Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: I. Overview

Unit Objective:

Students will demonstrate an understanding of how governmental policies and current trends influence agriculture by explaining, in an oral presentation, how a particular policy or trend has affected agriculture in their state.

Show-Me Standards: 1.8, CA6

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

MDC Private Land Assistance. Missouri Department of Conservation. Accessed March 11, 2004, from http://www.conservation.state.mo.us/landown/.

Missouri Cattlemen's Association. Accessed October 7, 2003, from http://www.mocattle.org/.

National Association of Conservation Districts. Accessed March 8, 2004, from http://www.nacdnet.org/.

National Pork Board. Accessed October 7, 2003, from http://www.porkboard.org/Home/default.asp.

Progressive Farmer.com. Accessed October 3, 2003, from http://www.progressivefarmer.com/farmer/.

Soil and Water Conservation Program. Missouri Department of Natural Resources. Accessed March 12, 2004, from http://www.dnr.state.mo.us/wpscd/swcp/service1.htm.

Successful Farming Online. Accessed October 3, 2003, from http://www.agriculture.com/sfonline/index.html.

United States Department of Agriculture. Accessed March 8, 2004, from http://www.usda.gov/.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 4.
- Students will complete AS 2.1, Missouri Cropland; and AS 4.1, The World Trade Organization (WTO).
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. I-6 (3), p. I-32 (1), and p. I-45.

Performance-Based Assessment:

Students will be divided into groups. Each group will develop an oral report that explains how a governmental program or agreement, such as the North American Free Trade Agreement, or a current trend in agriculture, such as precision farming, has affected agriculture within the state. Students should include appropriate visual elements, such as illustrations, graphs, or charts, to make the report interesting and support the information in the report.

Assessment will be based on the overall content and presentation of the report.

Unit I—Overview
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Prior to assigning the investigative portion of this assessment activity, lead a class discussion about governmental programs, trade agreements, and trends currently affecting agriculture. See Lesson 4, Government Influence and Current Trends, for study questions and topics.

2. Have students brainstorm about programs and trends affecting agriculture in their state and make a list of topics on the board. Sample topics could include the following:
   - ❑ Trade agreements, such as the North American Free Trade Agreement
   - ❑ Farming techniques, such as precision farming
   - ❑ Bioengineered products, such as Bt corn
   - ❑ Soil and water conservation programs, such as the Agricultural Nonpoint Source Special Area Land Treatment (AgNPS SALT) program
   - ❑ Organizations or groups, such as the Midwest Area Rivers Coalition 2000, could also be considered, if desired

3. Divide the class into groups.

4. Assign each group one of the topics or have groups choose their topic, as desired.

5. Have each group develop an oral report that explains how its assigned topic has affected agriculture within the state.

6. Have students incorporate appropriate visual elements into their report, such as illustrations, graphs, or charts, to make the report interesting and support the information in the report. Students could also use presentation software to give their report, if desired.

7. Students may use material found in the unit or discussed in class as well as additional outside material to complete their report.

8. Students may not use the source material word for word and must provide a complete bibliography of their sources following their report.

9. Students should be prepared to answer questions about their topic.

10. The final assessment score will be based on the overall content and presentation of the report.

11. ADDITIONAL ACTIVITY: Invite a guest speaker who is involved in a program such as the AgNPS SALT program to talk to the class about his or her experience. Have students prepare questions for the speaker.

Unit I—Overview
Student Handout

1. The instructor will divide the class into groups and assign each group a program, trend, or agreement that is currently making an impact on agricultural production.

2. Develop an oral report that explains how your topic affects agriculture in your state and present the report to the class.

3. Be prepared to answer questions from the instructor and your classmates about your topic.

4. Include appropriate visuals in your report, such as illustrations, graphs, or charts, to make your report interesting and informative.

5. You may use material found in the unit or discussed in class as well as additional outside material to complete your report.

6. You may not use the source material word for word and must provide the instructor with a complete bibliography of your sources following your report.

7. Your final assessment score will be based on the overall content and presentation of your report.

Advanced Crop Science

Unit I—Overview
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Information and Content of Report	❑ Information is complete ❑ Facts are accurate ❑ Well organized ❑ Supporting materials emphasize and clarify key points ❑ Answers questions from the instructor or students correctly	0 criteria met	1-2 criteria met	3 criteria met	4 criteria met	All 5 criteria met	X 20	
Presentation of Report	❑ Holds audience interest ❑ Speaks clearly and uses correct grammar ❑ Maintains good posture ❑ Needs little or no prompting from the instructor	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 5	
TOTAL								

Final Assessment Total _____/100 pts.

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: II. Plant Biology

Unit Objective:

Students will apply principles of plant biology by devising a time line for the growth stages of a common crop seed and comparing and contrasting, in a poster, the time line with the actual growth stages of seeds they plant and care for.

Show-Me Standards: 1.3, SC5

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Agriculture Network Information Center. Accessed March 29, 2004, from http://laurel.nal.usda.gov:8080/agnic/.

Agriculture Publications. MU Extension. University of Missouri-Columbia. Accessed October 7, 2003, from http://muextension.missouri.edu/explore/agguides/.

American Society of Plant Biologists. Accessed November 11, 2003, from http://www.aspb.org/.

Exploring Agriculture in America. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Plant Science. University of Missouri-Columbia, Instructional Materials Laboratory, 1991.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 and 2.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. II-6 (1, 2) and p. II-23.

Performance-Based Assessment:

Students will be divided into groups. Each group will devise a time line that outlines the expected growth stages of a common crop seed, such as corn, wheat, sorghum, or soybeans. Students will also plant actual seeds for their assigned crop and care for and record the progress of the seeds over the course of the activity. They will create a poster that compares and contrasts the expected growth stages with the actual growth stages of the seeds they plant. The poster will be displayed in class.

Assessment will be based on the overall content and presentation of the poster and the ability to care for the assigned plants.

Unit II—Plant Biology
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. NOTE: For this activity, students will plant seeds and follow their growth stages. Be sure to assign appropriate seeds and allow enough time for seeds to reach the desired growth stage.

2. Divide the class into groups and assign each group a common crop seed discussed in the unit, such as corn, wheat, sorghum, or soybeans.

3. Provide students with the following materials.
   - ❑ Seeds
   - ❑ Containers
   - ❑ Growing medium
   - ❑ Water
   - ❑ Fertilizer

4. Have students plant their seeds.
   a. Explain that students will be responsible for caring for the plants through the course of the activity. Indicate what care procedures students should perform, such as watering and fertilizing.
   b. Review basic plant-care procedures, if needed. Additional plant-care information can be found in the *Plant Science* curriculum guide and the Plant Science unit of the *Exploring Agriculture in America* curriculum guide, which are available from the University of Missouri-Columbia, Instructional Materials Laboratory.

5. Once students have planted their seeds, have the groups develop a time line that charts the expected growth stages of their assigned crop. Have students make their time line on half of a piece of poster board.

6. On the other half of the poster board, have students develop a time line that charts the progress of the seeds they planted. Students should update this time line over the course of the activity.

7. Have students include brief captions on their posters to indicate how the growth stages of their plants are similar to or different from the expected growth stages of their assigned crop.

8. Students should incorporate other elements, such as illustrations, as needed to make their poster interesting and informative.

9. Display completed posters in class.

10. The final assessment score will be based on the overall content and presentation of the poster and the ability to care for the assigned plants.

11. ADDITIONAL ACTIVITY: Choose one or more crops appropriate for your region. Plant some sample seeds in the ground outdoors and others in the greenhouse. Move the greenhouse plants outside when appropriate and label both samples. Have students follow the plants' growth stages over the course of the unit or longer, if desired. Lead a class discussion about the plants and have students compare and contrast the samples.

Unit II—Plant Biology
Student Handout

1. The instructor will divide the class into groups and assign each group a common crop seed.

2. The instructor will provide the following materials.
   - ❑ Seeds
   - ❑ Containers
   - ❑ Growing medium
   - ❑ Water
   - ❑ Fertilizer

3. Plant your sample crop seeds.
   a. You will be responsible for caring for the plants through the course of the activity.
   b. Follow the plant-care schedule determined by the instructor.

4. On one half of a piece of poster board, make a time line that charts the expected growth stages of your assigned crop.

5. On the other half of the poster board, make a time line that charts the progress of the seeds you planted. Update this time line over the course of the activity.

6. Include brief captions on the poster to indicate how the growth stages of your plants are similar to or different from their expected growth stages.

7. Incorporate other elements, such as illustrations, as needed to make your poster interesting and informative.

8. Completed posters will be displayed in class.

9. Your final assessment score will be based on the overall content and presentation of the poster and your ability to care for the assigned plants.

Advanced Crop Science

Unit II—Plant Biology
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Plant Care	Plants are properly cared for	Failed	Poor	Fair	Good	Excellent	X 7.5	
Thoroughness	First time line includes all expected growth stages; second time line follows plant development over the whole activity	Failed	Poor	Fair	Good	Excellent	X 5	
Accuracy	Information in captions is complete and accurate	Failed	Poor	Fair	Good	Excellent	X 5	
Presentation	Poster is well organized and eye-appealing	Failed	Poor	Fair	Good	Excellent	X 5	
Technical	Spelling, grammar, and punctuation are correct	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____/100 pts.

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: III. Soil Fertility and Management

Unit Objective:

Students will apply principles of soil fertility and management by conducting and analyzing soil tests and presenting, in an oral report, their crop recommendation and management strategy for the soil they sampled.

Show-Me Standards: 1.3, SC7

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Back-to-Basics Soil Fertility Information. Accessed November 11, 2003, from http://www.back-to-basics.net/.

Grassland Evaluation Contest Study Guide. University of Missouri-Columbia, Instructional Materials Laboratory, 1997.

"How to Take a Soil Sample." Missouri Department of Conservation. Accessed October 9, 2003, from http://www.conservation.state.mo.us/landown/wild/landmgmt/practices.htm#how.

International Potash Institute. Accessed October 9, 2003, from http://www.ipipotash.org/.

Missouri Cooperative Soil Survey. Accessed March 12, 2004, from http://soils.missouri.edu/.

Soil and Water Publications. MU Extension. University of Missouri-Columbia. Accessed October 9, 2003, from http://muextension.missouri.edu/explore/agguides/soils/index.htm.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 6.
- Students will complete AS 1.1, Estimating Soil Texture by Feel; AS 2.1, Interpreting Soil Survey Books; AS 3.1, Interpreting Soil Test Results; AS 3.2, Collecting a Soil Sample; AS 4.1, Calculating Fertilizer Needs and Cost; AS 5.1, Determining Tillage Costs; AS 5.2, Soil Compaction and How It Develops; AS 5.3, Estimating the Percent of Residue Cover; AS 6.1, Measuring Slope; and AS 6.2 and AS 6.2A, Contour Farming and Soil Erosion.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. III-23, p. III-35, p. III-59, and p. III-70.

Performance-Based Assessment:

Students will work in groups to collect soil samples from an assigned area. Students will categorize the samples based on texture as well as have the soil chemically tested. Based on the results of the physical and chemical tests, they will recommend an appropriate crop and management strategy for the soil. Students will present their findings to the class in an oral report.

Assessment will be based on the accuracy of the interpretation of the soil analysis, crop and management recommendations, and the overall content and presentation of the oral report.

Unit III—Soil Fertility and Management
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Divide the class into groups and assign each group a different area from which to collect soil samples, such as a yard, conservation area, football or softball field, or farm.
   a. If it is more practical, because of time or cost constraints, to only collect and test one composite sample, have students collect samples within one designated site and conduct this activity as a class project.
   b. If the activity is conducted as a class project, have students present their findings in a short written report, rather than an oral report, so that the groups will not be presenting the same information to the class.

2. Have each group collect soil samples to create a composite sample.
   a. Use AS 3.2, Collecting a Soil Sample, p. III-51. See also AS 3.1, Interpreting Soil Test Results, p. III-49, which can be used to identify components of a soil test and interpret the results.
   b. Be sure to collect samples early and allow enough time to receive a response if samples are submitted to an outside agency for testing.

3. Have students determine the soil texture based on feel. Use AS 1.1, Estimating Soil Texture by Feel, p. III-17.

4. Test the soil samples by having students submit their composite samples to a University of Missouri Outreach & Extension office or by testing the samples in class.
   a. Extension offices can be located by searching the University of Missouri Outreach & Extension web site at http://outreach.missouri.edu/regions/.
   b. If samples are tested in class, provide testing equipment and explain how to use it properly.
   c. If students test the samples, verify the accuracy of their results by retesting the samples.

5. Based on the results of the physical and chemical tests, have the students recommend an appropriate crop and management plan for the soil they sampled. Have students present their findings to the class as an oral report.

6. Indicate what information students must provide for their samples in their report. Topics could include the following:
   - ❑ Description of topography
   - ❑ Physical properties of the sample
   - ❑ Interpretation of physical properties
   - ❑ Soil analysis results
   - ❑ Interpretation of soil analysis
   - ❑ Crop recommendation
   - ❑ Management plan

7. Students should be prepared to answer questions about their interpretations and recommendations.

8. Students should also incorporate other elements, such as charts or illustrations, and make use of presentation software or other equipment or material as needed to make the report interesting and informative.

9. The final assessment score will be based on the accuracy of the interpretations of the physical and chemical soil test results, crop and management recommendations, and the overall content and presentation of the report.

Unit III—Soil Fertility and Management
Student Handout

1. The instructor will divide the class into groups and assign each group an area from which to collect soil samples.

2. Use the procedures in AS 1.1, Estimating Soil Texture by Feel, to estimate the soil's sand, silt, and clay content and determine its texture.

3. Submit your composite sample for testing.

4. Compile your observations and test results and present your findings to the class as an oral report. Keep in mind questions such as the following:
   - ❑ What is the topography of the sample area like?
   - ❑ What are the physical characteristics of the soil?
   - ❑ What do the physical characteristics indicate about the sample?
   - ❑ What does the soil analysis indicate about the sample?
   - ❑ Based on the physical characteristics and the soil analysis results, what crop would I plant in this type of soil?
   - ❑ What management plan would I recommend?

5. Be prepared to answer questions about your interpretations and recommendations.

6. Incorporate other elements, such as charts or illustrations, and make use of presentation software or other equipment or material as needed to make your report interesting and informative.

7. Your final assessment score will be based on the accuracy of your interpretations of the physical and chemical soil test results, crop and management recommendations, and the overall content and presentation of your report.

Advanced Crop Science

Unit III—Soil Fertility and Management
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Information and Content of Oral Report	❑ Information is complete ❑ Crop and management recommendations are valid ❑ Interpretation of physical and chemical soil tests are accurate ❑ Report is well organized ❑ Good use of supporting materials	0 criteria met	1-2 criteria met	3 criteria met	4 criteria met	All 5 criteria met	X 20	
Presentation of Oral Report	❑ Holds audience interest ❑ Speaks clearly and uses correct grammar ❑ Maintains good posture ❑ Needs little or no prompting from the instructor	0 criteria met	1 criterion met	2 criteria met	3 criteria met	4 criteria met	X 5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: IV. Identifying and Selecting Crops and Seeds

Unit Objective:

Students will demonstrate an understanding of basic principles of plant identification by collecting common crop and grassland plants, identifying them by their leaf characteristics, and presenting them on a poster or in another format, as determined by the instructor.

Show-Me Standards: 1.3, CA1

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Crop and Grassland Plant Identification Manual. University of Missouri-Columbia, Instructional Materials Laboratory, 1997.

Forage Identification Pages. Purdue University. Accessed November 11, 2003, from http://www.agry.purdue.edu/ext/forages/forageid.htm.

Kallenbach, R. L., & Bishop-Hurley, G. J. *A Guide to the Common Forages and Weeds of Pastures*. MU Extension. University of Missouri-Columbia. Accessed October 15, 2003, from http://muextension.missouri.edu/explore/manuals/m00169.htm.

Leaf Terms. MBG Net. Missouri Botanical Garden. Accessed October 27, 2003, from http://mbgnet.mobot.org/sets/temp/lftypes.htm.

Missouri CDE Handbook. Accessed March 12, 2004, from http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.

Plants of Missouri. Missouri Department of Conservation. Accessed October 14, 2003, from http://www.conservation.state.mo.us/.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 3.
- Students will complete AS 3.2, Identify Plant Seeds.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. IV-6 (2) and p. IV-45 (2).

Performance-Based Assessment:

Students will work in groups to identify common crop and grassland plants by their leaf characteristics. The groups will locate and identify samples that illustrate characteristics discussed in the unit—leaf and bud arrangement, leaf venation, leaf type, leaf shape, and leaf margin. They will present their collection on a poster or in another format, as determined by the instructor.

Assessment will be based on the overall content and presentation of the collection.

Unit IV—Identifying and Selecting Crops and Seeds
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Divide the class into groups.

2. Have each group collect and identify samples of common crop and grassland plants. Indicate how many samples students should collect.
   a. Students may use outside sources to help them in the identification process. For example, information regarding Missouri plants can be found on the Missouri Department of Conservation web site at http://www.conservation.state.mo.us/. An ID manual, the *Crop and Grassland Plant Identification Manual*, is available from the University of Missouri-Columbia, Instructional Materials Laboratory.
   b. For a list of common crop and grassland plants, see the Crop Plant and Weed Plant list that accompanies the Agronomy Career Development Event. The *Missouri CDE Handbook* is available from the Missouri Department of Elementary and Secondary Education at http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.
   c. If students do use web sites or other sources to help identify plants, they must turn in a list of these sources along with their completed project.

3. Have students classify the samples by their leaf characteristics and present the collection on a poster. Students should classify each sample according to each of the characteristics listed below.
   - ❑ Leaf and bud arrangement
   - ❑ Venation
   - ❑ Margin
   - ❑ Leaf type
   - ❑ Leaf shape
   - ❑ Base shape
   - ❑ Tip shape

4. If preferred, have students assemble their collection in a different format, such as in a binder or as a presentation using presentation software. Tell students what format is preferable. Adjust the student handout and scoring guide accordingly as needed.

5. Use TM 1.1, Leaf Characteristics, to explain or review the different physical characteristics of leaves. NOTE: Because the leaf characteristic illustrations in the TM are not included in the Student Reference, it might be useful to post the illustrations in class.

6. Display completed posters in class.

7. The final assessment score will be based on the overall content and presentation of the collection.

Unit IV—Identifying and Selecting Crops and Seeds
Student Handout

1. The instructor will divide the class into groups.

2. Collect and identify samples of common crop and grassland plants.

3. Classify the samples by their leaf characteristics. Classify each sample according to each of the characteristics listed below.
   - ❑ Leaf and bud arrangement
   - ❑ Venation
   - ❑ Margin
   - ❑ Leaf type
   - ❑ Leaf shape
   - ❑ Base shape
   - ❑ Tip shape

4. Assemble and present your collection as directed by the instructor.

5. You may use outside sources to help identify the crops and plants. Turn in a list of any sources you used to identify plants along with your completed collection.

6. Your final assessment score will be based on the overall content and presentation of your collection.

Advanced Crop Science

Unit IV—Identifying and Selecting Crops and Seeds
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Information and Content	Collection includes a representative sample of crop and grassland plants in which plants and leaf characteristics are correctly identified	Failed	Poor	Fair	Good	Excellent	X 17.5	
Presentation	Collection is well organized and eye-appealing	Failed	Poor	Fair	Good	Excellent	X 5	
Technical Considerations	Spelling, grammar, and punctuation are correct	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____/100 pts.

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: V. Safety, Environment, and Legal Issues

Unit Objective:

Students will demonstrate an understanding of the importance of safety and environmental and legal responsibility in agriculture by identifying and explaining a relevant current safety, environmental, or legal issue in a written report.

Show-Me Standards: 2.1, SC8

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Agricultural Safety. National Safety Council. Accessed November 11, 2003, from http://www.nsc.org/issues/agrisafe.htm.

Chemical Application Information. University of Georgia College of Agricultural and Environmental Sciences. Accessed November 11, 2003, from http://www.cpes.peachnet.edu/spray/.

Guide Sheets. University of Missouri Outreach & Extension. Accessed October 27, 2003, from http://www.fse.missouri.edu/ruralsafety/guide_sheets.htm.

National Ag Safety Database, Accessed October 27, 2003, from http://www.cdc.gov/nasd/index.html.

Pesticide Applicator Training. University of Missouri-Columbia. Accessed October 28, 2003, from http://ipm.missouri.edu/pat/index.asp.

Smart Communities Network. U. S. Department of Energy. Accessed November 11, 2003, from http://www.sustainable.doe.gov/.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 3.
- Students will complete AS 1.1, Farm Safety Survey; and AS 3.1, Legal Land Descriptions.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. V-15 (1, 2) and p. V-26 (2).

Performance-Based Assessment:

Each student will identify a current safety, environmental, or legal issue and explain how that issue affects crop producers and crop production in a written report. Students should include appropriate visual elements, such as illustrations, graphs, or charts, to make the report interesting and support the information in the report.

Assessment will be based on the overall content and presentation of the report.

Unit V—Safety, Environment, and Legal Issues
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Lead the class in a discussion to identify current safety, environmental, and legal issues in agriculture and make a list of topics on the board. Sample topics could include the following:
   - ❑ Potential dangers and necessary safeguards associated with farm equipment
   - ❑ Requirements for private and commercial pesticide applicator training
   - ❑ Effective soil management practices
   - ❑ Importance of waste management
   - ❑ Legal liabilities for mishandling chemicals

2. Have students choose a topic and explain how that issue affects crop producers and crop production in a written report.

3. Students may use material found in the unit or discussed in class as well as additional outside material to complete their report.
   a. Students may not use the source material word for word and must provide a complete bibliography of their sources along with their report.
   b. Students should include appropriate visual elements, such as illustrations, graphs, or charts, to make the report interesting and support the information in the report.

4. The final assessment score will be based on the overall content and presentation of the report.

5. ADDITIONAL ACTIVITIES:
   a. Suggest that students receive private pesticide applicator certification. Information regarding certification is available from the University of Missouri-Columbia at Pesticide Applicator Training, accessed October 28, 2003, from http://ipm.missouri.edu/pat/index.asp.
   b. Invite one or more experts to discuss specific safety, environmental, or legal issues in agriculture. Have students prepare questions for the speaker.

Unit V—Safety, Environment, and Legal Issues
Student Handout

1. Choose a current safety, environmental, or legal issue related to agriculture.

2. Explain in a written report how your chosen issue affects crop producers and crop production.

3. You may use material found in the unit or discussed in class as well as additional outside material to complete your report.

4. You may not use the source material word for word and must provide a complete bibliography of your sources along with your report.

5. Include appropriate visual elements, such as illustrations, graphs, or charts, to make the report interesting and support the information in the report.

6. Your final assessment score will be based on the overall content and presentation of your report.

Advanced Crop Science

Unit V—Safety, Environment, and Legal Issues
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Thoroughness	Information is complete; report provides a thorough overview of the topic	Failed	Poor	Fair	Good	Excellent	X 8.75	
Accuracy	Facts are accurate	Failed	Poor	Fair	Good	Excellent	X 8.75	
Presentation	Report is clear and well organized	Failed	Poor	Fair	Good	Excellent	X 2.5	
Supporting Materials	Supporting materials emphasize key points	Failed	Poor	Fair	Good	Excellent	X 2.5	
Technical Considerations	Spelling, grammar, and punctuation are correct	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: VI. Corn and Grain Sorghum Production

Unit Objective:

Students will demonstrate an understanding of basic principles of corn and grain sorghum production by explaining, in an oral report, a key aspect of production and developing five questions about their topic that can be used for a class review.

Show-Me Standards: 2.1, SC8

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Crops. *Missouri Farm Facts*. Accessed October 28, 2003, from http://agebb.missouri.edu/mass/farmfact/crops/index.htm.

Crops Publications. MU Extension. University of Missouri-Columbia. Accessed October 28, 2003 from http://muextension.missouri.edu/explore/agguides/crops/index.htm.

Missouri Corn Online. Missouri Corn Growers Association. Accessed October 28, 2003, from http://www.mocorn.org/.

National Corn Growers Association. Accessed October 28, 2003, from http://www.ncga.com/.

National Grain Sorghum Producers. Accessed November 11, 2003, from http://www.sorghumgrowers.com/.

University of Missouri Grain Sorghum Production Page. Accessed October 28, 2003, from http://www.psu.missouri.edu/cropsys/Grain_Sorghum/.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 8.
- Students will complete AS 1.1, Ingredients for a Successful Crop of Corn; AS 2.1, Identifying Corn and Sorghum Diseases; AS 3.1, Figuring Corn Populations and Costs; AS 4.1, Corn and Grain Sorghum Pests; AS 5.1, Determining Replanting Costs and Returns; AS 6.1, Measuring Harvest Losses; AS 7.1, Determining Storage Break-Even Costs; and AS 8.1, Determining Crop Costs and Returns.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. VI-5, p. VI-20, p. VI-45, and pp. VI-91–VI-92 (1, 2).

Performance-Based Assessment:

Students will be divided into groups. Each group will develop an oral report that explains a key aspect of corn and grain sorghum production, such as selecting a planting method or harvesting the crop. Each group will also develop five questions about its assigned topic that can be used by the instructor for a class review. Presentations should be from 5 to 15 minutes long and include appropriate supporting material, such as illustrations, tables, or charts.

Assessment will be based on the overall content and presentation of the report and the review questions.

Unit VI—Corn and Grain Sorghum Production
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Divide the class into groups and assign each group a key aspect of corn and grain sorghum production discussed in the unit. Choose topics from those listed below, which correspond to the lessons in the unit.
   - ❑ Planning the crop
   - ❑ Selecting a variety
   - ❑ Selecting a tillage and planning method
   - ❑ Selecting a pest control program
   - ❑ Scouting and maintaining the crop
   - ❑ Harvesting the crop
   - ❑ Marketing the crop
   - ❑ Figuring crop costs

2. Have each group develop an oral report about its topic and give the report to the class. Reports should be from 5 to 15 minutes long.

3. Have the groups write five questions and answers based on the material they present in their report.
   a. Questions should be short answer or multiple choice.
   b. Students should turn in their questions and answers following their report.

4. Have students incorporate other elements, such as illustrations, and make use of presentation software or other equipment or material as needed to make the report interesting and informative.

5. Students may use material found in the unit or discussed in class as well as additional outside material to complete their report.

6. Students may not use the source material word for word and must provide a complete bibliography of their sources following their report.

7. Students should be prepared to answer questions about their topic.

8. Guide or correct the students' presentations, if needed.

9. Following the reports, read through the students' questions and answers about their topic and check them for accuracy.

10. Use some or all of the questions for a class review of corn and grain sorghum production.

11. The final assessment score will be based on the overall content and presentation of the report and the review questions.

12. ADDITIONAL ACTIVITIES:
    a. Lead a discussion about nontraditional uses for products and by-products of corn and grain sorghum production. Have students provide examples and write the examples on a poster. Each day challenge the students to think of additional products and applications to add to the poster.
    b. Have students identify a nontraditional use for a product or by-product of corn or grain sorghum production and briefly explain it to the class. Students could work independently or in small groups.

Unit VI—Corn and Grain Sorghum Production
Student Handout

1. The instructor will divide the class into groups and assign each group a topic related to corn and grain sorghum production.

2. Develop an oral report that explains the key factors and considerations concerning your topic. Reports should be from 5 to 15 minutes long.

3. Write five questions and answers based on the material in your report.
   a. Questions should be short answer or multiple choice.
   b. You will turn in your questions following your report.

4. Include other elements, such as illustrations, and make use of presentation software or other equipment or material as needed to make your report interesting and informative.

5. You may use material found in the unit or discussed in class as well as additional outside material to complete your report.

6. You may not use the source material word for word and must provide the instructor with a complete bibliography of your sources following your report.

7. Present your report to the class. Be prepared to answer questions from the instructor and your classmates about your topic.

8. Your final assessment score will be based on the content and presentation of your report and the questions you wrote about your topic.

Advanced Crop Science

Unit VI—Corn and Grain Sorghum Production
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Information and Content of Report	❑ Information is complete ❑ Facts are accurate ❑ Report gives a thorough overview of the topic ❑ Includes five review questions and correct answers	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 17.5	
Presentation of Report	❑ Well organized ❑ Uses correct grammar ❑ Good use of supporting material ❑ Needs little or no prompting from the instructor	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 5	
Delivery of Report	❑ Holds audience interest ❑ Speaks clearly ❑ Maintains good posture ❑ Maintains eye contact	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 2.5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: VII. Soybean Production

Unit Objective:

Students will demonstrate an understanding of basic principles of soybean production by comparing and contrasting the management decisions applied by regional soybean producers and presenting their findings in an oral report.

Show-Me Standards: 2.1, CA6

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Missouri Soybean Association. Accessed October 30, 2003, from http://www.mosoy.org/MSA/msa.htm.

Soybeans. Missouri Farm Facts. Accessed October 30, 2003, from http://agebb.missouri.edu/mass/farmfact/crops/soybean/index.htm.

Soybeans. MU Extension. University of Missouri-Columbia. Accessed October 30, 2003, from http://muextension.missouri.edu/explore/agguides/crops/#Soybeans.

United Soybean Board. Accessed November 11, 2003, from http://www.unitedsoybean.org/.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 8.
- Students will complete AS 2.1, Selecting a Seed Variety; AS 2.2, Identify Soybean Diseases; AS 3.1, Determining Planting Rates; AS 4.1, Matching Herbicides to Specific Weeds; AS 5.1, Soybean Replant Worksheet; AS 6.1, Measuring Harvest Loss; AS 7.1, Figuring Soybean Returns; and AS 8.1, Determining Soybean Costs.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. VII-27, p. VII-37, p. VII-59, and p. VII-71.

Performance-Based Assessment:

Students will work in groups to compare and contrast the management decisions applied by soybean producers in their area. Each group will interview a different soybean producer to learn about the operation and management techniques the producer prefers and why. Following the interviews, groups will be paired to compare and contrast their findings. The groups will present their findings to the class in an oral report.

Assessment will be based on the overall content and presentation of the report.

Unit VII—Soybean Production
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Prior to assigning the performance-based assessment activity, contact soybean producers in the area and develop a list of producers willing to be interviewed by students. NOTE: It is preferable to have more producers, rather than fewer, if possible, because this will provide more opportunity for varied management styles and will help ensure a sufficient number of producers in case any must later cancel the interview. If possible, contact producers whose operations reflect the diversified uses of soybeans.

2. Divide the class into an even number of groups and assign each group one of the soybean producers to interview. If preferred, arrange for telephone interviews with the producers or have them attend class for a panel discussion.

3. Lead students in a discussion to establish key topics and develop a uniform interview questionnaire. A uniform questionnaire is important because students will be comparing and contrasting information they collect. Sample questions might include the following:
   - ❑ How did you get started working with soybeans?
   - ❑ What planting method do you use and why do you prefer this method?
   - ❑ What weeds represent the biggest threat to your crop and how do you control them?
   - ❑ What crops do you rotate with your soybeans?
   - ❑ What is the biggest challenge you face in your operation?
   - ❑ What do you foresee for the future of your operation?
   - ❑ What advice would you give to someone who is considering a career in soybean production?

4. Have the students interview their assigned producer about his or her soybean operation and management techniques.

5. Following the interviews, pair up groups to discuss how the two operations are similar and different. Each group will present its findings to the class in an oral report.

a. Explain that the pairs of groups should discuss their presentations so that their reports work together to provide a clear and thorough picture of the two operations rather than presenting the same information.
b. Students should be prepared to answer questions about their reports.

6. The final assessment score will be based on the overall content and presentation of the report.

7. ADDITIONAL ACTIVITIES:
   a. Lead a discussion about non-traditional uses for products and by-products of soybean production. Have students provide examples and write the examples on a poster. Each day challenge the students to think of additional products and applications to add to the poster.
   b. Have students identify a non-traditional use for a product or by-product of soybean production and briefly explain it to the class. Students could work independently or in small groups.

Unit VII—Soybean Production
Student Handout

1. The instructor will divide the class into groups and provide each group with the name of a soybean producer.

2. Your group will interview the producer about his or her soybean operation and management techniques.

3. Following the interviews, your group will meet with another group to discuss how the two operations are similar and different.

4. Present your findings to the class in an oral report. Remember that your group's report should work with the other group's report to provide a clear and thorough picture of the two operations rather than present the same information.

5. Be prepared to answer questions from your instructor and classmates regarding your report.

6. Your final assessment score will be based on the content and presentation of your report.

Advanced Crop Science

Unit VII—Soybean Production
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Information and Content of Report	❑ Addresses all key topics and questionnaire questions ❑ Information is complete ❑ Facts are accurate ❑ Report works well with other group's report and does not present the same information	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 20	
Presentation of Report	❑ Well organized ❑ Engages listeners ❑ Speaks clearly and uses correct grammar ❑ Maintains good posture and eye contact	0 criteria met	1 criterion met	2 criteria met	3 criteria met	All 4 criteria met	X 5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: VIII. Wheat and Small Grain Production

Unit Objective:

Students will apply basic principles of wheat and small grain production by devising a calendar that follows a variety of wheat or small grain from field preparation through marketing.

Show-Me Standards: 1.8, SC8

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Grains. MU Extension. University of Missouri-Columbia. Accessed October 31, 2003, from http://muextension.missouri.edu/explore/agguides/crops/#Grains.

Small Grains. Minnesota Association of Wheat Growers. Accessed November 11, 2003, from http://www.smallgrains.org/.

University of Missouri Small Grain Production Page. Accessed October 31, 2003, from http://www.psu.missouri.edu/cropsys/Wheat/.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 8.
- Students will complete AS 2.3, Wheat and Small Grain Diseases; AS 3.1, Making Planting Decisions; AS 5.1, Determining the Corrective Action; and AS 6.1, Determining Grain Loss and Moisture.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. VIII-5 (1) and p. VIII-20.

Performance-Based Assessment:

The instructor will randomly assign each student a variety of wheat or small grain discussed in the unit. Students will devise a calendar that follows their assigned grain from the planning stages through marketing. The calendar should include the appropriate time and a brief description of the student's management strategy for each of the following: planning the crop, tillage and planting method, pest control, scouting and maintenance, harvesting, marketing, and figuring costs. Students will present their calendar on a poster or in another format, as determined by the instructor.

Assessment will be based on the overall content and presentation of the production calendar.

Unit VIII—Wheat and Small Grain Production
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Randomly assign each student a variety of wheat or small grain discussed in the unit. If preferred, divide students into groups and assign each group a type of wheat or small grain.

2. Have students design a yearlong calendar that follows their assigned grain from the planning stages through marketing. The calendar should include the appropriate time and a brief description of the student's management strategy for each of the following:
   - ❑ Planning the crop
   - ❑ Tillage and planting method
   - ❑ Pest control
   - ❑ Scouting and maintenance
   - ❑ Harvesting
   - ❑ Marketing
   - ❑ Figuring costs

3. Have students present their calendar on a poster, which will be displayed in class. If preferred, have students make their calendar using presentation software. Tell students what format is preferable. Adjust the student handout and scoring guide accordingly as needed.

4. Have students incorporate other elements, such as illustrations, as needed to make their calendar interesting and informative.

5. Students may use material found in the unit or discussed in class as well as additional outside material to complete their calendar.

6. Students may not use the source material word for word and must provide a complete bibliography of their sources along with their calendar.

7. Display completed posters in class.

8. The final assessment score will be based on the overall content and presentation of the production calendar.

Unit VIII—Wheat and Small Grain Production
Student Handout

1. The instructor will assign you a variety of wheat or small grain.

2. Design a yearlong calendar that follows your assigned grain from the planning stages through marketing. The calendar should include the appropriate time and a brief description of your management strategy for each of the following:
   - ❑ Planning the crop
   - ❑ Tillage and planting method
   - ❑ Pest control
   - ❑ Scouting and maintenance
   - ❑ Harvesting
   - ❑ Marketing
   - ❑ Figuring costs

3. Present your calendar as directed by the instructor.

4. Include other elements, such as illustrations, as needed to make your calendar interesting and informative.

5. You may use material found in the unit or discussed in class as well as additional outside material to complete your calendar.

6. You may not use the source material word for word and must provide the instructor with a complete bibliography of your sources along with your calendar.

7. Your final assessment score will be based on the overall content and presentation of your production calendar.

Advanced Crop Science

Unit VIII—Wheat and Small Grain Production
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Thoroughness	Calendar addresses all key topics and provides a thorough overview of crop production from planning through marketing	Failed	Poor	Fair	Good	Excellent	X 10	
Accuracy	Information is accurate	Failed	Poor	Fair	Good	Excellent	X 7.5	
Presentation	Calendar is well organized and eye-appealing	Failed	Poor	Fair	Good	Excellent	X 5	
Technical Considerations	Spelling, grammar, and punctuation are correct	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: IX. Forage Production

Unit Objective:

Students will demonstrate an understanding of forage production by collecting and identifying common forage crops and their seeds and assembling their samples in a binder or other format.

Show-Me Standards: 1.3, SC7

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Crop and Grassland Plant Identification Manual. University of Missouri-Columbia, Instructional Materials Laboratory, 1997.

Forage Information System. Accessed November 11, 2003, from http://forages.oregonstate.edu/default.cfm.

Forages. MU Extension. University of Missouri-Columbia. Accessed November 3, 2003, from http://muextension.missouri.edu/explore/agguides/crops/#Forages.

Grassland Evaluation Contest Study Guide. University of Missouri-Columbia, Instructional Materials Laboratory, 1997.

Missouri CDE Handbook. Accessed March 12, 2004, from http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 8.
- Students will complete AS 1.1, Evaluating Topography and Soil for Forage Crops; AS 2.1, Identify Characteristics of Cool- and Warm-Season Grasses; and AS 6.1, Forage Seed and Plant Identification.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. IX-16 (2), p. IX-47 (2), and p. IX-76 (2).

Performance-Based Assessment:

As part of the instructional activities for this unit, students will collect and identify five common forage plants and their seeds. For the performance-based assessment activity, students should collect and identify as many additional forage plants and their seeds as they can and assemble all the samples in a binder, photo album, or other format, such as a poster. Students should further describe the forages by identifying each sample as an annual or perennial, a grass or legume, and a cool-season or warm-season crop.

Assessment will be based on the overall content and presentation of the collection.

Unit IX—Forage Production
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. As part of the instructional activities for the unit, have students complete AS 6.1, Forage Seed and Plant Identification.
   a. As part of AS 6.1, students will collect five common forage plants and their seeds. Students will mount the plants and seeds on sheets of paper and identify the plants by their common name.
   b. See AS 6.1 for additional details.

2. For the performance-based assessment activity, have students collect and identify as many additional forage plants and seeds as they can. Students should mount and label the samples in the same way as the samples for AS 6.1. NOTE: For areas where five or more forage samples would be difficult to locate, reduce the assigned number of samples for AS 6.1 and the performance-based assessment activity accordingly.

3. Have students identify each sample as an annual or perennial, a grass or legume, and a cool-season or warm-season crop.

4. Have students assemble all their samples in a binder or photo album. Students could also mount their samples on poster board, if preferred.

5. Students may use material found in the unit or discussed in class as well as additional outside material to identify their samples.

6. If students do use outside sources to help identify plants, they must turn in a list of these sources along with their project.

7. Completed projects could be displayed in class, if desired.

8. The final assessment score will be based on the overall content and presentation of the collection.

9. ADDITIONAL ACTIVITY: Have students evaluate hay samples using the format outlined in the hay judging portion of the Agronomy Career Development Event.

a. Refer to the *Missouri CDE Handbook* for guidelines regarding Career Development Events.
b. The *Missouri CDE Handbook* is available from the Missouri Department of Elementary and Secondary Education at http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.

Unit IX—Forage Production
Student Handout

1. Collect samples of common forage plants and their seeds.

2. Mount each plant and its seeds on a separate sheet of paper and write its common name on the bottom of the page. Follow the directions on AS 6.1 for preparing samples, as well as any additional directions from your instructor.

3. Identify each sample as an annual or perennial, a grass or legume, and a cool-season or warm-season crop and write this information on the sheet with the sample.

4. Assemble all your samples in a binder or photo album.

5. You may use material found in the unit or discussed in class as well as additional outside material to identify your samples.

6. Turn in a list of any sources you used to identify plants along with your completed project.

7. Your final assessment score will be based on the overall content and presentation of your collection.

Advanced Crop Science

Unit IX—Forage Production
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Thoroughness	Collection includes a representative assortment of forage crops	Failed	Poor	Fair	Good	Excellent	X 8.75	
Accuracy	Samples are correctly labeled and accurately identified as an annual or perennial, a cool-season or warm-season plant, and a grass or legume	Failed	Poor	Fair	Good	Excellent	X 8.75	
Presentation	Collection is well organized and eye-appealing	Failed	Poor	Fair	Good	Excellent	X 5	
Technical Considerations	Spelling and punctuation are correct	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: X. Cotton Production

Unit Objective:

Students will demonstrate an understanding of basic principles of cotton production by explaining, in a slide show presentation, a key aspect of cotton production in their state.

Show-Me Standards: 1.8, SS7

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

Agriculture in the Classroom. Accessed March 16, 2004, from http://www.agclassroom.org/.

Cotton. *Missouri Farm Facts*. Accessed November 5, 2003, from http://agebb.missouri.edu/mass/farmfact/crops/cotton/index.htm.

Cotton. MU Extension. University of Missouri-Columbia. Accessed November 5, 2003, from http://muextension.missouri.edu/explore/agguides/crops/#Cotton.

Crop and Plant Science Links. Agripedia. University of Kentucky College of Agriculture. Accessed March 16, 2004, from http://www.ca.uky.edu/agripedia/links/linkcrop.htm.

The World of Cotton. National Cotton Council of America. Accessed November 5, 2003, from http://www.cotton.org/econ/world/index.cfm.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 8.
- Students will complete AS 1.1, Soil Nutrients Needed by Cotton; AS 2.1, Cotton Variety Seed Selection; AS 5.1, Scouting a Crop; AS 6.1, Evaluating Harvested Cotton; and AS 7.1, Cotton Quality and Effect on Price.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. X-6, p. X-45 (1), and p. X-76.

Performance-Based Assessment:

Students will be divided into groups. Each group will develop a slide show using presentation software that explains a key aspect of cotton production in the state. Topics could include, but are not limited to, steps of production; major pests, weeds, and diseases; most commonly farmed varieties; related industries found within the state; and overall importance to the state's economy. Students will present their completed slide show to the class.

Assessment will be based on the overall content and presentation of the slide show.

Unit X—Cotton Production
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Divide the class into groups and assign each group a topic related to cotton production in the state. Topics could include, but are not limited to, the following:
   - ❑ Steps of production
   - ❑ Major pests, weeds, and diseases
   - ❑ Most commonly farmed varieties
   - ❑ Related industries found within the state
   - ❑ Overall importance to the state's economy

2. Have students develop a slide show using presentation software that illustrates and explains their assigned topic.

3. Students may use material found in the unit or discussed in class as well as additional outside material to complete their slide show.

4. Students may not use the source material word for word and must provide a complete bibliography of their sources.

5. Have students present their completed slide shows to the class.

6. The final assessment score will be based on the overall content and presentation of the slide show.

7. ADDITIONAL ACTIVITY: As a class project, plant some sample cotton seeds and have students follow the plants' growth stages over the course of the unit or longer, if desired.

Unit X—Cotton Production
Student Handout

1. The instructor will divide the class into groups and assign each group a topic related to cotton production in the state.

2. Create a slide show using presentation software that illustrates and explains your assigned topic.

3. In addition to illustrations, include charts, graphs, or other elements as needed to make your presentation interesting and informative.

4. You may use material found in the unit or discussed in class as well as additional outside material to complete your slide show.

5. You may not use the source material word for word and must provide the instructor with a complete bibliography of your sources following your presentation.

6. Present your completed slide show to the class.

7. Your final assessment score will be based on the overall content and presentation of your slide show.

Advanced Crop Science

Unit X—Cotton Production
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Information and Content	Information is complete and facts are accurate	Failed	Poor	Fair	Good	Excellent	X 8.75	
Supporting Materials	Slides—illustrations, graphs, charts, etc.—emphasize key points	Failed	Poor	Fair	Good	Excellent	X 8.75	
Presentation of Slide Show	Slide show is well organized and eye-appealing	Failed	Poor	Fair	Good	Excellent	X 5	
Delivery of Slide Show	Slide show is well delivered and holds audience interest	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____**/100 pts.**

Comments:

Advanced Crop Science

Curriculum Guide: *Advanced Crop Science*

Unit: XI. Rice Production

Unit Objective:

Students will demonstrate an understanding of basic principles of rice production by identifying and describing food and nonfood by-products and end products of rice production and presenting their findings on a poster or in a slide show presentation, as determined by the instructor.

Show-Me Standards: 1.2, SC8

References:

Advanced Crop Science. University of Missouri-Columbia, Instructional Materials Laboratory, 2000.

California Rice. California Rice Commission. Accessed November 5, 2003, from http://www.calrice.org/home.html.

National Agricultural Statistics Service. U. S. Department of Agriculture. Accessed November 5, 2003, from http://www.usda.gov/nass/.

Rice. Environmental Literacy Council. Accessed November 5, 2003, from http://www.enviroliteracy.org/article.php/573.html.

Riceweb. International Rice Research Institute. Accessed November 11, 2003, from http://www.riceweb.org/.

Students may use additional outside sources to complete this activity.

Instructional Strategies/Activities:

- Students will engage in study questions in lessons 1 through 7.
- Students will complete AS 5.1, The Harvested Crop; AS 5.2, Features of a Harvested Rice Variety; and AS 6.1, Rice Crops on the Market.
- Additional activities that relate to the unit objective can be found under the heading "Other Activities" in the following locations: p. XI-5 (3), p. XI-16 (2), pp. XI-25–XI-26 (1), p. XI-36 (2, 3), and p. XI-64 (2).

Performance-Based Assessment:

Each student will identify food and nonfood by-products and end products of rice production. For each listing, students will include a caption that provides factual information about that product or use. For example, along with a food use of rice, a student could include information about the nutritional value of rice or the amount of rice the average person consumes in a year. Students will present their findings on a poster or in a slide show presentation, as determined by the instructor.

Assessment will be based on the overall content and presentation of the poster or slide show.

Unit XI—Rice Production
Instructor Guide

The instructor should assign the performance-based assessment activity at the beginning of the unit. Students will work toward completing the activity as they progress through the unit lessons. The assessment activity will be due at the completion of the unit.

1. Have students identify as many different food and nonfood by-products and end products of rice production as they can.
   a. If desired, lead the class in finding a few examples. Guide them toward thinking broadly about rice-related products, if needed.
   b. If desired, have students include a category for potential uses that are being explored through research.

2. For each item, have students write a caption that provides factual information about that product or use. For example, along with a food use of rice, a student could include information about the nutritional value of rice or the amount of rice the average person consumes in a year.

3. Have students present their products, uses, and captions on a poster or have students use their findings to develop a slide show using presentation software. Tell students which format is preferable.

4. Have students incorporate appropriate visual elements, such as illustrations, charts, or graphs, as needed to make the poster or slide show interesting and informative.

5. Students may use material found in the unit or discussed in class as well as additional outside material to complete their poster or slide show.

6. Students may not use the source material word for word and must provide a complete bibliography of their sources along with their poster or slide show.

7. The final assessment score will be based on the overall content and presentation of the poster or slide show.

Unit XI—Rice Production
Student Handout

1. Identify as many different food and nonfood by-products and end products of rice production as you can.

2. For each item, write a caption that provides factual information about that product or use.

3. Present your products, uses, and captions on a poster or use them to make a slide show with presentation software, as directed by your instructor.

4. Include appropriate visual elements, such as illustrations, charts, or graphs, as needed to make the poster or slide show interesting and informative.

5. You may use material found in the unit or discussed in class as well as additional outside material to complete your poster or slide show.

6. You may not use the source material word for word and must provide the instructor with a complete bibliography of your sources along with your poster or slide show.

7. Your final assessment score will be based on the overall content and presentation of your poster or slide show.

Advanced Crop Science

Unit XI—Rice Production
Scoring Guide

Name _____

Assessment Area	Criteria	0 Points	1 Point	2 Points	3 Points	4 Points	Weight	Total
Thoroughness	Poster or slide show provides a thorough overview of rice-related by-products and end products	Failed	Poor	Fair	Good	Excellent	X 8.75	
Accuracy	Information is accurate	Failed	Poor	Fair	Good	Excellent	X 8.75	
Presentation	Poster or slide show is well organized and eye-appealing	Failed	Poor	Fair	Good	Excellent	X 5	
Technical Considerations	Spelling, grammar, and punctuation are correct	Failed	Poor	Fair	Good	Excellent	X 2.5	
TOTAL								

Final Assessment Total _____/100 pts.

Comments: