**Functions of Water in Living Things**

|  |  |  |
| --- | --- | --- |
| **Function** | **Description** | **Properties of Water** |
| **Metabolism** | * All cellular chemical reactions occur in solution.
* Water is a reactant or product of many cellular chemical reactions.
 |  |
| **Transport** | * Roots take up water and dissolved minerals.
* Animal circulatory systems carry nutrients, oxygen, and wastes.
 |  |
| **Temperature Control** | * Water requires a large amount of heat energy to change its temperature.
* Water remains a liquid over a large temperature range.
* When water evaporates, a large amount of heat energy is removed with the water vapor, cooling the organism (sweating, panting).
* Ice on top of a lake insulates the water below, allowing aquatic organisms to survive the winter.
 |  |
| **Support** | * Leaf and stem cells in plants contain large water vacuoles that support the cell, e.g., plants wilt when needing water.
* Aquatic plants are buoyant in water.
* Muscles push against water-filled coelom in the hydrostatic skeletons of earthworms and echinoderms.
 |  |
| **Reproduction** | * Medium for movement of gametes for fertilization.
 |  |

**Answer KEY**

**Functions of Water in Living Things**

|  |  |  |
| --- | --- | --- |
| **Function** | **Description** | **Properties of Water** |
| **Metabolism** | * All cellular chemical reactions occur in solution.
* Water is a reactant or product of many cellular chemical reactions.
 | Universal solvent |
| **Transport** | * Roots take up water and dissolved minerals.
* Animal circulatory systems carry nutrients, oxygen, and wastes.
 | Cohesion and adhesionUniversal solvent |
| **Temperature Control** | * Water requires a large amount of heat energy to change its temperature.
* Water remains a liquid over a large temperature range.
* When water evaporates, a large amount of heat energy is removed with the water vapor, cooling the organism (sweating, panting).
* Ice on top of a lake insulates the water below, allowing aquatic organisms to survive the winter.
 | Specific heat capacityHydrogen bondingHigh vaporization temperatureIce is less dense than water. |
| **Support** | * Leaf and stem cells in plants contain large water vacuoles that support the cell, e.g., plants wilt when needing water.
* Aquatic plants are buoyant in water.
* Muscles push against water-filled coelom in the hydrostatic skeletons of earthworms and echinoderms.
 | Cohesion and adhesionFluid properties |
| **Reproduction** | * Medium for movement of gametes for fertilization.
 | Fluid properties |