

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.

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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.

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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.

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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 | | | | | | | | |

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Final Assessment Total _____/100 pts.

Comments:

