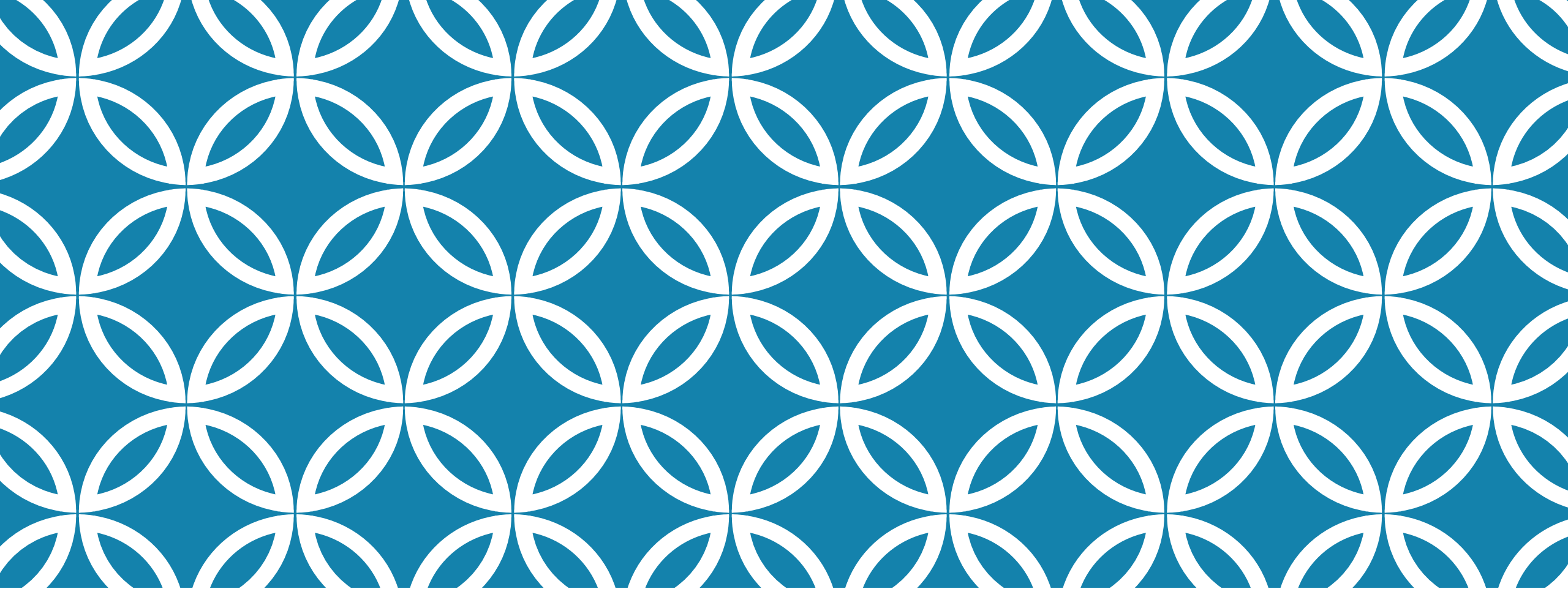


Target: I can classify types of matter.

K

C

Q



CLASSIFICATION OF TYPES OF MATTER



MATTER

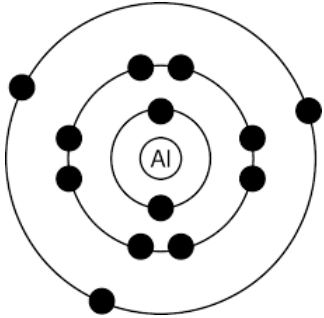
- Anything that takes up space and has mass.
- Things like thoughts, feelings, and ideas are “real” but they don’t have mass or take up space so they are not classified as matter.
- This is a very broad category so it is helpful to break it up into smaller, more specific categories.

ELEMENTS

Pure elements are made up of all 1 kind of atom.

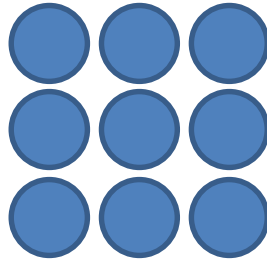
An element:

Single Aluminum Atom



An element:

Many of the same type of Atoms next to each other

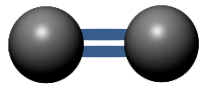
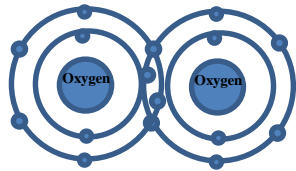
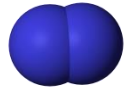


- **Every atom will have the same number of protons.**

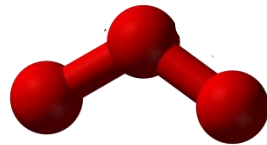
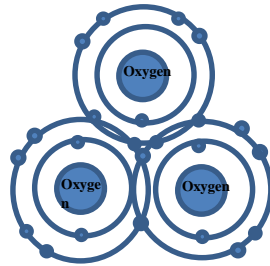
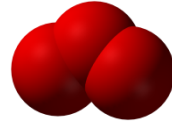
MOLECULES

More than one atom bonded together

Oxygen (O_2)



Ozone (O_3)



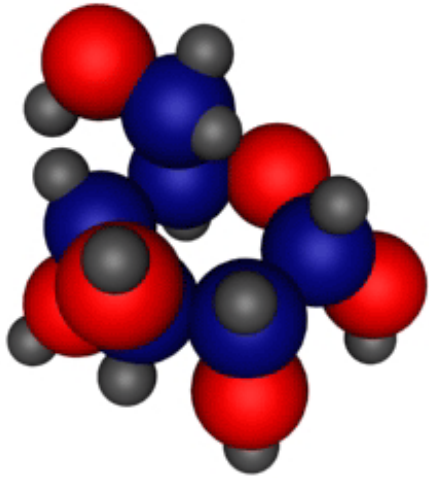
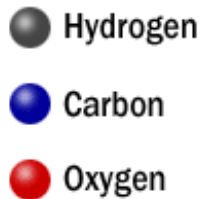
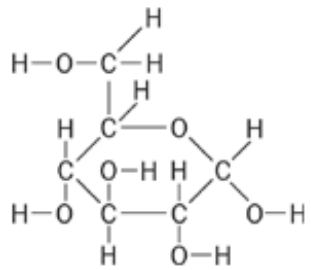
- Elements bond when they share or transfer their outer shell electrons (called valence electrons).
- Lots of ways to draw this as you can see!
- Can have
 - Single bonds
 - Double bonds
 - Triple bonds

MOLECULES

Molecules can have more than one type of element.

Sugar ($C_6H_{12}O_6$)

Molecular Construction of Glucose

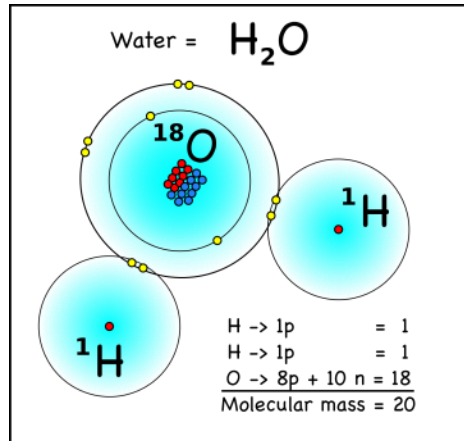
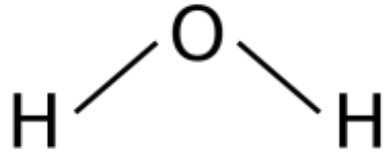


- The small numbers are called subscripts. These tell how many atoms of each element are bonded together. In $C_6H_{12}O_6$, there are 6 C's (carbon atoms), 12 H's (hydrogen atoms), and 6 O's (oxygen atoms).

COMPOUNDS

More than one *different* types of elements bonded together.

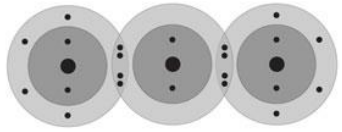
Water (H₂O)



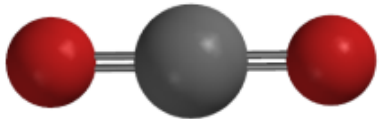
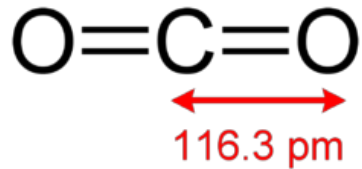
- Water, H₂O, has two hydrogen and one oxygen atom.
- You can tell it is a compound because there are two different chemical symbols (H and O).

COMPOUNDS

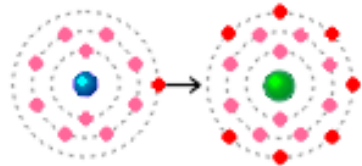
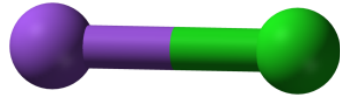
Carbon Dioxide
(CO₂)



Carbon Dioxide Molecule (CO₂)



Sodium Chloride
Salt (NaCl)

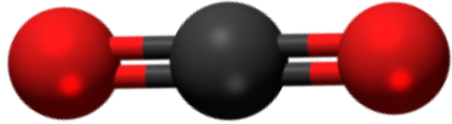


Sodium, Na Chlorine, Cl

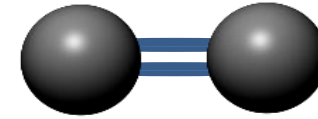
- Can have
 - Ionic bonds
 - Single bonds
 - Double bonds
 - Triple bonds
- Notice again that there are two **different kinds of elements**, Na and Cl. This makes it a compound.

COMPOUNDS

All compounds are also molecules!
(But not all molecules are compounds.)



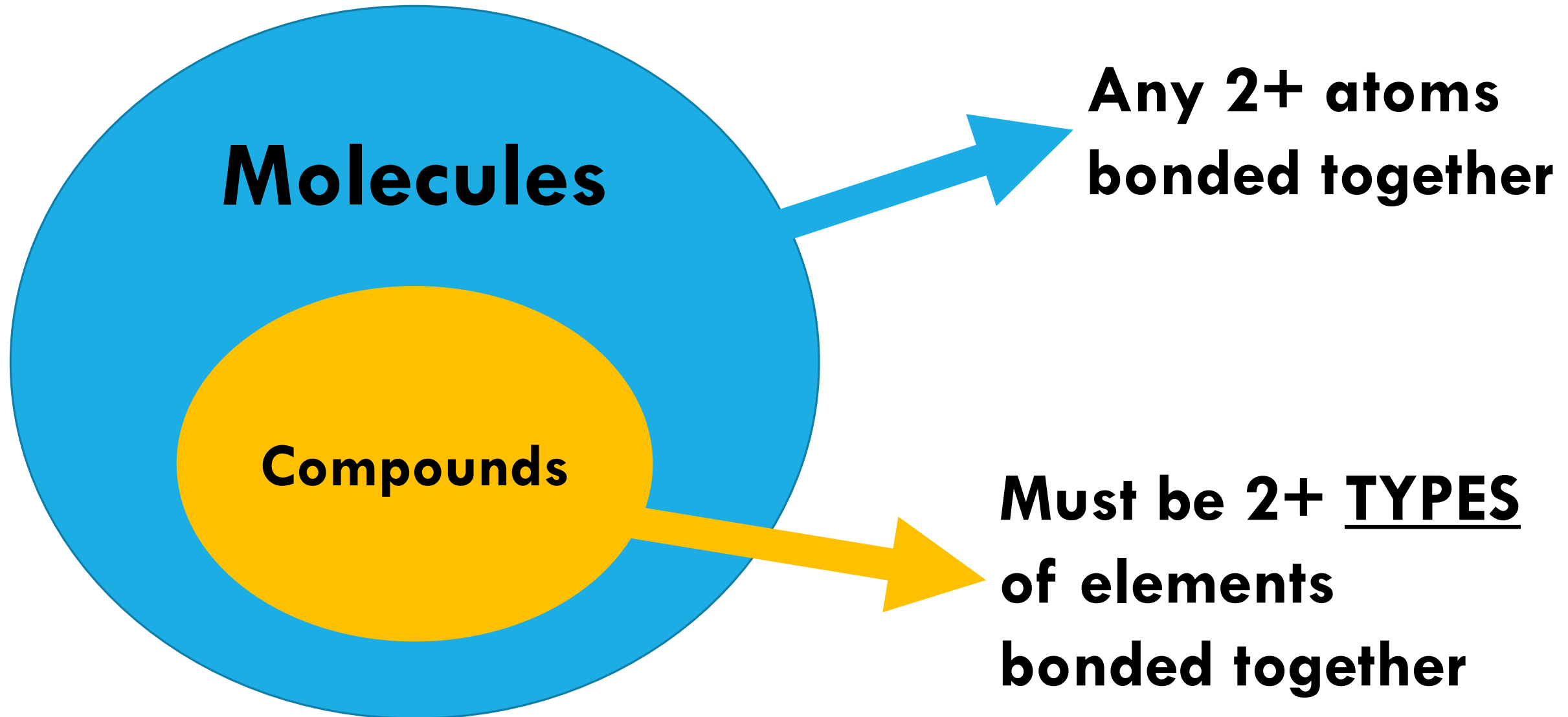
- Carbon dioxide (CO_2) is a molecule and a compound.
- There is more than one atom bonded together it is a molecule.
- Because the two atoms are different types of elements (notice the shading of the balls is different), it is also a compound.



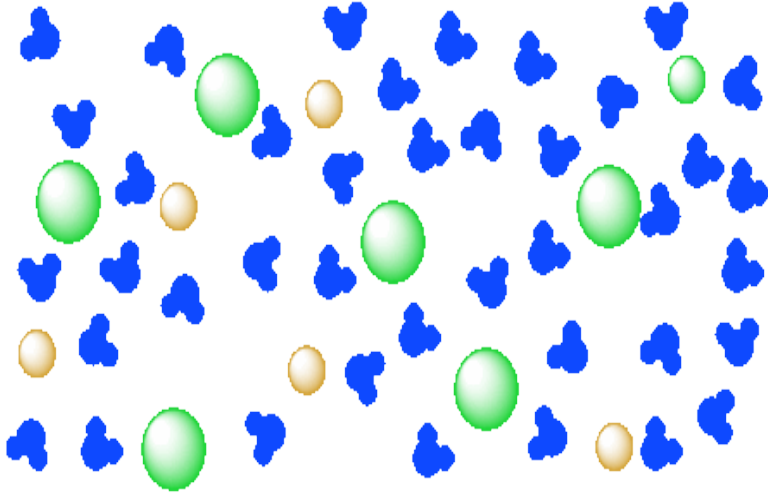
- Oxygen (O_2) is a molecule. It is not a compound.
- Because there is more than one atom bonded together it is a molecule.
- Because the two atoms are the same type of element (notice the shading of the balls is the same), it cannot be a compound.

COMPOUNDS

All compounds are also molecules!
(But not all molecules are compounds.)



MIXTURES



Salt Water
(NaCl dissolved in H₂O)

- Multiple types of elements, compounds and/or molecules mixed together, **but not bonded together.**
- Salt water is a solution. The water molecules are not bonded to the salt

Example Mixtures:

kool aid, salt water, air, brass,
14 carat gold, soda

MIXTURES

There are two types of mixtures.

Heterogeneous:

Mixtures that are not well mixed together.

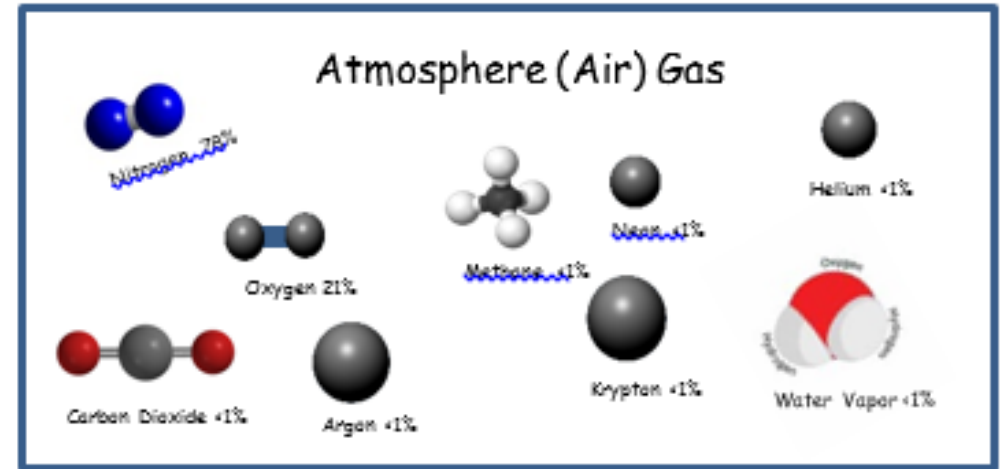
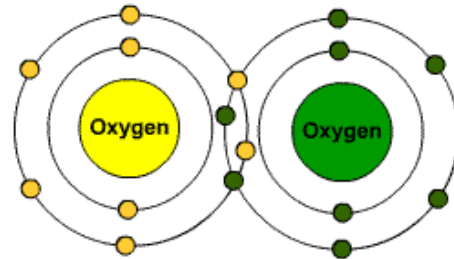
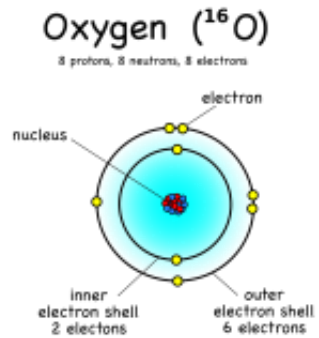
Examples: pizza, cookie dough, chex mix, Italian dressing
dirt, oil and vinegar

Homogeneous:

Mixtures that are perfectly mixed together and now uniform.

Examples: air, tree sap, soda, tap water

MIXTURES



NOT A MIXTURE

This an oxygen atom. A pure element.

NOT A MIXTURE

This an oxygen (O_2) the molecule. A pure molecule.

YES A MIXTURE!

“Air” is a mixture. There are many molecules mixed together but not bonded together. IMPORTANT: Oxygen is NOT air!!!! It is just one of many things that is inside what we call “air.”

Matter

Pure Substances

Mixtures

Elements

Molecules

Homogeneous

Heterogeneous

Compounds

YouTube Link to Presentation:

<https://youtu.be/tdUqZhMYog4>