Before You Read

NAME: _____

# What Are Molecules?

**1. Circle T if the statement is TRUE or F if it is FALSE.**

T F a) Connecting links between atoms are called **bonds.**

T F b) Atoms contain more than one molecule.

T F c) All particles in a pure material are the same.

T F d) Outer electrons form links that hold atoms together.

T F e) New molecules are formed during physical changes.

**2. Put a check mark (✓) next to the answer that is most correct.**

**a) All organic molecules contain the element**

- ○ A calcium
- ○ B carbon
- ○ C iron
- ○ D nitrogen

**b) Which is true of all polymer molecules?**

- ○ A They are all gases.
- ○ B They are all very long.
- ○ C They can all be used as fuel.
- ○ D They are all made in factories.

**c) Which of these contains one or more bond?**

- ○ A all atoms
- ○ B all materials
- ○ C all molecules
- ○ D all particles

NAME: _____

Reading Passage

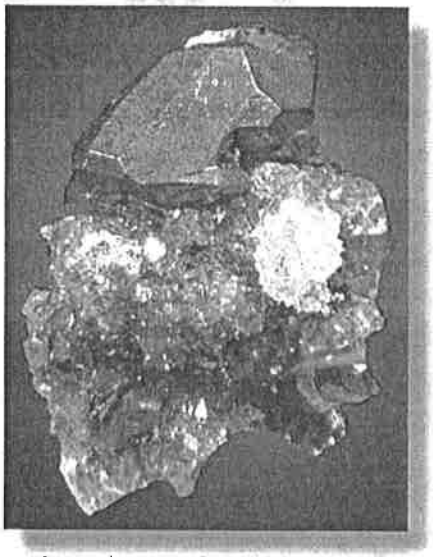
# What Are Molecules?

Silver

Sulfur

Some atoms are separate from each other and other atoms are fastened together. Groups of atoms fastened together are called **molecules**. When atoms fasten together to form molecules it is called a chemical change. When molecules break up into separate atoms, that is a chemical change too.

In molecules, atoms are held together by connecting links. These links are called **bonds**. Atoms become connected when some of the electrons from each atom act together to form a bond. Not all electrons can help form bonds. Only the electrons farthest from the nucleus form bonds. Also, not all atoms can bond together. The atoms must have the right number of electrons with the right energy to form a bond. The pictures show what happens when silver atoms bond to sulfur atoms to form silver sulfide.



**Silver atoms bond to sulfur atoms to form silver sulfide**


**Complete these sentences by filling the blanks with the words below. Use each word once.**

**chemical** **molecules** **atoms**

Bonds connect _____ to form _____. A _____ change happens whenever bonds are formed or broken.

Atoms and molecules are two kinds of **particles**. When all the particles in something are the same, it is called a **pure material**. All the particles in pure gold are gold atoms. All the particles in pure water are water molecules.

Scientists often use **chemical symbols** instead of names to talk about atoms. For an atom of oxygen they write "O". For an atom of sulfur they write "S". For some atoms the symbol is a big letter and a little letter. Aluminum is "Al". The symbol can mean just one atom or it can mean a material made of those atoms.

NAME: _____

# What Are Molecules?

Molecules are made of two or more atoms bonded together. The atoms in a molecule can be different or they can be the same. Oxygen in the air is made of oxygen molecules. An oxygen molecule is two oxygen atoms bonded together. Molecules of water are made of two kinds of atoms. Every water molecule has two hydrogen atoms and one oxygen atom.

Oxygen and water are small molecules. Many of the molecules that make up living things are much larger. Some molecules are made of hundreds or even thousands of atoms! Even these large molecules are much too small to see.

Most molecules in living things are called **organic** molecules. One thing is the same for all organic molecules. They all contain atoms of carbon. Another kind of molecules are called **polymers**. These are very long molecules. Polymer molecules become long by repeating the same small group of atoms over and over. Our clothes are made mostly of polymers. Some of these come from nature, like cotton and wool. Others are made in factories, like nylon and rayon. All these kinds of cloth are made of very long polymer molecules.

NAME: _____



# What Are Molecules?

**1. Circle T if the statement is TRUE or F if it is FALSE.**

T F **a)** Water molecules are polymers.

T F **b)** Sodium chloride is an organic molecule.

T F **c)** The letter "O" can mean "one oxygen atom."

T F **d)** A "pure material" can contain many kinds of molecules as long as they are pure.

T F **e)** Chemical bonds between atoms are formed by outer protons.

T F **F)** Any atom can form a molecule with any other atom.

**2. Write each word beside its meaning. Some words will not be used.**

| | | |
|---|---|---|
| bond | material | molecule |
| organic | polymer | symbol |

_____ **a)** a short way to write the name of an atom

_____ **b)** the connecting link between atoms on a molecule

_____ **c)** a molecule that contains carbon

_____ **d)** a long molecule with repeating groups of atoms

**3. When two atoms bond together to form a molecule, which parts of the atoms become part of the bond?**

_____

_____