Water

Water is the most important liquid we know. It is everywhere we look. Water is in the ground and in the air that we breathe. All animals, plants and humans need water to survive. Water has formed our earth since its beginning. It also prevents the earth from becoming too hot or too cold. Water never disappears. We use the same water over and over again.

CHEMISTRY OF WATER

Water consists of very small molecules. Each of them has two hydrogen atoms and one oxygen atom. The chemical formula of water is \( \text{H}_2\text{O} \).

Water can be a solid, a liquid or a gas, depending on the temperature it has. At 32°F (0°C) water freezes and turns into ice. It expands and becomes lighter. As a result ice floats on water. That is why you should let water out of pipes during the wintertime because it may freeze and burst the pipes. At 212°F (100°C) water boils and escapes as a vapour into the air. Between these two states water is a liquid. Most of the world’s water is in liquid form. It can be found everywhere on earth.

Water molecules always move. In ice they are very far apart from each other. They move very slowly or often not at all. Molecules in water vapour move very quickly.

WATER IN OUR DAILY LIVES

Water has been important for people for thousands of years. Without water there would be no life on earth.

We use water in our houses for cooking, bathing and washing the dishes. Water is used to grow food. In many dry areas farmers must bring water to the fields through canals and expensive irrigation systems.

Industries and factories also use water. Fruits and vegetables must be cleaned before they can be processed and sold in supermarkets. Water is used for cooling in many areas, for example in steel production.

Many countries around the world use water to produce energy. Power stations burn coal which turns water into steam. Countries with many mountains and rivers use the power of water to produce electricity.

Water is important for our free time. People enjoy themselves at seaside resorts or on cruise trips.

Transportation was at first carried out on waterways. Ancient civilizations traded goods across the Mediterranean Sea. Today oil, coal, wheat and other products are transported on waterways.
**Water and the Human Body**

The human body is made up largely of water. Up to 75% of our body is water. Water helps us digest food. Chemical reactions in our body would not be possible without water. It also needs water to help carry away the substances that we do not need any more. Water regulates our body temperature so that it always stays the same. Although we can live without food for a few weeks without water we would die within a few days. A normal human needs about 2 to 3 litres of water a day to survive.

**World Water Supply**

The amount of water we have on earth is always the same. However, clean water is getting rarer because of pollution.

Most of the world’s water, about 97% is in the oceans. 1.4 billion cubic kilometres is saltwater. Only 3% is the freshwater in lakes, rivers and glaciers.

Much of the world has enough fresh water but there are regions that are too dry and don’t get enough rain. Developing countries often do not have enough water for their growing populations. Other areas do not have enough water because people waste it.
Water moves in a **steady** cycle. It never goes away or **disappears** but it changes from **solid** to **liquid** to gas.

When the sun heats up water it becomes a gas and **evaporates**. As it rises it cools down and clouds form. Clouds have many very small **droplets** of water in them. When they get too heavy they fall down to the ground as rain or snow.

Although some of this **precipitation** rises directly into the **atmosphere** again most of it gets into the ground and **remains** in **aquifers**. Snow and ice **remain** on **glaciers** and **ice caps** until it gets warmer. Then it starts **melting** and the **liquid** follows into lakes and rivers.

Water has **shaped** the **surface** of the earth for many years. It causes **erosion**, makes mountains **smoother**, rivers **carve** themselves into **valleys** and makes them wider. Ocean waves form **coastlines**.
WATER TREATMENT

Not all water is safe to drink or to take a bath in. Some of it needs to be cleaned or purified before we can use or drink it. This is done in three basic steps:

1. Water first flows through a basin which has chemicals in it. The bacteria, mud and other dirty substances that are in the water stick to these chemicals and move down to the bottom of the basin.

2. Water then goes through a filter made up of sand and gravel. Other particles are filtered out.

3. In the last phase chlorine is added to the water. It kills the bacteria that somehow get through.

Dirty, used water is carried away through sewage systems. It often smells bad and has a lot of bacteria in it. Most cities have treatment plants that turn used water into clean water that can be used to irrigate fields.