DESE Creativity Grant
Spring 2015
Cambridge Public School
Interactive Ecosystems

Content Area/Course: Biology
Grade(s): 6

Summary

In this section of the unit students will be immersed in a virtual forest ecosystem while exploring the living and nonliving components of the forest. This virtual ecosystem affords students the ability to observe causal patterns over time and to analyze and share data with classmates as each assumes the role of one of four specialists and offers evidence to help answer a question of why visitor numbers have declined to the ecosystem in recent years.

By the end of this unit students will know and be able to:

- Recognize complex causal concepts in ecosystems, population dynamics and be able to think about spatial scale and time lags.

Science Learning Objective (student language): There are relationships between living and nonliving things in ecosystems and the interrelationships of these things results in cause and effect dynamics in ecosystems.

Literacy Learning Objective (student language): Vocabulary: stakeholder, species, population, Lyme disease

Essential Question to be addressed in this lesson:

1. How are we interdependent with Earth's ecosystems?
2. What does it mean to be alive?
3. How do scientists use evidence to support claims?

Lesson Plan Details

Instructional Resources/Tools

- Lenovo Thinkpad
- Saved game file
- Master Data file preloaded on laptop
- Access to Google Site Learning Quests
- Electronic or printed guiding worksheets that can be found in "Google Drive - For Students" folder.

File Management

Students will be using the EcoMUVE software over the course of several days. They will need to return to their saved games on the desktop. To do so, they will need to have access to their individual game file. When thinking about how you will use EcoMUVE in your classroom, you will want to consider the following:

- How will students name their files for easy identification?
- Students should use the same computer each time they log on for easy access to their game file.
- Students will use Google Docs folder: EcoMUVE - For Students to access individual role guide sheet templates, share data with classmates, share data with the teacher, link to Learning Quests and Google Slides Presentations.

Lesson Sequence and Description Lessons have been adapted, modified, or used directly from ecomuve.gse.harvard.edu **Lesson Structure** Each lesson plan is structured around four key areas of instruction: 1. Analyze: Access prior knowledge, interest, and inquiry 2. Expand: Introduce new content 3. Explore: Initiate self-directed discovery 4. Review, Extend, Apply: Reconnect to content, personal connections, and opportunities to use elsewhere	● Content background ● Accommodations for SPED, ELL, advanced students ● Time estimates ● Other notes

Learning Experience 1

Making Discoveries in the Ecosystem

DO NOW

Before we begin to learn about the forest ecosystem, let's consider briefly how wolves can change a river.

- Write down anything you know about wolves. Make a sketch of one.

HOOK

http://www.wimp.com/wolvesrivers/

Teacher Prep/Materials

- Laptop Carts/Computers
- Experience 1 Presentation & Do Now
- Student Pre-Survey
- EcoMUVE Forest Module (free) http://ecolearn.gse.harvard.edu/ecoMUVE/design.php
- *How Wolves Change Rivers* Video

Summary

Introduce a forest ecosystem and get students acquainted with the EcoMUVE. Students will explore the world and look for organisms in the forest ecosystem.

Understanding and Performance Goals

- Students will get to know the ecosystem, learn how to navigate in the world, and use the camera, zoom tool, field guide, and rotting-log tool to explore the new world and discover organisms.

Analyze (15 min.)

Before students share their do now activities, ask students to take the Pre-Survey either on paper or electronically on Google Forms.

Turn and talk - ask students to share their do now responses, what they already know about wolves, with a partner (proximity or clock partners), also sharing their illustrations. Ask for 3-5 volunteers to share out to entire group. Make notes in class presentation or on paper to refer back to during course of project.

Explain students will use the virtual world, a model, in EcoMUVE to study a forest environment on two different islands and learn about organisms such as wolves. Provide some highlights about what makes this experience different from going to a real forest:

- They can travel in time.
- They will have access to measurement tools and data difficult to gather in such a short time span.
- They can zoom in to see organisms they might not have noticed in the real world.

Expand (10 min.)

Time

50 minutes

Key Vocabulary

EcoMUVE
Ecosystem
Organism

1. Whole-class demonstration, or think aloud, of these aspects of the virtual world using a projector before sending students to explore on their own computer/laptop. a. Navigate using the arrow keys. b. Space bar to hop over things if they get stuck. c. Explore the map d. Camera tool to practice taking pictures. e. Once an organism has been photographed, use the field guide to learn more about the species living in the forest ecosystem. f. Zoom tool to find birds and small mammals that may otherwise be difficult to see. g. Find the rotting log tool to view the organisms living there. Use the zoom tool here to view smaller organisms. 2. Students may explore the other tools (Population, Calendar, Boat) as well, but these are not the focus of the day. **Explore (20 min.)** 1. Explain that the goal for today is to learn to use the tools in EcoMUVE to explore the forest ecosystem and find as many different organisms as they can. Ask students to be ready to share discovered organisms at the end of class. 2. Circulate around the room to help students explore the forest and get used to using the tools. **Review, Extend, Apply (5 min.)** 1. Go around the room and ask each student to name one organism they found. 2. Ask students to share whether there were any questions that came up. Ask for a few students to share some of the interesting experiences they had in EcoMUVE.	Note: There is an “end” to forest virtual world. The program does not allow students to wade into the water past their waist. If they reach the water (not rivers) they should turn around and explore another part of the island. If a student gets stuck in the water while exploring, they can get unstuck by changing time periods using the calendar tool.