By Georgia Brown’s Fifth-Grade Students, Sanibel (Florida) Elementary School

Our school is on Sanibel Island, a barrier island located on the southwest coast of Florida. Every person and every plant in Florida gets warmed by the sun. People perspire and plants transpire. So, when our class began to study trees, we were especially interested in transpiration, or the process by which plants give off water through their leaves. Some of us investigated transpiration in sea grape trees; the rest of us investigated transpiration in the gumbo limbo tree. We chose these trees because we have many of both kinds of trees on our school campus and because these trees have very different kinds of leaves. Sea grape leaves are large and simple (a single leaf on a stem), and gumbo limbo leaves are small and compound (many tiny leaves, or leaflets, share one stem). Of course, it was also a help that both kinds of trees had branches we could reach safely without standing on anything!

**We wanted to find out:**
1. Does water pass from leaves into the air?
2. Do the large sea grape leaves transpire more water than the smaller gumbo limbo leaves?

**We predicted:**
1. Water passes from leaves into air.
2. Larger leaves transpire more water than smaller leaves.

The gumbo limbo tree, Bursera simaruba, has red, papery bark and bunches of small leaves. Typically, the tree grows to be about 18 meters tall.

Gumbo Limbo Leaves

The sea grape tree, Coccoloba uvifera, is salt tolerant and grows in sandy soil. It has large, fleshy leaves; smooth bark; and clusters of edible red fruit. Typically, the tree grows to be about 7.5 meters tall.

Sea Grape Leaves
Our procedure:
We divided into groups of four or five students. Each group cut off a corner of a plastic bag and then taped a test tube in the hole. Outside in the schoolyard, some groups placed plastic bags over several leaves of gumbo limbo trees, and some groups placed bags over single leaves of sea grape trees. We sealed the bags tightly around the branches with masking tape, making sure the test tubes pointed toward the ground, and left the bags on the trees for 24 hours. The next day when we checked the bags, we observed that water had collected in the test tubes, and then we measured how much we collected!

We found out:
Water does transpire through plant leaves in varying amounts. For example, those of us who worked with sea grape leaves collected anywhere from 7 to 10 milliliters of water in our bags. Students who worked with the gumbo limbo trees, however, found a different story. When they examined their bags, they found only 2 milliliters of water (or less!) in each bag. From our data, we concluded that gumbo limbo leaves transpire less than sea grape leaves. Compared to gumbo limbo leaves, sea grape leaves are the transpiration champions!

One sea grape leaf transpires as much or more than one bunch of gumbo limbo leaves. To conclude our study, we made bar graphs showing our results.