

Biology

Ecology

Subject Area: Biology

Grade Levels: 9th and 10th

Date: August 1, 2012

Lesson Overview

The students will demonstrate comprehension of the relationship of abiotic and biotic factors by presenting a Poster, Power Point or Brochure Presentation to the class of how Maintaining Landscaping businesses benefit our environment.

Materials Included in this Lesson

Other Materials for this Lesson

- Computer Lab
- Research internet
- Pictures
- Power Point Program
- PGHS Campus

- Notebook, Biology Book
- Brochure Paper, Pens, Pencils, Poster Paper, Glue, Scissors, Ruler

Skills the Student will Learn

Student Deliverables

- Knowledge of how water, carbon, and nitrogen are necessary for life to exist
- To understand about photosynthesis and nitrogen fixation

- Brochure Presentation (3-fold-81/2x11)
- Poster Presentation (18x24 or bigger)
- Power Point Presentation (10 slides)

Length of Lesson: 3 Days

Activity Day One/Day Two

1. Questions – Abiotic vs biotic factors in the landscape. What are abiotic and biotic factors? How do landscape companies impact the environment in regards to photosynthesis and nitrogen fixation? What are the benefits of water, carbon and nitrogen to the landscape?
2. Students will explore practices such as: Sustainable use of natural resources, potential habitat areas, restoration of habitats, natural resources, preserving habitats, protection of species for plants and animals.
3. Students will research information about maintenance Landscape businesses that have an impact on the environment.
4. Construct Poster, Power Point, or Brochure Presentations

Activity Day Three

1. Presentations will be given in class
2. Students will be selected based on the quality of presentation to present December 6th.

Enrichment Suggestions

Enrichment suggestions are to go on a fieldtrip to PGHS landscaping or one of the landscape sites of Amundson and Singh Landscape Inc. to see how the landscaping practices effect the environment. Another enrichment activity would be to have a guest speaker from one of the sites such as a Master Gardener come speak to the

class. In addition to this the top two students who present in the class could be invited to present their Poster, Power Point, , or Brochure Presentation at the Externship Dinner December 6th at SCOE.

Student Resources

(www.aslandscape.net), Online searches, Biology Text, Lecture notes, worksheets

Foundation Academic Standards

6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:

a. Students know biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.

b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.

d. Students know how water, carbon, and nitrogen cycle between abiotic resources and organic mater in the ecosystem and how oxygen cycles through photosynthesis and respiration.

CTE Pathway Standards

1. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:

a. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.

d. Formulate explanations by using logic and evidence.

2. Communications-Students understand the principles of effective oral, written, and multimedia communication in a variety of formats and contexts

Lesson Plan Relevance To Externship

Amundson and Singh Landscape Inc. uses many different practices to conserve natural resources create, restore and preserve the plants and animals in the human environment. The students will explore the processes and practices in biology in real business.

Rubric for the Ecology Project

Student Deliverables

4

Exceeds

Expectations

3

Meets

Expectations

2

Approaches Expectations

1

Fails to meet Expectations

Research/ Group work

- Works well together, not distracted, well focused, excellent teamwork, communication and ability to follow directions.
- Works well together most of the time, some distractions, moderate teamwork, and follow most directions.
- Needs improvement in working together, not getting distracted, and did not listen to directions.
- Fails to work productively, or to communicate well, or to collect evidence/ research for their topic.

Poster/Power Point/ Brochure

- Excellent demonstration of Abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon and nitrogen to the landscape.
- Good demonstration of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon and nitrogen to the landscape.
- Needs Improvement of demonstration of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon and nitrogen to the landscape.
- Fails to meet any demonstration of competence or knowledge of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon and nitrogen in their Project.

Presentation

- Well spoken, uses appropriate vocabulary that demonstrates comprehension of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon, and nitrogen to the landscape.
- Good Use of appropriate vocabulary that demonstrates some comprehension of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon, and nitrogen to the landscape.
- Some Use of appropriate vocabulary that demonstrates comprehension of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon, and nitrogen to the landscape.
- Fails to demonstrate knowledge of vocabulary or concepts of abiotic and biotic factors within a landscape, the process of photosynthesis and nitrogen fixation, the benefits of water, carbon, and nitrogen to the landscape.

Ecology Rubric

- Must have a least 10 slides
- Must have a least 4 pictures
- Must have work sited
- Show the project-maintenance landscaping
- Show how the business-maintenance of landscaping benefitted the environment
- Email me if you want the opportunity to present your presentation at the dinner