**Functions of Water in Living Things**

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| **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**

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| **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 adhesion  Universal 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 capacity  Hydrogen bonding  High vaporization temperature  Ice 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 adhesion  Fluid properties |
| **Reproduction** | * Medium for movement of gametes for fertilization. | Fluid properties |