

UNIT II - PLANT SCIENCE

Lesson 1: The Importance of Plants

Competency/Objective: Describe how plants affect our lives.

Study Questions

1. **What are the benefits of plants?**
2. **What are the areas of science related to plants?**
3. **What is the economic importance of plants in Missouri?**

References

1. *Exploring Agriculture in America* (Student Reference). University of Missouri-Columbia: Instructional Materials Laboratory, 2000, Unit II.
2. *Turfgrass Management - Your Field of Dreams* (Ag Video 261). Missouri Resource Center for Career & Technical Education, University of Missouri-Columbia, 1990.
3. Transparency Master
TM 1.1 Value of Leading Missouri Crops in 1998
4. Activity Sheets
AS 1.1 Soil Dessert (Instructor)
AS 1.2 Landscaping Plant Material Collection
AS 1.3 Plant Science Businesses

UNIT II - PLANT SCIENCE

Lesson 1: The Importance of Plants

TEACHING PROCEDURES

A. **Introduction**

Plants are an important part of life. Without plants, humans would not be able to breathe or eat. They also help make the environment more enjoyable. This unit on plant science is designed to provide a basic understanding of the importance of plants and the related areas of agronomy and horticulture. It will provide information about plant growth and plant care, and students will have an opportunity to care for a plant and watch it grow.

B. **Motivation**

1. Conduct AS 1.1. Introduce basic concepts (e.g., common plant names, reproduction, benefits of plants, signs of plant health, and types of soil) that will be learned during this unit.
2. Bring in a wide variety of materials from horticulture and the related sciences. Mushrooms, ferns, garden flowers, lumber samples, fruits, vegetables, grain crops, cattails, cut flowers, and peanut butter are some examples. Have the students discuss how the items are similar and how they are different. Discuss how each item is or is not important to humans.
3. Have students identify and make a list of the houseplants that are in their homes and plants that grow in their yards and gardens. They may also use relatives' or neighbors' homes. Relatives and friends are encouraged to help them identify the plants. Discuss their plant lists and what benefits the plants provide.
3. Obtain scented geraniums and have students guess the fragrance after carefully rubbing the leaves. The foliage is used in potpourris and jellies, and the oil in the leaves is often distilled for perfume making.
4. Students will care for the plants each day that they grew earlier in the course.

C. **Assignment**

D. **Supervised Study**

E. **Discussion**

Q1. What are the benefits of plants?

A1.

- a) **Biological benefits**
 - 1) **Convert carbon dioxide to oxygen**
 - 2) **Provide food**
- b) **Physical benefits**
 - 1) **Provide materials for shelter**
 - 2) **Provide materials for clothing**
 - 3) **Provide shade, cooling, and wind control**
 - 4) **Reduce wind and water erosion**

- 5) **Provide energy sources**
- 6) **Provide habitat for wildlife**
- c) **Emotional benefits**
 - 1) **Provide beauty from landscapes and individual specimens**
 - 2) **Provide an enjoyable hobby**
 - 3) **Provide a relaxing effect**

Bring in several items made from plants that are important to people. Examples might include peanut butter, cotton clothing, a board, firewood, vegetables, fruits, and a blooming flower. Ask students why each item is important.

Q2. What are the areas of science related to plants?

A2.

- a) **Botany is the science of plants: anatomy, ecology, pathology, physiology, and taxonomy.**
- b) **Horticulture includes producing, processing, and marketing of fruits, vegetables, flowers, ornamental shrubs, and trees; nursery and landscaping; and turf management.**
- c) **Agronomy is the study of field crops and soil management.**
- d) **Forestry is the science of managing trees for lumber, paper, and other wood products.**

Bring in samples of plants that fall into these areas and discuss which area of plant science they belong in. Some examples might include algae or plankton for botany; field corn, cotton, or hay for agronomy; a walnut or redwood board to represent forestry; and examples of fruits, vegetables, and ornamental plants for horticulture. Assign AS 1.2 for students to complete by themselves or in teams. The fall quarter is an excellent time for this activity.

Q3. What is the economic importance of plants in Missouri?

A3. The value of plants in Missouri in 1998 was approximately \$3 billion.

Show TM 1.1 and ask students how they are personally affected by the various amounts of money represented in this chart. Is their life enriched in any way? What advantages do they enjoy? Are any members of their family affected by the plants in Missouri? Several businesses are derived from the economic importance of plants as seen in AS 1.3.

F. *Other Activities*

- 1. Have people from plant industries talk to the class.
- 2. Make a bulletin board with examples of how people benefit from plants or with pictures of different plant science careers.
- 3. Take a field trip to a floral shop, greenhouse, nursery, orchard, agronomy research facility or park.
- 4. Have students make a bud vase or small flower arrangement.

G. *Conclusion*

Plants are essential for humans to breathe and eat. Plants make life more comfortable because they provide shelter, clothing, and shade. Plants also make our world more pleasant through their beauty. Botany, horticulture, agronomy, and forestry are all related plant sciences. The

value of plants produced in Missouri in 1998 was approximately \$3 billion, which would make the Fortune 500 list.

H. ***Answers to Activity Sheets***

The instructor should determine if answers to all activity sheets are appropriate.

I. ***Evaluation***

A unit test is provided at the end of this unit. If a lesson quiz is needed, use questions pertaining to this lesson from the unit test.

Value of Leading Missouri Crops in 1998

Crop	Approximate Value (Millions of Dollars)
Soybeans	857
Corn	550
Hay	533
Winter wheat	137
Cotton	119
Rice	64
Grain sorghum	46
Floriculture	44
Tobacco	11
Potatoes	10
Watermelons	6
Apples	5
Peaches	4
Grapes	1
Oats	1

Major Areas of Floriculture Production by Commercial Growers

Item	Wholesale Value (Millions of Dollars)
Bedding plants (flats) & baskets	21
Indoor/patio plants	11
Cut flowers	.6

Reference: *Missouri Farm Facts 1999*

Soil Dessert

Objective: Students will become aware of some basic plant science concepts.

Materials and Equipment:

Ingredients for soil dessert recipe (see below)

One houseplant
One medium flowerpot
Plastic wrap
Bowls
Plates and spoons
Serving utensils

Soil dessert recipe

24 oz. chocolate sandwich cookies (such as Oreos)
1 cup powdered sugar
8 oz. cream cheese
Two 3-oz. boxes instant chocolate pudding
2 cups milk
One 12-oz. container whipped topping (such as Cool Whip)
1 package gummy worms candy

Procedure:

Note: This activity is to be used as an interest approach and an introduction to basic concepts about soil and plants. Depending on the portion and number of students, a bigger batch of soil dessert may have to be made.

1. Complete steps 2 through 9 below before class begins.
2. Crush cookies (mixture one) and set aside.
3. Mix powdered sugar and cream cheese (mixture two) and set aside.
4. Mix instant chocolate pudding and milk, then blend with whipped topping (mixture three).
5. Layer the three mixtures in numerical order in the flowerpot, saving some crushed cookies (mixture one) to sprinkle on top.
6. Place gummy worms into the dessert.
7. Chill in a refrigerator for approximately three hours.
8. Put plastic wrap around the root system of the houseplant. The roots may have to be pruned. Put the houseplant in the soil dessert in the flowerpot.
9. Keep the rest of the mixtures in the refrigerator until needed.
10. Use the houseplant as an interest approach to begin the lesson. Place the houseplant on a table at the front of the classroom. Ask students the key questions below to assess their prior knowledge of some basic plant science concepts.

- a. What type of plant is it? What are some names of other common houseplants?
 - b. How does it reproduce? Could you cut off part of the plant and make a new one? (Actually do this, especially if it is a plant that can asexually reproduce.)
 - c. What does the plant provide us?
 - d. Is it a healthy plant? (You may want to select an unhealthy plant.) How can you tell and what do you look for?
 - e. What is in the potting mix or soil? Does the type of soil have an effect on the plant?
11. Finally, surprise the students by asking them if they would like a closer look at the soil. Serve them some soil.

Lesson 1: The Importance of Plants

Name _____

Landscaping Plant Material Collection**Objective:** Students will press, mount, and identify plants.**Directions:** Collect, press, mount and correctly identify 12 plants from the list below. Your sample should be representative so a positive identification can be made. Be sure to include stems, leaves, flowers, and seeds as appropriate.**Materials and Equipment:**

Cardboard
 Newspaper or paper
 Heavy objects like books or bricks
 Clear contact paper

Procedure:

1. Immediately after collecting your sample, place it between a newspaper or other paper and then place it between some cardboard.
2. Place the cardboard, containing the sample, between or under books, bricks, or other heavy objects. The purpose of pressing the plant is to remove moisture and make a more representative sample.
3. Leave the plant in the press for 2 or 3 days.
4. Take the sample out of the press and cover it with clear contact paper.
4. Label the plant by common name and include a picture and description from the publication* provided by your instructor.
5. Organize your collection by making a cover. Decide how to arrange the plants in the collection and put in a notebook, binder, ring, etc.

This major assignment is due on _____.

The collection is worth a total of 29 points with each plant worth 2 points. Neatness in labeling and applying contact paper, cover design, and organization will be worth 5 of the points. Up to 5 extra credit points can be earned by collecting more than 12 plants from the list or other plants found in the publication.

- | | | |
|--|---------------------------------------|--|
| <input type="checkbox"/> Arborvitae | <input type="checkbox"/> Ginkgo | <input type="checkbox"/> Oak |
| <input type="checkbox"/> Ash, White | <input type="checkbox"/> Honey Locust | <input type="checkbox"/> Pine |
| <input type="checkbox"/> Barberry | <input type="checkbox"/> Juniper | <input type="checkbox"/> Spruce |
| <input type="checkbox"/> Birch | <input type="checkbox"/> Linden | <input type="checkbox"/> Winged Euonymus |
| <input type="checkbox"/> Dogwood | <input type="checkbox"/> Maple | <input type="checkbox"/> Yew |
| <input type="checkbox"/> Flowering Crabapple | | |

*Suggested publication: *Effective Landscaping*, Missouri Landscape and Nursery Association, 23750 State Route V, Clarksdale, MO 64430, 816-233-1481

Lesson 1: The Importance of Plants

Name _____

Plant Science Businesses**Objective:** Students will be able to identify plant science businesses in the community.**Directions:** Using a phone book, list the names of plant science businesses that are examples of the following categories.

- | | |
|---|--------------------------------|
| 1. Nursery | 6. Lawn Management |
| a. | a. |
| b. | b. |
| 2. Floral Designer | 7. Tree Specialist or Arborist |
| a. | a. |
| b. | b. |
| 3. Landscape Designer or Landscape Artist | 8. Seed Store |
| a. | a. |
| b. | b. |
| 4. Greenhouse | 9. Agronomist/Research |
| a. | a. |
| b. | b. |
| 5. Golf Course | |
| a. | |
| b. | |

