

Write one important fact for **each** paragraph in this space.

## Science Shorts-8

### The Periodic Table

Elements are the basic building blocks of all things. Water is a combination of the elements hydrogen and oxygen. Silicon is an element used in computer chips. Gold and silver are elements used to make jewelry. The element carbon is found in all living things.

Elements are made of atoms. Atoms are tiny. You need a special microscope to see atoms. Even though they are small, atoms have weight. The atomic mass of an element is the weight of one atom of the element.

In 1869 Dimitri Mendeleev listed all the elements known at the time in order of their atomic weight. He arranged his list into a table of columns and rows. He started his table with the lightest element, hydrogen. He continued to add elements, moving from lightest to heaviest.

When he had finished, Mendeleev noticed patterns in his chart. The traits in each row of elements changed gradually. That is, the second element on his chart was very similar to the first. The third one was slightly less similar, and so on. Mendeleev noticed other patterns in his chart. At regular intervals, traits of elements were repeated. For example, every fifth element might be shiny. Every eighth element might be liquid at room temperature.

Mendeleev also noticed gaps in his chart. Sometimes an expected trait was missing at a regular interval. Mendeleev guessed elements would one day be discovered to fill his gaps. He left blanks in his chart where he expected new elements to fit. Soon new elements were found. They fit the blanks left in Mendeleev's table.

In Mendeleev's day there were 63 known elements. Today we know of almost 100 elements that can be found in nature and about 20 that can be made in the laboratory. These elements are listed in a chart very much like Mendeleev's. The chart is called the periodic table. On the modern chart, elements are listed by atomic number instead of atomic mass. We know about atomic numbers today because we have learned about the parts that make up an atom. All atoms are made up of three types of smaller particles: protons, electrons and neutrons. Each element has a specific number of protons in the nucleus of its atom. An element's atomic number is the number of protons inside one atom of the element. When elements are listed in order of their atomic number, the patterns Mendeleev discovered are even more clear.

Each square on the periodic table tells about one element. The number at the top of the square is the atomic number. The number at the bottom of the square is the element's atomic mass (weight). Above the atomic mass, the element's name is listed. The big letter, or pair of letters, in the middle of the square is the element's symbol.

6	Atomic number
C	Symbol of element
Carbon	Element name
12.01115	Atomic mass

## Facts

The seven horizontal rows of the periodic table are called periods. The number of protons and electrons in the atoms of elements in each period increases from left to right. The number of electrons in the atoms of the element decides an element's traits. That's why the traits of elements change gradually in each row.

Vertical columns in the periodic table are called families or groups. Groups are numbered from left to right. Elements in groups are closely related. For example, most elements in Group 1 are shiny and soft. They explode when mixed with water. They are known as alkali metals. Members of group 18 are gases that do not like to mix with other elements. They are known as noble gases.

Chemists and students use the periodic table as a reference tool. The chart distinguishes metals from nonmetals. It tells the mass and symbols of elements. It shows which elements share traits. For these reasons, it is a useful tool in the laboratory.



### Vocabulary

**A.** Words from the article are written below with missing letters. Read the clues to help you fill in the missing letters.

- groups are made of these columns that go up and down      vert \_\_\_\_\_ x
- these parts of an atom decide an element's traits      elec \_\_\_\_\_ x
- Mendeleev's chart ordered elements by this      ato \_\_\_\_\_ w \_\_\_\_\_ ight x
- this particle is even smaller than an atom      pro \_\_\_\_\_ x
- horizontal rows on the periodic table chart      \_\_\_\_\_ iod \_\_\_\_\_ x
- a chart that lists elements      \_\_\_\_\_ iodic ta \_\_\_\_\_ x
- the letter or pair of letters that stand for an element in a periodic table square      sy \_\_\_\_\_ x
- the number at the top of each square in the periodic table      atom \_\_\_\_\_ numb \_\_\_\_\_ x

**B.** Now write the letters that have an **x** under them:

\_\_\_\_\_

Unscramble the letters to complete this sentence:

The periodic table is an arrangement of the \_\_\_\_\_ found in nature.