

Course	Agricultural Science II
Unit	Crop Science
Lesson	Plant and Seed Identification
Estimated Time	Four 50-minute blocks

Student Outcome

The student will be able to identify common plants and seeds in Missouri.

Learning Objectives

1. Describe how seeds are identified.
2. Describe the characteristics of selected crop and weed seeds.
3. Identify the three classes of weeds in Missouri.
4. Describe how plants are identified.
5. Describe the characteristics of selected crop and weed plants.

Grade Level Expectations

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slides
 - ☐ PPt 1 – A Bean Seed
 - ☐ PPt 2 – A Cereal Grain
 - ☐ PPt 3 – Leaf Characteristics of Some Legumes
 - ☐ PPt 4 – Parts of a Grass Plant
 - ☐ PPt 5 – Parts of a Grass Leaf
 - ☐ PPt 6 – Leaf Characteristics of Three Grass Species
2. Activity Sheets
 - ☐ AS 1 – Parts of a Bean Seed and Cereal Grain
 - ☐ AS 2 – Parts of a Grass Plant and Leaf
 - ☐ AS 3 – Characteristics of Selected Crop and Weed Plants
 - ☐ AS 4 – Seed Identification Score Sheet
3. *Crop Science* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 1992.
4. *Crop Science Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- ☐ Packages of mixed seeds (e.g., corn, sunflower, and pinto bean)

Supplemental Information

1. Internet Sites

- ❑ Invasive Species. Missouri Department of Conservation. Accessed January 15, 2008, from <http://www.mdc.mo.gov/nathis/exotic/>.
- ❑ Missouri Vegetation Management Manual. Missouri Department of Conservation. Accessed January 15, 2008, from <http://www.mdc.mo.gov/nathis/exotic/vegman/index.htm>.
- ❑ Noxious Weed Control. Missouri Department of Agriculture. Accessed January 15, 2008, from <http://www.mda.mo.gov/Pest/noxiousweed.htm>.
- ❑ Seed ID Workshop. Department of Horticulture and Crop Science, Ohio Agricultural Research and Development Center, Ohio State University. Accessed January 15, 2008, from <http://www.oardc.ohio-state.edu/seedid/>.
- ❑ Weed ID Guide. Weed Science Program, College of Agriculture, Food and Natural Resources, University of Missouri. Accessed January 15, 2008, from <http://weedid.missouri.edu/>.
- ❑ Weeds of the North Central States. University of Illinois Extension and departments of the University of Illinois College of Agricultural, Consumer and Environmental Sciences. Accessed January 15, 2008, from http://www.ag.uiuc.edu/~vista/html_pubs/WEEDS/list.html.

2. Print

- ❑ Coombs, E. M., J. K. Clark, G. L. Piper, and A. F. Cofrancesco, Jr., eds. *Biological Control of Invasive Plants in the United States*. Corvallis: Oregon State University Press, 2004.
 - ❑ Czarapata, E. J. *Invasive Plants of the Upper Midwest: An Illustrated Guide to their Identification and Control*. Madison: University of Wisconsin Press, 2005.
 - ❑ Kaufman, S. R. and W. Kaufman. *Invasive Plants: A Guide to Identification, Impacts, and Control of Common North American Species*. Mechanicsburg, PA: Stackpole Books, 2007.
 - ❑ Yatskievych, G. *Steiermark's Flora of Missouri*. Vol. 2. St. Louis: Missouri Botanical Garden Press, 2006.
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Interest Approach

Divide the class into groups. Give each group a package of mixed seeds (e.g., corn, sunflower, and pinto bean). Have students separate and identify them. Discuss how they identified the seeds and why identification is important.



Communicate the Learning Objectives

1. Describe how seeds are identified.
2. Describe the characteristics of selected crop and weed seeds.
3. Identify the three classes of weeds in Missouri.
4. Describe how plants are identified.
5. Describe the characteristics of selected crop and weed plants.

Instructor Directions	Content Outline
Objective 1 <i>While the students are divided into groups with the seeds separated, point out to them distinguishing characteristics of specific seeds. Use PPt 1-2 to aid in this discussion. Have students complete AS 1.</i> <input type="checkbox"/> PPt 1 – A Bean Seed <input type="checkbox"/> PPt 2 – A Cereal Grain <input type="checkbox"/> AS 1 – Parts of a Bean Seed and Cereal Grain	Describe how seeds are identified. <ol style="list-style-type: none">1. Size2. Shape3. Color4. Surface markings5. Other botanical characteristics
Objective 2 <i>Select some crop and/or weed seeds that you feel are important and prepare seed samples on paper plates. (NOTE: Seed samples are available through IML.) Have students use the crop and weed seed information in the student reference to identify the seeds.</i>	Describe the characteristics of selected crop and weed seeds. <ol style="list-style-type: none">1. Crop seeds (student should use information in student reference)2. Weed seeds (student should use information in student reference)
Objective 3 <i>Weeds are plants. However, a weed is any plant that is growing</i>	Identify the three classes of weeds in Missouri. <ol style="list-style-type: none">1. Prohibited – weeds that are nearly impossible to control; Missouri law “prohibits” the sale of

Instructor Directions	Content Outline
<p><i>where it is not wanted. Weeds can be classified into groupings for identification.</i></p>	<p>agricultural seeds which contain “prohibited” weed seeds.</p> <ol style="list-style-type: none"> 2. Noxious – weeds that can be controlled with some difficulty; the presence of “noxious” weed seed in agricultural seeds is restricted in Missouri. 3. Common – weeds that are relatively easy to control, but reduce crop yields and increase production costs.
<p>Objective 4</p> <p><i>Identification of plants is important in crop production and weed control. There are several characteristics which can be used to identify crop and weed seeds. Refer to AS 2.</i></p> <p> AS 2 – Parts of a Grass Plant and Leaf</p>	<p>Describe how plants are identified.</p> <ol style="list-style-type: none"> 1. Life cycle 2. Plant height 3. Leaves 4. Stems 5. Flower 6. Roots
<p>Objective 5</p> <p><i>Select a few plants that you feel are important and prepare several samples of major field crop and weed plants of Missouri. Be sure to select those plants that display distinct characteristics (e.g., flowers, leaves, roots, and stolons). Use PPt 3-6 to discuss the differences of plant characteristics (e.g., pinnately or palmately structured leaves). Have students refer to information in the student reference and complete AS 3.</i></p> <p> PPt 3 – Leaf Characteristics of Some Legumes</p> <p> PPt 4 – Parts of a Grass Plant</p> <p> PPt 5 – Parts of a Grass Leaf</p>	<p>Describe the characteristics of selected crop and weed plants.</p>

Instructor Directions	Content Outline
<p>☐ PPt 6 – Leaf Characteristics of Three Grass Species</p> <p>📄 AS 3 – Characteristics of Selected Crop and Weed Plants</p>	
<p>Application</p> <p>📄 AS 1 – Parts of a Bean Seed and Cereal Grain</p> <p>📄 AS 2 – Parts of a Grass Plant and Leaf</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> 1. Raphe (d) 2. Hilum (f) 3. Micropyle (g) 4. Cotyledons (c) 5. Seed coat (a) 6. Radicle (b) 7. Shoot (e) 8. Mid vein (b) 9. Callus (d) 10. Suture (f) 11. Awn (a) 12. Apex of palea (c) 13. Lemma (e) 14. Teeth of edge of palea (keel) (i) 15. Palea (g) 16. Rachilla (h) <p>Answers to AS 2</p> <ol style="list-style-type: none"> 1. Culm (a) 2. Leaf blade (e) 3. Ligule (b) 4. Sheath (d) 5. Auricles (c) 6. Inflorescence (e) 7. Culm (d) 8. Sheath (b) 9. Roots (c) 10. Leaf blade (h) 11. Node (g) 12. Stolon (f) 13. Rhizome (a)

Instructor Directions	Content Outline
<p> AS 3 – Characteristics of Selected Crop and Weed Plants</p> <p> AS 4 – Seed Identification Score Sheet</p>	<p>Answers to AS 3 Instructor needs to determine if answers are appropriate.</p> <p>Answers to AS 4 Instructor needs to determine if answers are appropriate.</p> <p>Other activities</p> <ol style="list-style-type: none"> 1. During this lesson, have a daily display of selected seeds in a tray identified only by a number. Have students identify them. Do at least 5 a day until all seeds are identified. Develop a score chart to record student progress. (A classroom contest can be arranged for motivation.) Use AS 4. 2. Display pictures of selected crop and weed plants identified by only a number. Have students identify them. Do at least 5 a day until all crops and weeds in the lesson are identified.
Closure/Summary	<p>The presence of weeds in crops is costly to the producer. Proper plant identification plays a part in the process of reducing weeds and in turn reducing the damage to crops because of them.</p>
Evaluation: Quiz	<p>Answers: Correct answers need to be determined by the instructor.</p>