

# The Periodic Table: Understanding the Elements and their Behaviour

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## Commentary

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## DESCRIPTION

The periodic table is one of the most iconic and recognizable symbols of science. With its rows and columns of elements, each with its own unique properties and characteristics, the periodic table provides a wealth of information about the building blocks of matter. The periodic table has undergone numerous revisions and updates over the years as new elements have been discovered and our understanding of the fundamental properties of matter has deepened. Today, the periodic table contains many elements, arranged in order of increasing atomic number. Each element is represented by a symbol, such as H for hydrogen or Fe for iron, and is organized into rows, or periods, and columns, or groups, based on its electronic configuration and chemical properties. One of the key features of the periodic table is its ability to predict the properties of elements based on their position within the table. Elements in the same group, tend to have similar chemical and physical properties, such as the same valence electron configuration and similar reactivity. The periodic table also provides a wealth of information about the properties and behaviour of individual elements. Each element is assigned a number of key properties, including its atomic mass, density, melting and boiling points, and electronegativity.

In addition to these basic properties, the periodic table also provides information about the electronic structure of each element, including the number of valence electrons and the electronic configuration of the outermost shell. This information is critical for understanding the chemical behaviour of elements and their reactivity with other substances. One of the most exciting areas of research in the field of chemistry today is the development of new materials and compounds based on the properties of individual elements and their combinations. By understanding the properties and behaviour of individual elements, researchers can design new materials with specific properties and functions, such as superconductors or catalysts for chemical reactions.

The periodic table is also a key tool for understanding the behaviour of matter on a fundamental level. By studying the properties and behaviour of individual elements and their combinations, scientists can gain insights into the nature of matter and the underlying processes that govern its behaviour. Overall, the periodic table is a vital tool for understanding the building blocks of matter and the fundamental properties that underlie the behaviour of all substances. With continued advances in our understanding of the properties and behaviour of individual elements and their combinations, we can look forward to many exciting discoveries and innovations in the field of chemistry in the years to come. The periodic table is also a powerful tool for predicting the behaviour of new elements and compounds before they are even synthesized. By understanding the properties of elements in a given group or period, scientists can make predictions about the properties of as-yet-unknown elements and their potential applications.

Today, researchers are using the periodic table to predict the properties and behaviour of new materials with potential applications in fields such as electronics, energy storage, and biomedicine. By studying the properties of different elements and their combinations, researchers have developed new materials with the ability to store large amounts of energy, such as lithium-ion batteries. The periodic table is also a key tool for understanding the behaviour of elements in living organisms. Many of the elements that make up our bodies, such as carbon, nitrogen, and oxygen, are located in specific groups and periods on the periodic table.

By understanding the properties and behaviour of these elements, scientists can gain insights into the biochemical processes that underlie life itself. In recent years, there has been renewed interest in the periodic table as a symbol of scientific progress and discovery. Hence, scientists can gain insights into the underlying processes that govern the behaviour of all substances, from the simplest elements to the most complex materials.