

# Elements, Molecules, and Mixtures

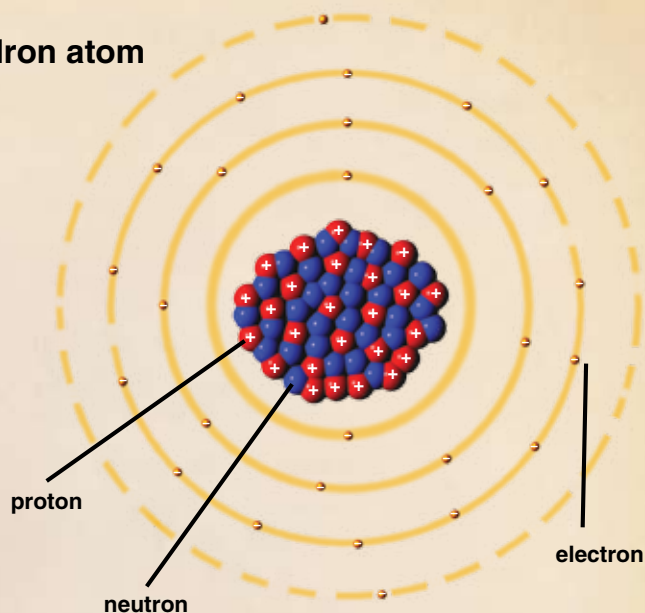
## Atoms and Elements

Everything is made of atoms. Atoms are tiny particles (PAR-tuh-kuhls). Your desk, the air around you, even you are made of atoms. Atoms are so small that a million billion billion of them fit on a teaspoon. Humans can only see them with powerful electron microscopes.

When a substance is made entirely of the one kind of atom, it is called an element (ELL-em-ent). Elements cannot be easily transformed into other elements. In other words, iron will always be iron. You can heat it, hit it, or drop it in acid. No matter what you do, it will still be iron. It may not look the same after so much abuse, but it will still be composed of iron atoms.

There are about 100 different elements. They can be put together in many different ways. Each different way makes one of the millions of different things that exist. This is called atomic arrangement (uh-TOM-ik uh-RANGE-muhnt).

Iron atom

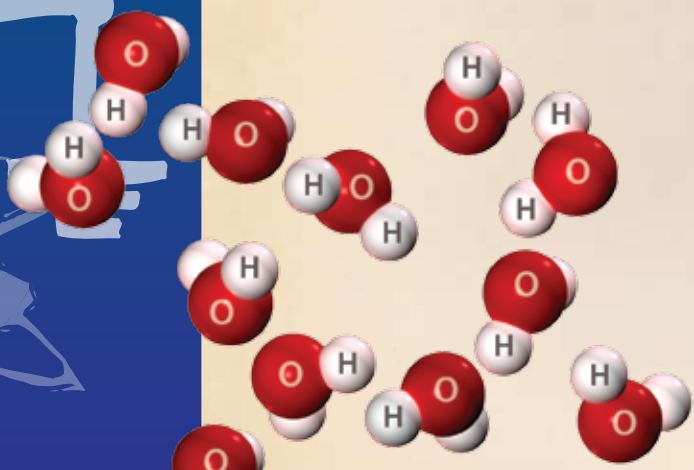


## Molecules and Compounds

Atoms combine to make molecules (MOL-uh-kyools). In molecules, the component atoms share electrons. Together, they become a new substance called a compound (KOM-pownd). A compound has different properties from the elements that went into it.

For example, water is a compound of hydrogen and oxygen, but it isn't like either of them. Each water molecule has two hydrogen and one oxygen atom. The atomic arrangement is written as  $H_2O$ . The number two means that there are two hydrogen atoms in the molecule; no number after the O means there is just one oxygen.

Compounds are made by reactive (ree-AK-tiv) elements that join easily with others in chemical reactions. Some elements are very reactive; some are not. The more reactive an element, the more likely it will form compounds.

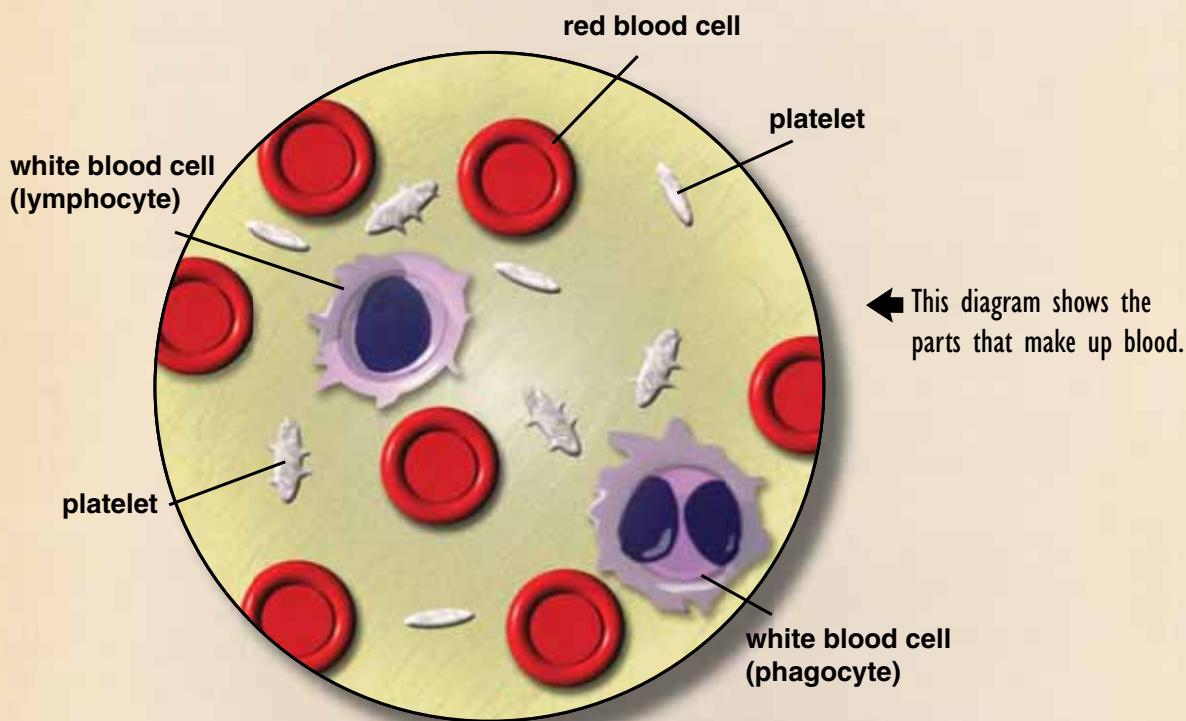


← Water molecules

## Mixtures

A mixture is not the same as a compound. Some everyday mixtures are air and blood. They contain many different types of atoms and molecules, and not all of them are the product of chemical reactions. They can be separated easily if you know how.

To separate a mixture, use the properties of the substances in the mixture such as their melting and boiling points. Magnetic ingredients or ingredients that form solid chunks are easy to separate out. Magnets can separate out the magnetic molecules. A sieve can separate the big chunks from the small chunks.



### Comprehension Question

Describe the role of atoms in elements, compounds, and mixtures.