

## **Notes - Physical Science in Action: Elements Compounds and Mixtures Video**

1. What is matter? **Matter is anything that has mass and takes up space.**
2. What are atoms? **Atoms are the smallest particles of an element that still retain the properties of that element.**
3. What are the two main parts of the atom? **The center of the atom is called the nucleus. The outside shell of the atom is called the electron cloud.**
4. What are the three different kinds of particles in an atom? **The nucleus of an atom usually contains two different sub-atomic particles: protons and neutrons. (Some hydrogen atoms do not have neutrons, but all other atoms do.) The electron cloud of an atom has particles called electrons.**
5. What are elements? What makes one element different from another element? **An element is a substance that cannot be broken down into simpler substances by a chemical reaction. Elements are made of only one type of atom with a particular number of protons. For example, hydrogen atoms always have one proton, and gold atoms always have 79 protons.**
6. How many different elements are there? **There are 92 naturally occurring elements, and about 26 laboratory-created elements.**
7. What is the most common element in the Universe? **About 90% of the Universe is made of the element Hydrogen.**
8. What are the four most common elements on Earth? **The elements oxygen, hydrogen, silicon and carbon are the most common elements on Earth.**
9. What are compounds? How are they made? **A compound is a substance made of two or more elements chemically bonded together into a new substance with different properties than the component elements. For example, one atom of the reactive metal sodium bonded to one atom of the poisonous gas chlorine creates the compound sodium chloride, commonly known as table salt. Salt is neither a metal nor a gas, and is not poisonous. Compounds are created in chemical reactions.**
10. What is a molecule? **A molecule is made of two or more atoms chemically bonded together. If the bonded atoms are of the same element, such as in hydrogen (H<sub>2</sub>) or oxygen (O<sub>2</sub>), then it is a molecule of an element. If the bonded atoms are from two or more different elements, such as hydrogen and oxygen combining to form water (H<sub>2</sub>O), then it is a molecule of a compound.**
11. What is a mixture? **A mixture is the physical blending of two or more substances without a chemical reaction or creation of new chemical bonds. Mixtures can be separated into their components by physical processes such as filtering or dissolving.**

12. What are the two kinds of mixtures? **There are two kinds of mixtures: homogeneous and heterogeneous. Homogeneous mixtures have a completely uniform blending of the component parts, so that every sample has the same ratio of parts. Examples are milk and lemonade. Heterogeneous mixtures are not uniformly blended, so that every sample of the mixture will have a different ratio of components. Examples are trail mix and most rocks.**
13. What is a solution? **A solution is a homogeneous mixture in which one or more substances, called solutes, are dissolved into a greater quantity of another substance called the solvent. For example, in salt water, water is the solvent and salt is the solute.**
14. How small are molecules? **To see a small atom or molecule, it has to be magnified about one million times its actual size. There are 602,300,000,000,000,000,000 molecules of H<sub>2</sub>O in 18 mL of water. Large numbers like this can be expressed in scientific notation:  $6.023 \times 10^{23}$ .**