Transpiration

By Cindy Grigg

[1] You already know that plants need water to live, and you know that plants get water through their roots from the soil around them. But how does a tree move the water and other minerals taken in by its roots to its trunk, branches, and leaves?

[2] Trees belong to a group of plants called vascular plants. Vascular tissue forms long, narrow tubes that transport water and dissolved nutrients throughout the plant. A tree has networks of vascular tissue that go to every part of the tree. You can see this vascular tissue in a green leaf. The veins that branch through a leaf are vascular tissue.

[3] Vascular tissue allows water and nutrients taken in at the roots to move all the way to the top of a plant. Less than five percent of the water taken in by a plant is used by the plant to perform photosynthesis and other life processes. The rest of the water evaporates or becomes a gas called water vapor. If you have ever looked at trees in the distance after a rain, you might have seen clouds of water vapor rising from them. This process involving the evaporation of water in a plant's stems, leaves, and other parts is called transpiration.

[4] As water evaporates on the surface of a plant, water that is taken in through the roots moves up the plant and fills the space occupied by the water before it evaporated. It's a little like you drinking through a straw. No more liquid can come into the straw from the bottom of the cup until some of the liquid moves out of the top of the straw into your mouth. If you are not making the liquid move out the top of the straw, no more liquid can come in through the bottom of the straw. This cycle of transpiration is one reason why water and nutrients move from a plant's roots to the tips of its leaves.

[5] Transpiration is an important part of the water cycle; it accounts for about ten percent of the water in the atmosphere. One tree can add more than one hundred gallons of water to the air every day! Transpiration rates vary widely depending on weather conditions, such as temperature, humidity, sunlight availability and intensity, and also precipitation, soil type, and wind. Desert plants can survive in their dry environment by limiting transpiration via smaller leaves and other adaptations.

Name _____ Science Pd _____

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1. What is vascular tissue? (A) Tissue that transports oxygen and carbon dioxide throughout a plant (B) Tissue that transports sugars from the roots to the leaves (C) Tissue that forms long narrow tubes that transport water and dissolved nutrients throughout a plant	2. What is transpiration? (A) The process by which water in a plant becomes a gas called water vapor (B) The transport of oxygen and carbon dioxide throughout a plant (C) The transport of sugars throughout a plant
3. Most of the water a vascular plant takes in _____. (A) Goes back into the soil (B) Evaporates in the process of transpiration (C) Is used to perform photosynthesis and other life processes	4. Where in the plant does transpiration occur? (A) In the leaves, stems, and other parts (B) In the roots, leaves, and stems (C) Only in the leaves
5. All vascular plants contain vascular tissue. (A) False (B) True	6. Water and other nutrients are taken into a plant by _____. (A) The stem (B) The leaves (C) The roots
7. In which direction does water move through a plant? (A) Upward from the roots (B) Sideways (C) Downward from the leaves	8. Transpiration is part of the _____ cycle. (A) Water (B) Nitrogen (C) Carbon