Energy Flow Through Ecosystems

Summary

The objective of this lesson plan is to give students a basic understanding of how energy flows through an ecosystem by introducing them to the concepts of food chains and energy pyramids. Included in this lesson are two small group activities and a power point presentation. The power point presentation provides the students with fundamental knowledge about one way that organisms in an ecosystem interact and depend on one another. By using the power point lecture, the students are able to visualize food chains and energy pyramids. It is hoped that through the small group activities, the students will help each other gain a better understanding of how energy flows through an ecosystem.

Time Frame

1 class periods of 90 minutes each

Group Size

Small Groups

Materials

LCD projector and classroom computer
1 computer for every 2 students
Graph paper
Microsoft PowerPoint
Internet Access on each computer

Student Prior Knowledge

Students will be expected to have a basic understanding of ecosystems and organism interactions. Students should also know that organisms get their energy to survive by eating other organisms. Having a group discussion about the concepts that were just listed will assess prior knowledge.
Students must have a working knowledge of PowerPoint and will be required to have the skills necessary to create basic slides.
Students will also be expected to have basic knowledge of the Internet and how to carry out Internet searches.

Intended Learning Outcomes

Given a diagram of an energy pyramid, students will consistently be able to label each level of the pyramid and describe verbally to other students in their cooperative learning groups why there is less useable energy as you go up the pyramid.
Students will be able to consistently identify and label organisms in an ecosystem as being producers, scavengers, consumers, or decomposers and will demonstrate this knowledge by creating and correctly labeling their own food chain.
Students will be able to create a sample food chain and energy pyramid using resources from the Internet and PowerPoint.

Instructional Procedures

The basic facts about food chains (15 min.)
The lesson will begin with a group discussion on what makes up an ecosystem. After the discussion, the teacher will begin the power point presentation explaining what roles producers, consumers,

scavengers, and decomposers play in their ecosystem. The concept of a food chain will be introduced and example food chains will be displayed in the power point presentation.
Food chain student activity (25min.)
The students will break off into groups of 2 and will go to a computer. There, they will use the Internet to search for pictures of organisms that fill each energy role. They will need pictures of the sun, producers, consumers, and decomposers. They will import the pictures into PowerPoint and create a sample food chain. The food chain will be labeled and arrows will be drawn to indicate the direction of the energy flow.
The basics of energy pyramids(15 min.)
The PowerPoint presentation will continue and will introduce the concept of the energy pyramid. The students will learn that as you go up the food chain, the amount of useable energy available decreases. The students will be shown an example energy pyramid, which will be displayed in the PowerPoint presentation.
Energy pyramid group activity (10 min.)
The students are split up into groups of 3 students each, and one piece of graph paper is given to each group. The 1st student is given the role of the producer and will cut a 10 by 10 block of squares from the graph paper. The block represents the total amount of food energy stored in the producer. The producer then cuts a row of 10 squares from the block and will hand it to the 2nd student, who is assigned the role of primary consumer. The 10 squares represent the amount of energy out of the whole that is transferred up the food chain. The first level consumer will cut 1 square from the row and pass it to the 3rd student (the second level consumer). The students will see that only a small portion of the original energy stored in the producer reaches the second level consumer.
Energy pyramid PowerPoint activity (25 min.)
Students will get back into their groups of 2 and will return to the computer. They will use resources from the Internet to create an energy pyramid on a slide in PowerPoint.
All work done in PowerPoint will be saved so that the students can return to them during reviews for tests.

Assessment Plan

Student learning will be assessed through the finished PowerPoint slides that they will save on a disk and turn in to the teacher. The degree to which a food chain and an energy pyramid were created and correctly labeled will indicate student ability to understand food chains and organism's energy roles. Learning will also be assessed by how well the students complete the energy pyramid activity. Further assessment will be conducted with an end of unit exam containing questions from this lessons lecture.

Rubrics

Energy Flow PowerPoint Slides

Bibliography

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