Activity 23:

Overhead Roots

Objective: Create oversized art and write poetry to understand the different types of root systems

Time: 50 minutes

Materials: *Tops & Bottoms*, trowel, overhead projector, two large (about 3 feet by 4 feet) sheets of light-colored bulletin board or chart paper, markers, crayons, map pencils, a bucket half full of water, paper towels, a timer or watch, *A Closer Look* observation page, magnifying lens, thesaurus

NOTE: Before this activity, water the areas from which you will be taking root specimens if the soil is not already softened with moisture.

Begin the session by reading Janet Stevens's book *Tops & Bottoms* to the children. This book is rich with possibilities for discussion. Sample questions include:

- Do you recognize any of the vegetables in the illustrations?
- What were the best parts of each—the tops (leaves and shoots) or the bottoms (roots)?
- What do you notice about the roots of some of the vegetables?
- Do you think the bigger single roots are better to eat?
- What do you notice about the vegetables with tasty "tops?" What do their roots look like?
- Do you think they would be good to eat?
- What plant part would you call the "middles" on the last plant in the story?

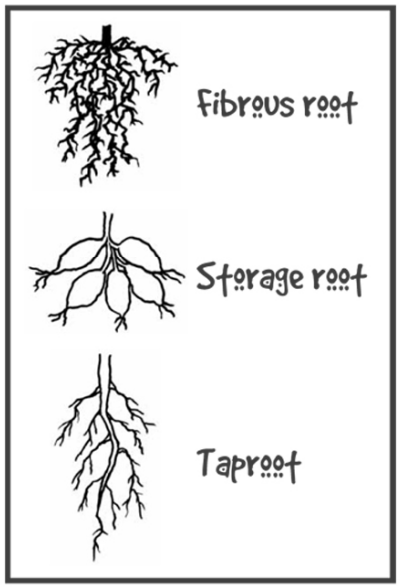
Take the students and a trowel to an area where weeds can be found. Ask the students what function roots serve for plants (absorb water and nutrients and anchor the plant). Explain that different plants have different types of roots; and they will try to find them hiding under the soil. Ask the group for help to find good examples of the two main types:

Fibrous roots – many short roots growing close together

Taproot – one larger and longer root

Have the children point out weeds for you to dig up. Discuss the importance of being careful when looking for and digging up a specimen—they should try not to break many roots and damage the plant. Without digging up too many plants, try to find one example of a taproot and one of a fibrous root system.

This is a good time to have the students hypothesize about why some plants have taproots and others fibrous roots. (Plants that take in water from near the surface use fibrous roots. Those with taproots send a larger main root deep into the soil to absorb water from deeper underground.)



Another type of root system includes storage roots such as radishes, carrots, beets and turnips. These roots actually store energy for future use by the plant, but they are sometimes edible and tasty enough to be eaten by people! Revisit the story and see how many storage root vegetables are shown in the illustrations of the book. Carrots are an example of taproots that are also storage roots.

When you have good samples of both root types, wash them to remove the soil and pat one of them dry. Take them indoors and place them on an overhead projector. Project the image of one of the plant's roots on one of the large sheets of paper.

Allow the students to take turns drawing a section of the outline of the roots. When each outline is complete, have a student draw where the ground line would be.

Note: It helps if you make the turns short—from 15 to 30 seconds—so the children aren't kept waiting too long.

Overhead Roots
JMG Level One
Literature in the Garden,
p113-116

Roots will usually keep for 2 or 3 days without showing noticeable changes. You may want to wrap each root in a moist paper towel and put it in a plastic zipper bag for storage.

Once the root outline and ground line are completed, have a student write a nice title for the poster, making sure that the terms are spelled correctly, that the letters are large enough, and that an eye-catching color is used. The title can be simple and direct, such as *Fibrous Roots,* or it can be more creative, such as *Fantastic Fibrous Roots*. Encourage the students to use a thesaurus to find the "best" words. Normally, the children will take a bit longer to complete the fibrous root system than the taproot system.

When the first poster is complete, have the students return to their seats. Give each child a copy of the *A Closer Look* observation page. Ask the students to fill in the page with the name, date, root type, a careful observational drawing of the first root, and some good words to describe what they saw (and what they drew).

Some children may be tempted to draw a generic plant. However, the focus of this exercise is for them to make neat, careful drawings based on their observations.

Encourage them to include color by using map pencils.

This is also a wonderful opportunity for the children to use and develop vivid descriptive language. Try to steer them away from vague terms such as *long*. Instead, encourage them to compare the length with something they already know (Example: "long like a piece of curved spaghetti").

Repeat the process with the second type of root.

For closure, have the children share their best descriptive words or phrases. If time allows, have them put their favorite descriptions on the poster at the front of the room, along with their names. You should have a beautiful poster for classroom or hallway display.

Variation: If you wish, you can have the children work on their individual observation pages while they are waiting for their turn on the big poster.

In the Classroom

Both science and poetry require children to make careful observations. Don't neglect either one. Many types of short poem forms could work as a spin-off from this activity.

One such form is haiku. A haiku is usually a quiet, reflective, short poem about nature. It is easy to get kids hooked on writing them once they understand the structure: three lines, made up of five syllables (first and third lines) and seven syllables (second line).

Have the children make a beautifully illustrated book of poems, all about ROOTS! Sample haikus are below:

Taproot	**Fibrous Roots**
Thirsty, light brown, you	Thick, yellowed tangles
Probe deep looking for only	Grabbing the rich and damp soil
Your sweet survival	Living and growing

6

Overhead Roots
JMG Level One
Literature in the Garden, p113-116