

## Matter

## 3. Periodic Table

## CONCEPT 1

## LESSON GUIDE

## PATTERNS OF THE PERIODIC TABLE

## PRECISE LEARNING POINTS

## KNOW

I know what the periodic table is and identify periods and groups.

## APPLY

I can apply my knowledge to identify elements in the periodic table by their symbol and atomic number.

## EXTEND

I can extend my knowledge of the periodic table to explain how Dimitri Mendeleev designed it.

## NOTES

The periodic table is a chart that lists all known chemical elements. Patterns and trends can be seen from the way elements are arranged in the periodic table.

**Metal elements** can be found on the left and in the middle of the periodic table.

**Non-metal elements** (except for hydrogen) are on the right of the table.

At the boundary between metal and non-metal elements are **metalloids**. These are elements which have some, but not all, metal properties.

**Rows** in the periodic table are called **periods** and the **numbered columns** are called **groups**.

Groups are families of elements with similar properties.

Metals in the centre of the periodic table are called **transition metals**. They do not have separate groups. The transition metals include some of the most used metals such as iron, copper and gold.

Every element has an **atomic number**. In the modern periodic table elements are arranged in atomic number order which increases from left to right across the table.

Each element has its own chemical symbol. The first letter of an element's symbol is a capital letter e.g. hydrogen = H, potassium = K. If there is a second letter it is lowercase e.g. magnesium = Mg, iron = Fe.

**John Dalton** first defined elements as having different atoms in 1807.

**Dimitri Mendeleev** produced the first periodic table of 64 elements in 1869. He arranged elements based on their properties and left **gaps** for those he believed had not yet been discovered. He also predicted the properties of the undiscovered elements. All of the gaps Mendeleev left have now been filled.

New elements have only been produced by smashing lighter atoms into each other. These man-made elements have very heavy unstable atoms which often exist for less than a second before breaking down.