**Purpose**
Youth recognize the parts of common plants and are able to identify leaves, stems, roots and seeds, and which direction each grows.

**Facts to Know**
- **Suggested group size:** six to eight children per adult volunteer
- **Time frame:** group meeting 30 to 60 minutes
- **Recommended ages:** 5- to 7-year-olds (kindergarten through second grade)
- **Materials:**
  - A blanket
  - Eight to 10 plant parts or plant products
  - Potting soil
  - White glue
  - Assorted seeds
  - Pencils/markers
  - Seed collection boards (one per member, see Figure 1)
  - Clear, plastic cups (one per member)

**Background Knowledge**
Plants come in many shapes and sizes and even in several colors. From the coastal redwoods of California standing more than 30 stories tall to the purple and red stalks of Swiss chard growing in a backyard garden, plants are all around us.

We use plants and plant parts for many things. Think of all the edible plants in a garden: peas, carrots, lettuce, tomatoes, corn and berries. Trees are plants, and trees provide wood to build our homes and schools, cork to make corkboards, and fruit and bark to eat (think apples and cinnamon).

Every plant is different, but every plant grows up and every plant grows down. Stems, leaves, flowers, fruits and seeds all grow up, but the roots grow down. Every plant needs sunlight, water and air to live and grow.
**Do: Getting Started**

**Kim’s Game (10 minutes)**

Before the meeting, collect eight to 10 plant objects and cover them with a blanket. The objects all should have some relation to one another (for example, rubber bands, cork board and cotton balls all relate to things made from plants).

1. Explain to the members that because of circumstances beyond your control, you have to give them a test. The members probably will groan. Then further explain that this is a most unusual test. It will be fun. The children will become more aware of plants and plant parts all around them.

2. Have the members sit in a half circle in front of the covered objects. Lift the blanket slowly and have them concentrate on the objects for about 30 seconds. After 30 seconds, replace the blanket. Ask if they can remember the objects. Ask for details about each one. Discuss the what, how and where of each object, then ask everyone to share a new observation as you proceed around the circle.

3. Ask the members what they thought of the test. Would they take another test like this? What objects were new to them? Do the objects all relate to one another and tell a story? What is the story?

*(Kim’s Game, 2013)*

**Do: Looking Within**

**Make a Seed Collection (20 minutes)**

Before the meeting, create seed collection boards for each member. You can use the “Seed Collection” Cloverbud handout available on the web. Collect at least 10 different seed kinds from one plant type for members to use in their collections. Plant types for seed collecting might be crops, flowers, garden plants or trees.

1. Have members write the title of their seed collection at the top of the collection board. Below this, have members write where, how and when the seeds were collected, and which plant type their seed collection represents.

2. Have members place a small drop of glue on the sample squares and press two or three seeds of the same kinds in the glue. Have members choose at least 10 kinds of seeds to put in their collection. Have members label each kind of seed.

3. Discuss the different shapes and sizes. If you have examples, point out how the wind blows the dandelion or stickers attach to animal fur and they are carried to new locations.

**Do: Digging Deeper**

**Build-a-Tree (20 minutes)**

Number of participants: minimum 10. Locate a wide, open space. The activity works best outside in an open area near a forest or a small patch of trees, but an open room works as well.

1. Have members stand in a large circle. Place yourself in the center. Ask: “What is a tree? How does a tree work? Has anybody ever seen the inside of a tree? What does it look like?” Explain that the group will be building a tree.

2. Choose tall or strong-looking children for the heartwood. Place them in the middle of the circle. Tell them: “Your job is to hold the tree tall and strong. The rest of the tree hangs on you. The branches, the growing wood, the bark and the leaves all depend on you to hold them up. You are the heartwood. You used to be alive, bringing water and food up and down thousands of tiny tubes, but now you are dead, clogged with resin and pitch. You keep the tree upright during windstorms, snowstorms and all sorts of awful weather. You are the heartwood. Let’s practice your line: When I say, ‘The wind’s ablowing and ahollering,’ you say, ‘I’ve got heart!!!’”

3. Next, choose other strong-looking children to be the taproot. Have them kneel at the base of the heartwood. Tell them: “Try to imagine sinking down into the ground 30 feet. You are
the taproot. You anchor the tree firmly to the ground, sinking deep into the soil, through clay and rock. You hold tightly onto the earth. When the fiercest storms come, you keep the tree from being blown over by the raging winds. You are the taproot. Let’s practice your line: When I say, ‘The wind’s ablowing and ahollering,’ you say, ‘Anchors away!’

4. Then choose children to be lateral roots. You might want to choose children with long hair so you can demonstrate the root hairs extending down into the soil. Have them lie on their backs with their feet up against the heartwood and their bodies extending away from the tree. Tell them: “Hundreds of you stretch out from the trunk in all directions for long distances, sometimes hundreds of feet. You are the lateral roots. Like the heartwood and the taproot, you help hold the tree up. Some trees, like redwoods, depend only on you. They don’t have taproots. Extended from you are tiny little roots called root hairs. (At this point, kneel down and spread out the hair of the lateral roots.) Your root hairs suck up water trapped by the soil. You are the lateral roots. You supply the tree with water, so when I say, ‘Slurp,’ you make slurping sounds.”

5. The sapwood children are next. Have them encircle the heartwood, facing inward, being careful not to step on the root hair or lateral roots. Tell them: “You draw water up from the roots and lift hundreds of gallons of water a day high into the air. In your tiny tubes, water sometimes surges upwards at 200 miles per hour. After the roots bring up the water from the ground, your job is to bring the water up the tree. You move water up the tree, so when I say, ‘Bring the water up,’ you say, ‘Whooooo!’” (ascending note).

6. Have the tree practice its parts, then choose children to be the cambium/phloem layer of the tree. Have them form a circle around the sapwood, facing inward, and stretching their arms upward and outward so they intersect with each other at the wrists, leaving their hands free to flutter like leaves. Tell them: “You are the most vital, alive part of the tree. You are the cambium/phloem layer. When I say, ‘Make food,’ you rustle your leaves in the sun. And when I say, ‘Bring the food down,’ you say, ‘Whoooooo!’ (long descending note), bend at the knees and drop your arms and body to the ground.”

7. Review the sounds and motions of the tree parts. Then have the remaining children be bark and circle around the tree. They face outward because they protect the tree. Tell them: “Your job is to protect the tree. You are the bark. You work day and night, putting up with all kinds of abuse. If some critter gnaws on your bark, you soon grow a new layer. You are the bark. Because you are so protective, let’s practice your line: When I say, ‘Chomp! Chomp!,’ you say, ‘Roff! Roff!’ like a dog and snarl.”

8. Walk around the tree and lead the group in the following sequence:

Adult leader says: The winds ablowin’ and ahollerin’
   Heartwood – I’ve got heart!
   Taproot – Anchors away!

Adult leader says: Slurp
   Lateral roots – Slurp!

Adult leader says: Bring the water up
   Sapwood – Whoooo! (ascending note)

Adult leader says: Make food
   Phloem – Rustle leaves

Adult leader says: Bring the food down
   Phloem – Whoooo! (descending note)

Adult leader says: Chomp! Chomp!
   Bark – Roff! Roff! and snarl

9. Go through the sequence two or three times. Finally, have everyone applaud the group’s stupendous tree.

(Build a Tree, 2013)
Reflect: Bringing Closure

Root View Cups (10 minutes)

This activity works best with a quick-growing seed. Good seed choices might be garden peas, beans, marigolds or sunflowers.

1. Give each member a clear plastic cup. Ask members to fill the cup three-fourths full with potting soil.

2. Have members carefully plant seeds right against the plastic and spaced around the edge of the cup. Gently water the seed cups.

3. Place in a warm, sunny window and keep moist but not soaked. Seeds should germinate within seven days. Ask members to watch the root and stem as they grow from each seed. Which grows up and which grows down?

4. As the seed grows, members can watch the roots growing against the plastic edge of the cup. Transplant into a flower pot or garden once the new plants have six to eight leaves.

Apply: Going Beyond

1. Make a sweet, seedy snack. Make a gooey mix of equal parts honey, peanut butter and cocoa powder. Roll Ping-Pong-sized balls of the gooey mix in edible seeds. Try sunflower, sesame, pine nuts, peanuts or soy nuts. Set on wax paper and enjoy! (Super Seed Fun, 1995)

2. Grow a garden glove. Soak five cotton balls in water and drop one into each fingertip of a clear, non-latex glove. Drop a different garden seed into each finger. Tape the garden glove to a window, keep the cotton balls moist but not soaked and watch the garden glove grow.

3. Grow a homemade chia pet. Sprinkle grass or alfalfa seed into the toes of an old sock or sheer panty hose. Fill in with potting soil until it’s the size of a baseball. Knot the end of the sock or hose and decorate to look like a face. Thoroughly water the soil and place knot side down in a cup with water. Keep in a sunny spot and watch the seeds sprout.

Acknowledgements

Project Coordinator and Editor: Monique Snelgrove, Extension Agent, Center for 4-H Youth Development

Curriculum Consultant and Editor: Dean Aakre, 4-H Youth Development Specialist, Extension Center for 4-H Youth Development

Author: Monique Snelgrove

Resources


For more information, see www.ndsu.edu/4h

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, sex, sexual orientation, status as a U.S. veteran, race or religion. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701) 231-7708. This publication will be made available in alternative formats for people with disabilities upon request, (701) 231-7881.