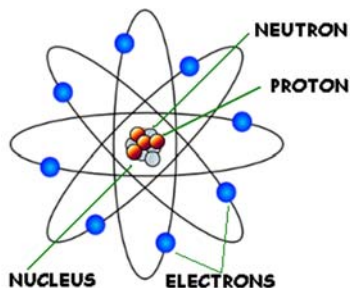


Name _____



Exploring the Marvelous World of Atoms

Atoms are the building blocks of matter, and they make up everything around us, from the air we breathe to the food we eat. Understanding the structure of an atom and its various parts is like unlocking the secrets of the universe! In this reading passage, we will delve into the fascinating world of atoms and discover their incredible structure.

The Structure of an Atom

Imagine an atom as a tiny solar system, with a nucleus at the center and electrons orbiting around it. The nucleus is the central part of the atom, and it contains two types of particles: protons and neutrons. Protons have a positive electric charge, while neutrons are electrically neutral or have no charge at all.

The Nucleus: Protons and Neutrons

Protons and neutrons are tightly packed within the nucleus, held together by a strong force called the nuclear force. Protons, with their positive charge, repel each other due to their like charges. The nuclear force overcomes this repulsion, holding the protons and neutrons together, creating a stable nucleus.

Electrons: The Electromagnetic Dancers

Now, let's focus on the electrons, which are the smaller, negatively charged particles that move around the nucleus. Electrons are found in regions called electron shells or energy levels. These shells are like different orbits where electrons whirl around the nucleus, but not in a fixed path like planets around the sun.

Each electron shell can hold a specific number of electrons. The innermost shell, closest to the nucleus, can hold up to 2 electrons, while the second shell can hold up to 8 electrons. The outermost shell, called the valence shell, is the most important when it comes to an atom's chemical behavior.

Atomic Number and Mass Number

An atom's identity is determined by the number of protons in its nucleus, which is called its atomic number. For example, all atoms with 6 protons are carbon atoms, and atoms with 8 protons are oxygen atoms.

The mass number of an atom is the sum of its protons and neutrons. It gives you the total number of particles in the nucleus. For example, if an atom has 6 protons and 6 neutrons, its mass number is 12.

Electrically Neutral Atoms and Ions

Most atoms are electrically neutral, which means they have an equal number of protons and electrons. This balance between positive and negative charges keeps the atom stable. However, sometimes atoms gain or lose electrons, creating charged particles called ions. When an atom loses electrons, it becomes positively charged (cation), and when it gains electrons, it becomes negatively charged (anion).

