

WEEKDAY WONDERS



Content developed by the
Tennessee Aquarium
Education Department



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Mad Scientists: Day 1

Science is an important part of our lives, even when we do not realize it. This week, young scientists will have a chance to explore some of the science topics that we encounter around us every day. Whether it is plants or weather, water or colors, this week young scientists have a chance to find out more about the science around us.

These curated activities are listed in a suggested sequence but may be done in the order that works best for you and your young scientists. Learn more about this series in the [Introduction to Weekday Wonders](#).



Question of the Day

Why do plants look wilted or die if they do not get water?



Daily Nature Journal

Ask your young scientist to spend some time outside today completing a daily nature journal entry. Use the [Guide to Nature Journaling](#) to support them in nature journaling each day.



Plant Finder

Have your scientist go outside to find two plants s/he thinks are interesting. Ask your scientist to draw the plants. Your scientist might also enjoy tracing outlines of the leaves from the plants into their journals.

Have your scientist compare the two plants to see what is similar and what is different between them. If s/he is not sure, prompt them with questions about leaves, flowers, colors, and size. Then ask your scientist if s/he thinks the plants need the same things to grow. Make sure that s/he mentions water as one of the needs.

Ask your scientist if he or she knows the names of the plants. If not, they may want to research online or using an app such as iNaturalist to help identify the plants.



Celery Colors

In the previous activity, your scientist may have said that plants need water when s/he compared the two plants. Your scientist may know that plants can take in water through their roots, but does s/he know where the water goes after that?

Gather several light-colored celery stalks with leaves still attached. White flowers such as carnations work as well. Help your scientist trim the bottom ends of the celery stalks or flower stems. Ask him or her to fill several cups with water and add 10-15 drops of food coloring to each. Darker colors such as blue and red work best with celery.

Your scientist should place the end of one celery stalk or flower into each cup. Make sure they are stable and will not fall over. Ask your scientist to check on the plants every hour or so to watch the process.

Have your scientist make observations each time. For older scientists, you may wish to have them measure and note how far the color has moved each time and calculate the rate at which it moves through the plant using the distance divided by the time. For an extra challenge, have your scientist keep track of whether the rate stays the same throughout the day.

Fully changing the leaves can take several hours, but your scientist should be able to start seeing changes after only an hour or two. Have your scientist describe what s/he thinks happens to the water that a plant's roots take in.



Plant Transpiration

In the previous activity, your scientist saw where water goes in plants after it is taken in. Ask him or her what happens to it after that. If s/he says that it stays there, have him or her think about filling up a balloon with water and whether or not you can continue to fill it forever. Then, complete the following activity.

Take a walk outside with your young scientist. Bring along a clear plastic bag (check that there are no holes in the bag) and a twist tie or piece of string. Ask your young scientist to find a plant with sturdy stems and leaves.

Have your scientist place the plastic bag over the end of a stem, covering several leaves. Help him or her tie the bag closed around the stem. It should be tied tightly, but should not cut into the stem.

After a few hours, take another walk to check on the bag and the plant. Ask your scientist what changes have happened inside the bag.

Your scientist should see that water has begun to collect inside the bag. This water actually comes from the plant itself!

Explain to your scientist that plants lose water through their leaves. This is somewhat similar to how your scientist loses water from his or her body when s/he sweats. In plants, this process is called transpiration. Your scientist may want to leave the bag on the plant all day to see how much water collects. Just remember to bring the plastic bag back inside when your experiment is done.

Extend this activity by having your scientist choose several different plants to compare the transpiration. He or she might ask if the same amount of transpiration happens throughout the day or if the leaf size makes a difference in the amount of water. Challenge him or her to come up with a way to quantify the amount of water, so s/he can do an accurate comparison.

If your scientist would like to know more about transpiration, search for a picture of plant stomata on the Internet. This will help him or her visualize how water is moving out of the plant. Let him or her know that these holes can open and close depending on the needs of the plant, such as needing more water, needing to cool off, or needing to release carbon dioxide. Challenge your scientist to draw, write, or create a flowchart to show the relationship between plants and water movement.