



RESOURCES AVAILABLE TO TEACHERS

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- Posters
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- Activities

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www.nutrientsforlife.org

YOUR VOICE OUR RESOURCES

Nutrients for Life is a nonprofit organization that provides information and resources to educators and individuals like you, to help inform the public about the vital role that fertilizer plays in feeding the world. The information we have compiled is science-based and user-friendly. It has been successfully implemented by educators across the country. Through a grassroots effort, we can spread the word about soil health to students of all ages and to adult organizations that are always looking for programs. Our story is not only important, but it is interesting and serves a vital role in educating consumers and decision-makers in the future.

IF YOU DON'T TELL YOUR STORY, WHO WILL?

Your story matters.
Soil science matters.



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RELAX! HERE'S A LESSON WORTH TEACHING.

From Root to Plant

Appropriate for All Ages



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PROCEDURE



From Root To Plant

Here is a quick, but effective lesson that you can use at a moments notice.

Visual aids: Water glass, water, food coloring and celery stalk. Prior to the demonstration, cut the celery into pieces approximately 2 inches long. Make sure the cut surfaces are flat.

Optional: Nutrients for Life NPK poster.

This lesson is found in NFLF's curriculum, *Nourishing the Planet in the 21st Century*.

When going to the classroom, bring a copy of the curriculum and accompanying poster to gift to the teacher.

All NFLF resources are free.

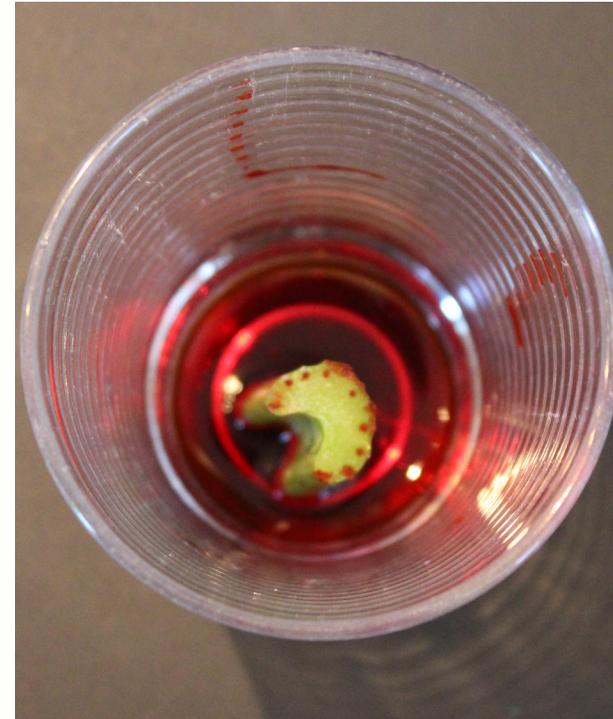


1) Ask the students, "How do water and nutrients get from the roots to the rest of the plant?" Active transport is the process used by cells to move molecules from an area of lower concentration to one of higher concentration. It requires energy. This is similar to humans' circulatory system through our veins and arteries. Depending on the group size, you can do one demonstration or bring multiple supplies for students to break into groups.



2) Pour 10 drops of food coloring into the cup or enough to cover the base.

3) Place the piece of celery stalk into the cup of food coloring so that it is resting on its cut surface.



4) Ask students what they predict will happen to the food coloring.

5) Allow the celery to stand undisturbed for 10-15 minutes. During this time, talk about your job and the company you work for.

6) After 10-15 minutes, ask the students to comment on what they observed.

7) Reiterate the importance of the nutrients being brought up into the plant and conclude the activity.

OVERVIEW

In order to understand how nutrients are transferred to a plant, students must first understand the interaction between the plants and the soil. Plants move water and nutrients through the root system either into the root cells from the soil by diffusion or by an energy-requiring process (active transport). This activity demonstrates transport of water through the xylem by using celery and food coloring.

MAJOR CONCEPTS

- Water and nutrients are moved throughout plants by active transport or transpiration
- Xylem are the hollow tubes where you can see the food coloring. Plants contain many xylem vessels stretching from the roots to the leaves.