# Chapter 5: Field and Garden

## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts of a Grass Plant</td>
<td>1</td>
</tr>
<tr>
<td>Soil Shakes</td>
<td>3</td>
</tr>
<tr>
<td>Tree-erific Movement</td>
<td>5</td>
</tr>
<tr>
<td>Careers in Horticulture</td>
<td>9</td>
</tr>
<tr>
<td>Parts of a Worm</td>
<td>11</td>
</tr>
<tr>
<td>Investigating Worms</td>
<td>13</td>
</tr>
<tr>
<td>Small Grain Crops</td>
<td>15</td>
</tr>
<tr>
<td>Wonderful Wheat</td>
<td>17</td>
</tr>
<tr>
<td>Inside of a Tree</td>
<td>19</td>
</tr>
<tr>
<td>Leaf Identification</td>
<td>21</td>
</tr>
<tr>
<td>The Name Game</td>
<td>23</td>
</tr>
<tr>
<td>Lawn Pests</td>
<td>25</td>
</tr>
<tr>
<td>Compost for Your Garden</td>
<td>27</td>
</tr>
<tr>
<td>Recipe for Compost</td>
<td>29</td>
</tr>
<tr>
<td>Vegetable Chart</td>
<td>31</td>
</tr>
<tr>
<td>Order Up</td>
<td>33</td>
</tr>
<tr>
<td>Soil pH</td>
<td>35</td>
</tr>
<tr>
<td>Parts of a Flower</td>
<td>39</td>
</tr>
<tr>
<td>First Class Travelers</td>
<td>43</td>
</tr>
<tr>
<td>Plant Nutrients</td>
<td>45</td>
</tr>
<tr>
<td>Adopt a Plant</td>
<td>47</td>
</tr>
<tr>
<td>Corn Plant and Seed Part Identification</td>
<td>49</td>
</tr>
<tr>
<td>Corn Fill-In</td>
<td>51</td>
</tr>
<tr>
<td>Soybean Plant and Seed Parts</td>
<td>53</td>
</tr>
<tr>
<td>Sensational Soybeans</td>
<td>55</td>
</tr>
</tbody>
</table>
Field and Garden
Parts of a Grass Plant

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

In this activity you will:
- learn the parts of the grass plant.

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

Developed by: Angie Eckert, M.S.
Field and Garden
Parts of a Grass Plant

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

In this activity you will:
- learn the parts of the grass plant.

identification—Key

1. I roots
2. G ligule
3. A seedhead
4. B leaf blade
5. E seed
6. F midrib
7. H node
8. C crown
9. D 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?

<table>
<thead>
<tr>
<th>After Three Minutes</th>
<th>After Ten Minutes</th>
<th>After One Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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?

<table>
<thead>
<tr>
<th>After Three Minutes</th>
<th>After Ten Minutes</th>
<th>After One Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
**Tree-erific Movement**

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? ________________________________
   _____________________________________________________________________________
   _____________________________________________________________________________
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? ____________ 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 in 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? \underline{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? \underline{water}
9. What does this tell you about the plant? \underline{This shows that plants lose water through their leaves. This process is called transpiration.}
### Field and Garden

#### Careers in Horticulture

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

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

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**

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

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

### 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.

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.

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? _______________________________________________________________________

   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

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?
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 y 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.

<table>
<thead>
<tr>
<th>Oats</th>
<th>Wheat</th>
<th>Rye</th>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List four foods made from grain:
1. __________________________________
2. __________________________________
3. __________________________________
4. __________________________________
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.

gr 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.

<table>
<thead>
<tr>
<th>Oats</th>
<th>Wheat</th>
<th>Rye</th>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

List four foods made from grain:

1. ____________________________ 3. ____________________________
2. ____________________________ 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

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

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

True 1. One acre of land can produce enough wheat for bread for a family for ten years.

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.

6 The wheat plants produce a milk-like fluid inside their seeds.

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
- cuticle
- root hairs
- roots
- xylem
- bark
- phloem (flow-um)
- stomata

1. These microscopic openings on the undersides of leaves open and close to release water from the leaves into the air.
2. The underground network of a tree.
3. These underground parts of a tree absorb 95 percent of the plant’s water and nutrients.
4. The “pipes” inside the trunk that move nutrients up from the roots to the other parts of the tree.
5. These “pipes” move food made by the leaves down to the stems, trunk, and the roots.
6. This waxy coating on the leaf prevents the plant from losing too much water through its leaves.
7. The network in a leaf that moves water and nutrients from the stem to the parts of the leaf.
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? ___________________
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—Key

In this activity you will:
• learn about the insides of a tree.

Matching

Draw a line from the words to their definitions.

1. These microscopic openings on the undersides of leaves open and close to release water from the leaves into the air.

2. The underground network of a tree.

3. These underground parts of a tree absorb 95 percent of the plant’s water and nutrients.

4. The “pipes” inside the trunk that move nutrients up from the roots to the other parts of the tree.

5. These “pipes” move food made by the leaves down to the stems, trunk, and the roots.

6. This waxy coating on the leaf prevents the plant from losing too much water through its leaves.

7. The network in a leaf that moves water and nutrients from the stem to the parts of the leaf.

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
Field and Garden

Leaf Identification

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? ______________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Identification

In this activity you will:
• learn about leaves.

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.

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.

---

**Identification—Key**

**In this activity you will:**

- learn about leaves.
Field and Garden
The Name Game

In this activity you will:
- learn what a plant’s Latin name reveals about a plant’s features.

Key of Latin Terms

cyan = blue
purpurea = purple
chloro = green
lutea = yellow
ruber = red
giganteum = giant
japonica = from Japan
lavendula = lavender
corda = heart
rosea = rosy
phylla = leaf

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
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  
phylla = leaf  
japonica = from Japan  
lavendula = lavender  
cordata = heart  
rosea = rosy  
giganteum = giant

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:

<table>
<thead>
<tr>
<th>Cotoneaster horizontalis</th>
<th>Viburnum cylindricum</th>
<th>Pilea microphylla</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picea abies compacta</td>
<td>Dracena fragrans</td>
<td>Cucurbita maxima</td>
</tr>
</tbody>
</table>

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
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

---

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—Key

In this activity you will:
- learn some of the names of common lawn pests.
- complete a lawn pest word search.

Developed by: Angie Eckert, M.S.
**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.

**What Belongs?**

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

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

What Belongs?
Circle the things that you think belong in a compost pile.
- flowers
- weeds
- eggshells
- bones
- bread
- dairy products
- fatty foods
- wood chips
- meat
- fish
- coffee grounds
- fertilizer
- water
- soil
- cooking oil
- vegetables and fruits
- 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!

Developed by: Angie Eckert, M.S.
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!**
**Field and Garden**

**Recipe for Compost**

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!**

- Soil
- Grass clippings or leaves
- Waste

**Activity—Key**

In this activity you will:

- learn the steps in building a compost pile.

Developed by: Angie Eckert, M.S.
### 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
- cauliflower
- kale
- spinach
- carrots
- muskmelon
- potatoes
- watermelon
- radish
- cabbage
- cucumber
- beans
- Swiss chard
- beets
- tomatoes
- corn
- celery
- broccoli
- kale
- spinach
- carrots
- muskmelon
- potatoes
- watermelon
- radish
- cabbage
- cucumber
- beans
- Swiss chard

#### Stems We Eat
1. _______________
2. _______________

#### Leafy Greens We Eat
1. _______________
2. _______________
3. _______________
4. _______________
5. _______________
6. _______________

#### Flowers We Eat
1. _______________
2. _______________

#### Plants With Underground Edible Parts
1. _______________
2. _______________
3. _______________
4. _______________
5. _______________

#### Vine Crops
1. _______________
2. _______________
3. _______________
4. _______________
5. _______________

#### Seeds We Eat
1. _______________
2. _______________
3. _______________

### Word Search

In this activity you will:
- learn characteristics of vegetable plants.

#### 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 ___________________________
   - barrhbu ___________________________

2. Which family of plants can make nitrogen in the soil available to plants?
   - gluseme ___________________________
**Field and Garden**

**Vegetable Chart**

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

<table>
<thead>
<tr>
<th>Stems We Eat</th>
<th>Leafy Greens We Eat</th>
<th>Flowers We Eat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. celery</td>
<td>1. collards</td>
<td>1. broccoli</td>
</tr>
<tr>
<td>2. rhubarb</td>
<td>2. lettuce</td>
<td>2. cauliflower</td>
</tr>
<tr>
<td></td>
<td>3. spinach</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. kale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Swiss chard</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. cabbage</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plants With Underground Edible Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. radish</td>
</tr>
<tr>
<td>2. carrots</td>
</tr>
<tr>
<td>3. turnip</td>
</tr>
<tr>
<td>4. beets</td>
</tr>
<tr>
<td>5. potatoes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vine Crops</th>
<th>Seeds We Eat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. cucumber</td>
<td>1. corn</td>
</tr>
<tr>
<td>2. muskmelon</td>
<td>2. peas</td>
</tr>
<tr>
<td>3. watermelon</td>
<td>3. beans</td>
</tr>
<tr>
<td>4. pumpkin</td>
<td></td>
</tr>
<tr>
<td>5. squash</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word Scramble</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unscramble these words to answer the questions. Choose from these possible words: asparagus, collards, legume, pumpkin, rhubarb, and spinach.</td>
</tr>
<tr>
<td>1. Which vegetables are perennials (plants that will come back next year)?</td>
</tr>
<tr>
<td>pasugaras asparagus barrhbu rhubarb</td>
</tr>
<tr>
<td>2. Which family of plants can make nitrogen in the soil available to plants?</td>
</tr>
<tr>
<td>gluseme legume</td>
</tr>
</tbody>
</table>

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.

**In this activity you will:**
- learn how to select and order vegetable seeds.

---

### Find a vegetable that:

<table>
<thead>
<tr>
<th>Name of the Seed or Vegetable</th>
<th>Number of Seeds in the Packet</th>
<th>Cost Per Packet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Has oval-shaped vegetables.</strong> Milano Hybrid Tomato</td>
<td>30</td>
<td>$1.69</td>
</tr>
<tr>
<td><strong>Has oval-shaped vegetables.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Produces giant tomatoes.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Can be harvested in 50 days or less.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Produces a yellow vegetable.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Needs at least 80 days to grow before harvest.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tolerates cool weather.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Produces edible roots.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grows like a vine.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Produces a giant squash.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tastes “hot.”</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Produces a purple vegetable.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Cost**
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.

<table>
<thead>
<tr>
<th>Find a vegetable that:</th>
<th>Name of the Seed or Vegetable</th>
<th>Number of Seeds in the Packet</th>
<th>Cost Per Packet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has oval-shaped vegetables.</td>
<td>Milano Hybrid Tomato</td>
<td>30</td>
<td>$1.69</td>
</tr>
<tr>
<td>Produces giant tomatoes.</td>
<td>Big Boy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be harvested in 50 days or less.</td>
<td>Radishes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produces a yellow vegetable.</td>
<td>Summer Squash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs at least 80 days to grow before harvest.</td>
<td>Pumpkin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolerates cool weather.</td>
<td>Peas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produces edible roots.</td>
<td>Carrots, Radishes, Parsnips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grows like a vine.</td>
<td>Pumpkin, Squash</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produces a giant squash.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tastes “hot.”</td>
<td>Jalapeno Peppers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Produces a purple vegetable.</td>
<td>Eggplant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Cost

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.

<table>
<thead>
<tr>
<th>SOIL pH</th>
<th>Litmus turns pink</th>
<th>Neutral</th>
<th>Litmus turns blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Acidic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ACIDIC

Too acidic for most plants

NEUTRAL

Most desirable range for plants

BASIC

Too basic for most plants

pH = 5.5-7.0

*Developed by: Angie Eckert, M.S.*
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
- 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.
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 _____
2. anther _____
3. filament _____
4. pistil _____
5. stigma _____
6. style _____
7. ovary _____
8. ovule _____
9. petal _____
10. sepals _____

A. made up of the stigma, style, and the ovary
B. the brightly colored parts of a flower that surround the pistil and the stamens
C. the male part of the flower that includes the filament and the anther
D. connects the stigma to the ovary
E. the long, stem-like tube that attaches to the anther
F. the tip of the filament that holds pollen
G. the sticky part of the pistil that collects pollen
H. the outer part of the flower, look like leaves outside the petals in many flowers
I. the part of the flower that holds the ovule
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
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.

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

Matching—Key

In this activity you will:

• learn the parts of a flower.
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:

<table>
<thead>
<tr>
<th>nwid</th>
<th>mnalsia</th>
<th>terwa</th>
<th>eeoelp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example:

<table>
<thead>
<tr>
<th>nwid</th>
<th>mnalsia</th>
<th>terwa</th>
<th>eeoelp</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
First Class Travelers

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:

- wind
- animals
- water
- people

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.

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

**Plant Nutrients**

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

- molybdenum
- oxygen
- carbon
- magnesium
- hydrogen
- nitrogen
- sulfur
- phosphorus
- calcium
- boron
- zinc
- manganese
- copper
- iron
- potassium
- chlorine

**Fill in the Blanks**

Plants get these nutrients from the air.

O __ __ __ __

Plants need these primary nutrients for healthy growth.

__I __ __ __ G __ N
__ H __ S __ __ 0 __ __ U __
__ __ T __ __ S I __

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

CA _______________ M ____________ UM
S ________________ B ____________ N
_________________ C
_________________ C
_________________ I
_________________ I
_________________ S
_________________ 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**  
**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

**Fill in the Blanks**

Plants get these nutrients from the air.

- CARBON
- OXYGEN

Plants need these primary nutrients for healthy growth.

- NITROGEN
- PHOSPHORUS
- POTASSIUM

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

- CA __________ LCIUM
- S __________ ULFUR
- ZIN __________
- MANGANESE
- MOLYBDENUM

**Word Scramble**

Plants get these nutrients from the rain:

- ygodreh __________ hydrogen
- ulfrs __________ sulfur
- lorinche __________ chlorine

Plants get these nutrients from organic matter in the soil:

- rabnoc __________ carbon
- gdroyhen __________ hydrogen
- togrinne __________ nitrogen
- gonexy __________ oxygen
- furuls __________ sulfur

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.

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

In this activity you will:
- learn about the parts of a corn plant and seed.

### Identification

#### 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.

---

*Developed by: Angie Eckert, M.S.*
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.

Developed by: Angie Eckert, M.S.
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

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.

In this activity you will:

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

1. In the United States, 80 percent of the corn produced is used to feed _______ livestock _______.
2. When corn is used for feeding cattle, the entire plant is often harvested and used to make _______ silage _______.
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 _______ wallboard _______.
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 _______ corn belt _______.
7. Ohio farmers produce approximately 450 million _______ bushels _______ of corn each year.
8. The United States produces more than _______ one-half _______ of the corn grown in the world.
9. Corn is a tall member of the _______ grass _______ family of plants.
10. Corn is an _______ annual _______ 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 _______ maturity _______ 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 _______ weed _______ is a plant growing in a place where it isn’t wanted or needed.
14. There are _______ fifty-six _______ pounds of corn in a bushel.

In this activity you will:
• learn about corn and its production in the United States.

Developed by: Angie Eckert, M.S.
**Field and Garden**

**Soybean Plant and Seed Parts**

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

---

**Identification**

**In this activity you will:**

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

---

**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.

---

*Developed by: Angie Eckert, M.S.*
**Field and Garden**

**Soybean Plant and Seed Parts**

In this activity you will:

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

---

**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.
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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Made with Soy Oil</th>
<th>Made with Soy Meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margarine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salad Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soaps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cosmetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mayonnaise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed for livestock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat extenders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baby food</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhesives/Glue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flour</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Soy Oil</th>
<th>Soy Meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margarine</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Salad Oil</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Soaps</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Paint</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Cosmetics</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Chocolate</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>Soy Oil</td>
</tr>
<tr>
<td>Feed for livestock</td>
<td>Soy Meal</td>
</tr>
<tr>
<td>Meat extenders</td>
<td>Soy Meal</td>
</tr>
<tr>
<td>Baby food</td>
<td>Soy Meal</td>
</tr>
<tr>
<td>Adhesives/Glue</td>
<td>Soy Meal</td>
</tr>
<tr>
<td>Flour</td>
<td>Soy Meal</td>
</tr>
</tbody>
</table>