Name _____

The Magical Dance of Atoms: How They Combine to Form Molecules

Short Answer Key

1. Atoms consist of a nucleus (protons and neutrons) and electrons orbiting the nucleus. Electrons are involved in chemical bonding, either by sharing (covalent bonds) or transferring (ionic bonds) to form molecules.
2. Covalent bonds involve the sharing of electrons between atoms, while ionic bonds involve the transfer of electrons between atoms. An example of a covalent bond is found in water (H2O), where hydrogen and oxygen share electrons. An example of an ionic bond is sodium chloride (NaCl), where sodium donates an electron to chlorine.
3. The octet rule states that atoms tend to gain, lose, or share electrons to achieve a stable electron configuration with 8 electrons in their outermost energy level. Covalent bonds form when atoms share electrons to satisfy the octet rule.
4. Water (H2O) is essential for life on Earth. Its unique properties, such as its ability to dissolve substances and moderate temperature, make it vital for various biological processes and ecosystems.
5. The ability of atoms to combine in diverse ways allows for the creation of countless molecules with unique properties. These molecules are the building blocks of matter and the substances that make up our world.