, Compound, or Mixture?

Diamond



Element, Compound, or Mixture?

Diamond

C



Element, Compound, or Mixture?

Tea



Element, Compound, or **Mixture**?

Tea



Element, Compound, or Mixture?

Salt



Element, **Compound**, or Mixture?

NaCl

Salt



Element, Compound, or Mixture?

Neon Gas



Element, Compound, or Mixture?

Ne

Neon Gas



Element, Compound, or Mixture?

Salad



Element, Compound, or **Mixture**?

Salad



Element, Compound, or Mixture?

Pure Water



Element, **Compound**, or Mixture?

Pure Water



Element, Compound, or Mixture?

Aluminum



Element, Compound, or Mixture?

Aluminum

Al



Element, Compound, or Mixture?

Lemonade



Element, Compound, or Mixture?

Lemonade



Element, Compound, or Mixture?

Silver



Element, Compound, or Mixture?

Silver

Ag



Element, Compound, or Mixture?

Sand



Element, Compound, or **Mixture**?

Sand



