

Course Syllabus

Title

Ecosystems and Human Impact

Target Audience

This course is intended for pre-service and in-service teachers of life science in grades K-4.

Prerequisites

To successfully participate and complete the assignments in this course, the learner must:

- Be familiar with taking an online course or have completed the PBS “Practice Learning Online with TeacherLine” course.
- Have some experience in grades K-12 classrooms.
- Have an interest in life sciences.

Course Description

This course focuses on three elements: content knowledge, inquiry and other teaching strategies, and use of multimedia and visualization tools in teaching and learning about ecosystems and human impact. Ecosystems and Human Impact examines the complex interactions of living and nonliving things that comprise an ecosystem and provides a context for understanding the nature of human impact on ecosystems. Through the readings, videos, discussions, assignments, and other interactive experiences, learners in this course will have multiple opportunities to develop content knowledge about interactions of organisms and human impact on the environment. Learners will experience a rich multimedia, inquiry-based learning environment as their students ideally would in their own classrooms. The course provides effective teaching methodologies, strategies and tools that can be used when teaching life science concepts.

Instructor/Facilitator

See instructor/facilitator sheet.

Credits

To be determined by college or university.

Course Goals

As a result of participating in this course learners will:

- Identify the components of an ecosystem;
- Understand that plants and animals are as important as the physical environment of the ecosystems in which they live;
- Explore the variety of ways in which organisms can interact;
- Understand that certain aspects of the natural environment are critical to the survival of all species;
- Understand that human-caused environmental changes can be beneficial or detrimental; and
- Explore effective questioning and discussion strategies for the classroom.

Outline of Content and Assignments

Learners in this course are expected to participate in discussions and complete assignments. Learners are also expected to keep a personal notebook (which is not assessed) to keep notes, complete exercises and record reflections about their learning experiences in this course.

Discussion Activities

- **Essential Question** – Each session includes a discussion about an essential question and teaching and learning issues related to this question. Learners post responses to questions posed in the course and respond to posts submitted by their colleagues.

Assignments - Learners are expected to submit assignments. Rubrics are provided for assessment of all assignments, and the course content includes assignment samples.

Assignments in this course include:

- **Questions: Compare Your Answer** - Learner's written responses to a question are compared to answers written by experts in the field.
- **Writing Assignments** - Short writing assignments (essays) are submitted to the facilitator.

Required Readings

- "What Is Fertilizer and Why Do Plants Need It?"
- "Complex Relations"
- "Ecosystems"
- "Teaching About Ecosystems"
- "Sea Life is Troubled by Noise"
- "Fish Creek"
- "Alaska's Cold Desert"

SESSION 1: INTERACTIONS OF ORGANISMS

Objectives - After completing this session, learners will be able to:

- Define an ecosystem.
- Provide examples of the various ways organisms interact with one other.
- Construct a food chain that shows how energy is lost as it moves from one organism to another.
- Construct a food web that shows how various forms of life are interconnected.
- Provide examples of how organisms interact with nonliving things such as air, water, and sunlight.
- Describe the effects of change in ecosystems, recognizing that all organisms cause changes in their environments and that these changes can be beneficial or detrimental to the organisms themselves and to other organisms.
- Use a range of effective questioning strategies.

Using an inquiry-based approach, the session is divided into the following sections: Invitation, Exploration, Explanation, Application and Putting It into Practice. The **Essential Question** for this session is: **What is an ecosystem, and how are the organisms in it interdependent?**

Activities in this session delve into the connections among living things and their environments— in particular, the relationship between food chains and energy sources, predator-prey relationships, food and ecosystems, and the interconnection between living and non-living things.

Assignments in this session require learners to describe relationships within an ecosystem and recognize the impact of nonliving elements of an ecosystem on its inhabitants.

Discussions in this session focus on finding solutions for the essential question for this session.

Learners will record notes and reflections in their personal notebook about different concepts, methods, activities and ideas presented throughout the session.

SESSION 2: HUMAN IMPACT ON THE ENVIRONMENT

Objectives - After completing this session, learners will be able to:

- Explain how humans depend on the natural environment for their survival.
- Provide examples of human-caused environmental changes that may be beneficial or detrimental to humans and other organisms.
- Evaluate environmental decisions in terms of their consequences and benefits.
- Describe the impact that group discussions have on learning and develop ways to promote effective group discussion in their teaching.

Using inquiry-based approach, the session is divided into the following sections: Invitation, Exploration, Explanation, Application and Putting It into Practice. The **Essential Question** for this session is: **How do humans affect their environments?**

Activities in this session delve into the concept of human beings as living things. Learners examine the complex relationship between humans and the environment, and some of the benefits and tradeoffs of human-caused changes in the ecosystem.

Assignments in this session require learners to demonstrate an understanding of the pros and cons of human-caused changes in the environment and that small changes in ecosystems can have unforeseen consequences. Learners also revise a lesson plan to include resources and concepts from the course.

Discussions in this session focus on finding solutions for the essential question for this session.

Learners will record notes and reflections in their personal notebook about different concepts, methods, activities and ideas presented throughout the session.

Schedule

This course is scheduled to take approximately 30 hours to complete.

Requirements

Learners are expected to:

- Complete all assignments.
- Participate and actively engage in discussions with fellow learners while contributing to the social construction of knowledge.
- Be self-directed and self-motivated.
- Ask for assistance when they need it.

Facilitators are expected to:

- Provide feedback to all learners.
- Participate in discussions to keep them moving forward.
- Provide assistance to learners who need it.

Technical Requirements

- Word Processor
- Internet service provider
- E-mail
- Shockwave and Flash: <http://www.macromedia.com/downloads/>
- Acrobat Reader: <http://www.adobe.com/products/acrobat/readstep.html>
- QuickTime: <http://www.apple.com/quicktime/download/>

Standards of Academic Integrity

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As posted on PBS TeacherLine Web site at
http://teacherline.pbs.org/teacherline/help/help_template3.cfm?subID=197

Evaluation

This course is evaluated on a letter grade basis, and graduate credit may be available. See the PBS TeacherLine Web site for details pertaining to specific graduate credit instructions.

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