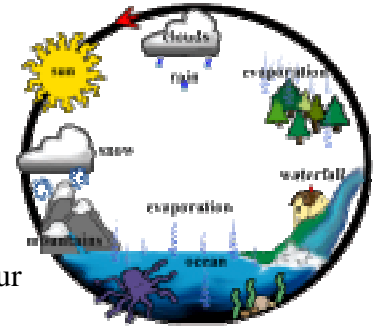


## How Plants Are Part Of The Water Cycle

**Objective:** The students will observe how a tree transpires water and describe how the water is returned to the air to become part of the water cycle. They will discuss how trees and plants are part of the water cycle.

**Materials:** Leaves on a tree that can be easily reached or plants in your room, plastic bags, and nametags for game.



**Background:** Once water enters the roots of a tree, it becomes part of a slender strand of water and nutrients that extends unbroken through the xylem from root tip to an opening in the bark or leaf. As a molecule of the water strand evaporates from the opening (stomata), more fluid is pulled from below much like a rope being hauled in hand over hand. Wind, heat, and sunlight increase evaporation and, therefore, the movement of water through the tree. Since every tree has millions of openings, each tree is like a living fountain, spouting water vapor from every pore. The new xylem cells each year cover last year's cells as a layer of fine, thin tubes. Last year's cells become part of the wood of the tree. The tubes are made of stacks of a type of cell that is strong on four sides but so thin at its top and bottom that a strand of stacked cells can act as a straw to pull water from the ground.

**Procedure:** If you contain water vapor as it evaporates from the leaves, it will condense as droplets of water that you can see or even measure. To see the effect of sunshine on the rate of water loss, set up two experiments. Tie one plastic bag so that it fits over a few leaves that are in direct sunshine. Tie another over the same number of shaded leaves on the same tree. After an hour or perhaps longer inspect each bag for water droplets. Which set of leaves produced the most moisture? You might want to repeat the experiment overnight and compare the results. This is called **transpiration**. Discuss the parts of the water cycle including how plants use and return the water. Discuss where the water that the plants don't use goes – the part that is transpired goes into the air, the parts that seep into the ground might go into the ground and form a cave, or become part of the ground water system.