

EDCI 786 “Topics/Science Research in the Classroom” Instructional Unit Outline

Participant Name: Gary Pinkall

Project Title: Identifying Mycorrhizae in the school yard.

Instructional Overview and Timeline:

1. The unit will begin with a discussion/ activity to identify different types of fungi. We will play a game where students try to identify which item listed does not belong with the other two in the group. As the game is played, students begin to learn that two of the items are fungi or related in some way to fungi, and one is not. This game will introduce students to examples of fungi. A discussion of fungi will follow the game.

2. We will do activities to learn about relevant vocabulary: Symbiosis, Mutualism, Parasitism, Fungi, Mycorrhizae. This will be done by playing a card game adapted from the **Project Wild** activity book called “Good Buddies”. The game begins with a card handed out to each student. They must then find their “Buddy” who has a card that identifies an organism that shares a symbiotic relationship with their card. The buddy groups then research and share with the class “Why do these organisms live together?”, “What advantages and disadvantages do they provide each other?”, and “What would happen if one of them was not here?”. From these presentations, the class will make a list of and definition for, Mutualism, Parasitism, and Commensalism.

3. I will share/ show information about the historical work on Mycorrhizae by A.B. Frank.

4. Students will collect root samples of Pine trees on the school grounds and sort to identify mycorrhizae. Once the mycorrhizae are identified, students match their mycorrhizae to an image of the same mycorrhizae provided by the teacher. Once matched, they will copy and paste the genetic sequence of the mycorrhizae provided with the image into the NCBI website and search for a genetic match. Once the match is found, this will identify the type of mycorrhizae.

Purpose:

To identify Mycorrhizae from pine trees on the school grounds.

Grade Level(s): Middle School up to High School

Student Learning Outcomes (Instructional Objectives):

1. Students will identify examples of organism from the Kingdom Fungi
2. Students will identify examples of Symbiotic relationships, Mutualism, Parasitism, and Commensalism.
3. Students will learn why mycorrhizae are beneficial to plants.
4. Students will collect and identify examples of Miccorhizae from pine trees on school grounds.
5. Students use genetic sequences to identify types of mycorrhizae.

Pertinent Sections of Science Standards:

SCIENCE AS INQUIRY – The student will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.

Benchmark 1: The student will demonstrate abilities necessary to do the processes of scientific inquiry.

Benchmark 2: The student will apply different kinds of investigations to different kinds of questions.

LIFE SCIENCE – The student will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.

Benchmark 1: The student will model structures of organisms and relate functions to the structures.

Benchmark 4: The student will identify and relate interactions of populations of organisms within an ecosystem.

Plan for Implementation:

This activity will be done with my 7th grade General Science classes.

Unit Assessment:

1. I will use a performance assessment based on student sample collections of mycorrhizae and sequence matching.
2. A formal assessment will be based on factual information presented such as examples of fungi, vocabulary words, and historical work of A.B. Frank.
3. Students will be given a subjective assessment of ideas they have on how information from this research could be used.

Extentions:

Reproduction of Fungi

Classification

Allergies

Diseases

Decomposition/Food Chains

Ethics

Resources (Print and Websites)

Project Wild activity book, “Good Buddies”.

National Center for Biotechnology Information website: <http://www.ncbi.nlm.nih.gov/>

Micorrhizae images and sequences provided by Dr. Ari Jumponen, KSU