Talk

The children discuss why plants need water.

Photosynthesis

With the exception of carnivorous species, plants do not actually obtain any food for themselves. Rather, they produce it through photosynthesis.

Photosynthesis is the process whereby green plants that possess a green pigment called chlorophyll produce energy (food). Thanks to this process, and with the help of sunlight, plants can produce energy from water and carbon dioxide.

Photosynthesis occurs in two phases.
Firstly, light-dependent reaction, known as the energy conversion phase, when light is absorbed and its energy converted into chemical (bond) energy. At this time, water molecules are broken down. Two gases are released: oxygen, a side product of this process that the plant no longer requires, and hydrogen, which is needed for the next phase.
The second phase is the light-independent reaction stage, when light is not involved. The hydrogen released during the light reaction phase combines with the CO_2 carbon dioxide taken by the plant to create a simple sugar – glucose. The plant uses glucose as a base to produce other organic compounds: proteins, fats and compound sugars, such as starches. To produce protein, plants need mineral salts, which they draw from the soil together with water.

Observing

Is water in a glass flat?

The capillary action

The specific behavior of fluid in small objects, for example thin tubes (capillaries) or porous materials, is known as capillary action. This effect is seen in the tendency of liquid to “creep” through narrow spaces. The liquid moves without any external force, and can also move in the opposite direction to any external force: e.g. in the opposite direction to gravitational pull. Capillary action can be best observed when placing a tube (a capillary) in a vessel of water. We notice then that the level of water in the capillary is higher than in the vessel. The water “creeps into” the tube, and this is an example of capillary action. Sometimes we can see it happening in a normal straw in a glass filled with a beverage. Capillary action is also responsible for the absorbency of porous materials, such as towels, tissues and wicks in lamps. The free spaces between the fibers forming these materials perform the same role as thin tubes.

Talk

How did the water make its way from the full vessel into the empty cups?

The fibers of materials and the phenomenon of capillary action

The children once more observed the phenomenon of capillary action. The fibers of materials are arranged in such a way that spaces form between them and water enters into these spaces. The empty spaces between the fibers serve the same purpose for water molecules as the thin tubes did in the earlier experiment. The water easily penetrates these narrow spaces.

The fibers of materials and the phenomenon of capillary action

The children once more observed the phenomenon of capillary action. The fibers of materials are arranged in such a way that spaces form between them and water enters into these spaces. The empty spaces between the fibers serve the same purpose for water molecules as the thin tubes did in the earlier experiment. The water easily penetrates these narrow spaces.