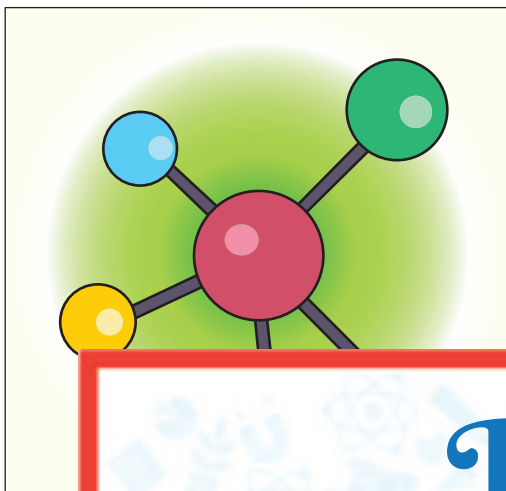


The Building Blocks of Matter



Atoms are the fundamental building blocks of matter, and they play a crucial role in shaping the world around us. Understanding how atoms come together to form molecules is like deciphering the secret language of the universe. In this exploration,

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Bonding: Atoms Unite

Atoms have a strong desire to fill their outermost energy level, and they do so by forming bonds with other atoms. There are two primary ways atoms achieve this:

1. **Covalent Bonds:** In a covalent bond, atoms share electrons to complete their outer shells. For instance, in a molecule of water (H_2O), two hydrogen (H)

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atoms share their electrons with one oxygen (O) atom. This sharing creates a strong bond that holds the atoms together.

2. Ionic Bonds: In an ionic bond, atoms transfer electrons to one another. For example, table salt (NaCl) forms when sodium (Na) donates an electron to chlorine (Cl),

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molecules made up of two hydrogen atoms bonded through covalent bonds.

Hydrogen is the lightest element in the universe.

- **Carbon Dioxide (CO₂):** This gas, produced during respiration and combustion, consists of one carbon (C) atom and two oxygen (O) atoms, bonded covalently. It's a critical component in Earth's carbon cycle.

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• **Ammonia (NH₃):** Ammonia is composed of one nitrogen (N) atom and three hydrogen (H) atoms, bonded covalently. It is commonly used in cleaning products and as a refrigerant.

The Importance of Molecules

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all the substances we encounter in our daily lives and are the building blocks of the complex chemistry that drives the natural world and our existence within it.

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1) What is the nucleus of an atom primarily composed of?

- A) Electrons
- B) Protons and electrons
- C) Protons and neutrons
- D) Neutrons

2) The banner features a red border and a background of light blue science-related icons. The word 'Preview' is written in a large, blue, serif font. Below it, the text 'Become a member to unlock unrestricted access to both printable and online worksheets.' is written in a smaller, blue, sans-serif font. At the bottom right of the banner is a yellow padlock icon. The website address 'www.tutoringhour.com' is centered at the bottom of the banner.

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3) D) It achieves stability by having a complete set of electrons in its outermost shell.

4) What is the primary difference between covalent bonds and ionic bonds?

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5) What role do molecules play in chemical reactions?

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