

Name: Melissa Jenkins
Subject: EDL-Biology
Major Content: Ecology

Date: 2006
of Students: 32

Age/Grade Level: Sophomore 10th
of IEPs: n/a
Unit Title: Rivers...supporting LIFE

ACTIONS

Goals and Objectives:

1. Students will recall previous learning experiences about the Kingdoms we have learned in previous units. They will identify 6 kingdoms and their characteristics including cell type, nutrition, body type, and cell structure. We will identify organisms belonging to each Kingdom.
2. Students will then be assigned groups of 4 where they will answer questions related to a fresh water biome. (see questions for the experts handout) The students will use a cooperative learning strategy called Café Conversation where each group visits a station and will answer a question concerning a topic while also considering the responses left before them. This will motivate the students to learn more about specific habitats of watershed.
3. Students will identify and define components of a watershed.
4. Students will observe how kingdoms utilize water source for their survival.
5. Students will identify organisms belonging to all 6 kingdoms and describe those organisms using kingdom appropriate field guides.
6. Students will create a (specific location) Bratton Branch guide to Kingdoms of Life.
7. Students will examine the possible affects of human impact on a watershed.

Connections:

Targeted Learning Objectives related to KY Learner Goals:

- 1.3/1.4 Students will visually observe watershed and the environment.
- 6.2/6.3 Students will use their previous learning experiences to build upon to develop a new interpretation of kingdoms of life.

Program of Studies:

- Biological Change:
 - S-HS-LS-6 Examine the diversity of organisms and biological classification
- The Interdependence of Organisms:
 - S-HS-LS-9 Examine interrelationships and interdependencies of organisms in ecosystems and the factors that influence the interactions between organisms.
 - S-HS-LS-10 Explore how human activities alter ecosystems.

Targeted Core Content:

- SC-H-3.4.3 Biological classifications are based on how organisms are related.
- SC-H-3.4.2 The great diversity of organisms is the result of more than 3.5 billion years of biological change over time.
- SC-H-3.3.2 The broad patterns of behavior exhibited by organisms have hanged over time through nature selection to ensure reproductive success.
- SC-H-3.5.3 Organisms both cooperate and compete in ecosystems.
- SC-H-3.5.5 Human activities can deliberately or inadvertently alter the dynamics in ecosystems.

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Context:

This lesson is part of a sequence of a unit of Ecology Content. The unit is a series that will discuss populations, ecosystems, classification and human impact of watershed. The lesson will have students make connections to previous learning experiences about the major characteristics of kingdoms. The integrated lessons will have students working intrapersonally as well as interpersonally to assess students' ability at different levels. The entire unit consists of a variety of activities intended to increase student motivation and interaction throughout the content.

Unit Outline:

- I. Watershed and its Habitat
 - i. Ecosystems: Students will be introduced to Biosphere and Ecosystems
 - ii. Facts: Students will be able to name Abiotic and Biotic factors of Ecosystem and their interactive impact on ecosystem.
 - iii. Webquest: Students will visit www.enature.com and discover much knowledge of the ecology of the state of Kentucky. Students will complete a web search answering several questions concerning plants and animals in Kentucky.
- II. Watershed supports all Kingdoms of Life
 - i. Energy Flow: Students will compare and contrast Food Chains, Webs and Pyramids.
 - ii. Biogeochemical Cycles: Students will trace the cycles of nutrients (Water, Nitrogen, Carbon) between the earth and atmosphere. They will read an article on nutrient cycling and deforestation for real life application.
 - iii. **Watershed Café Conversation: Students will recall previous learning experiences about the Kingdoms listing organisms that belong to each kingdom. In group effort, students answer questions related to a fresh water biome. ***
 - iv. **Field Guide: Students will identify organisms belonging to all 6 kingdoms and describe those organisms using kingdom appropriate field guides. ***
 - v. **Students will create a (specific location) Bratton Branch guide to Kingdoms of Life.***
*Lesson described in detail below.
- III. Water Quality
 - i. Introduction to testing methods: Students learn significance of testing water and the proper procedures for measuring pH, dissolved oxygen,

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water temperature, fecal coliform, microinvertebrate and macroinvertebrate in the watershed.

- ii. Field Testing: Students visit watershed and perform water analysis testing.
- iii. Organism Indicators: Students discuss the results of water quality and pollution's impact on organisms.

IV. Protecting the watershed...Your responsibility.

- i. NON-Renewable Resources: Students calculate the amount of water they use daily and develop a water conservation plan.
- ii. Pollution: Students will identify primary and secondary pollutants and describe the sources of industrial, agricultural and domestic sources of pollution.
- iii. Ecological Balance: Students read a newspaper article concerning human impact on the environment (*Wal-Mart superstore to affect environment*, Morehead News July 7, 2006) They will respond to an Open Response question defending their position of building location for Wal-Mart.
- iv. Field Trip: Student visit Water Treatment Plant and guest speaker from KY division of water will discuss the importance of human intervention in water quality.

Special Concerns:

- All students are in assigned seating and/or groups, arranged so student ability levels, personality, etc complement each other and minimize classroom/field disruptions.
- As always lesson sequence and or days spent on each lesson may vary.

Vocabulary

- Habitat
- Ecosystem
- Population
- Biosphere
- Abiotic
- biotic
- Microhabitat
- Niche
- Community
- Symbiosis
- Endangered species
- Field guide/dichotomous key
- Other

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Lessons: Watershed supports ALL Kingdoms of Life

Resources/materials:

- Pencil/pen
- Paper/journal
- Multimedia projector
- Expectations Chart
- Binoculars
- Field guides
- Wetland wheel (WOW: Wonders of Wetlands)
- Collecting equipment (nets, trays, forceps)
- Magnifying glasses
- Markers/colored pencils
- Wet clothes
- Mini-binder
- Colored paper

Procedures:

Day 1

1. Students will recall previous learning experiences about the Kingdoms we have learned in previous units. They will identify 6 kingdoms and their characteristics including cell type, nutrition, body type, and cell structure. We will also make a list of organisms that belong to each kingdom.
2. Students will then be paired in groups of 4 where they will answer questions related to a fresh water biome. (see *questions for the Experts* handout) The students will use a cooperative learning strategy called Café Conversation where each group visits a station and will answer a question concerning a specific topic while also considering the responses left before them. This will motivate the students to learn more about habitats of watershed.
3. We will address the questions together as a class. Answers will not be completely clarified until their investigation of the watershed is complete. More background information will be given to the students on Watersheds throughout the entire unit in readings, websites and PowerPoint presentations. (see background on Watershed) Students will revisit the list of questions at the end of the lesson to add any additional information they have learned.

Day 2 (Field Day)

4. Students will be divided into 6 Groups: The Plants, Animals: vertebrates, Animals: invertebrates, Fungi, Protists, and Bacteria. Each group will have a leader that will assist the members in organism identification, observations, watershed evaluation etc.

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5. Students will learn how to investigate their specific watershed habitat. Tips will be given to ensure students understand expectations and follow [Rubric for proper field behavior](#).
6. Students will visit Bratton Branch and observe how kingdoms utilize water source for their survival.
7. Students in groups will identify organisms belonging to their assigned group of organisms (Plants, Animals: vertebrates, Animals: invertebrates, Fungi, Protists, and Bacteria) and describe those organisms using kingdom appropriate field guides. Students will make notes using their note taking guide worksheets. (see [Note taking guide](#))

Day 3 and 4

8. Students will create a (specific location) Bratton Branch guide to Kingdoms of Life. Students will provide image and provide detailed description of their 10 organisms that they identified on Day 2 of their field trip. ([Rubric for Field Guide Project](#))
9. As a class, we will discuss the organisms found. We will discuss the quality of water and the impact that we may have on the environment. (on-going discussion throughout the unit)

Required Components for each organism in Field Guide

- a. 10 total organisms including common name and genus and species name
- b. image of organism (site all sources)
- c. detailed description of organism
 - i. habitat description
 1. ecosystem
 2. flow organism prefers/ ground/tree organism prefers
 - ii. reproduction
 - iii. food sources
 - iv. interesting Facts (be creative)

Student website resources: A few websites to help students out to a good start!

- Local Field Guides: www.enature.com
- Kingdoms of Life Resources: <http://www.geocities.com/RainForest/6243/diversity2.html>
- Kentucky Department of fish and wildlife: www.kdfwr.state.ky.us
- Macroinvertebrates: www.iowater.net/Benthickey.htm
- Protists: <http://biology.rwc.uc.edu/hompage/BWS/planktonkey/phtozoo.html>

Student Assessment:

Day 1

Watershed Café Conversation: Students will recall previous learning experiences about the Kingdoms listing organisms that belong to each kingdom. (Verbal: Formative Assessment) In group effort, students answer questions related to a fresh water biome. The questions will be taken up and participation grade will be given. Right or wrong answers aren't relevant at this point as students are to be gaining interest to the topics at hand.

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Day 2

Students will identify organisms belonging to all 6 kingdoms and describe those organisms using kingdom appropriate field guides. As a group, students will complete the [Note taking Guide](#) (see attached) Completion of this guide is graded in addition to their field behavior. Each group will be assessed on their effort in the field while completing the project using the [Field Behavior Rubric](#) (attached).

Day 3

Students will create a (specific location) Bratton Branch guide to Kingdoms of Life. [Field Guide Project Rubric](#) is attached which includes all required components and characteristics in which the field guides will be graded.

Definitions/Explanation of Concepts
(see attached)

IMPACT

[Reflection/Analysis of teaching and learning:](#) (To be completed as follow-up after lesson is taught.)

REFINEMENT

[Lesson Extension/Follow-up:](#) (To be completed as follow-up after lesson is taught.)

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