Animal Habitats and Interactions

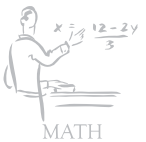
This project allowed students to apply their knowledge of ecosystems and the interdependence of living things, in a way that made the learning personal. Students who were otherwise unmotivated learners, became animated, self-directed learners.

7-8

GRADE LEVEL

ARTS

LANGUAGE



MATH

Misc

MISCELLANEOUS

SCIENCE

HISTORY

SOCIAL STUDIES

5

MONTHS

$1000

TOTAL BUDGET

Curriculum/State Standard

Life Science Standard 1: Achieve a solid base of scientific knowledge in Life Science content strands to make determinations about how the world works.

Benchmark 7.1.5 (SOL LS.7) Students investigate and understand that organisms within an ecosystem are dependent on one another and on non-living components of the environment.

Benchmark 7.1.6 (SOL LS.8) Students explore interactions that exist among members of a population.

Benchmark 7.1.7 (SOL LS.9) Students explore interactions and interdependence among populations in a biological community.

Benchmark 7.1.8 (SOL LS.10) Students investigate and understand how organisms are adapted to abiotic factors in a biome.

Benchmark 7.1.9 (SOL LS.11) Students recognize that ecosystems, communities, populations, and organisms are dynamic and change over time.

Overview

After conducting thorough research and presenting a project proposal, students were allowed to create a living microcosm of the biome of their choice. Students were then responsible for taking on the role of "habitat keeper," which entailed daily observation and data collection. Students used the data they collected to maintain a balance within their ecosystem and to analyze the impact of biotic an abiotic factors on the living systems within their ecosystem.

Meaningful learning depends on a student's ability to connect new information to previous life experiences. Particularly at the middle school level, real life connections provide the concrete examples of the increasingly abstract concepts taught in the classroom. While the project was initially created to target and reinforce life science concepts, students found themselves motivated to improve their data collection and analysis skills, as well as their written communication. The key was that each activity was related to the ecosystem and environment, which they had carefully researched and created. Students were given the opportunity

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SHOPA Foundation for Educational Excellence

Kids In Need A Program of the SHOPA Foundation

THIS WINNING LESSON PLAN WAS SUBMITTED BY:

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"Animal Habitats" project continued...

to practice true interdisciplinary learning and the work they produced was evidence of the effectiveness of this educational strategy.

Objectives

- Students will be able to design and create an ecosystem that contains biotic and abiotic factors that are interdependent.
- Students will be able to make scientific observations, collect data, display data graphically, and write a report describing the types of interactions that occur within the ecosystem they have created.
- Students will compare and contrast the environmental conditions within different types of ecosystems, and explain how the animals in each are adapted to the specific conditions of its environment.
- Students will be able to predict the impact of human interactions, both positive and negative, on an ecosystem.

Readiness Activity

Students researched the biome they had selected and prepared a detailed project proposal. In the proposal, each student team had to include information about the biotic and abiotic factors typically found within their biome. Each proposal had to describe the kinds of interdependent relationships that would exist within their ecosystem and how the needs of each living organism would be met.

Strategies/Activities

1. Student teams select or are assigned specific ecosystems (oceans, deserts, rainforests, mountains, lakes, rivers, ponds, grasslands) to research.
2. Teams present information about their assigned ecosystem: its abiotic conditions (climate, landforms, water source, nutrient resources etc.) as well as the biotic factors present (indigenous plant and animal species) in the form of a written proposal. This proposal includes a list of materials needed and a budget for maintaining the ecosystem. Upon approval, students were provided with the materials requested in their proposal.
3. Teams create a living model of the ecosystem they researched, complete with at least one example of an interdependent biotic relationship.
4. Teams collect and analyze data daily regarding the changes observable within their ecosystem over time, including life functions such as growth and reproduction, abiotic changes such as erosion and pollution, and dynamic relationship such as predation and symbiosis.
5. Teams assume responsibility for maintaining the balance within their ecosystem models throughout the school year, analyzing both the positive and negative impacts that human interaction can have on an ecosystem.

Culminating Activity

The culminating activity involved establishing a partnership with the local elementary school. Students prepared a brochure explaining their projects for a class of second graders who were studying life cycles. The second grade class was invited to visit the "living lab" at Burke Center on a field trip. During this field trip, the second grade class was divided into small groups. The groups rotated around the lab stopping at each "Biome-Station" for an information session presented by the "student scientists" who created that particular ecosystem. The second graders were encouraged to ask questions, and the middle school students participating in the project were assessed on their presentations and responses to questions.

Evaluation

The ecosystem proposal was used to assess student mastery of the following concepts: biotic and abiotic factors, dependent relationships within an ecosystem, and adaptations that enable plants and animals to survive within a given environment.

Construction of a museum style, living ecosystem model that successfully supported the plant and animal life it contained was used to measure students' ability to apply their knowledge of ecosystem dynamics in real life.

Daily observation logs, weekly data analysis and graphing activities, along with anecdotal journaling, provided students with ongoing opportunities to demonstrate their mastery of scientific observation and reporting skills.

Monthly inter-team sessions in which students formally presented and discussed their respective ecosystem's data provided evidence of their ability to compare and contrast the conditions and adaptations specific to their ecosystem and others'.

Cause and effect case studies based on problems and solutions encountered by the teams while caring for their ecosystems, were used to assess students' ability to predict and resolve issues resulting from human interactions.

The information and question/answer sessions presented to second graders from a local school were used as the final performance assessment task.