

# Elements, Compounds, and Mixtures Reading

Name \_\_\_\_\_

Date \_\_\_\_\_

**Essential Questions**

1. What is the difference between elements, compounds and mixtures?
2. How are the atoms in air, water and oxygen the same and how are they different?

**Vocabulary**

element, compound, molecule, mixture

**Objectives**

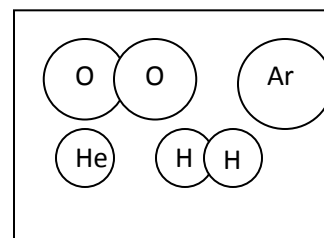
1. Differentiate between elements, compounds, and mixtures

## Molecules

**Molecules** form when atoms are chemically joined together, and are made up of two or more atoms. The size of a molecule depends upon the size and number of atoms that make it up. For example, the oxygen molecules we breathe are made out of only two atoms joined together and can be represented by the chemical formula  $O_2$ . On the other hand, one molecule of aspirin is made of twenty-one atoms and is represented by the chemical formula of  $C_9H_8O_4$ .

## Elements

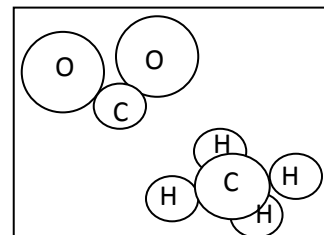
Molecules are classified into two major types: elements and compounds. Remember, if a molecule is made out of only one type of atom, it is an **element**. Elements can have just one atom, or they can have many of the same atoms joined together. If all of the atoms in a molecule are alike, then the molecule is classified as an element. For example, the  $O_2$  we breathe is an element, since both of the atoms are oxygen. Air also contains other elements, such as Helium (H), Nitrogen ( $N_2$ ), Hydrogen ( $H_2$ ), Argon (Ar) and Neon (N). Which of these elements are molecules and which are atoms?



Examples of elements as molecules and atoms

## Compounds

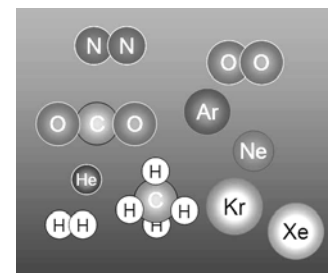
Molecules that have more than one type of atom are called **compounds**. All molecules are made of atoms that have been joined together. However, if all of the atoms are not the same, the molecule is classified as a compound. The aspirin molecule of  $C_9H_8O_4$  is made of three different types of atoms: carbon atoms, hydrogen atoms, and oxygen atoms. Therefore,  $C_9H_8O_4$  is a compound. Air contains compounds such as carbon dioxide ( $CO_2$ ), methane ( $CH_4$ ), and water vapor ( $H_2O$ ). Notice that all these examples have two or more different elements in them.



Examples of molecules. Notice they have more than one type of atom.

## Mixtures

**Mixtures** are composed of two or more substances which each keep their original properties and do not combine chemically when put together. A salad is an example of a mixture. Each part keeps its own properties—lettuce, tomatoes, carrots, peppers all taste like themselves—but they are all combined. The special trait of mixtures is that physical forces can still remove the basic parts. Air is considered a mixture, because it contains different elements and compounds, but each one still maintains its own properties. The oxygen in air is mixed with other elements and compounds, but it is still oxygen.



Example of a mixture. Notice the composition of air includes both elements and compounds.