

BOTANY, PLANT PHYSIOLOGY AND PLANT GROWTH

Lesson 5: PLANT PARTS AND FUNCTIONS

Roots

PART 3

I. LESSON DESCRIPTION

Lesson Synopsis: Students attend a presentation on plant roots then participate in classroom team activity to quiz their knowledge of roots. *Estimated time requirement for this lesson is 40 minutes.*

Curriculum Standards: Minnesota Academic Standards in Science, Minnesota Department of Education, 5-24-10, Grades 9-12:

- 9.4.1.2.4 “Explain the function and importance of cell organelles for prokaryotic and/or eukaryotic cells as related to the basic cell processes of respiration, photosynthesis, protein synthesis and cell reproduction.”

National Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards, National Council for Agricultural Education, 2009:

- Natural Resource Systems (NRS):
 - NRS.01.02.01.a. Describe morphological characteristics used to identify trees and other woody plants.
- Plant Systems (PS):
 - PS.01.02.02.a. Identify the components, the types and the functions of plant roots.

Roots anchor the plant as well as provide water and nutrients.

Student Learning Objectives: After this class students will be able to:

- (1) Name three functions of roots.
- (2) Describe the functions of the root for the plant.

Instructional Methods: Informal Lecture, Cooperative Learning Activity

II. LESSON PLAN

Introduction

Legend:

Text in normal face - Represents teacher's words.

Text in italic face - Represents suggestions for the teacher.

Interest Approach:

- Draw on the chalkboard or whiteboard: "Roots".*
- QUESTION: Can you please give me some specific examples of roots - examples that are important to everyday life for food, clothing, and so forth? First, what are some examples of roots?
- STUDENT RESPONSE: *(Correct answers can include carrots, sweet potatoes, and radishes.)*
- QUESTION: Remember that white potatoes and onions are composed of stem tissue, not roots.

Learning Objectives:

- After attending this class, you will be able to:
 - (1) Name three functions of roots
 - (2) Name the parts of a root

Relevancy:

- Now let's learn some basic anatomy and physiology of roots.

Body

Lecture: 20 minutes estimated

- Present the PowerPoint file 05_Roots_PowerPoint.ppt, according to the narration script file, 05_Roots_PowerScript.doc.*

Cooperative Learning Activity: 30 minutes estimated

- Divide the class into teams of about 6 students each.*
- Distribute the handout, "05_Roots_Task.doc".*
- Now let's practice some of the principles we've learned.
- PART ONE - ROOTS: First, I want you to assess your understanding of roots. In your team discuss the possible answers for this challenge in Part One of your handout. You have a list of three words in each row, but only one word relates to roots. In the blank, enter the first letter of the correct response. You have 10 minutes to produce a team consensus.

Summary:

With the new knowledge and skills, you developed, you can:

- (1) Understand the hidden workings of a healthy root system,

We've completed the series of root functions.

EXTENSIONS

- If the school has a garden or greenhouse, then you can schedule some field time making further observations regarding roots.
- If a plant in your yard or a student's yard has recently succumbed, consider performing an autopsy. Dig up the plant and wash off all the soil, then examine the root system; perhaps you'll even learn what killed the plant.

05_Roots_LessonPlan.doc