



### What are roots and what do they do?

#### Plant Concepts:

- As seeds germinate, roots emerge first.
- Regardless of how a seed is placed in the ground, the roots grow downward because of gravity.
- Roots anchor plants, absorb water and minerals, and store food.
- Dicots, such as the carrot, usually have taproots.
- The taproot is a large main root with smaller roots branching out and down.
- Parts of the taproot include: root cap, epidermis, and root hairs.
- Monocots, such as grass, usually have fibrous root systems, which branch out from the stem.
- All roots contain xylem and phloem tissues. These vascular vessels carry nutrients throughout the plant.
- Xylem carries water and minerals up from the root to the rest of the plant.
- Phloem carries the food made in the leaves down to the roots.

**Vocabulary Words:** gravity taproot fibrous root root cap root hairs  
\*epidermis \*geotropism

**Read:** *Lots of Science Library Book #15.*

#### Activities:

##### Angiosperm Roots - Graphic Organizer

**Focus Skill:** compare and contrast

**Paper Handouts:** 2 sheets of 8.5"x11" paper  
a copy of Graphics 15A – D  
Angiosperm Book

Flowering Seed Plants Angiosperms		monocot	dicot	
monocot	dicot			

**Graphic Organizer:** Make two Small Question and Answer Books. Turn one with the fold on the left side and one with the fold on the right side. Glue the books next to each other on the middle page of the Angiosperm Book. On the top of the left book write *monocot*. On the top of the right book write *dicot*.

**Monocot Roots:** On the bottom left tab, glue/draw the fibrous root system, Graphic 15C. Open the tab. On the right section, glue/draw the identical picture, Graphic 15D. On the left section write about the parts and functions of the roots.

**Dicot Roots:** On the bottom right tab, glue/draw the taproot system, Graphic 15B. Open the tab. On the left section, glue/draw the cross section of the taproot, Graphic 15A, and label the parts of it. On the right section, write about the parts and functions of the roots.

## Functions of Roots – Graphic Organizer



**Paper Handouts:** 8.5"x11" sheet of paper    a copy of Graphics 15E – G  
index cards

**Graphic Organizer:** Make a Pyramid Project. Glue/draw on each side pictures that illustrate the functions of roots. Describe the functions of the root on the index cards next to the Pyramid Project or hang them from each side as a mobile.

## Collect Roots - Plant ID Book

**Materials:** Nature Guide Book

**Paper Handouts:** 8.5"x11" sheet of white paper    Plant ID Book

**Graphic Organizer:** Make a Large Question and Answer Book. Glue it side-by-side to the Plant ID Book made in the previous lesson.

Note: Be sure to have permission to dig up the plants before the activity begins. Students select two plants to feature in their Plant ID Books, examining the root structure of each. Draw one plant on each tab including the roots. Record the plant observations under the tabs.

## Experiences, Investigations, and Research

Select one or more of the following activities for individual or group enrichment projects. Allow your students to determine the format in which they would like to report, share, or graphically present what they have discovered. This should be a creative investigation that utilizes your students' strengths.



1. Make Ginger Root Beer. Ingredients: 3 cups water, 2 inches finely grated fresh ginger, 2 tablespoon honey (or to taste), 1/2 sliced lemon. Mix the ingredients and boil for ten minutes. Strain the tea. Serve hot or iced.



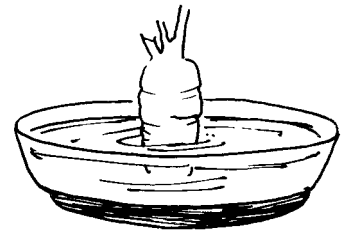
2. Read *The Turnip* by Alexei Tolstoy. . . .



3. Investigate the orchid plant's aerial root system. This plant has its roots above the ground, absorbs water from the air, and minerals from decaying plant material. Discover other aerial plants.

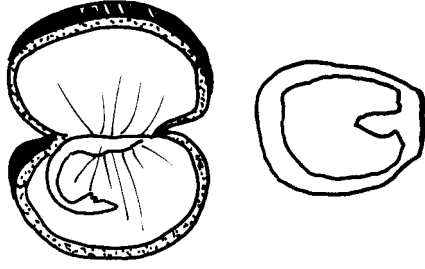


4. Make "root" entries in your Record Holding Plants Journal.





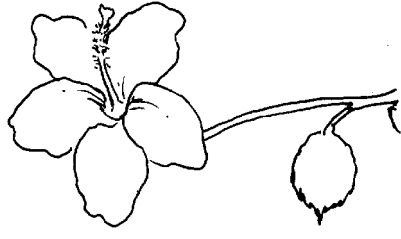
**What are the two types of seeds?**



*Lots of Science Library Book #14*



**What are stems and what do they do?**



*Lots of Science Library Book #16*



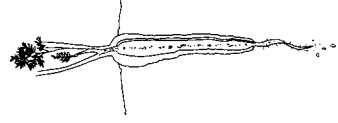
**How does an angiosperm develop and grow?**



*Lots of Science Library Book #13*



**What are roots and what do they do?**



*Lots of Science Library Book #15*



random  
vascular bundles

- \* epidermis
- \* herbaceous
- \* plumule

Explain the functions  
of the stem.

monocot  
dicot

Explain how all  
seeds are alike.  
How do seeds differ?

Explain the functions  
of roots.

mature  
explosion  
\* germination  
\* dormancy

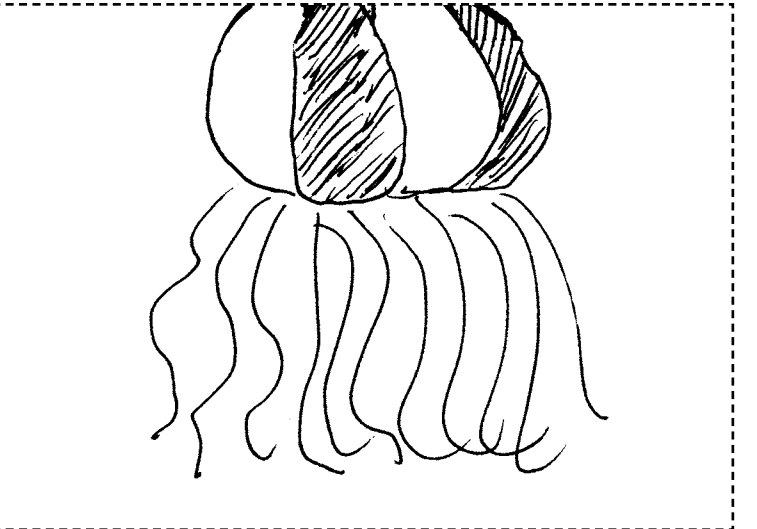
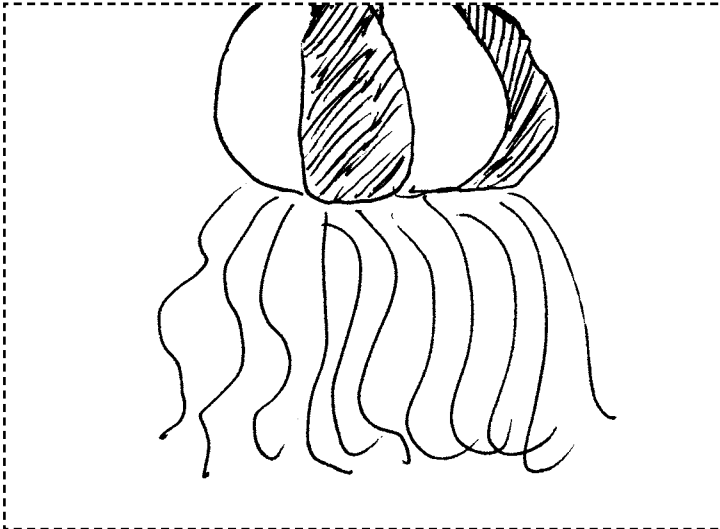
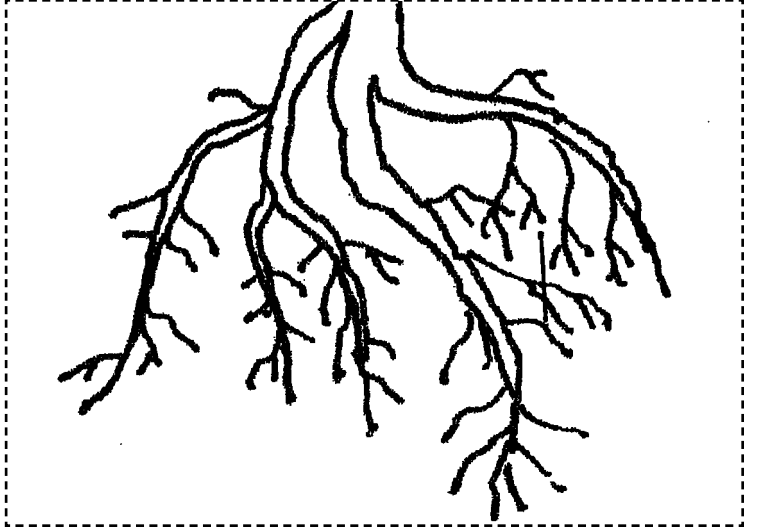
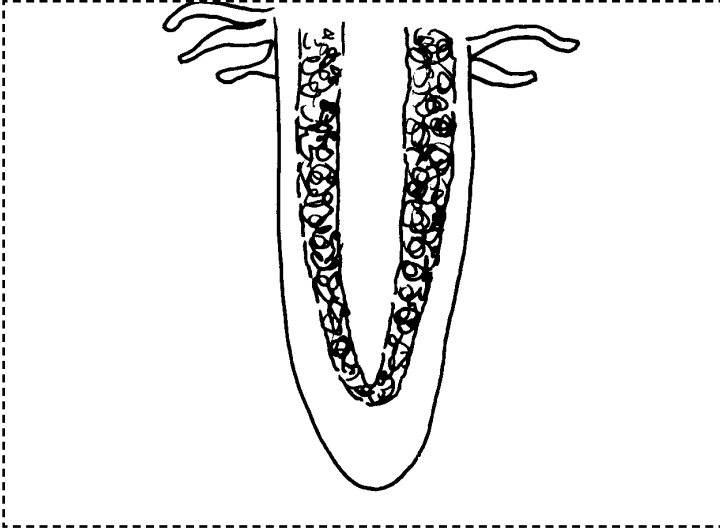
Explain how and  
why seeds are  
scattered.

- gravity
- root cap
- taproot
- root hairs
- fibrous root
- \* epidermis
- \* geotropism

15-A

Angiosperm Roots

15-B

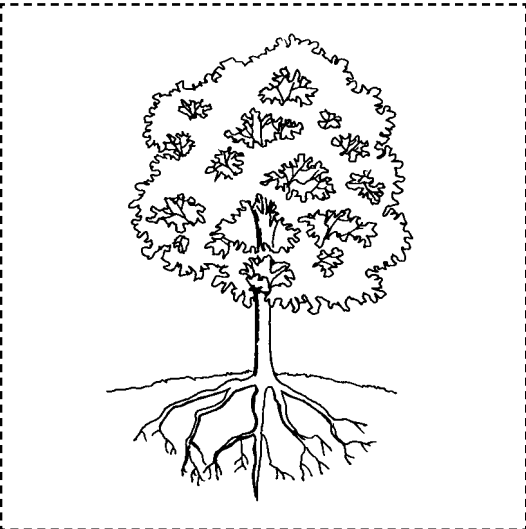


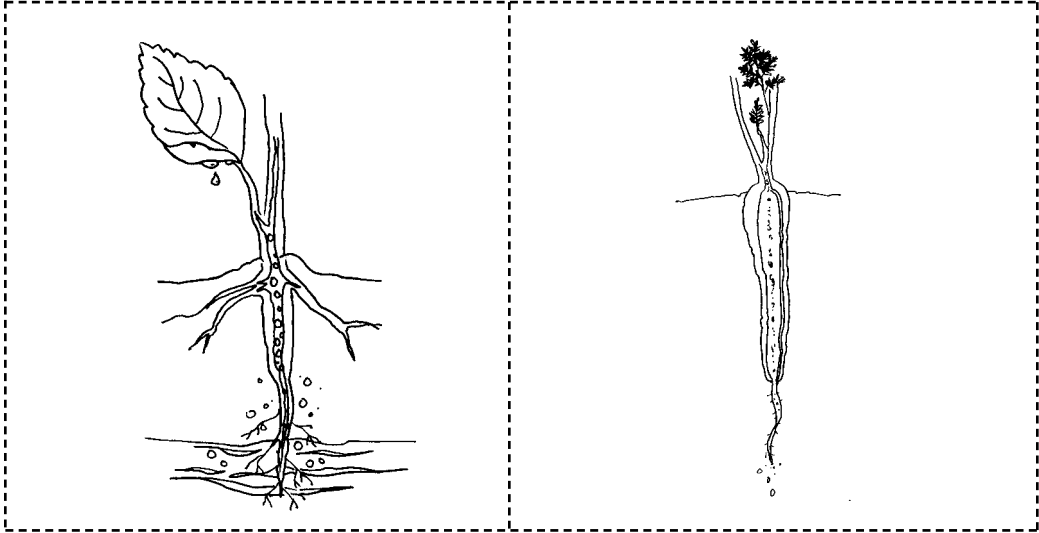
15-C

15-D

Functions of Roots

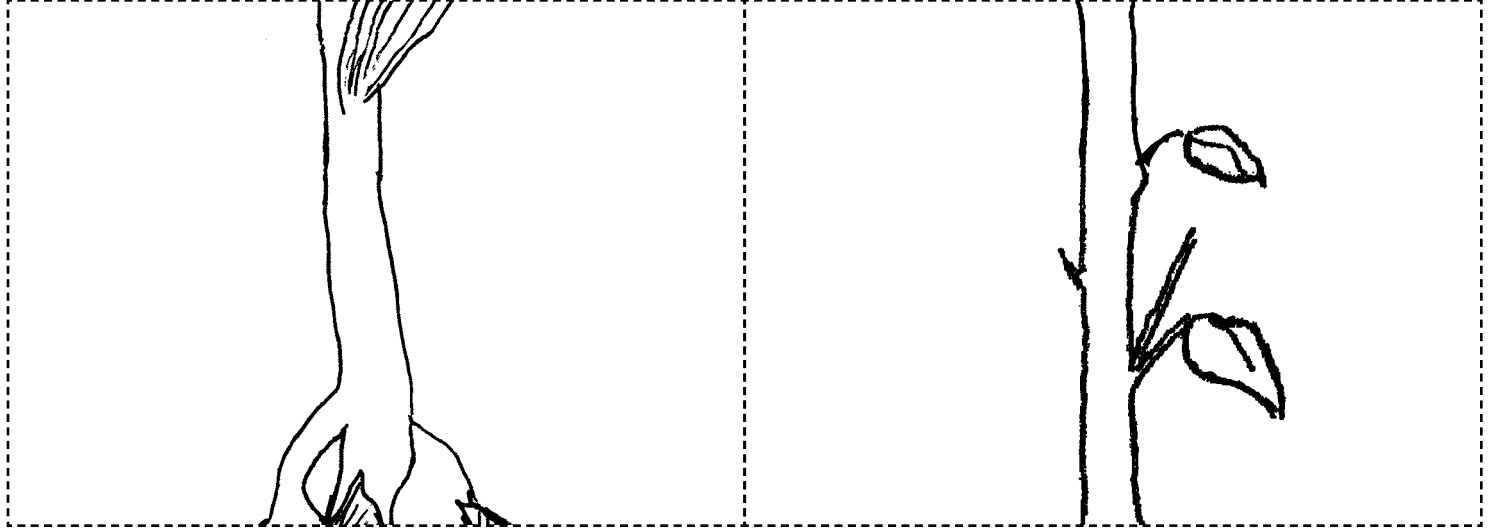
15-E





Angiosperm Stems - Monocot 16-A

Dicot 16-B



Angiosperm Stems

16-C Monocot 16-D Dicot

