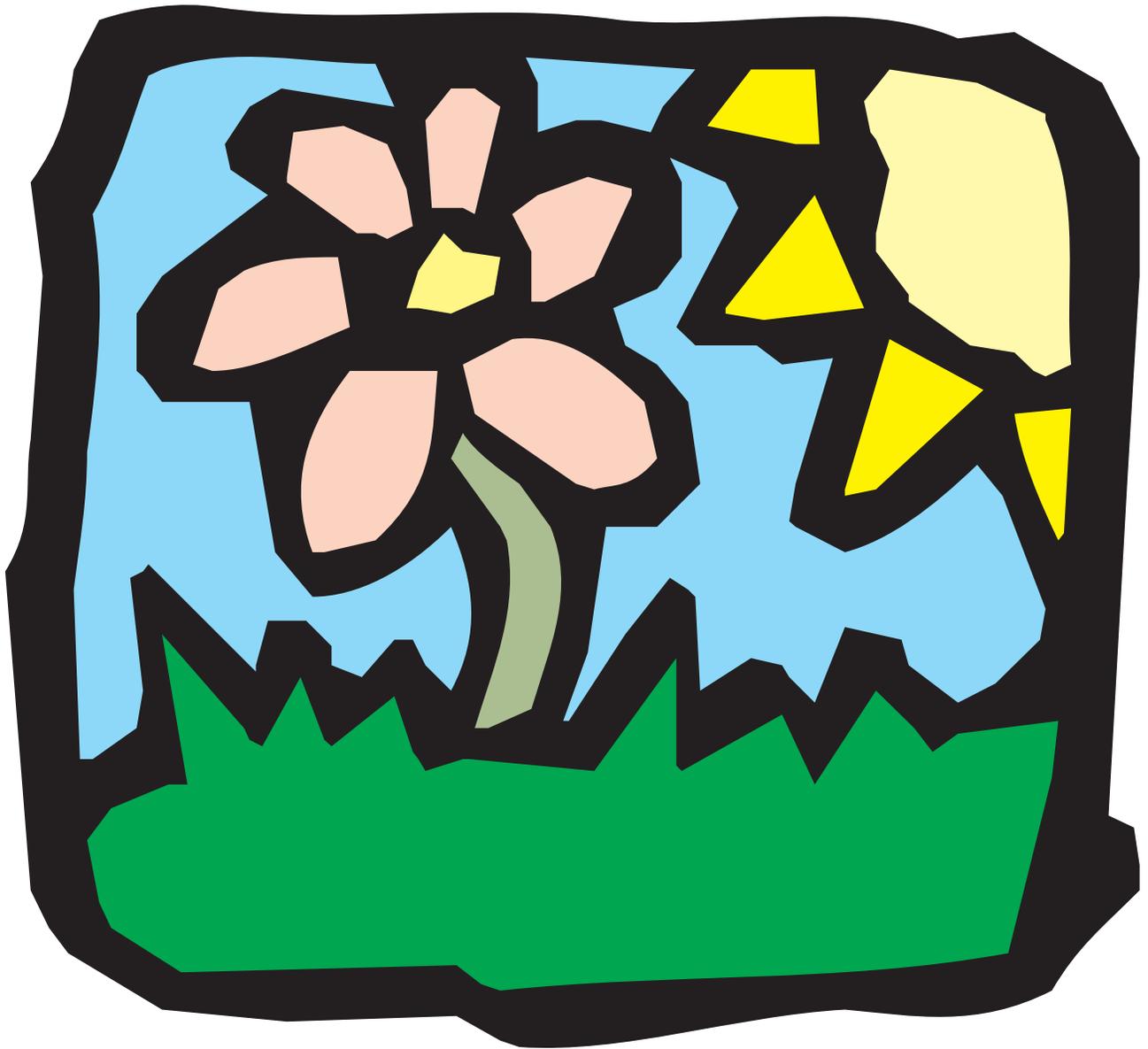


Countdown Chapter 5

Field and Garden



Chapter 5: Field and Garden

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Field and Garden

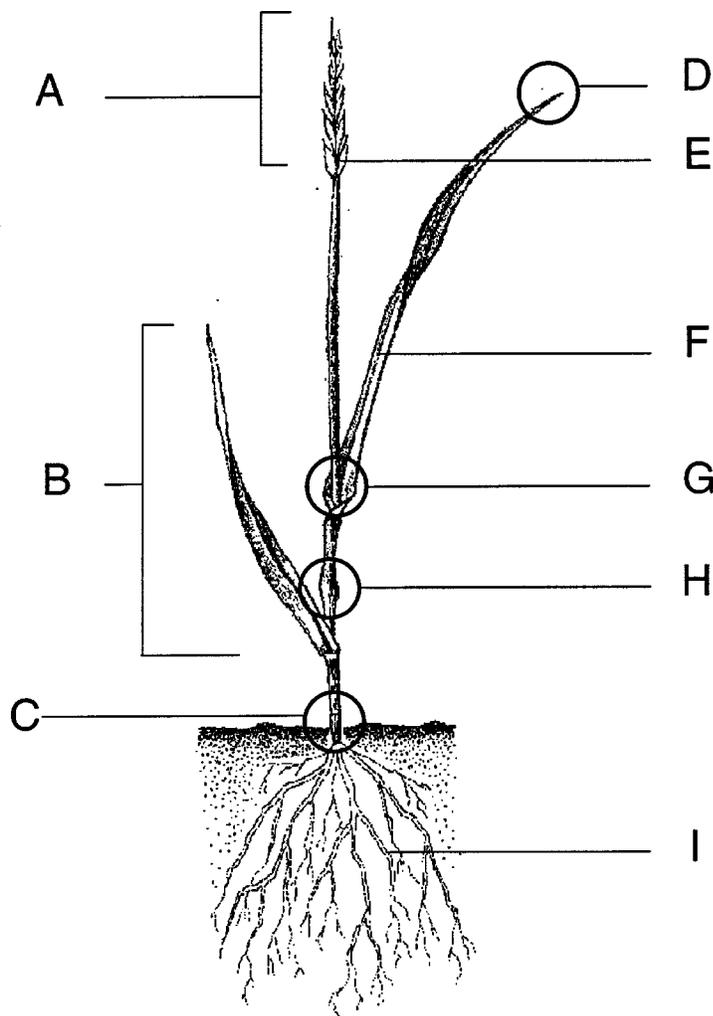
Parts of a Grass Plant

Identification

In this activity you will:

- learn the parts of the grass plant.

Identify the parts of the plant. Write the letter in front of the word.



- | | | |
|-----------------|-------------------|-----------------|
| 1. ___ roots | 4. ___ leaf blade | 7. ___ node |
| 2. ___ ligule | 5. ___ seed | 8. ___ crown |
| 3. ___ seedhead | 6. ___ midrib | 9. ___ leaf tip |

Developed by: Angie Eckert, M.S.

Field and Garden

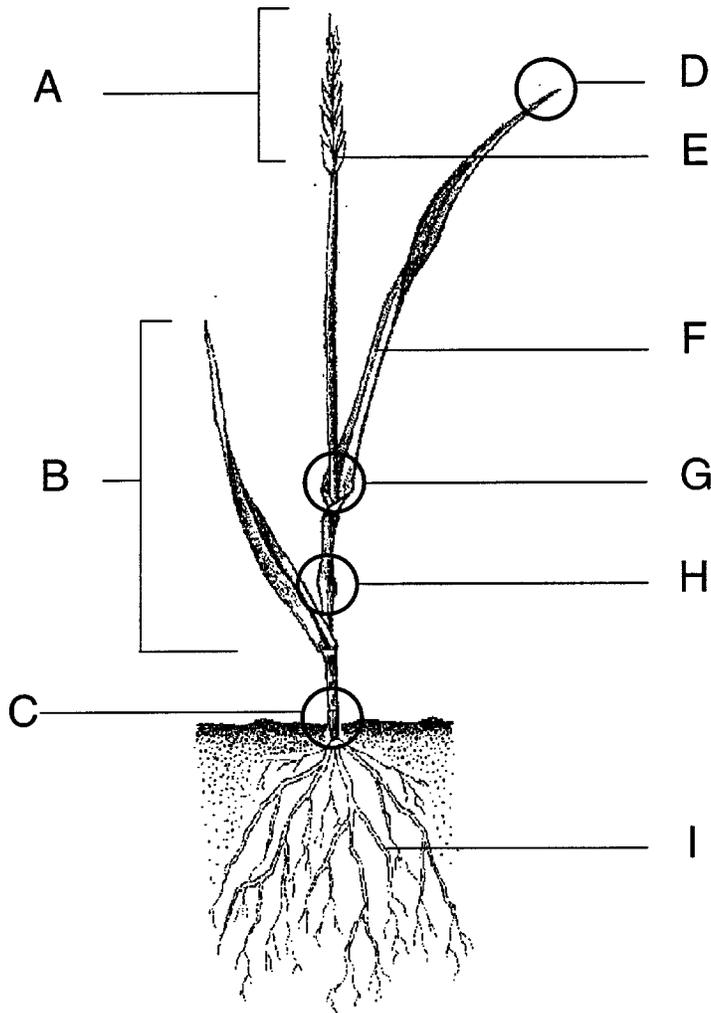
Parts of a Grass Plant

Identification—Key

In this activity you will:

- learn the parts of the grass plant.

Identify the parts of the plant. Write the letter in front of the word.



- | | | |
|----------------------|------------------------|----------------------|
| 1. <u>I</u> roots | 4. <u>B</u> leaf blade | 7. <u>H</u> node |
| 2. <u>G</u> ligule | 5. <u>E</u> seed | 8. <u>C</u> crown |
| 3. <u>A</u> seedhead | 6. <u>F</u> midrib | 9. <u>D</u> leaf tip |

Developed by: Angie Eckert, M.S.

Field and Garden Soil Shakes

In this activity, each person or group will need:

- soil from outside
- a pint or quart-sized jar with a lid (clean plastic peanut butter jars work best)
- water
- alum (optional: can be found in the spice section of most grocery stores)

Soils are made of three kinds of particles: sand, silt, and clay. Good garden soil is made up of a balanced mixture of these three particles: sand, silt, and clay. Make a soil shake to observe the particles in your soil.

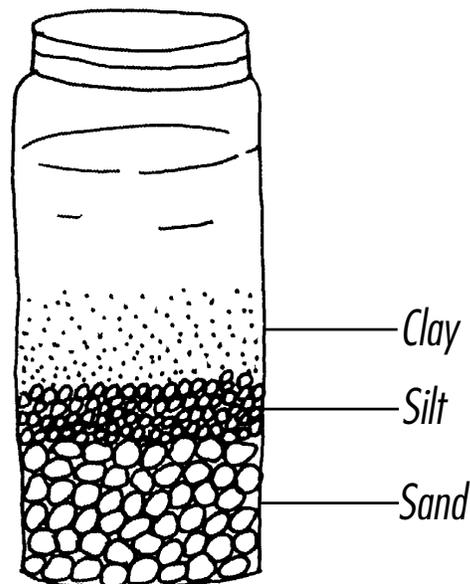
1. Collect soil from outside and fill a jar two-thirds full with the soil.
2. Fill the jar almost to the top with water. Leave one to two inches of air space at the top. *Optional: Add one tablespoon of alum. Alum speeds the soil settling process.*
3. Put the lid on tightly.
4. Shake the jar for three to five minutes until all the clumps of soil are mixed well with the water. *You may need a spoon to break apart some of the clumps.*
5. Set the jar down and wait for three minutes.

What does the soil inside the jar look like?

Observation

In this activity you will:

- learn that soil is made of different sized particles.



<i>After Three Minutes</i>	<i>After Ten Minutes</i>	<i>After One Hour</i>

Do you think your soil would be a good soil for growing plants? Why or why not?

Compare your "soil shake" to another person's or another group's shake. How are they similar? How are they different?

Field and Garden Soil Shakes

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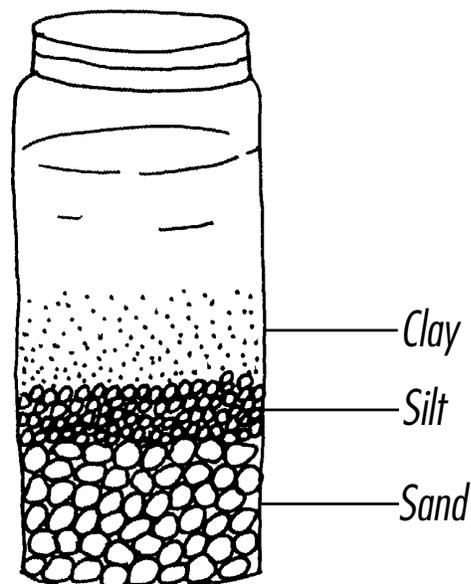
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What does the soil inside the jar look like?

Observation—Key

In this activity you will:

- learn that soil is made of different sized particles.



<i>After Three Minutes</i>	<i>After Ten Minutes</i>	<i>After One Hour</i>
<p>Some experimenters may observe more than three layers. Encourage them to name these layers with a combination of the soil terms such as: coarse sand and fine sand.</p>		

Do you think your soil would be a good soil for growing plants? Why or why not?

Answers will vary. If the soil has a balanced mixture of all three particles, it is likely to be a soil that is good for growing garden plants.

Compare your “soil shake” to another person’s or another group’s shake. How are they similar? How are they different?

Answers will vary.

Developed by: Angie Eckert, M.S.

Field and Garden

Tree-erific Movement

Observation

In this activity you will:

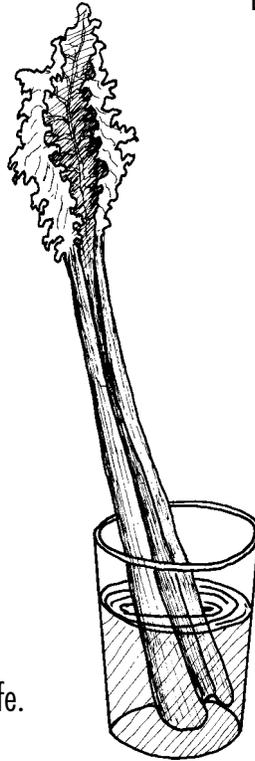
- learn about water movement in trees.

In this activity you will do two experiments. Follow the instructions and answer the questions in the space provided.

Experiment 1

Each group will need:

- glass jar or cup
- measuring cup
- warm water
- food coloring
- celery stalk with leaves
- knife



1. Fill the jar or cup with 1 cup warm water.
2. Add 10 to 15 drops of food coloring to the water.
3. Cut the bottom of your celery stalk carefully with the knife.
4. Place the bottom part of the celery stem in the water.
5. What do you think will happen to the celery stem and leaves? _____

6. Wait 20 minutes. (You may want to begin Experiment 2 of this activity.)
7. What happened to the celery stalk? _____

8. What is happening to the water? _____

Developed by: Angie Eckert, M.S.

Experiment 2

Each group will need:

- well-watered plant or tree
- small plastic bag
- twist tie
- paper towel

1. Select a plant outside (preferably one that is in the sun).
2. Cover at least three leaves on the end of the stem or twig of the plant with the plastic bag.
3. Fasten the twist tie around the plastic bag being careful not to damage the plant.
4. What do you think will happen inside the plastic bag? _____

5. Wait twenty minutes.
6. Remove the plastic bag and the twist tie.
7. Wipe the inside of the plastic bag with a paper towel.
8. What do you see on the towel? _____

9. What does this tell you about the plant? _____

Field and Garden

Tree-erific Movement

Observation—Key

In this activity you will:

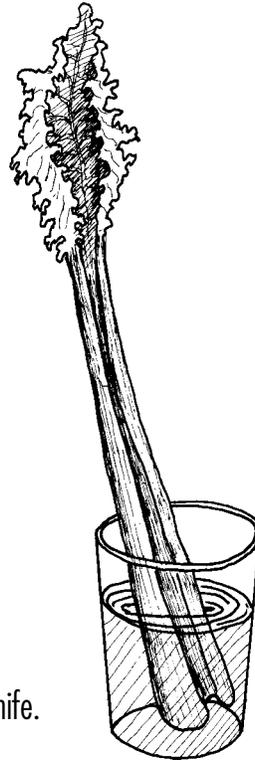
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3. Cut the bottom of your celery stalk carefully with the knife.
4. Place the bottom part of the celery stem in the water.
5. What do you think will happen to the celery stem and leaves?

Answers will vary.

6. Wait 20 minutes. (You may want to begin Experiment 2 of this activity.)
7. What happened to the celery stalk? **The stems and leaves will start to show the color of the dye.**

8. What is happening to the water? **Water is drawn from the glass, up the stem, to the leaves. This shows that trees take up water from the soil with their roots.**

Developed by: Angie Eckert, M.S.

Experiment 2

Each group will need:

- well-watered plant or tree
- small plastic bag
- twist tie
- paper towel

1. Select a plant outside (preferably one that is in the sun).
2. Cover at least three leaves on the end of the stem or twig of the plant with the plastic bag.
3. Fasten the twist tie around the plastic bag being careful not to damage the plant.
4. What do you think will happen inside the plastic bag? **Answers will vary.**

5. Wait twenty minutes.

6. Remove the plastic bag and the twist tie.

7. Wipe the inside of the plastic bag with a paper towel.

8. What do you see on the towel? **water**

9. What does this tell you about the plant? **This shows that plants lose water through their leaves. This process is called transpiration.**

Field and Garden Careers in Horticulture

Matching

In this activity you will:

- learn about careers in horticulture.

Match the career with the description and fill in the blank.

- | | | | |
|------------------------|-------------------|------------------------------|---------------------------|
| A. Landscape designer | E. Orchardist | H. Extension agent | K. Garden center employee |
| B. Nursery employee | F. Interiorscaper | I. Horticultural salesperson | L. Professor or teacher |
| C. Golf course manager | G. Florist | J. Greenhouse employee | M. Arborist |
| D. Groundskeeper | | | |

- ___ 1. Grows plants (mostly trees and shrubs) used for landscaping, producing fruit, or replanting forests.
- ___ 2. Maintains indoor plant displays in places such as malls, office buildings, and hotels.
- ___ 3. Designs attractive outdoor arrangements of plants, lawns, and recreational spaces.
- ___ 4. Cares for and prunes large shrubs and trees. Job involves tree climbing.
- ___ 5. Cares for, grows, transports, and sells plants and gardening supplies. May also place orders and assist customers.
- ___ 6. Creates and sells arrangements of cut flowers and plants, works with customers, orders supplies, and prices arrangements.
- ___ 7. Shares horticultural information with the public.
- ___ 8. Plants and maintains turf and plants on the golf course.
- ___ 9. Maintains turf and/or plants in areas such as shopping malls, apartment complexes, cemeteries, airports, schools, parks, private estates, or businesses.
- ___ 10. Manages fruit trees.
- ___ 11. Teaches horticulture at a high school, technical school, college, or university.
- ___ 12. Sells supplies needed for growing and caring for plants.
- ___ 13. Grows and maintains plants and operates equipment in greenhouses.

Questions

1. Which jobs involve designing and creating? _____
2. Which jobs might involve working outdoors year-round? _____
3. Which jobs are primarily indoor jobs? _____
4. Assuming you had enough knowledge of the subject, which of these jobs could you start as your own business? _____
5. List five businesses in your area that employ horticulturists. _____

Developed by: Angie Eckert, M.S.

Field and Garden

Careers in Horticulture

Matching—Key

In this activity you will:

- learn about careers in horticulture.

Match the career with the description and fill in the blank.

- | | | | |
|------------------------|-------------------|------------------------------|---------------------------|
| A. Landscape designer | E. Orchardist | H. Extension agent | K. Garden center employee |
| B. Nursery employee | F. Interiorscaper | I. Horticultural salesperson | L. Professor or teacher |
| C. Golf course manager | G. Florist | J. Greenhouse employee | M. Arborist |
| D. Groundskeeper | | | |

- B** 1. Grows plants (mostly trees and shrubs) used for landscaping, producing fruit, or replanting forests.
- F** 2. Maintains indoor plant displays in places such as malls, office buildings, and hotels.
- A** 3. Designs attractive outdoor arrangements of plants, lawns, and recreational spaces.
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- E** 10. Manages fruit trees.
- L** 11. Teaches horticulture at a high school, technical school, college, or university.
- I** 12. Sells supplies needed for growing and caring for plants.
- J** 13. Grows and maintains plants and operates equipment in greenhouses.

Questions

1. Which jobs involve designing and creating? landscape designer, florist
2. Which jobs might involve working outdoors year-round? landscape maintenance, turf maintenance
3. Which jobs are primarily indoor jobs? interiorscaper, florist, Extension agent, professor or teacher, horticultural supply salesperson, horticultural manager, greenhouse employee
4. Assuming you had enough knowledge of the subject, which of these jobs could you start as your own business? greenhouse employee, groundskeeper, nursery employee, vegetable grower, orchardist
5. List five businesses in your area that employ horticulturists. Answers will vary.

Developed by: Angie Eckert, M.S.

Field and Garden

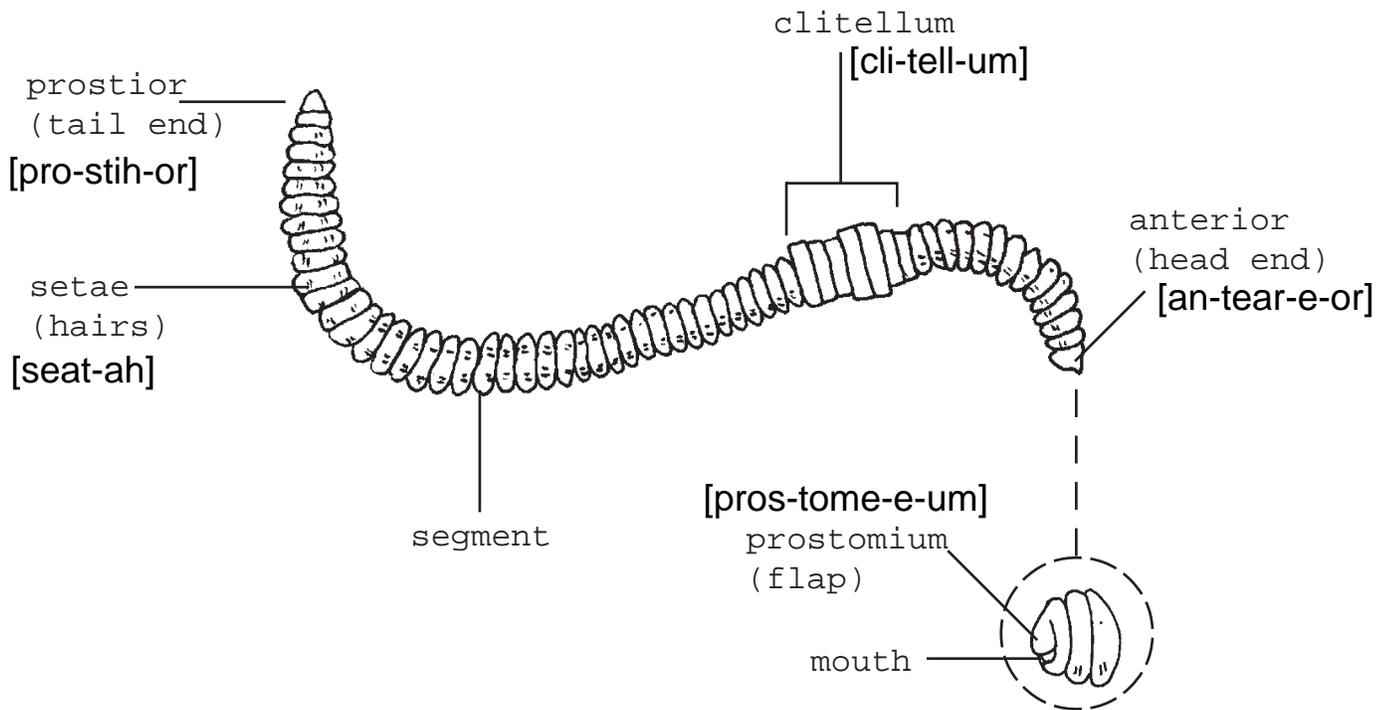
Parts of a Worm

Refer to the drawing to answer the following questions. Pronunciations of worm body parts are in brackets.

Identification

In this activity you will:

- learn about the parts of a worm.



1. What are the rings with grooves that make up a worm's body called? _____
2. What are the bristles on each segment of a worm that help it move called? _____
3. What is the end of a worm called? _____
4. What is the head end of a worm called? _____
5. What is the flap on a worm's head above the mouth called? _____
6. What is the swollen band that a worm uses to make a cocoon called? _____
7. Do you want worms in your garden? Why or why not? _____

Developed by: Angie Eckert, M.S.

Field and Garden

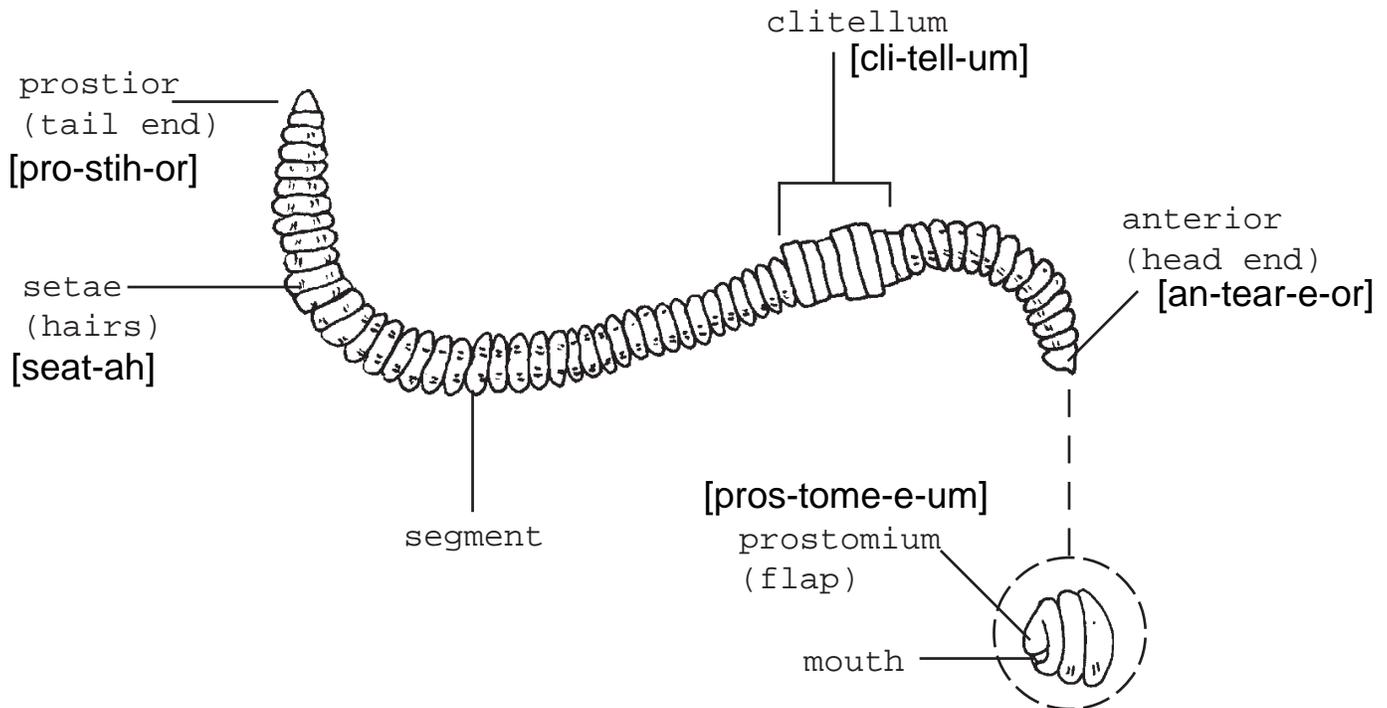
Parts of a Worm

Refer to the drawing to answer the following questions. Pronunciations of worm body parts are in brackets.

Identification—Key

In this activity you will:

- learn about the parts of a worm.



1. What are the rings with grooves that make up a worm's body called? segment
2. What are the bristles on each segment of a worm that help it move called? setae
3. What is the end of a worm called? prostior
4. What is the head end of a worm called? anterior
5. What is the flap on a worm's head above the mouth called? prostomium
6. What is the swollen band that a worm uses to make a cocoon called? clitellum
7. Do you want worms in your garden? Why or why not? Yes. Worms tunnel underground, making room for air, water, and roots. Worms excrete waste in the soil, which acts as a fertilizer.

Developed by: Angie Eckert, M.S.

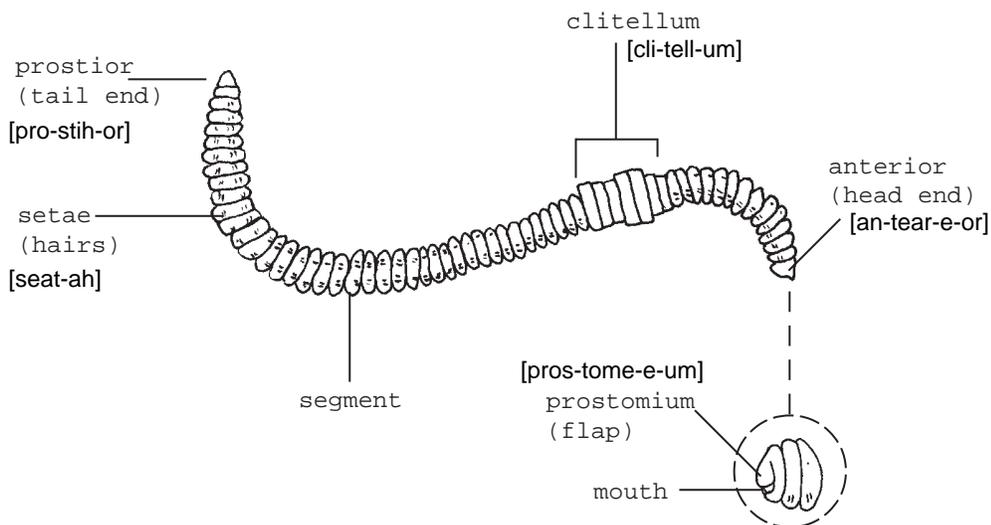
Field and Garden

Investigating Worms

Did you know worms are good for the soil? Worms tunnel underground, making room in the soil for air, water, and plant roots. When worms eat food scraps and bacteria in the soil, they excrete their waste in the soil. Their waste, called castings, contains many bacteria, organic matter, and nutrients which help plants grow. Pronunciations of worm body parts are in brackets.

You will need:

- an earthworm (available from bait shops or find your own outside in moist soil)
- paper towels
- water
- hand lens
- ruler
- flashlight



Observation

In this activity you will:

- discover what worms do for the soil and where worms like to live.

Be gentle with the worm. Do not allow it to dry out. When you are finished with your investigation, release the worm outside in a cool damp place.

1. Carefully place your worm on a wet paper towel. Use the hand lens to look for the parts of the worm. Can you find them?

2. How long is your worm? Be very gentle not to hurt the worm as you stretch it out to measure it with the ruler. _____

3. Does your worm like light? Shine the flashlight on the worm. What does it do? _____

4. Does your worm respond to sound? (Whistle, clap, or shout.) _____
5. Does your worm like wet or dry? Put a dry paper towel beside the wet paper towel. Place the worm in the middle so that half of its body is on the wet towel and half is on the dry towel. Which way does the worm move? _____

Developed by: Angie Eckert, M.S.

Field and Garden

Small Grain Crops

In this activity you will do a word search, answer questions, and research grain products.

For this activity, you will need: food labels or boxes from hot and cold cereals, crackers, breads, and other snacks.

Find the Grains

In the sequence of letters, find and circle the 4 small grains grown in Ohio.

g r a r y e s w h e a t s f a m b a r l e y i o a t s l y

What plant family do grains belong to? (Hint: look at the uncircled letters above) _____

Small grains are used in many ways. From the list below, circle the numbers that describe uses of grain.

1. ground into flour for bread, cake, cookies, crackers, snacks
2. food for animals
3. straw for bedding and mulch
4. planted to control erosion
5. planted to replenish nutrients to the soil (green manure)
6. used to produce malt for beverages
7. used to make paper and cardboard

Grain Scoreboard

Collect food labels or containers of hot and cold cereals, crackers, breads, and other snacks. Read the ingredient labels and record the types of grains in each product on the score sheet. Draw a bar graph on graph paper to show your results.

Oats	Wheat	Rye	Barley

List four foods made from grain:

1. _____
2. _____
3. _____
4. _____

Word Search

In this activity you will:

- learn about small grains and their uses.

Field and Garden

Small Grain Crops

Word Search—Key

In this activity you will:

- learn about small grains and their uses.

In this activity you will do a word search, answer questions, and research grain products.

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Find the Grains

In the sequence of letters, find and circle the 4 small grains grown in Ohio.

g r a r y e s w h e a t s f a m b a r l e y i o a t s l y

What plant family do grains belong to? (Hint: look at the uncircled letters above) grass family

Small grains are used in many ways. From the list below, circle the numbers that describe uses of grain.

1. ground into flour for bread, cake, cookies, crackers, snacks
2. food for animals
3. straw for bedding and mulch
4. planted to control erosion
5. planted to replenish nutrients to the soil (green manure)
6. used to produce malt for beverages
7. used to make paper and cardboard

All are uses. All should be circled.

Grain Scoreboard

Collect food labels or containers of hot and cold cereals, crackers, breads, and other snacks. Read the ingredient labels and record the types of grains in each product on the score sheet. Draw a bar graph on graph paper to show your results.

Oats	Wheat	Rye	Barley

List four foods made from grain:

1. _____
2. _____
3. _____
4. _____

Answers will vary, but could include breads, cereals, pasta, crackers, oatmeal, cream of wheat, noodles, etc.

Developed by: Angie Eckert, M.S.

Field and Garden

Wonderful Wheat

Activities

In this activity you will:

- learn about the parts of a wheat kernel.
- discover unique facts about wheat.
- learn how wheat is harvested.

True or False

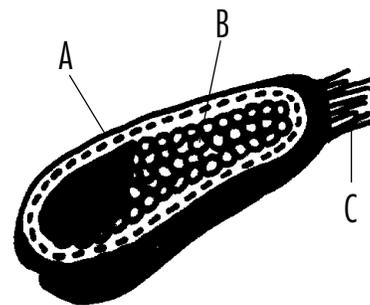
Which of the following are true? Mark true or false next to the statement.

- _____ 1. One acre of land can produce enough wheat for bread for a family for ten years.
- _____ 2. One bushel of wheat will make seventy one-pound loaves of bread.
- _____ 3. The average person consumes an average of 123 pounds of wheat products each year.
- _____ 4. A building that stores grain is called a "grain escalator."
- _____ 5. Bread, which is made of wheat, is the most widely eaten food.
- _____ 6. Wheat can be grown in the summer and the winter.
- _____ 7. Wheat plants are not damaged by diseases or weeds.

Matching

This is a picture of a kernel of wheat. The kernel is the part of the seed used in food products. Look at the letters on the drawing. Write the letter next to the coordinating description.

- _____ **Germ** is the smallest part of the kernel. It is the sprouting part of the seed and is also included in whole wheat flour.
- _____ **Endosperm** is the largest portion of the kernel. It is the only part of the kernel that is used in white flour.
- _____ **Bran** is the second largest part of the kernel. It is included in whole wheat flour and bran cereals and is high in protein and fiber. It is the outermost layer of the kernel.



Arrange in Correct Order

Imagine you are growing a winter crop of wheat. Number the steps of wheat production order that they occur, 1 through 9.

- _____ Chemicals are sprayed on the wheat to control weeds and insects.
- _____ The wheat is planted with a grain drill and fertilized in fall.
- _____ The wheat plants produce a milk-like fluid inside their seeds.
- _____ The plants turn from green to brown.
- _____ Wheat seeds become dry and hard.
- _____ The wheat plants sprout.
- _____ Harvest the wheat with a combine.
- _____ The wheat begins to grow again.
- _____ The plant stops growing during the cold months. The snow serves as a blanket to protect the crop from cold temperatures.
- _____

Parts of this activity were adapted from the Ohio Ag in the Classroom: Fourth Grade Curriculum Guide.

Developed by: Angie Eckert, M.S.

Field and Garden

Wonderful Wheat

Activities—Key

In this activity you will:

- learn about the parts of a wheat kernel.
- discover unique facts about wheat.
- learn how wheat is harvested.

True or False

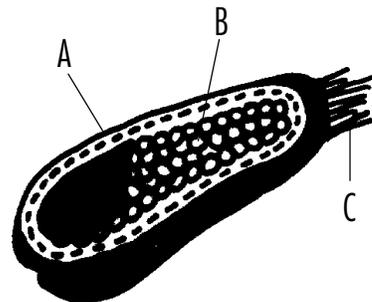
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- True** 2. One bushel of wheat will make seventy one-pound loaves of bread.
- True** 3. The average person consumes an average of 123 pounds of wheat products each year.
- False** 4. A building that stores grain is called a “grain escalator.” **It is called a grain elevator.**
- True** 5. Bread, which is made of wheat, is the most widely eaten food.
- True** 6. Wheat can be grown in the summer and the winter.
- False** 7. Wheat plants are not damaged by diseases or weeds. **Diseases and weeds attack wheat. Farmers must use methods to control them.**

Matching

This is a picture of a kernel of wheat. The kernel is the part of the seed used in food products. Look at the letters on the drawing. Write the letter next to the coordinating description.

- C** **Germ** is the smallest part of the kernel. It is the sprouting part of the seed and is also included in whole wheat flour.
- B** **Endosperm** is the largest portion of the kernel. It is the only part of the kernel that is used in white flour.
- A** **Bran** is the second largest part of the kernel. It is included in whole wheat flour and bran cereals and is high in protein and fiber. It is the outermost layer of the kernel.



Arrange in Correct Order

Imagine you are growing a winter crop of wheat. Number the steps of wheat production order that they occur, 1 through 9.

- 5** Chemicals are sprayed on the wheat to control weeds and insects.
- 1** The wheat is planted with a grain drill and fertilized in fall.
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- 7** The plants turn from green to brown.
- 8** Wheat seeds become dry and hard.
- 2** The wheat plants sprout.
- 9** Harvest the wheat with a combine.
- 4** The wheat begins to grow again.
- 3** The plant stops growing during the cold months. The snow serves as a blanket to protect the crop from cold temperatures.

*Parts of this activity were adapted from the Ohio Ag in the Classroom: Fourth Grade Curriculum Guide.
Developed by: Angie Eckert, M.S.*

Field and Garden

Inside of a Tree

The inside of a tree is like a highway! Trees have networks inside of them that move water from the roots, through the trunk, to the leaves, and out into the air.

Activities

In this activity you will:

- learn about the insides of a tree.

Matching

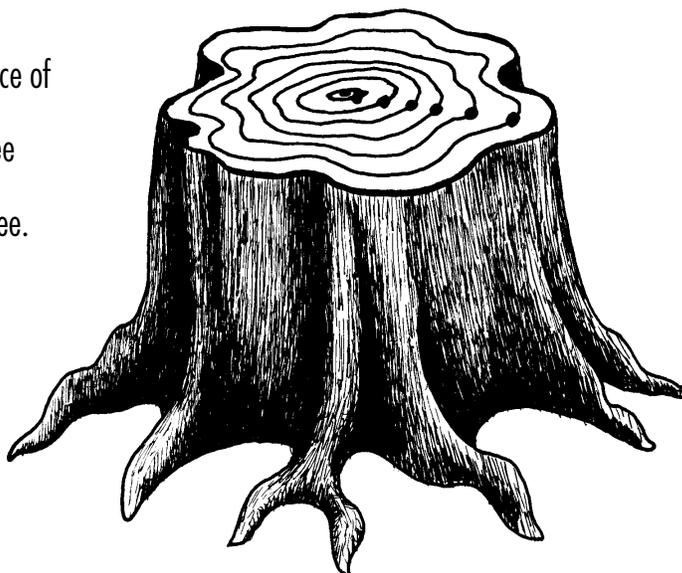
Draw a line from the words to their definitions.

- | | |
|------------------|---|
| veins | 1. These microscopic openings on the undersides of leaves open and close to release water from the leaves into the air. |
| cuticle | 2. The underground network of a tree. |
| root hairs | 3. These underground parts of a tree absorb 95 percent of the plant's water and nutrients. |
| roots | 4. The "pipes" inside the trunk that move nutrients up from the roots to the other parts of the tree. |
| xylem | 5. These "pipes" move food made by the leaves down to the stems, trunk, and the roots. |
| bark | 6. This waxy coating on the leaf prevents the plant from losing too much water through its leaves. |
| phloem (flow-um) | 7. The network in a leaf that moves water and nutrients from the stem to the parts of the leaf. |
| stomata | 8. The outside layer of the tree that protects the inside of the tree. |

Counting Rings

Look at the end of the piece of firewood. (If you don't have a piece of firewood, look at the drawing of the tree on this page.) As the tree ages, the inside of the tree hardens which gives strength to the tree.

A tree shows a new ring for each year of its life. Count the number of rings you see. How old do you think this tree was when it was cut? _____



Developed by: Angie Eckert, M.S.

Field and Garden

Inside of a Tree

Activities—Key

In this activity you will:

- learn about the insides of a tree.

The inside of a tree is like a highway! Trees have networks inside of them that move water from the roots, through the trunk, to the leaves, and out into the air.

Matching

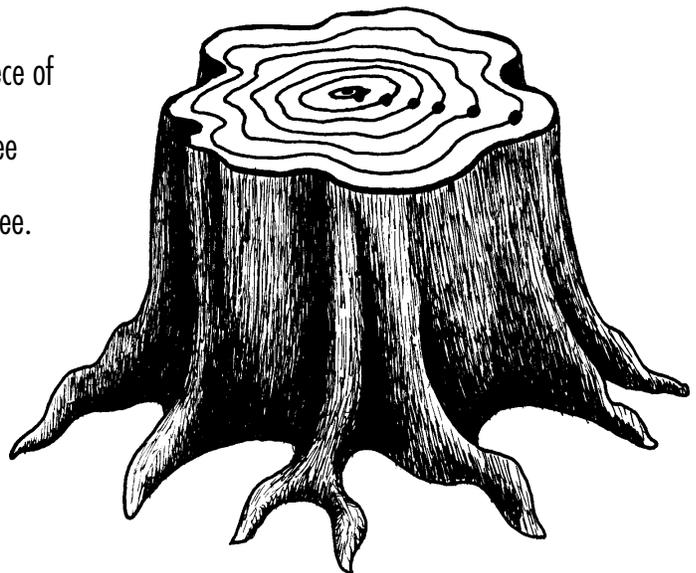
Draw a line from the words to their definitions.

- | | |
|------------------|---|
| veins | 1. These microscopic openings on the undersides of leaves open and close to release water from the leaves into the air. |
| cuticle | 2. The underground network of a tree. |
| root hairs | 3. These underground parts of a tree absorb 95 percent of the plant's water and nutrients. |
| roots | 4. The "pipes" inside the trunk that move nutrients up from the roots to the other parts of the tree. |
| xylem | 5. These "pipes" move food made by the leaves down to the stems, trunk, and the roots. |
| bark | 6. This waxy coating on the leaf prevents the plant from losing too much water through its leaves. |
| phloem (flow-um) | 7. The network in a leaf that moves water and nutrients from the stem to the parts of the leaf. |
| stomata | 8. The outside layer of the tree that protects the inside of the tree. |

Counting Rings

Look at the end of the piece of firewood. (If you don't have a piece of firewood, look at the drawing of the tree on this page.) As the tree ages, the inside of the tree hardens which gives strength to the tree.

A tree shows a new ring for each year of its life. Count the number of rings you see. How old do you think this tree was when it was cut? 8 years



Developed by: Angie Eckert, M.S.

Field and Garden

Leaf Identification

Identification

In this activity you will:

- learn about leaves.

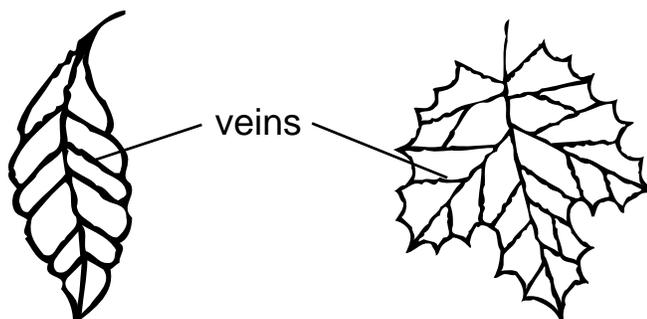
Find a leaf. Draw your leaf below or tape your leaf to the page. Look closely at the veins.

Are the veins parallel (side-by-side)? _____

Does it have one main vein or several main veins? _____

Can you count the number of branching veins? _____

What would happen to a tree if it had leaves without veins? _____



Field and Garden

Leaf Identification

Find a leaf. Draw your leaf below or tape your leaf to the page. Look closely at the veins.

Identification—Key

In this activity you will:

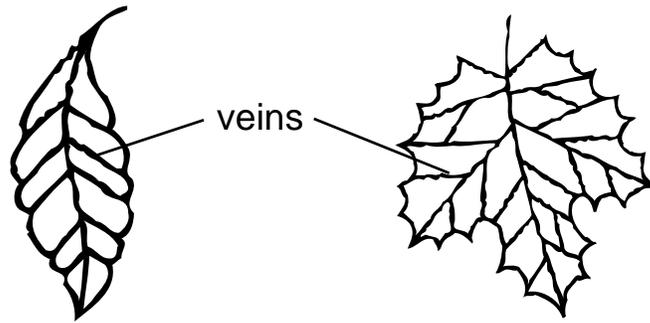
- learn about leaves.

Are the veins parallel (side-by-side)? _____

Does it have one main vein or several main veins? _____

Can you count the number of branching veins? _____

What would happen to a tree if it had leaves without veins? **The tree would die from a lack of nourishment.**



Field and Garden

The Name Game

Plants are given a common name (like Ohio Buckeye) and a Latin name (like *Aesculus glabra*). This allows people from different parts of the world to talk about plants using the same names. Latin is the world-wide language of plants.

Key of Latin Terms

cyan = blue

purpurea = purple

chloro = green

lutea = yellow

ruber = red

japonica = from Japan

lavendula = lavender

phylla = leaf

giganteum = giant

cordata = heart

rosea = rosy

Matching

In this activity you will:

- learn what a plant's Latin name reveals about a plant's features.

Solve the Mystery

Use the key to solve the mystery of the names.

1. What color are this plant's flowers? *Trillium lutea* _____
2. In what country do you think this plant was discovered? *Acer japonica* _____
3. What kind of shape would you expect this plant's leaves to be? *Viola cordata* _____
4. What color flowers does this plant have? *Coreopsis rosea* _____
5. What color do you think this tree's leaves are? *Acer purpurea* _____
6. What might the flowers of this plant be like? *Allium giganteum* _____

Matching

Guess the answer to the questions using plants from this list:

Cotoneaster horizontalis

Viburnum cylindricum

Pilea microphylla

Picea abies compacta

Dracena fragrans

Cucurbita maxima

1. Which plant grows low to the ground? _____
2. Which plant is small? _____
3. Which plant has small leaves? _____
4. Which plant grows tall and narrow (like a cylinder)? _____
5. Which plant has fragrant leaves? _____
6. Which plant produces large fruits? _____

Developed by: Angie Eckert, M.S.

Field and Garden

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Solve the Mystery

Use the key to solve the mystery of the names.

1. What color are this plant's flowers? *Trillium lutea* yellow
2. In what country do you think this plant was discovered? *Acer japonica* Japan
3. What kind of shape would you expect this plant's leaves to be? *Viola cordata* heart-shaped
4. What color flowers does this plant have? *Coreopsis rosea* rose-colored or pink
5. What color do you think this tree's leaves are? *Acer purpurea* purple
6. What might the flowers of this plant be like? *Allium giganteum* large in size

Matching

Guess the answer to the questions using plants from this list:

Cotoneaster horizontalis

Viburnum cylindricum

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Developed by: Angie Eckert, M.S.

Field and Garden

Lawn Pests

A lawn pest is an organism that interferes with the healthy growth or appearance of the grass. Lawn pests include diseases, insects, weeds, and animals.

Find the following in the word search:

annual weeds

(live for one year)

chickweed

crabgrass

purslane

henbit

perennial weeds

(live for more than one year)

Canada thistle

ground ivy

dandelion

oxalis

insects

cinch bug

billbug

sod webworm

white grub

aphid

diseases

rust

powdery mildew

red thread

dollar spot

animals

skunk

dog

mole

chipmunk

rabbit

Word Search

In this activity you will:

- learn some of the names of common lawn pests.
- complete a lawn pest word search.

D I S E A S E S T C E S N I V
T O P S F Y V I D N U O R G I
M O L E H C H I P M U N K U O
A C D L J W H I T E G R U B L
R I C R A B G R A S S E Q L A
E N A L S R U P L O A O U L D
D C R A B B I T D R P X A I E
T H E A L T H W N T H A S B E
H B P O W D E R Y M I L D E W
R U G E K B N K O S D I O T K
E G C N W I B W E E D S G V C
A B U O N O I L E D N A D W I
D K R U S T T A N I M A L S H
S M E L T S I H T A D A N A C

Developed by: Angie Eckert, M.S.

Field and Garden

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ground ivy

dandelion

oxalis

insects

cinch bug

billbug

sod webworm

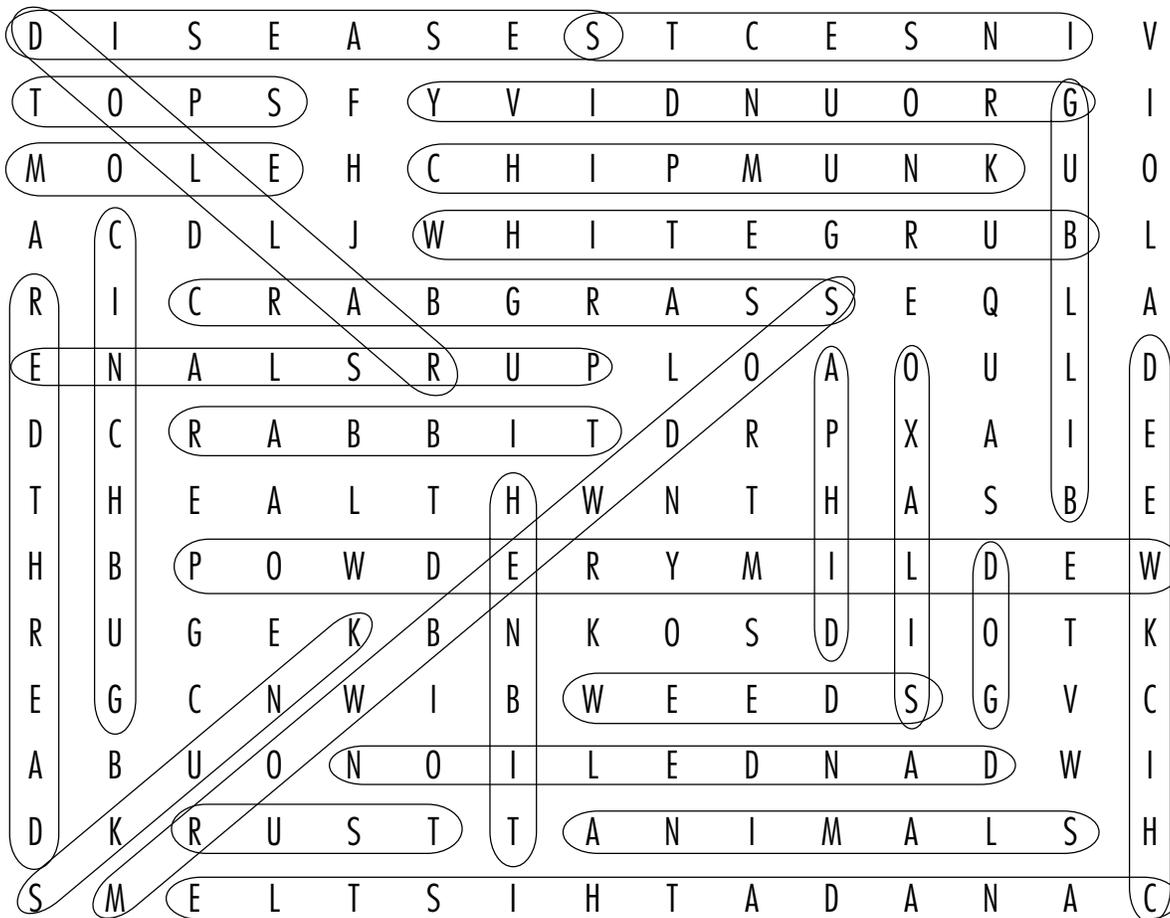
white grub

aphid

Word Search—Key

In this activity you will:

- learn some of the names of common lawn pests.
- complete a lawn pest word search.



Field and Garden

Compost for Your Garden

In this activity you will do a word circle and a word search.

Composting is a way to recycle kitchen and yard wastes into an organic matter that can be used in the garden. Over time, the wastes decompose into a rich soil-like material containing nutrients that plants need to grow.

Activities

In this activity you will:

- learn what kinds of kitchen wastes and lawn wastes can be added to a compost pile.

What Belongs?

Circle the things that you think belong in a compost pile.

flowers	weeds	eggshells	bones
leaves	bread	dairy products	fatty foods
dead animals	wood chips	meat	fish
large twigs	coffee grounds	fertilizer	water
grass clippings	soil	cooking oil	vegetables and fruits
twigs	yarn	apple peels	manure

Word Search

All the items named in the search are good for a compost pile. Things that should not be added to the compost pile will not be found in the word search. Check your answers to see if you found all fifteen!

V	G	D	W	C	O	M	P	O	S	T	E	W	Y	I
B	E	R	A	P	P	L	E	P	E	E	L	S	A	W
I	H	G	T	H	S	S	R	E	W	O	L	F	R	O
M	V	F	E	R	T	I	L	I	Z	E	R	U	N	V
L	U	C	R	T	B	G	H	M	A	G	O	P	M	T
D	N	L	A	Q	A	D	K	V	N	G	H	B	A	W
P	G	A	C	U	N	B	E	F	M	S	W	B	N	I
S	R	R	S	H	D	S	L	F	T	H	E	R	U	G
C	O	F	F	E	E	Q	N	E	Z	E	E	E	R	S
J	U	I	K	F	R	U	I	T	S	L	D	A	E	J
U	N	C	L	C	L	Y	M	O	J	L	S	D	Y	A
Z	D	C	L	I	P	P	I	N	G	S	B	X	L	G
A	S	P	I	H	C	D	O	O	W	K	S	E	T	W

Developed by: Angie Eckert, M.S.

Field and Garden

Recipe for Compost

Activity

In this activity you will:

- learn the steps in building a compost pile.

Compost piles are made by layering material. (It's like making lasagna!) Circle the correct answer in each of the steps.

Step 1 Select a site for the compost pile in **full sun** or **shade**.

Step 2 Build a compost pile on **concrete** or **soil**.

Step 3 Add **6 to 8 inches** or **12 to 15 inches** of yard waste.

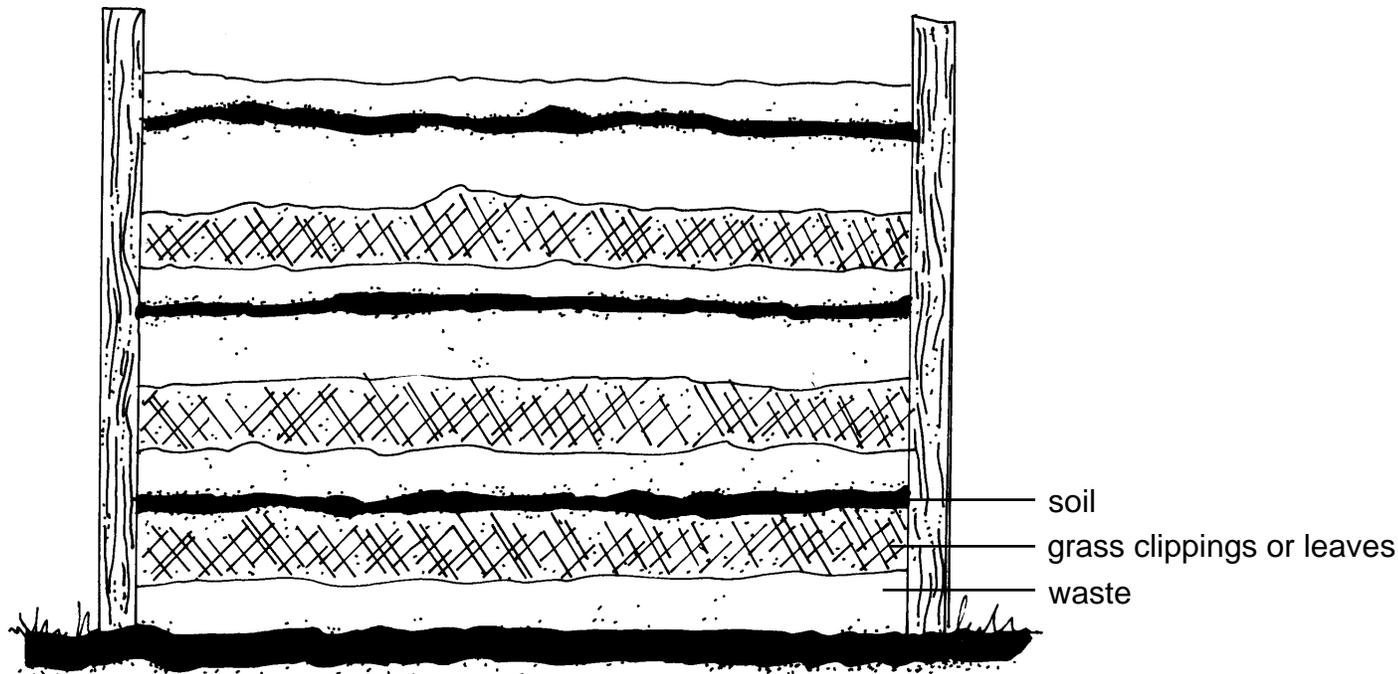
Step 4 Add one inch of **soil** or **fertilizer**.

Step 5 Sprinkle a thin layer of **soil** or **fertilizer**.

Step 6 Repeat the layers until the pile is **one foot** or **three feet** or **nine feet** tall.

Step 7 Turn the compost pile **once a day** or **every few weeks**.

Step 8 In **several months** or **one year** the compost is ready for use in the garden.



Cross Section of a Compost Pile—It's Like Making Lasagna!

Developed by: Angie Eckert, M.S.

Field and Garden

Recipe for Compost

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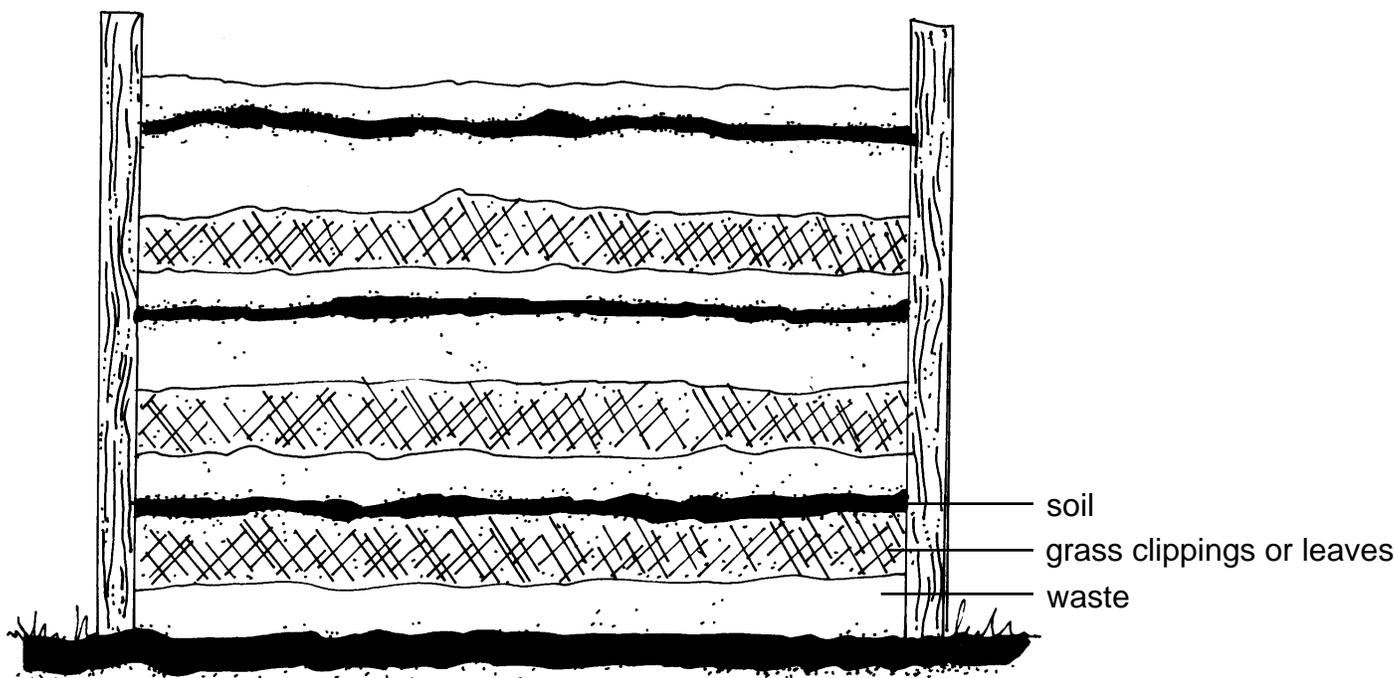
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Cross Section of a Compost Pile—It's Like Making Lasagna!

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Field and Garden

Vegetable Chart

What part of the plant do we eat? Sort the following vegetables into categories:

broccoli	beets	collards	turnip	
peas	tomatoes	corn	celery	pumpkin
cauliflower	kale	spinach	carrots	rhubarb
muskmelon	potatoes	watermelon	radish	squash
cabbage	cucumber	beans	Swiss chard	lettuce

Word Search

In this activity you will:

- learn characteristics of vegetable plants.

<i>Stems We Eat</i>	<i>Leafy Greens We Eat</i>	<i>Flowers We Eat</i>
1. _____ 2. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____	1. _____ 2. _____
<i>Plants With Underground Edible Parts</i>	<i>Vine Crops</i>	<i>Seeds We Eat</i>
1. _____ 2. _____ 3. _____ 4. _____ 5. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	1. _____ 2. _____ 3. _____

Word Scramble

Unscramble these words to answer the questions. Choose from these possible words: asparagus, collards, legume, pumpkin, rhubarb, and spinach.

- Which vegetables are perennials (plants that will come back next year)?
pasugaras _____ barrhbu _____
- Which family of plants can make nitrogen in the soil available to plants?
gluseme _____

Developed by: Angie Eckert, M.S.

Field and Garden

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broccoli	beets	collards	turnip
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cauliflower	kale	spinach	carrots
muskmelon	potatoes	watermelon	radish
cabbage	cucumber	beans	Swiss chard
			pumpkin
			rhubarb
			squash
			lettuce

Word Search—Key

In this activity you will:

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<i>Stems We Eat</i>	<i>Leafy Greens We Eat</i>	<i>Flowers We Eat</i>
1. <u>celery</u>	1. <u>collards</u>	1. <u>broccoli</u>
2. <u>rhubarb</u>	2. <u>lettuce</u>	2. <u>cauliflower</u>
	3. <u>spinach</u>	
	4. <u>kale</u>	
	5. <u>Swiss chard</u>	
	6. <u>cabbage</u>	
<i>Plants With Underground Edible Parts</i>	<i>Vine Crops</i>	<i>Seeds We Eat</i>
1. <u>radish</u>	1. <u>cucumber</u>	1. <u>corn</u>
2. <u>carrots</u>	2. <u>muskmelon</u>	2. <u>peas</u>
3. <u>turnip</u>	3. <u>watermelon</u>	3. <u>beans</u>
4. <u>beets</u>	4. <u>pumpkin</u>	
5. <u>potatoes</u>	5. <u>squash</u>	

Word Scramble

Unscramble these words to answer the questions. Choose from these possible words: asparagus, collards, legume, pumpkin, rhubarb, and spinach.

1. Which vegetables are perennials (plants that will come back next year)?

pasugaras asparagus barrhbu rhubarb

2. Which family of plants can make nitrogen in the soil available to plants?

gluseme legume

Developed by: Angie Eckert, M.S.

Field and Garden Order Up

Use a seed catalog (or visit a store) to find the information necessary to complete the chart. There are many correct answers for each category. When you have found the price of seeds for each category, add the costs to find the total.

You will need:

- at least one seed catalog or
- to visit a store that sells seeds.

Information, Please

In this activity you will:

- learn how to select and order vegetable seeds.

<i>Find a vegetable that:</i>	<i>Name of the Seed or Vegetable</i>	<i>Number of Seeds in the Packet</i>	<i>Cost Per Packet</i>
Has oval-shaped vegetables.	Milano Hybrid Tomato	30	\$1.69
Has oval-shaped vegetables.			
Produces giant tomatoes.			
Can be harvested in 50 days or less.			
Produces a yellow vegetable.			
Needs at least 80 days to grow before harvest.			
Tolerates cool weather.			
Produces edible roots.			
Grows like a vine.			
Produces a giant squash.			
Tastes "hot."			
Produces a purple vegetable.			
<i>Total Cost</i>			

Developed by: Angie Eckert, M.S.

Field and Garden

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Has oval-shaped vegetables.	Milano Hybrid Tomato	30	\$1.69
Has oval-shaped vegetables.			
Produces giant tomatoes.	Big Boy		
Can be harvested in 50 days or less.	Radishes		
Produces a yellow vegetable.	Summer Squash		
Needs at least 80 days to grow before harvest.	Pumpkin		
Tolerates cool weather.	Peas		
Produces edible roots.	Carrots, Radishes, Parsnips		
Grows like a vine.	Pumpkin, Squash		
Produces a giant squash.			
Tastes "hot."	Jalapeno Peppers		
Produces a purple vegetable.	Eggplant		
<i>Total Cost</i>			

Developed by: Angie Eckert, M.S.

Field and Garden

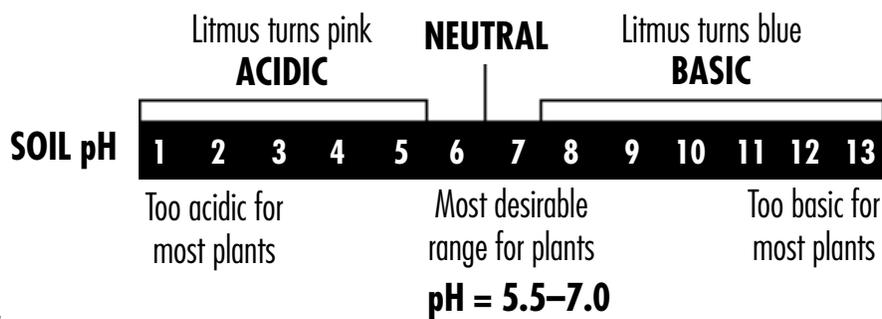
Soil pH

You will need:

- two glass jars with lids
- masking tape
- litmus paper (available from teacher supply stores or science suppliers)
- spoon
- limestone (available at garden centers)
- iron sulfate (available at garden centers)
- measuring cup
- water
- soil from the lawn or garden

Nutrients in the soil are only available to plants if the pH of the soil is between 5.5 and 7.0. If the soil pH is too acidic or too basic, the plants will not grow. Gardeners test the soil with a kit or send it to a lab to have the pH measured. Then they decide whether to add limestone and iron sulfate to the soil to change the pH.

Experiment with pH by using litmus paper. Litmus paper changes color when it touches acidic or basic solutions. Blue litmus paper turns red when it touches an acidic solution. Red litmus paper will turn blue if it touches a basic solution.



Experiment

Use the chart above to help you with the experiment.

Test the pH of limestone and iron sulfate.

Step 1 Label two jars with masking tape.

Step 2 Put a strip of litmus paper at the bottom of each jar.

Step 3 Put a spoonful of limestone in one jar and a spoonful of iron sulfate in the other.

Step 4 Add 1/2 to 1 cup water to each jar.

Step 5 Place the lid on the jar and shake it.

Step 6 Look at the litmus paper.

Developed by: Angie Eckert, M.S.

Soil Test

In this activity you will:

- learn about soil pH and why it is important to plants.
- do an experiment with a partner to measure pH.

1. What color is the litmus paper in the jar with limestone? _____
2. Is limestone acidic or basic? _____
3. What color is the litmus paper in the jar with iron sulfate? _____
4. Is iron sulfate acidic or basic? _____
5. Circle which one you would add to the soil if the pH was too high. iron sulfate limestone
6. Circle which one you would add to the soil if the pH was too low. iron sulfate limestone

Soil Test

Collect a sample of soil from outside. Perform the litmus test on the soil. Is the soil acidic, neutral, or basic? Do you need to add anything to change the pH to the desirable range?

Practice testing the pH of items such as fruits, drinking water, beverages, soapy water, vinegar, milk, juice, tomatoes, potatoes, etc.

Field and Garden

Soil pH

You will need:

- two glass jars with lids
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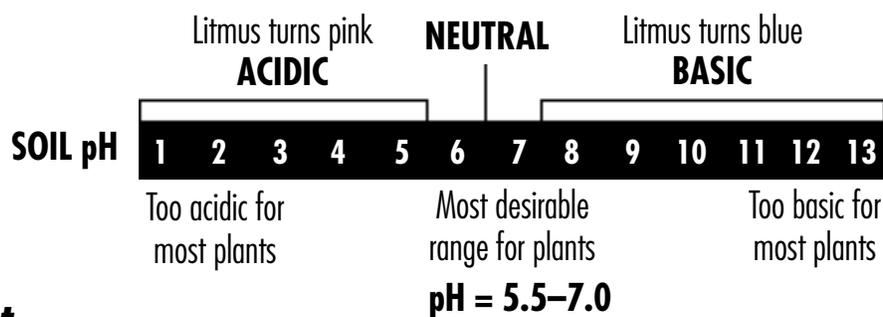
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Developed by: Angie Eckert, M.S.

1. What color is the litmus paper in the jar with limestone? blue
2. Is limestone acidic or basic? basic
3. What color is the litmus paper in the jar with iron sulfate? pink
4. Is iron sulfate acidic or basic? acidic
5. Circle which one you would add to the soil if the pH was too high. iron sulfate limestone
6. Circle which one you would add to the soil if the pH was too low. iron sulfate limestone

Soil Test

Collect a sample of soil from outside. Perform the litmus test on the soil. Is the soil acidic, neutral, or basic? Do you need to add anything to change the pH to the desirable range?

Practice testing the pH of items such as fruits, drinking water, beverages, soapy water, vinegar, milk, juice, tomatoes, potatoes, etc.

Answers will vary.

Field and Garden

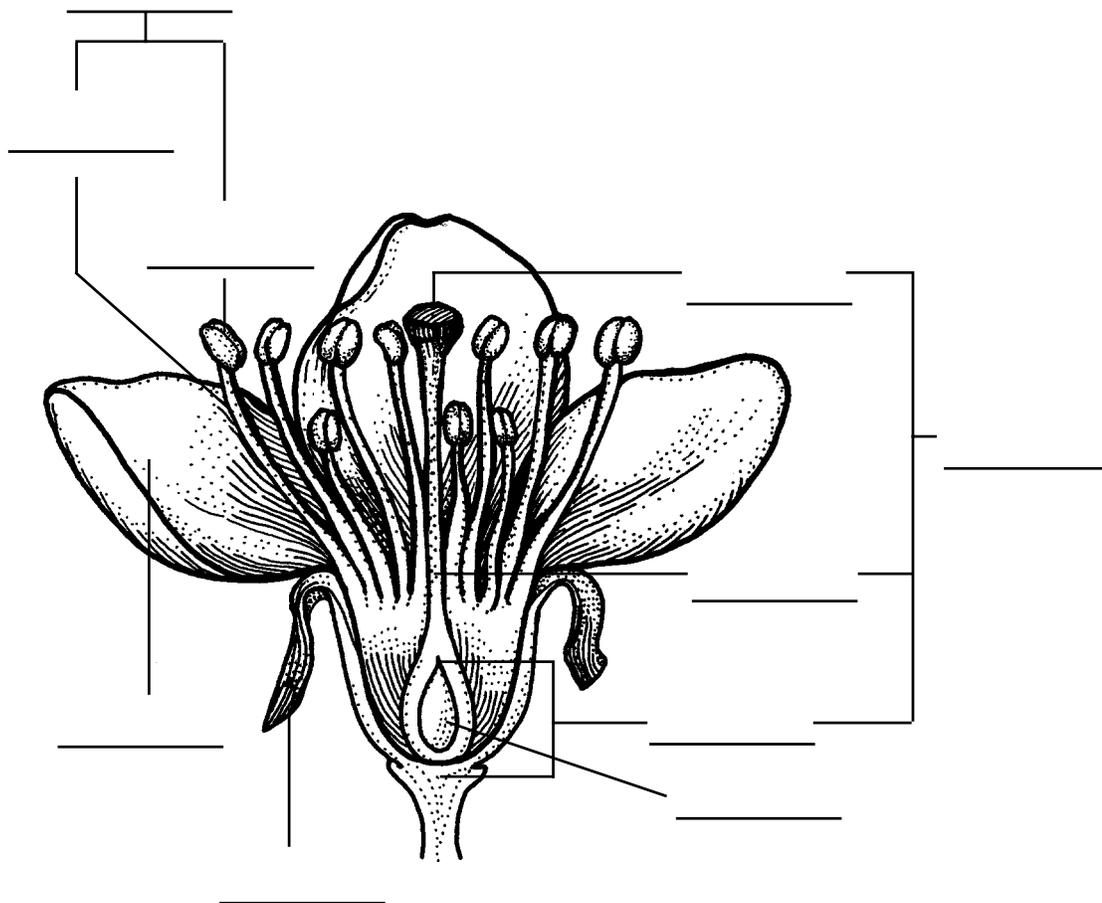
Parts of a Flower

Identify the parts of a flower and design your own flower. Number the parts of a flower on the drawing and match them with the correct description.

Matching

In this activity you will:

- learn the parts of a flower.



- | | | |
|-------------|-------|--|
| 1. stamen | _____ | A. made up of the stigma, style, and the ovary |
| 2. anther | _____ | B. the brightly colored parts of a flower that surround the pistil and the stamens |
| 3. filament | _____ | C. the male part of the flower that includes the filament and the anther |
| 4. pistil | _____ | D. connects the stigma to the ovary |
| 5. stigma | _____ | E. the long, stem-like tube that attaches to the anther |
| 6. style | _____ | F. the tip of the filament that holds pollen |
| 7. ovary | _____ | G. the sticky part of the pistil that collects pollen |
| 8. ovule | _____ | H. the outer part of the flower, look like leaves outside the petals in many flowers |
| 9. petal | _____ | I. the part of the flower that holds the ovule |
| 10. sepals | _____ | J. the part of the ovary that becomes the seed |

Developed by: Angie Eckert, M.S.

Create Your Own Flower

Work by yourself or with a partner to make your own flower out of the following materials: colored construction paper, glue, cotton swabs, pipe cleaners, straws, gumdrops, small beads and/or beans. Be sure to include all the parts from the drawing on the previous page in your model.

Field and Garden

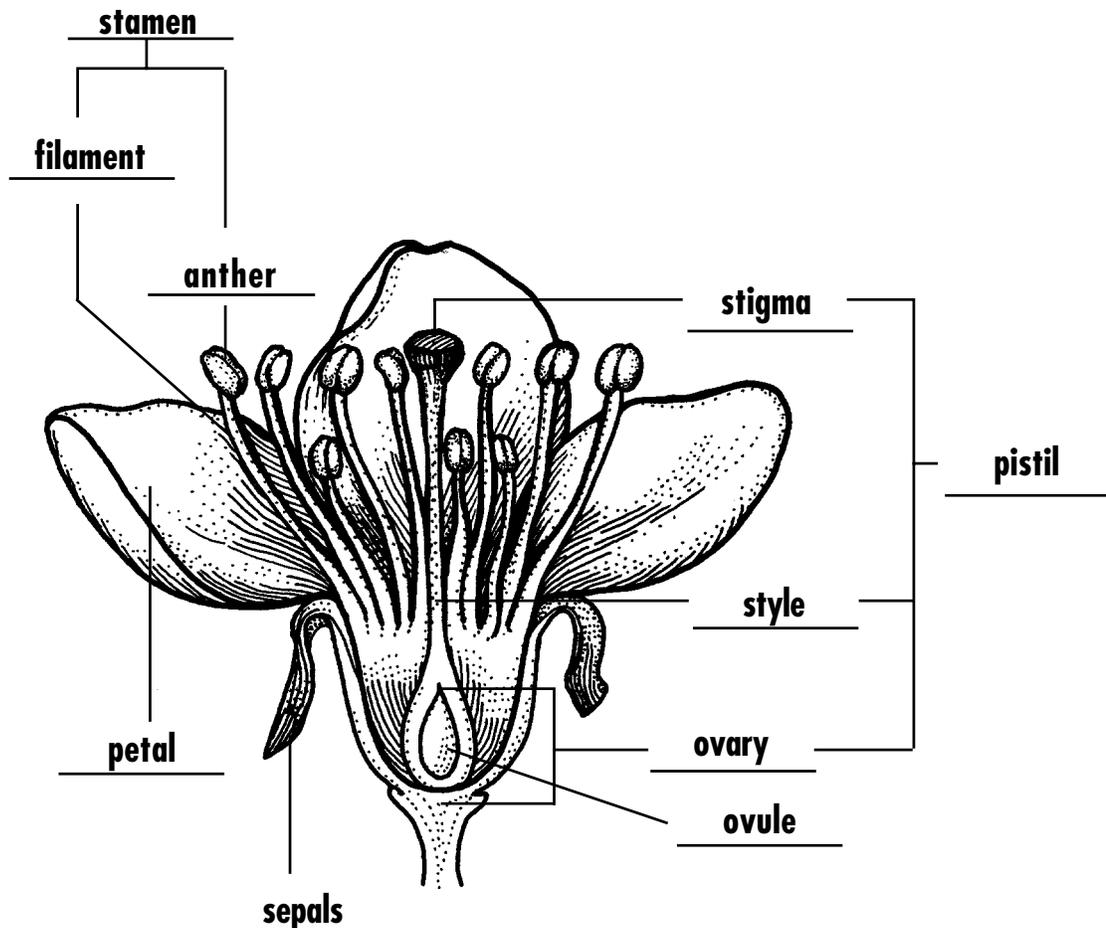
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Developed by: Angie Eckert, M.S.

Field and Garden

First Class Travelers

Word Scramble

In this activity you will:

- learn about seeds that travel with the help of their special adaptations.

In this activity you will need:

- beans
- glue
- tape

miscellaneous supplies (several of the following: paper clips, rubber bands, cotton swabs, feathers, aluminum foil, tape, cotton balls, paper, plastic wrap (such as Saran Wrap™), balloons, scissors, adhesive bandages, plastic bags)

Seeds cannot walk or drive as people do, so they have to find other ways to move themselves to a place where they can grow.

Unscramble the words to see how seeds travel. Can you think of an example of a plant that travels each way? For example, raspberries, which contain seeds, can travel by animal (birds often carry them away).

Seeds can travel by:

Example:

nwid

mnalsia

terwa

eeopl

Make Your Own Seeds

Use one bean seed and the materials of your choice to design each of the following seeds.

1. A seed that can float on water for more than one minute.
2. A seed that can fly in the air for five feet.
3. A seed that attracts an animal.
4. A seed that sticks to you while you walk 15 feet.

Field and Garden

First Class Travelers

Word Scramble—Key

In this activity you will:

- learn about seeds that travel with the help of their special adaptations.

In this activity you will need:

- beans
- glue
- tape

miscellaneous supplies (several of the following: paper clips, rubber bands, cotton swabs, feathers, aluminum foil, tape, cotton balls, paper, plastic wrap (such as Saran Wrap™), balloons, scissors, adhesive bandages, plastic bags)

Seeds cannot walk or drive as people do, so they have to find other ways to move themselves to a place where they can grow.

Unscramble the words to see how seeds travel. Can you think of an example of a plant that travels each way? For example, raspberries, which contain seeds, can travel by animal (birds often carry them away).

Seeds can travel by:

nwid	<u>wind</u>
mnalsia	<u>animals</u>
terwa	<u>water</u>
eeopl	<u>people</u>

Example:

milkweed, dandelions, cottonwood, samaras (helicopters from a maple tree), etc.

nuts and fruits: acorns, walnuts, cherries, apples, etc.

very light-weight seeds and fruits that float: coconuts and cranberries, etc.

cockleburrs, fruit (when we throw down the core or seed), etc.

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Field and Garden

Plant Nutrients

Use words from the list below to help you fill in the missing letters and unscramble the words.

molybdenum

oxygen

carbon

magnesium

hydrogen

nitrogen

sulfur

phosphorus

calcium

boron

zinc

manganese

copper

iron

potassium

chlorine

Word Scramble

In this activity you will:

- learn what nutrients plants need to survive and grow.

Fill in the Blanks

Plants get these nutrients from the air.

___ R ___ N

O _____

Plants need these primary nutrients for healthy growth.

___ I ___ G ___ N

___ H ___ S ___ O ___ U ___

___ T ___ S I ___

Plants need these micronutrients in smaller amounts than the primary nutrients.

CA _____

M _____ UM

S _____

B _____ N

_____ C

C _____ R

_____ SE

I _____ N

_____ BD _____

Word Scramble

Plants get these nutrients from the rain:

ygodreh _____

uulfrs _____

lorinche _____

Plants get these nutrients from organic matter in the soil:

rabnoc _____

gdroyhen _____

togrinne _____

gonexy _____

furuls _____

Which nutrients do you find on more than one of these lists? _____

Developed by: Angie Eckert, M.S.

Field and Garden

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P H O S P H O R U S

P O T A S S I U M

Plants need these micronutrients in smaller amounts than the primary nutrients.

CA L C I U M

M A G N E S I U M

S U L F U R

B O R O N

 Z I N C

C O P P E R

 M A N G A N E S E

I R O N

 M O L Y B D E N U M

Word Scramble

Plants get these nutrients from the rain:

ygodreh **hydrogen**

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Plants get these nutrients from organic matter in the soil:

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gonexy **oxygen**

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Which nutrients do you find on more than one of these lists? **oxygen, carbon, hydrogen,**

nitrogen, sulfur

Developed by: Angie Eckert, M.S.

Field and Garden

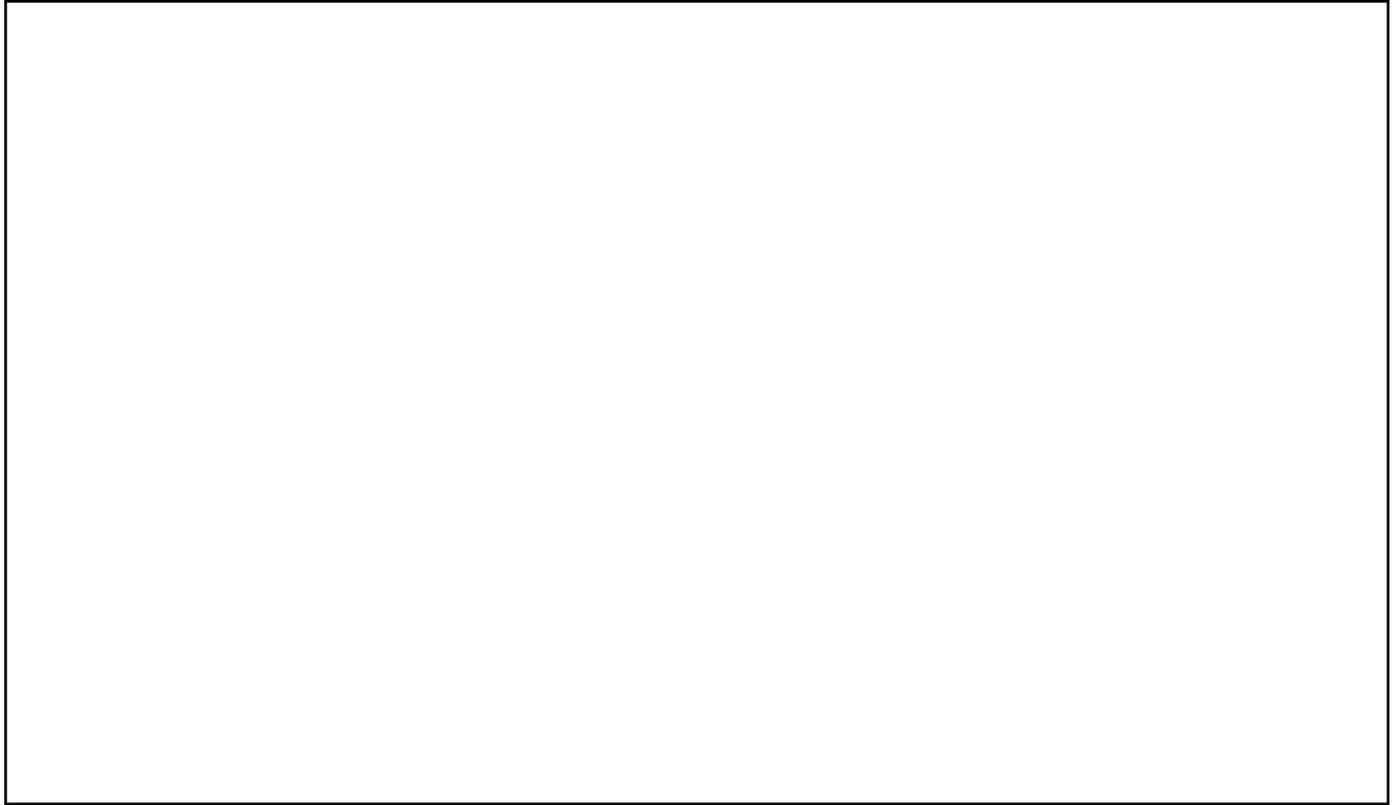
Adopt a Plant

Using a garden catalog or a book about garden plants, cut out a picture or draw a picture of a plant that interests you.

Observation

In this activity you will:

- learn about a plant that interests you.



Answer as many of the following questions as you can from the information about the plant.

1. Where does the plant grow?
2. How tall does the plant grow?
3. How wide does the plant grow?
4. What color are the flowers?
5. What color are the leaves?
6. Are the leaves deciduous (fall off in winter)? Are they evergreen (remain on the plant year-round)?
7. What is special about this plant?
8. Where could you plant this plant? In a pot? In your lawn? In a garden?

Field and Garden

Corn Plant and Seed Part Identification

Identify the parts by writing its name on the respective line.

Identification

In this activity you will:

- learn about the parts of a corn plant and seed.

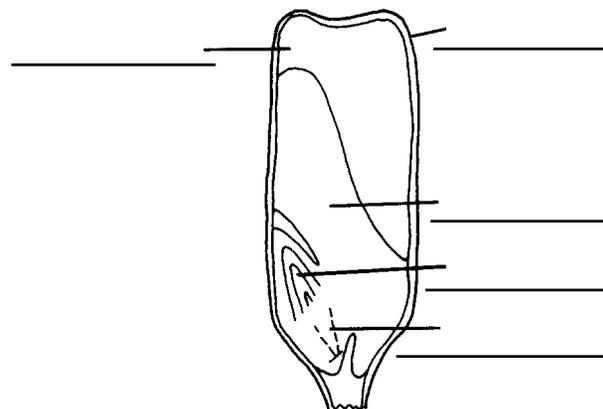
Plant

- Seminal roots** Part of the root system that develops early in the plant's growth and helps to anchor the plant and supply it with nourishment.
- Prop Roots** Roots which add stability and support to the corn plant and are especially important because of the height of the corn plant.
- Leaves** Use water and nutrients provided by the roots and energy provided by the sunlight and photosynthesis process to manufacture food for the plant.
- Stalk** The portion which gives the plant its internal structure and to which the leaves and ears are attached.
- Tassel** The flowers of the plant which usually appear during the hottest part of the growing season and which produce and disburse the plant's pollen.



Seed

- Pericarp** The hard, outer coat that protects the seed both before and after planting.
- Endosperm** Has the chief function of providing food energy for the young plant after germination and until the plant is mature enough to produce its own food.
- Plumule** The five to six miniature new leaves of the young corn plant.
- Radicle** The main root of the seedling that takes up water and nutrients from the soil to nourish the seedling.
- Cotyledon** Provides food for the tiny new plant during germination.



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Field and Garden

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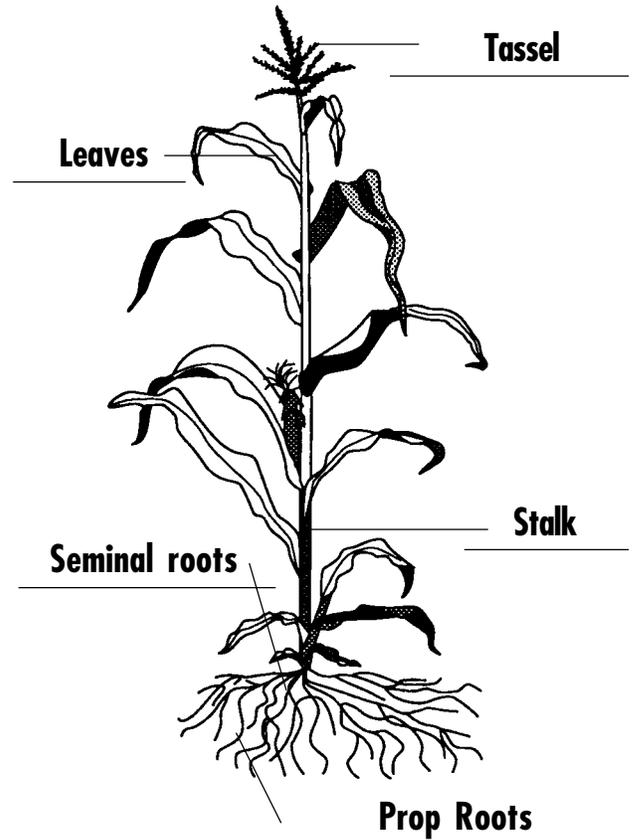
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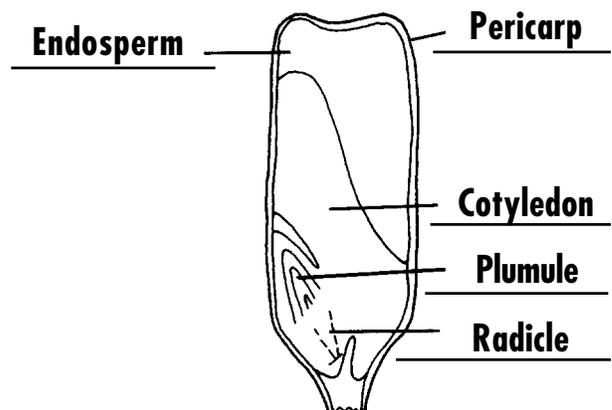
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Field and Garden

Corn Fill-In

Using the words below, fill in the blanks to complete these sentences about corn.

weed one-half livestock silage
nitrogen annual cornstarch bushels
sweet corn wallboard fifty-six grass
corn belt maturity

Fill-In

In this activity you will:

- learn about corn and its production in the United States.

1. In the United States, 80 percent of the corn produced is used to feed _____.
2. When corn is used for feeding cattle, the entire plant is often harvested and used to make _____.
3. _____ is a popular American vegetable and may be purchased fresh, canned, or frozen.
4. Gasohol is made from fermented _____.
5. The stalk of the corn plant can be used to manufacture paper and _____.
6. Much of the United States' corn is produced in the fertile, well drained land of the north central United States, an area often called the _____.
7. Ohio farmers produce approximately 450 million _____ of corn each year.
8. The United States produces more than _____ of the corn grown in the world.
9. Corn is a tall member of the _____ family of plants.
10. Corn is an _____ plant, meaning that it cannot survive the winter and must be planted anew each year.
11. The length of time that it takes for corn to grow from the day it is planted until the ears have filled out is called its _____ time.
12. _____ is a primary nutrient that is required for sturdy stalks and wide leaves, and is a major portion of the protein found in the corn kernel.
13. A _____ is a plant growing in a place where it isn't wanted or needed.
14. There are _____ pounds of corn in a bushel.

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Field and Garden

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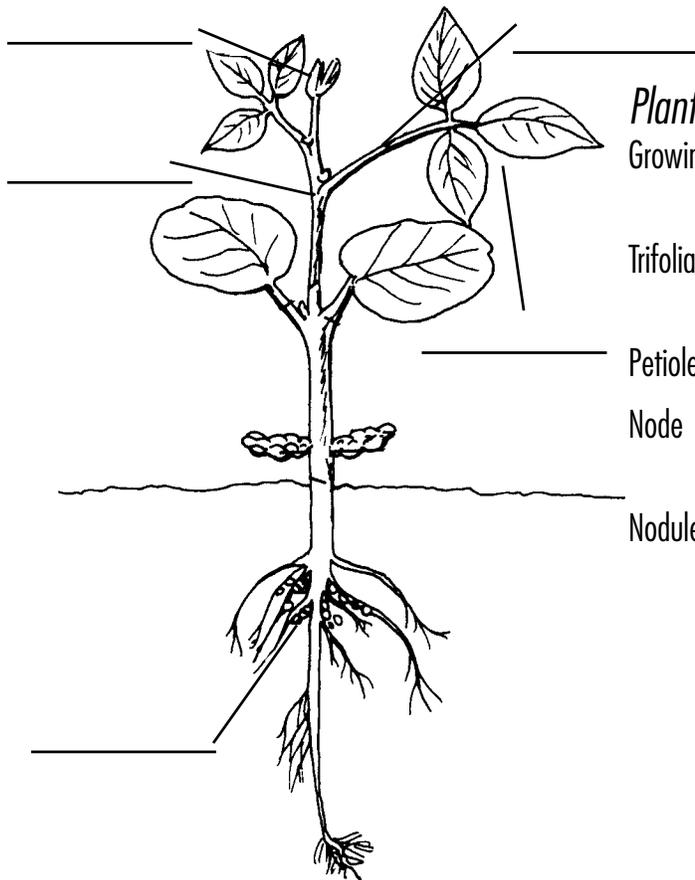
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14. There are fifty-six pounds of corn in a bushel.

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Field and Garden

Soybean Plant and Seed Parts

Identify the part by writing its name on the respective line.



Plant

Growing Point

This is the tip or point where the epicotyl continues to grow upward producing more stems and leaves.

Trifoliate Leaf

The leaves which develop above the pair of unifoliate leaves.

Petiole

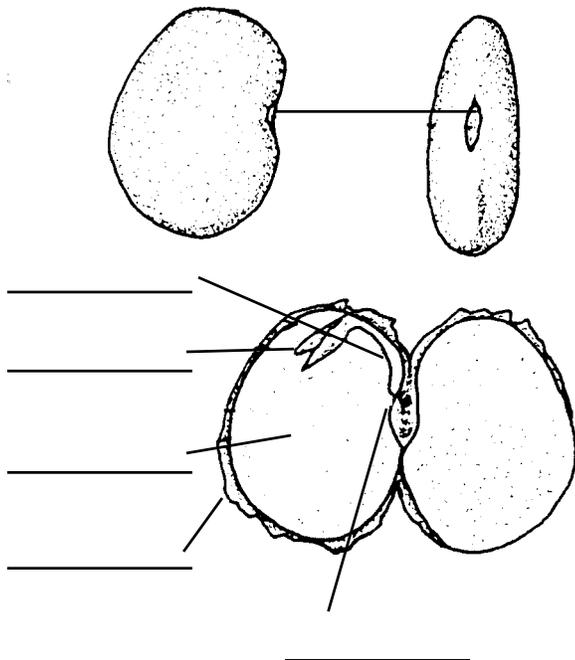
The slender stalk which supports the trifoliate leaves.

Node

The point at which the petiole is connected with the main stem of the plant.

Nodules

A swelling of the roots due to the presence of the bacterium *Rhizobia japonicum*.



Seed

Hypocotyl

The lower portion of the seedling's stem.

Hilum

Part of the seed where it was once attached to the soybean pod.

Radicle

Main root of the seedling that takes up water and nutrients from the soil to nourish the seedling.

Epicotyl

The uppermost part of the seedling which has two leaves that are unifoliate.

Cotyledon

The part of the seed in which food for the seedling is stored. Each bean seed has two cotyledons which form a protective shield around the seedling.

Identification

In this activity you will:

- learn about the parts of a soybean plant and seed.

Field and Garden

Soybean Plant and Seed Parts

Identify the part by writing its name on the respective line.

Growing Point

Petiole

Node

Plant

Growing Point

Trifoliolate Leaf

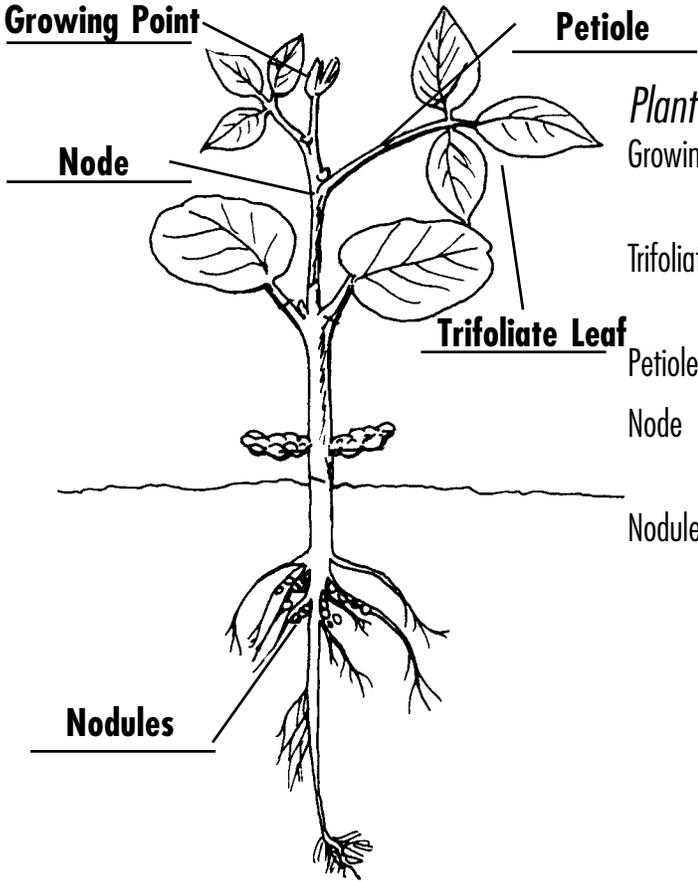
Trifoliolate Leaf

Petiole

Node

Nodules

Nodules



Identification—Key

In this activity you will:

- learn about the parts of a soybean plant and seed.

This is the tip or point where the epicotyl continues to grow upward producing more stems and leaves.

The leaves which develop above the pair of unifoliolate leaves.

The slender stalk which supports the trifoliolate leaves.

The point at which the petiole is connected with the main stem of the plant.

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Hilum

Radicle

Epicotyl

Cotyledon

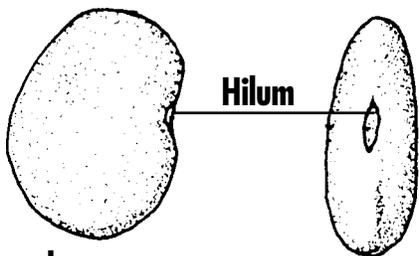
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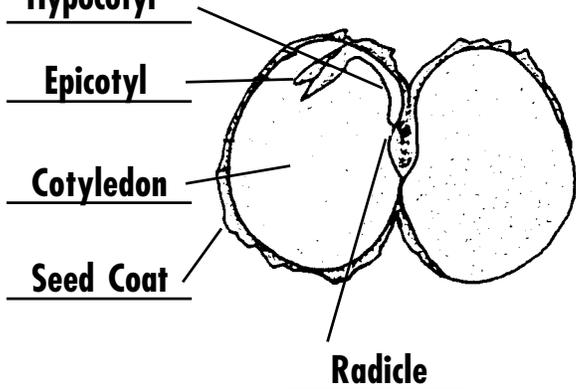
Hypocotyl

Epicotyl

Cotyledon

Seed Coat

Radicle



Developed by: Angie Eckert, M.S.

Field and Garden

Sensational Soybeans

Soybeans are included in a number of food products that you eat regularly or household products that you use — and you probably don't even know that you are eating or using soybeans.

In these two activities, you and your club will learn more about which food and household products are made with soybeans. One bushel (or 60 pounds) of soybeans produces about 11 pounds of soybean oil or 47 pounds of soybean meal. Both soybean oil and soybean meal are used to make food and other usable products.

It's in There!

Give each individual three index cards and a copy of the SoyOil™ symbol. Ask members to visit a local grocery store and look for food items that include the symbol on the label. They can also check the list of ingredients for soy meal or other soybean products.

Once they locate a food item made with soybeans, the students should write the name and list of ingredients on one of the index cards. They should make special note of where soybeans occur in the ingredient list (ingredients are listed in the order by amount included in the food item; i.e., if soybeans are listed first, there are more soybeans in the food item than any other ingredient). At your next gathering, have each person share what they learned.

Soy Oil versus Soy Meal

Each member will need a copy of the Soy Oil versus Soy Meal worksheet.

Both soy oil and soy meal are used to make several products that you eat or use every day. Write on the line whether the food was made with soy oil or soy meal.

Margarine	_____
Salad Oil	_____
Soaps	_____
Paint	_____
Cosmetics	_____
Chocolate	_____
Mayonnaise	_____
Feed for livestock	_____
Meat extenders	_____
Baby food	_____
Adhesives/Glue	_____
Flour	_____

Identification

In this activity you will:

- learn more about which food and household products are made with soybeans.



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SOYOIL