

## PROJECT

### COLLECT INFORMATION OF FIRST SIX ELEMENTS IN THE PERIODIC TABLE

- Title of the Project** : Collect information of first six elements in the periodic table.
- Purpose of the project** : To know the characteristics and uses of chemical elements.
- Hypothesis** : An element is a substance made up of atoms of the same type. Different elements have different characteristics, which are determined by the number of subatomic particles (protons, neutrons and electrons) they have.
- Material** : Internet, some pictures in science books.
- Procedure** :

We collected data about the characteristics of some elements from internet and some science magazines and some science text books. we collected the information of the uses of elements, photograph of the discoverer and properties of the elements.

#### Intruduction:

An element is a substance made up of atoms of the same type. It cannot be broken down into simpler substances. Different elements have different characteristics, which are determined by the number of subatomic particles (protons, neutrons and electrons) they have. Scientists have found approximately 100 natural elements so far; a further 18 or so artificial kinds have been made by scientists in laboratories. These elements are divided into metals, semi-metals and non-metals. An atom is the smallest part of an element that can exist. All the elements have been arranged in a table, called the Periodic Table, in order of their atomic numbers—the number of protons an element has in each of its atoms. Elements in the same group on the Table have similar properties.

#### Hydrogen:

- Chemical symbol : H
- Atomic number : 1
- Atomic weight : 1.008
- Discovered : In 1781, Henry Cavendish.
- Named by : Antoine Lavoisier

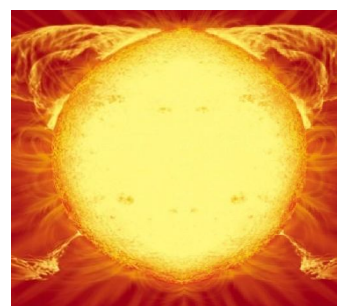
#### Properties :

It is the simplest and lightest element: its atom has just two subatomic particles: one proton and one electron. At room temperature and pressure, hydrogen is a colourless, odourless, tasteless, non-toxic (not poisonous), highly combustible (quick to catch fire) gas. The most abundant element in the Universe, hydrogen forms the bulk of the sun and most stars.

The majority of hydrogen found on Earth is in compounds, most commonly in water (joined to oxygen to form  $H_2O$ ), as well as hydrocarbons and carbohydrates.



Henry Cavendish



The Sun

### Helium:

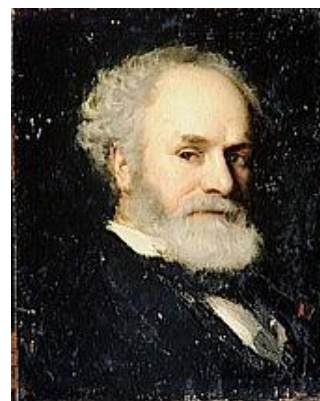
Chemical symbol : He  
Atomic number : 2  
Atomic weight : 4.0026  
Discovered : Pierre Janssen, Norman Lockyer (1868)  
Named by : Lockyer and Edward Frankland

### Properties :

It is a noble gas. It has the lowest boiling point (-268.9°C or 452°F) of all the elements, so it is a gas except for in exceptionally cold conditions—or extremely hot conditions, when it becomes plasma. Helium gas is colourless, tasteless and odourless. Helium is the second most abundant element in the Universe, after hydrogen, although it is rare in the Earth's atmosphere.

Most helium for commercial use is extracted from natural gas. The best-known use of helium is in balloons and airships, but it is chiefly used in cryogenics (creating very low temperatures) and in various industrial processes.

**A Helium-filled air ship** ➡



**Pierre Janssen**



### Lithium:

Chemical symbol : Li  
Atomic number : 3  
Atomic weight : 6.94  
Discovered : Johan August Arfwedson (1817)

### Properties :

It is an alkali metal. These metals react with water to form alkaline solutions. Lithium is the lightest metal and the least dense solid element of all. It is a good conductor of heat and electricity. Like all alkali metals, lithium is flammable and highly reactive. It bonds so easily with other elements that lithium metal is never found in nature, but is obtained from compound minerals and salts in seawater, rocks and clay.

Lithium and its compounds are used in lithium batteries (as anodes, through which electrical charge flows), in light but strong metal alloys, such as with aluminium, in heat-resistant glass and ceramics and in mood stabilizing medications (lithium salts affect the nervous system).



**Johan August Arfwedson**



**Lithium floating in oil**

### **Beryllium:**

Chemical symbol : Be  
Atomic number : 4  
Atomic weight : 9.01218  
Discovered : Louis Nicolas Vauquelin (1797)

### **Properties :**

It is one of the alkaline earth metals. Like the other alkaline earth metals, beryllium is a shiny, silvery metal at room temperature and pressure. Beryllium does not occur naturally as a pure element, but is found combined with other elements in more than 100 rare minerals. One of these minerals, beryl, comes in the form of the gemstones aquamarine and emerald. Beryllium is often used in alloys with other metals such as aluminium and copper because of its strength, low density ("lightness") and stability over a wide range of temperatures.

### **Boron:**

Chemical symbol : B  
Atomic number : 5  
Atomic weight : 10.81  
Discovered : Joseph Louis Gay-Lussac and  
Louis Jacques Thénard (30 June 1808)

### **Properties :**

It is a semi-metal, also called a metalloid. Semi-metals have properties in between metals and non-metals. Like other semi-metals, boron is metallic in appearance (it is grey and shiny) but too brittle to use on its own for construction or tools. Boron metal is found in meteoroids—small lumps of rock in space, once parts of comets or asteroids—but does not occur naturally on Earth. Boron is extracted from rocks containing boron compound minerals, such as borax (sodium borate) and kernite (sodium borate hydroxide).

Boron compounds are used in fibreglass, polymers, ceramics, pharmaceuticals, fertilizers and insecticides.



*Louis Nicolas Vauquelin*



**Beryllium-copper pliers**



Joseph Louis Gay-Lussac



Louis Jacques Thénard

## Carbon:

|                             |   |
|-----------------------------|---|
| Chemical symbol             | : C                                     |
| Atomic number               | : 6                                     |
| Atomic weight               | : 12.011                                |
| Discovered                  | : Egyptians and Sumerians<br>(3750 BCE) |
| Recognized as an element by | : Antoine Lavoisier (1789)              |

## Properties :

It is a non-metal that is solid at room temperature. Unlike most elements, carbon occurs as several allotropes (allotropes are different forms of an element, caused by the atoms bonding together differently). Well-known carbon allotropes are: diamond, which is transparent and extremely hard; graphite, which is black and soft; and amorphous carbon—coal is mostly amorphous carbon. Carbon is the fourth most common element in the Universe and makes up one-fifth of the human body.

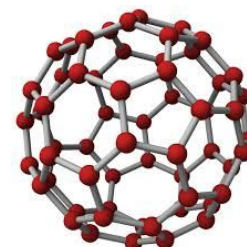
Atoms of carbon bond easily with other atoms, forming more than 10 million known compounds, more than any other element. Common carbon compounds include carbon dioxide in the air, hydrocarbons (such as fossil fuels, petrochemicals and plastics), carbonate rocks (such as limestone and marble), carbohydrates (such as sugars and starches) and DNA.



Antoine Lavoisier



A large sample of glassy carbon.



Allotropes of carbon: Diamond, Graphite and Fullerene.

## Observations:

- We observed the efforts of the scientists who discovered the elements.
- We observed the properties of elements.
- We have known the uses of the elements.
- We have known the allotropes of carbon.

## Conclusion :

We have known the uses of elements in our daily life. With the help of our parents and teachers we collected some data in the internet and various science magazines about the elements and their properties. We have know the uses of elements in our daily life.

**References :** internet and science magazines

## Project report

**Title of the project** : Collect information of first six elements in the periodic table.

**Class** : 10th

**subject** : Chemistry

**School** :

**Time frame** : 5 days

**Materials/sources** : internet, science magazines and some books.

### **Details of the procedure followed:**

We collected data about the characteristics of some elements from internet and some science magazines and some science text books. we collected the information of the uses of elements, photograph of the discoverer and properties of the elements. We have known about the use of the elements in our daily life. We observed the efforts of scientists who discovered the elements. We collected some data about the characteristics of elements in the internet.

### **Observations :**

- We observed the efforts of the scientists who discovered the elements.
- We observed the properties of elements.
- We have known the uses of the elements.
- We have known the allotropes of carbon.

### **Project outcome :**

We have known the uses of elements in our daily life. With the help of our parents and teachers we collected some data in the internet and various science magazines about the elements and their properties. We have know the uses of elements in our daily life.

**References** : internet and science magazines

### **Name of the group members and work allotment:**

| Sl.no. | Name of the team member | Work allotment |
|--------|-------------------------|----------------|
| 1      |                         |                |
| 2      |                         |                |
| 3      |                         |                |
| 4      |                         |                |
| 5      |                         |                |
|        |                         |                |

Date of submission :

signatures.