

Atoms

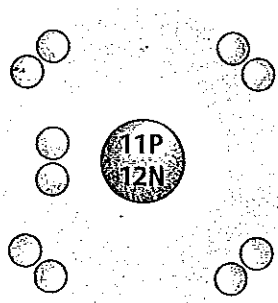
Combinations of Atoms

Directions: Circle the term in parentheses that makes each statement correct.

1. The building blocks of matter are (atoms, compounds).
2. Isotopes are atoms of the same element that have different numbers of (neutrons, protons).
3. Electrically charged atoms are (electrons, ions).
4. An example of a (compound, mixture) is water.
5. The (chemical, physical) properties of an element determine how the element will change when it reacts with another element.
6. An example of matter is (air, heat).
7. A difference in the (mass, atomic) number of atoms means the atoms are of different elements.
8. Combined atoms form a (molecule, proton).
9. Table salt is an example of a (compound, mixture).
10. Isotopes enable scientists to determine the (size, age) of some rocks and fossils.

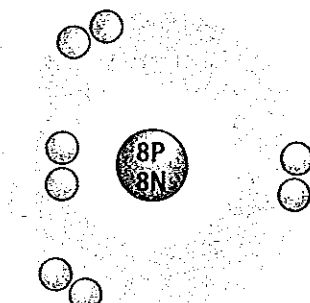
Directions: On the lines beneath each atom, indicate which two are ions and which one is not. Then indicate which ion is negative with a minus sign (-) and which is positive with a plus sign (+).

11 protons
12 neutrons
10 electrons



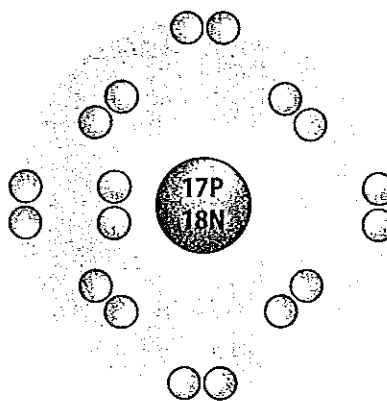
11. _____

8 protons
8 neutrons
8 electrons



12. _____

17 protons
18 neutrons
18 electrons



13. _____

Combinations of Atoms

Directions: Define the following terms.

1. compound _____

2. mixture _____

Directions: Identify each of the following as a mixture or a compound.

3. NaCl _____
4. solution _____
5. water _____
6. NaCl + H₂O _____
7. salt _____
8. H₂O _____
9. air _____
10. salt water _____
11. vinegar and oil _____

Directions: Complete the following sentences using the correct terms.

12. Sweetened tea is a type of mixture called a(n) _____.
13. A water molecule is made up of two atoms of _____ and one atom of _____.
14. The substances in a(n) _____ can be physically separated from one another.
15. Table salt is made up of one ion of _____ and one ion of _____.
16. A(n) _____ cannot be separated into its individual elements by physical means.

Atoms

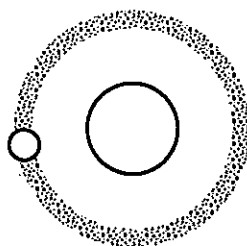
Each element is made of just one kind of atom. The number of protons in the atoms of an element is unique to that element. The number of protons in an atom is called the **atomic number**. The mass of an atom depends on the number of its protons and neutrons. The **mass number** is the sum of the protons and neutrons in the nucleus. The mass of an electron is so small that it is usually omitted in mass determinations.

Directions: Use the definitions of atomic number and mass number to help you fill in the blanks in the table below.

Element	Symbol	Number of protons	Number of neutrons	Number of electrons	Atomic number	Mass number
1. Oxygen	O	8		8		16
2. Silicon	Si	14	14			28
3. Aluminum	Al		14	13	13	
4. Iron	Fe				26	56
5. Calcium	Ca	20		20		
6. Sodium	Na				11	23
7. Copper	Cu	29	35	29		
8. Magnesium	Mg				12	24
9. Gold	Au	79				197
10. Silver	Ag		61	47		

Directions: Add electrons to complete the atomic models of helium and sodium.

11. Helium
Atomic number 2
Mass number 4



12. Sodium
Atomic number 11
Mass number 23

