



How Does the Energy Flow?

Introduction

Objective:

Students will select presentation formats for which to identify and explain the flow of energy within a jungle ecosystem.

Students will generate thought provoking questions for discussion on the transfer of energy with regards to change, its effect and key factors.

Academic Content Standards:

- ❖ National Science Education Standards: Life Science
 - *Characteristics of organisms*
 - *Life cycles of organisms*
 - *Structure and function in living systems*
 - *Populations and ecosystems*
 - *Interdependence of organisms*
 - *Matter, energy and organization in living systems*

- ❖ Ohio Academic Content Standards for Science: Life Sciences
 - *Students demonstrate an understanding of how living systems function and how they interact with the physical environment. This includes an understanding of the cycling of matter and flow of energy in living systems.*
 - *Benchmarks: B and C (4th & 5th Grades)*
 - *Benchmarks: C (6th Grade)*

Getting Started

Materials:

- Mural/chart paper
- Markers, crayons, paints, or colored pencils
- Directional arrows, either purchased from office supply store or self-created from construction paper

Vocabulary:

- Ecosystem
- Energy flow
- Transfer

Technology:

- Videotape student presentations and combine into a disc of class ecosystem studies.
- Digital pictures of the presentations for student portfolios.

Lesson

Orientation Activity:

The class will create a chart that places animals into categories based upon their characteristics. The chart will focus on characteristics that are factors of various food chains for animals that are herbivores, carnivores, omnivores, decomposers or predators. Student expert groups will share data

about an animal and add it to a class chart. Students will also make observations and inferences from the total collection of data. The teacher will ask the question: What does all the data reveal about animal food chains and their role in the flow and transfer of energy found in a rainforest ecosystem/habitat?

Learning Activity:

One student from each animal expert group will regroup to form a new group of seven members, each member representing one of the previously researched seven animals. This new group will use the data collected to design and share a presentation illustrating the flow of energy found within a rainforest ecosystem.

Groups may:

- Create a mural displaying the assigned animals, their ecosystem and how each functions within that system. Arrows are included on the mural to pinpoint the energy flow within the specific ecosystem. Visual imagery for the mural addresses how the needs of each animal are met within the ecosystem.
- Prepare a PowerPoint™ presentation that illustrates the various elements and layers of a rainforest ecosystem and the animals that function within each layer. Arrows again are used to pinpoint the energy flow. Visual imagery addresses how the needs of each animal are met within the ecosystem.
- Perform an original skit or play illustrating the flow of energy within a rainforest ecosystem. A backdrop illustrating the ecosystem will include imagery to highlight the flow and transfer of energy within the ecosystem.
- Write and perform a song or rap that details the characteristics and appearance of the ecosystem and the animals living within it. Lyrics will also address the flow and transfer of energy within the system.

Each group of seven members will also pose a question about a change and/or effect of a change that alters the “normal” functioning of the energy flow within the ecosystem. Possible ideas include:

- A change in the water or food supply
- The removal or addition of specific animals
- Change in the climate or weather conditions
- Reduction in the amount of sunlight, etc.

The group will present the question to the class and lead a class discussion to generate an answer or answers to the question. Before the discussion, the group will have brainstormed possible solutions or answers of their own. Each member of the group is responsible for being able to answer the question that is posed to the class. Each small group conducts presentations and discussions.

Evaluation and Follow-Up

Assessment Tools and Methods:

- Scoring rubric designed by the teacher, students and/or together. Distribute the rubric before the construction of group presentations for student use of as a quality guideline. Each group member will use the rubric to rate his or her self individually and the other group members as well. A teacher evaluation is combined with the student self-evaluation.
- Each student selects one of the questions posed to the class and writes an explanation of the change and effect on the flow of energy within the rainforest ecosystem. The writing will also address how the animals survive and meet their basic needs.

Interdisciplinary Connections:

Language Arts: Collect written descriptions of the rainforest for examples of student expository writing.

Social Studies: Include criteria for information about the geographic and global location of rainforests in-group presentations.