Water junior

Water is the most valuable resource on Earth. It can change both the geology and the landscape of our planet and its presence and abundance made life on Earth possible. Water covers ¾ of the Earth's surface; in fact, the Earth seen from space appears to be a "blue planet". The first forms of cellular life appeared in the oceans about 3.5 billion years ago, only a billion years after the birth of our planet. With the passing of time, these cells evolved into more complex forms, leaving the water to colonise the dry land, but never becoming fully independent of it. In fact, there is no life without water. To understand the importance this element has for all forms of life and for the planet it is enough to know that the water molecule is the most abundant compound on Earth and that all living things are made up of water in a percentage that ranges from 50% to over 95% (for example in jellyfish).

Water is an odourless, tasteless and colourless liquid. The water molecule is formed by two atoms of hydrogen bonded to one atom of oxygen (H_2O). Moreover, water is the only natural resource present on Earth in the three states of matter: solid, liquid and gas. Pure water passes from the liquid to the solid state, in other words it freezes, at 0°C. At sea level, instead, it boils at 100°C (the higher the altitude, the lower the temperature at which water starts boiling). When water freezes, it expands and its density decreases at constant volume: it is for this reason that ice floats on water or a bottle full of water cracks when kept in the freezer.

Water can be found in its liquid state in rain and dew, but especially in seas, lakes and rivers. In its solid state, water is present as ice, snow and frost while in its gaseous state it is present as vapour and fog. Water vapour is also a major component of clouds. Thanks to the Sun's energy, water is constantly in motion: all the processes through which water passes as it leaves the ocean, enters the atmosphere, reaches dry land and then returns to the ocean make up the water cycle. Water evaporates from the soil, from living organisms (transpiration) and from water surfaces (seas, rivers, lakes). The vapour that is created rises to higher altitudes and forms clouds, clusters of very small water droplets and ice crystals. When clouds are too heavy, they release the water that falls as rain, snow or hail. In this way water falls to the earth again: a part of it joins the watercourses and then reaches the sea once again while some soaks into the soil and is absorbed by the roots of plants. A part of the water seeps into the depths of the subsoil and joins the water-bearing layer, a real underground water "deposit".

Water is essential for numerous human activities. Agricultural use of water is the most important of human uses and it concerns two thirds of the world's supply of fresh water. This water is mainly used for irrigation. Household water uses include human nourishment, preparation of food, personal hygiene and domestic and public hygiene. In this case not only the quantity of water available but also its quality becomes significant. Man uses water even in industrial activities. Here, three different types of uses can be identified: as a raw material (for example, in the production of food), for cooling machinery and lastly for washing plants and equipment. In addition water is also a source of renewable energy produced in hydroelectric plants.