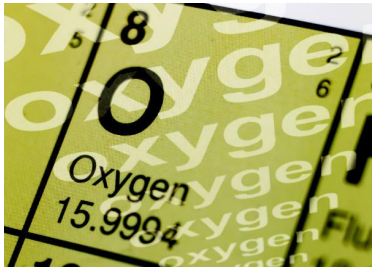
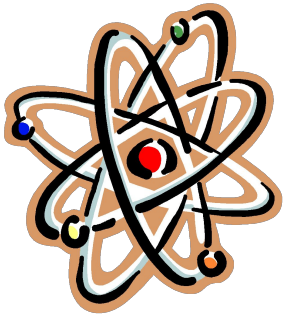
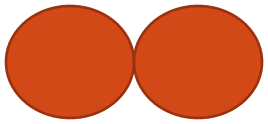
Classifying Matter: Elements, Compounds, and Mixtures

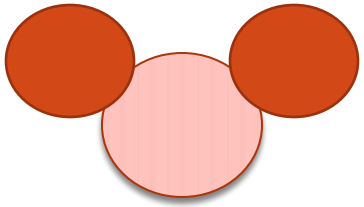
Pure Substances

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



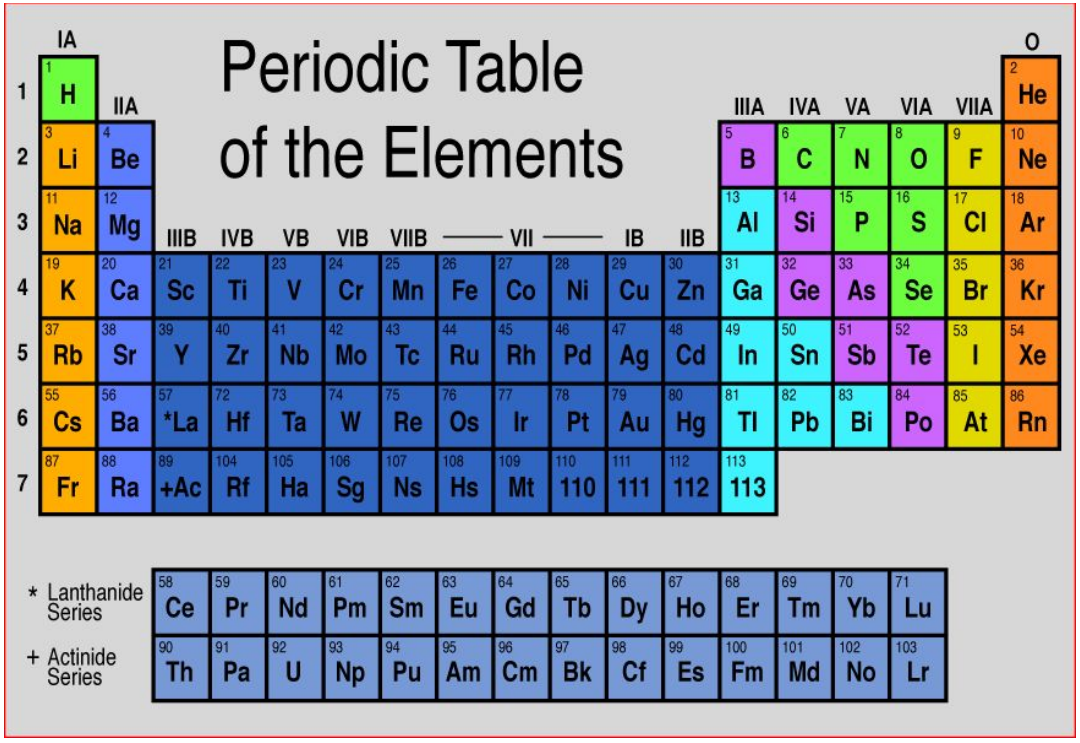






Elements

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



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

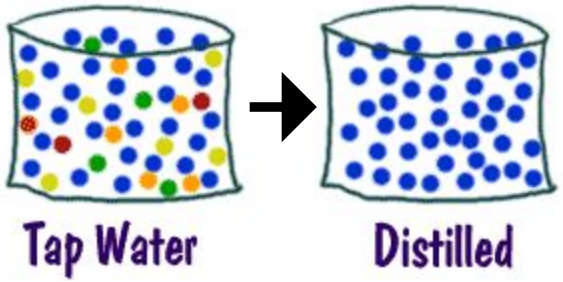
H_2O

$NaCl$

CO_2

Mixtures

- A combination of two or more pure substances that are not chemically combined.
- substances held together by *physical forces, not chemical*
- No chemical change takes
- Each item retains its prope
  in the mixture
- ohysically



Mixtures vs. Compounds

	Mixture	Compound
Composition	Variable composition – you can vary the amount of each substance in a mixture.	Definite composition – you cannot vary the amount of each element in a compound.
Joined or not	The different substances are not chemically joined together.	The different elements are chemically joined together.
Properties	Each substance in the mixture keeps its own properties.	The compound has properties different from the elements it contains.
Separation	Each substance is easily separated from the mixture.	It can only be separated into its elements using chemical reactions.
Examples	Air, sea water, most rocks.	Water, carbon dioxide, magnesium oxide, sodium chloride.

http://www.bbc.co.uk/schools/ks3bitesize/science/chemistry/elements_com_mix_6.shtml

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?

Cu

Copper

Element, Compound, or Mixture?

Jelly Beans

Element, Compound, or Mixture?

Jelly Beans

Element, Compound, or Mixture?

Table Sugar

Element, Compound, or Mixture?

Table Sugar

$C_{12}H_{22}O_{11}$

Element, Compound, or Mixture?

Diamond

Element, Compound, or Mixture?

C

Diamond

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

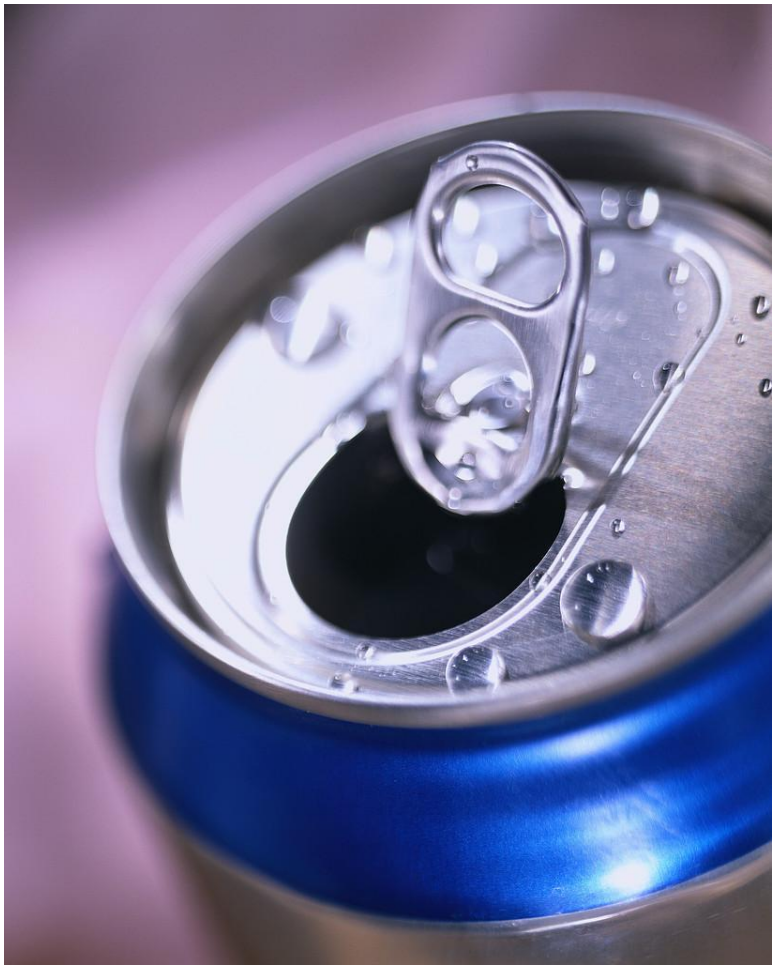
Element, Compound, or Mixture?

H_2O

Pure Water

Element, Compound, or Mixture?

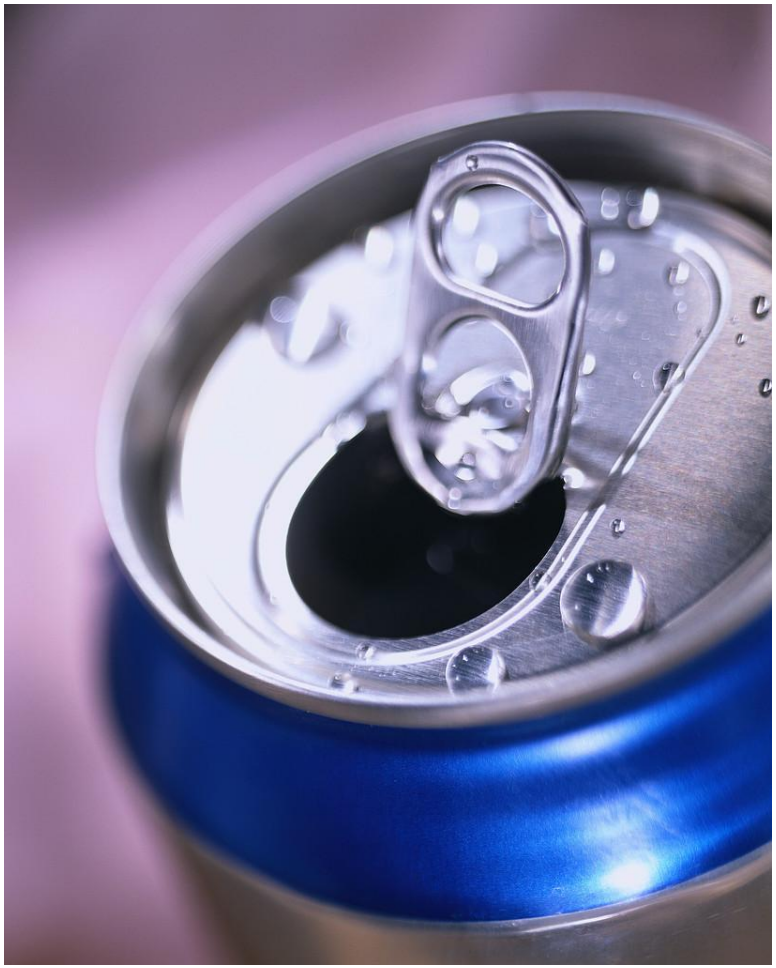
Aluminum



Element, Compound, or Mixture?

Al

Aluminum



Element, Compound, or Mixture?

Lemonade

Element, Compound, or Mixture?

Lemonade

Element, Compound, or Mixture?

Silver

Element, Compound, or Mixture?

Silver

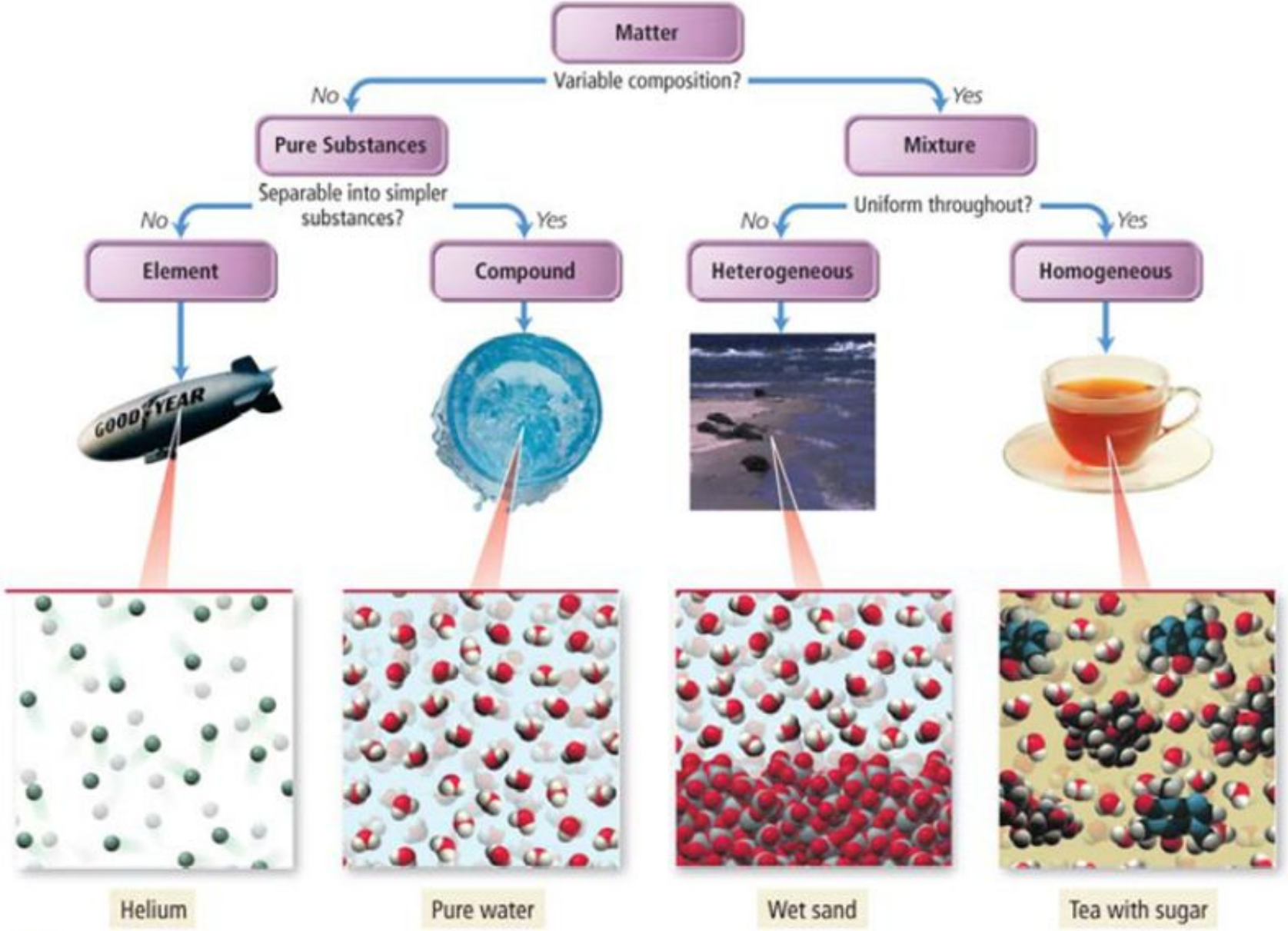
Ag

Element, Compound, or Mixture?

Sand

Element, Compound, or Mixture?

Sand



Notes

- Detailed notes are located at:

http://www.middleschoolscience.com/elements-compounds-mixtures-notes-isn.pdf

- Flow Chart:

http://www.middleschoolscience.com/matter-flow-chart-isn.pdf