
Activity 17

Plant Identification

Curricula Supported	Related Competencies
Agricultural Science II, <i>Introduction to Grassland Management</i>	2. Identify plant classifications found in grasslands. 3. Recognize the characteristics of grassland plants that are used in plant identification.
Agricultural Science II, <i>Leadership II</i>	5. Prepare and deliver a presentation.

Curricula References:

1. *Introduction to Grassland Management*. University of Missouri-Columbia: Instructional Materials Laboratory, 1997.
2. *Leadership and Personal Development*. University of Missouri-Columbia: Instructional Materials Laboratory, 1991.

Overview:

Part 1 of this activity provides experience in identifying plants and capturing the image of plant specimens with a digital camera or scanner. The images can be used in various applications. One use is to identify the plant and the type of disease or insect damage the plant may have. Part 2 of this activity provides experience in creating and delivering a presentation using presentation software.

Activity Objectives:

1. Capture plant images electronically using a digital camera or scanner. (Part 1)
2. Research plants and identify them by common name, life cycle, type, and identifying characteristics. (Part 1)
3. Describe how a digital plant image can be used in plant science or plant production. (Part 1)
4. Prepare and deliver a plant identification presentation. (Part 2)

Activity Sheets:


- AS 17.1 Plant Identification
- AS 17.2 Plant Identification Presentation

Scoring Guide:

- SG 17.2 Plant Identification Presentation


Instructor Preparation/Directions:

Part 1

1. All activities and associated files are provided on the *Computer Lab Activities in Agriculture* instructor CD-ROM. Items followed by the CD-ROM icon  are provided on the *Computer Lab Activities in Agriculture* student CD-ROM.
2. Before assigning this activity to students, check the web links provided to ensure they are still available and current.
3. Check to see if there is a student use policy at your school for using the network and Internet. Students and parents may have to sign a form that releases the students to use the network and Internet during class.
4. Discuss Internet cautions with the students before beginning this activity. Inform them not to provide any personal information over the Internet through chat rooms or other sites. Personal information includes full name, address, phone number, social security number, or picture. Check with your school for additional rules and regulations on Internet use.
5. Refer to the operator's manual for the scanner or digital camera for instructions for use.
6. Instruct each student to find five plants and capture their images with a digital camera or scanner. Have students find plant specimens that are different plant types or have different identifying characteristics. If a digital camera is used, have each student bring the plants to class to photograph or take the class to an overgrown field, agricultural area, or wooded area to photograph the plants on-site. If a scanner is used, have students bring the plants to class.

Activity-Part 1 Length: 100 min.

Part 2

1. All activities and associated files are provided on the *Computer Lab Activities in Agriculture* instructor CD-ROM. Items followed by the CD-ROM icon  are provided on the *Computer Lab Activities in Agriculture* student CD-ROM.
2. Familiarize yourself with the presentation software the students will be using for this activity and have a user's manual for the software available for reference. In addition, it is helpful to pair computer-literate students with those who are not.
3. Review the procedures of the activity with the students and the specific requirements for the criteria included in SG 17.2. If available, provide related examples of exemplary work.

Activity-Part 2 Length: 300 minutes

Discussion Questions:

Part 1

1. What are possible uses for digital plant images?
 - Sending the image via the Internet to plant experts for analysis (e.g., University of Missouri-Columbia Plant Diagnostics Clinic, local University of Missouri-Columbia extension agents, agronomists/plant scientists). The University of Missouri-Columbia Plant Diagnostics Clinic web site can be accessed at [<http://www.agebb.missouri.edu/pdc/>](http://www.agebb.missouri.edu/pdc/).
 - Digital plant images can be used to diagnose diseases and identify insect damage.
 - Digital plant images can be used to compare plants for landscape selection or to design a pruning plan.
2. What is the importance of identifying plants and diagnosing plant diseases or insect damage?
 - This information can be used when making management decisions such as which herbicide program to use or what cultural control methods to use (e.g., crop rotation, no-till, controlled burning, trap crops).
3. What are other applications for using digital images in agriculture?
 - Photographing and cataloging a herd of livestock for calving management
 - Photographing buildings, animals, and equipment for insurance reasons
 - Photographing an animal to advertise for sale
 - Building a plant list for landscaping purposes
 - Developing employee identification records

Part 2

1. Who are the various audiences that would be interested in this presentation?
 - A group of producers interested in learning about plants
 - Wildlife agents and foresters who want to know about the plants that they may encounter
 - Members of a garden club who want to be able to identify plants that are growing in their yards

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2. How can learning how to prepare a presentation benefit students?
 - These types of presentations are commonplace among professionals in many fields. The creation of this presentation will provide students with practice and give them a basic idea of how to effectively produce a slide presentation.
 3. How can delivering a presentation benefit students?
 - The ability deliver a presentation is a very useful skill because leadership and communication skills are highly valued in the professional world. The ability to deliver an effective presentation improves your leadership skills.

Assessment:

AS 17.1 - Answers to AS 17.1 will vary based on the plants selected. It is suggested that this activity sheet is graded before proceeding to Part 2 of this activity.

AS 17.2 - Grade the students' presentations based on SG 17.2 located at the end of AS 17.2. To increase the number of points for the project, assign more points to the criteria that you want to emphasize. For example, apply a scale multiplier that makes one or more criteria worth two times as much as the other criteria. For an example presentation, view the PlantID_presentation file, a PowerPoint file on the *Computer Lab Activities in Agriculture* CD-ROM.

Alternative Applications:

1. Submit a digital image of a diseased plant, weed pest, or insect pest to an expert for analysis. The expert can identify the pest or potential problem and aid the student in making a management decision. For example, an image of a weed pest could be sent to an agronomist. The agronomist could then provide advice in selecting a weed control program (e.g., spray herbicide, different tillage methods). See the related curriculum and competencies below.

Advanced Crop Science

- F. 4. Select a pest control program.
- G. 4. Select a weed control program.
- H. 4. Select a pest control program.
- J. 4. Select a weed control program.

2. Have students collect insects, research them, and capture their images with a digital camera. The students could use the digital images to create an entire insect collection. See the related curriculum and competency below.

Agricultural Science II,
Entomology

- 2. Prepare an insect collection.

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3. This activity can also be used to support the following curricula and competencies.
- | | |
|---|--|
| <i>Advanced Crop Science</i> | D. 1. Identify crop and weed seeds and plants |
| Agricultural Science II,
<i>Crop Science</i> | 3. Identify common plants and weeds in Missouri. |

Credits:

Forages Information System <<http://www.forages.css.orst.edu/>> 11 October 2000.

Gee, Kenneth L., Michael D. Porter, Steve Demarais, Fred C. Bryant, and Gary Van Vreede. *White-tailed Deer: Their Foods and Management in the Cross Timbers*. Ardmore, OK: The Samuel Roberts Noble Foundation, 1994.
Intermediate Web Publishing
<<http://www.uoregon.edu/~jqj/inter-pub/images/images-gif.html>> April 6, 2001.

Missouri Weeds, MU Agronomy Extension.
<<http://www.psu.missouri.edu/fishel/Default.htm>> October 11, 2000.

Presenters Online. <<http://www.presentersonline.com>> October 10, 2000.

Uva, Richard H., Joseph C. Neal, and Joseph M. DiTomaso. *Weeds of the Northeast*. Ithaca, NY: Cornell University Press, 1997.

Student Activity Sheet
Plant Identification

Name _____

Student Objectives:

1. Capture plant images electronically using a digital camera or scanner.
2. Research plants and identify them by common name, life cycle, type, and identifying characteristics.
3. Describe how a digital plant image can be used in plant science or plant production.

Equipment and Materials:

- Computer with Internet access
- Digital camera or flatbed scanner
- Floppy disk

Procedure:

1. Following your instructor's directions, find five plants and capture their images with a digital camera or scanner. Each specimen should be a different plant type or have different identifying characteristics.

a. Digital Camera Option:

- 1) Capture each of your plant specimens with a digital camera. Make sure that the plant does not blend in with its background. Use a piece of paper or cardstock as a background to provide contrast if needed. See Figure 17.1 for an example of a plant image captured with a digital camera.

Tip: Freshly collected plants or living plants ensure greater quality images. Try to capture images when the wind is at a minimum so that the image is in focus.

- 2) Per manufacturer's instructions, transfer the images to the computer (floppy disk or a location that your instructor specifies).
- 3) Convert the files to JPEG format with a resolution of 72 dpi (dots per inch), which is standard screen resolution.

b. Scanner Option:

- 1) Using a flatbed scanner, lay a plant specimen on the glass plate and close the cover.

Tip: Freshly collected plants or living plants ensure greater quality images. When placing the plant on the scanner glass, try to make the

plant as flat as possible and close the scanner lid carefully. The part of the plant directly on the glass will be the clearest image.

- 2) Use the scanner's RGB (Red Green Blue) color photo mode and scan at a resolution of 72 dpi (dots per inch), which is standard screen resolution.
- 3) Save the image in JPEG format to a floppy disk or a location your instructor specifies. See Figure 17.2 for an example of a plant image captured with a scanner.

Note: The JPEG and GIF graphic file formats (with the extensions .jpg and .gif respectively) are both commonly used for screen display. These formats have a relatively smaller file size, which allow for a faster loading time. GIF images are typically used for line art and icons and JPEG images are used for photographs.



Figure 17.1 - Digital camera image of bull thistle



Figure 17.2 - Scanner image of goosegrass

2. Research the plant specimens to find their common name, life cycle, type (e.g., grass, legume, woody, forb), and three identifying characteristics (e.g., stem type, leaf type, flower type, plant uses, habitat, root type). See the following list for suggested references about plant identification.

Plant Identification References:

Books:

- Gee, Kenneth L., Michael D. Porter, Steve Demarais, Fred C. Bryant, and Gary Van Vreede. *White-tailed Deer: Their Foods and Management in the Cross Timbers*. Ardmore, OK: The Samuel Roberts Noble Foundation, 1994.
- Uva, Richard H., Joseph C. Neal, and Joseph M. DiTomaso. *Weeds of the Northeast*. Ithaca, NY: Cornell University Press, 1997.

Web sites:

- Forages Information System. <<http://www.forages.css.orst.edu/>>
- Missouri Weeds, MU Agronomy Extension.
<<http://www.psu.missouri.edu/fishel/Default.htm>>

3. Record your findings in the following table.
4. Print each image and key it to the information in the table by labeling each printout with the specimen letter. Attach your printouts to this activity sheet.
5. Below the table, be sure to list the references used for the information.

	Common Name	Life Cycle	Identifying Characteristics
Specimen A			1. 2. 3.
Specimen B			1. 2. 3.
Specimen C			1. 2. 3.

Table continues on next page

	Common Name	Life Cycle	Identifying Characteristics
Specimen D			1. 2. 3.
Specimen E			1. 2. 3.

References used: _____



Student Activity Sheet
Plant Identification Presentation

Name _____

Student Objective:

Prepare and deliver a plant identification presentation.

Equipment and Materials:

- Computer
- Presentation software, e.g., PowerPoint, Corel Presentations
- SG 17.2 Plant Identification Presentation Scoring Guide 
- PlantID_blank template (PowerPoint file) 
- Floppy disk

Procedure:

1. Refer to SG 17.2 for the criteria you will be graded on.
2. Select the four best plant images from Part 1. Use plants that represent at least four different plant types (e.g., grass, legume, woody, forb) or life cycles (i.e., annual, perennial, or biennial).

TIP: Ensure the images are JPEG format and set at a low resolution (72 dpi). The pictures will take up less space and load in the presentation much faster.
3. Using the PlantID_blank template (provided on the CD-ROM) or a design of your own, create a slide show presentation. On the first slide, type the title of your presentation and your name.
4. As you develop your presentation, save the file often to a floppy disk or to a location your instructor specifies.
5. Insert a plant image on each of the next four slides. Each slide should also contain labels and information about the name of the plant, life cycle, type, and three identifying characteristics.
6. On the last slide, type a bibliography (listing of all the sources you used for the plant identification information). Each listing should include the title, author/publisher, and date.
7. When your slide show is complete, test it on the hardware you will be using to ensure there are no technical problems.
8. Deliver a short presentation discussing the plants on the slides.

Plant Identification Presentation Scoring Guide

Name _____

Exemplary--2 pts.	Acceptable--1 pt.	Needs Work--0 pts.	Pts.
Font Appearance			
Meets all of the following criteria: 1. Readable (type style, size) 2. Eye appealing (compatible fonts) 3. Appropriately formatted (use of bold, italics, etc.)	Meets two of the criteria	Meets one or none of the criteria	
Text Mechanics			
No grammar or spelling errors	A few minor errors that are not distracting	Numerous or distracting errors	
Colors			
Meet all of the following criteria: 1. Good contrast 2. Appropriate number of colors 3. Eye appealing	Meet two of the criteria	Meet one or none of the criteria	
Content Accuracy			
All facts are correct	One or two facts are incorrect	Three or more facts are incorrect	
Content Organization			
Well organized (information is consistently presented)	Not completely organized	Poorly organized	
Content Completeness			
All elements are present	One or two elements are missing	Three or more elements are missing	
Transitions			
Meet all of the following criteria: 1. Keep viewers' attention 2. Help the flow 3. Consistently used	Meet two of the criteria	Meet one or none of the criteria	
Animation			
Meets all of the following criteria: 1. Helps the flow 2. Timing is effective 3. Keeps viewers' attention	Meets two of the criteria	Meets one or none of the criteria	
Navigational Aids			
Buttons work on all slides	Buttons work on 5 out of 6 slides	Buttons work on 4 or fewer slides	
Images			
Meet all of the following criteria: 1. Represent content 2. Good quality (good resolution, clear) 3. Appropriate size	Meet two of the criteria	Meet one or none of the criteria	
Bibliography			
All sources are listed and include the following elements: title, author/publisher, and date	All sources are listed but one or two elements are missing	No sources are listed or more than two elements are missing	
Presentation Delivery			
Enthusiastic throughout	Enthusiastic most of the time	Enthusiastic rarely	
Stands erect on both feet throughout	Stands erect on both feet most of the time	Stands erect rarely	
Maintains good eye contact throughout	Maintains good eye contact most of the time	Maintains good eye contact rarely	
Maintains good volume and tone throughout	Maintains good volume and tone most of the time	Maintains good volume and tone rarely	
Uses appropriate gestures to emphasize key points throughout	Uses appropriate gestures to emphasize key points most of the time	Uses appropriate gestures to emphasize key points rarely	

Total points out of 32 _____