



## Curiosity Guide #704

### Leafy Science

Accompanies Curious Crew, Season 7, Episode 4 (#704)

#### Sweaty Stomata

Investigation #8

#### Description

Try this tree-mendous investigation to see how plants move water and help our world!

#### Materials

- Household plant
- Clear plastic bag
- Twist tie

#### Procedure

- 1) Cover a large section of a household plant with a clear plastic bag.
- 2) Use a twist tie to close the bag securely around a strong stem of the plant to keep the bagged part airtight.
- 3) Continue to water the plant normally. Keep the plant in the sun for several days.
- 4) What do you notice?

#### Results

## Explanation

In time, the inside of the bag will become wet and cloudy. This is a result of the water that has been released through the leaves. Water moves through the plant from the roots and gets stored in cells in the plant. Extra water is released through the leaves in a process called transpiration, a necessary function to keep plants alive. This usually happens on the undersides of leaves, where guard cells open or close stomata, which are small pores, to maintain moisture levels. When the stomata are closed, the water is captured. In this case, we can look through the bag and see evidence of that released moisture as droplets on the inside of the bag.

**Did you know?** When the guard cells open the stomata on the underside of the leaf, carbon dioxide moves in. That also means that some of the water in the spongy mesophyll layer evaporates out. We saw evidence of that water vapor that condensed inside the plastic bag on the plant. This release of water vapor through the stomata is called transpiration. Through the process of transpiration, plants move a lot of water from the ground into the air. In fact, the leaves from an acre of corn give off between three and four thousand gallons of water each day. Leaves from a mature oak tree give off 40,000 gallons of water in a year. Leaves sure are important!

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