

# Wet and Wonderful

GARDENING ACTIVITY #8

## Summary:

Two demonstrations show that plants transport and transpire water. Three types of irrigation are the modeled for all to observe.

## Why Do This?

Folks will pay much closer attention to how much they water and how they do it when they understand that it makes a difference to the plants.

## Some Helpful Information:

All parts of garden plants need water. Leaves of plants use water to make the sugar the entire plant needs to grow. Roots gather the water likewise for the entire plant. This means the leaves have something the roots need and the roots have something the leaves need. There are lots of tiny pipes that run up and down through the plant carrying water and nutrients to the places they are needed. The thick strings in a celery plant are examples of these kinds of waterpipes. They carry water up from the base of the plant to the leaves. If you supply these pipes with colored water you can see it move up into the celery leaves over time. Cut the celery and you will see the tiny tubes filled with colored water.

Plants need just enough water to grow well. Too much water in the soil keeps a plant from getting the oxygen it needs, but not enough lets it dry up. Either way, with too much or too little water, the plant may die. Roots absorb water from the soil. Large plants have deep roots, and smaller plants have roots closer to the soil surface. Deep-rooted plants need lots of water to penetrate the soil to reach the roots deep below. These plants do not need frequent watering, because deep down the water doesn't dry up quickly (if the soil type is loam or clay). Shallow rooted plants need watering more often to keep their roots moist and are prone to losing moisture to evaporation at the surface.

Garden plants can be watered using various methods. **Furrow watering** is seen often in big farms along the road. The farmer digs a long trench and mounds soil on either side of the trench. Water flows down the trench and the plants are planted in the mounds alongside. **Drip irrigation** supplies water very slowly in steady stream of drips in one spot. The water slowly seeps straight down. **Overhead sprinkling** is like rain: it wets the surface of the soil uniformly. Different plants benefit from these different types of irrigation. Sprinkling is great for seedlings that are not deep in the soil and need frequent watering. More water is lost due to evaporation if sprinklers are turned on during the day. When they get water on their leaves through overhead watering, some plants that are susceptible to mold and mildew diseases get damaged. Drip is used in mature deep-rooted plants that won't move for a long time, like grapes. Drip only waters at the roots of the desired plant. It conserves water and decreases weeds. Furrow watering keeps water off the plant leaves, preventing molds and mildews, and it doesn't require the expense of buying drip materials. When a large crop is only grown for a few months, then plowed under, it is too much work to set up drip equipment.

## Time:

1+ hour(s)

## Materials:

a plastic bag and twist tie or rubber band  
stalks of celery with leaves and/or white carnations  
food coloring  
2 cups  
three groups, each with:  
    glass bowl  
    fine grain soil  
    1/2 cup measure  
one group with spray bottle  
one group with a juice can with small hole poked in bottom  
copies of irrigation method illustrations

## Preparation:

1. One full day ahead place red or blue food coloring (15 drops) in a pitcher or jar of water. Under running water, cut off the bottom of the celery stalks (or carnation stems). Quickly place them in the colored water. Or, split carnation stems part way. Snip off the ends under running water and put one half in red water and the other in blue water (see illustration).
2. Make sure soil is fine grain. You can sift coarse soil through a 1/4" screen or hand pick out any rocks and other large pieces.
3. Poke a tiny hole in the bottom of the juice can. (Put can over a broom handle and tap a small nail into the bottom.)
4. At the meeting site, several hours early (2 hrs on a sunny day, 4 hrs on a cloudy day): Stick a small branch with lots of leaves into the plastic bag and fasten it there with the rubber band or twist tie (see illustration). Make sure not to break the stem, and choose a stem that is low enough for all to get a close look at.

## Step by Step:

1. Break into three groups. Distribute the celery (or flowers). Tell group the plants didn't grow that way, and they weren't that way yesterday. Ask everyone to talk together to decide how they got their coloring.
2. Take everyone out to see the leaves you bagged earlier. Ask them what they see. How did the water get there? Where did it come from? (Don't forget to take the bag off!)
3. Now that everyone has seen that plants use water and transport it, we will look at ways to water our garden plants.
4. Separate into three groups. Each group is to try an irrigation technique in their glass bowl. Give them the handout with directions and other materials.
5. Have all the groups look at the alternative methods demonstrated by the other two groups.
6. As a large group decide which method is best for deep-rooted plants? For shallow-rooted plants? Which uses least water?

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## WET AND WONDERFUL • TWIGS GARDENING ACTIVITY #8

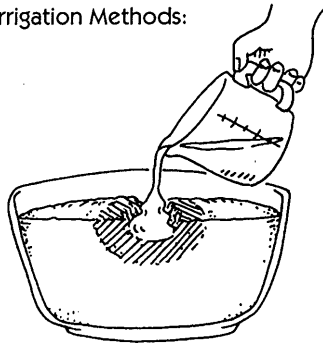
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### **Extensions:**

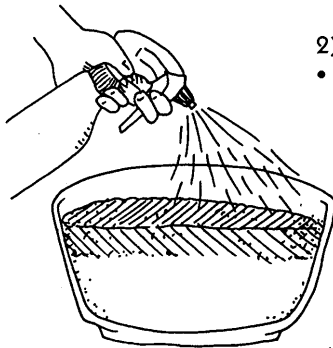
- Water three plants in different amounts and keep track of their growth (height, number of leaves) over several weeks.
- Keep track of how many weeds there are in the drip irrigated part of a garden compared to an overhead sprinkled area.
- Have folks sprinkle an area for 1 minute, another area for 5 minutes, and another for 30 minutes. Dig down and see how deep the water has gone in the different areas.
- Try putting different soil types (clay, sand, loam) in a colander lined with cheesecloth and compare how fast water moves through each.

## Handout • Gardening Activity #8 WET AND WONDERFUL

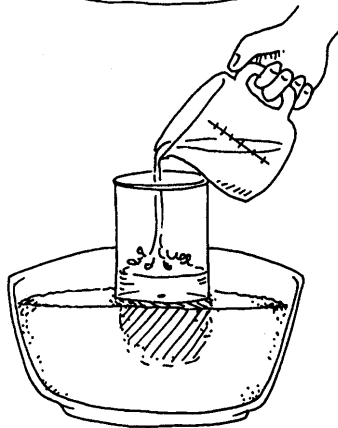
Irrigation Methods:



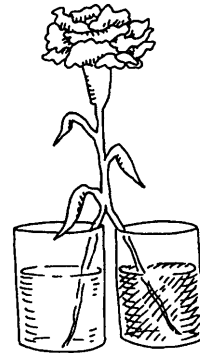
- 1) Furrow Watering
- Fill bowl with soil and pack down. Make furrow. Water slowly with 1/2 cup of water. Note how water moves through soil.



- 2) Spray Bottle Watering
- Fill bowl with soil. Pack down. Using the spray can, water with 1/2 cup of water. Note how water moves through soil.



- 3) Drip Can Watering
- Fill bowl with soil and pack down. Place can on soil near edge of bowl. Water slowly with 1/2 cup of water. Note how water moves through soil.



Carnation stem split part way with one half in red water and the other in blue water.



Small branch with leaves stuffed into a plastic bag and fastened there with a rubber band or twist tie. This branch is still attached to the plant!

