

Trees Get Thirsty, Too

By Cindy Cranford

Trees need a lot of water to help them grow and survive. We have all seen a tree that didn't get quite enough water. The result is that it was unable to survive. Why? Trees, unlike humans, do not have blood to help move nutrients throughout their system. Therefore, they must have enough water. Depending on its size, a tree may need up to a ton of water each day! Imagine — 2,000 pounds of water!



Because trees must have water and nutrients, the water must be able to push the nutrients to the top of the tree. For some large trees, that may be up to 300 feet. Once the water is taken in by the tree's roots, it still has a long journey to get to the top of the tree. We know that Earth's gravity pulls things toward the ground, such as rain falling toward the ground, so how does water move up through a tree?

A tree's ability to get water to its upper branches is based on a process known as capillary action. All plants, including trees, have an internal system of long, slender, tube-like structures, known as capillaries. These structures help draw water from the ground, through roots and stems, and transport water throughout the tree. Water is able to rise through these tubes because of the attraction of water molecules to each other and to the molecules on the side of the solid capillary. As water moves up through these tubes, nutrients are spread throughout the tree.

An example of capillary action can be observed when you place a straw into a glass of water. It appears as though the water is "climbing" up inside the straw as liquid in the straw rises above the level of liquid in the glass. This occurs because the water molecules are attracted to the straw molecules.

Remember that water has a cohesive property (the ability to stick together). Therefore, when one water molecule moves closer to the straw molecules, the other water molecules slowly move up into the straw because they are cohesively attracted to that water molecule. Capillary action, however, is limited by gravity and the size of the tube (straw). The thinner the tube or straw, the higher up capillary action will pull the water. Trees, like other plants, pull water up into their roots and stems using capillary action.

It is important that trees get the amount of water they need based on their size. Without proper quantities of water, a tree does not get the nutrients it needs. A lack of water results in a tree that either does not grow properly or does not survive.

The Challenges – Teacher Resources

Reading Response Questions

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- Short response

The text states that water can move up through tubes within a tree because of capillary action. Explain how the process of capillary action takes place within a tree.

- Extended response

Water is vital to the life of a tree. Imagine you are a tree. Now, write to explain about your water needs.

