

Ecolonization Lesson 1

Food Chain and Food Web Exploration

Content standard addressed (California Standards):

[Grade 4, Science, Life Sciences content standard 2b] Producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs, and may compete with each other for resources in an ecosystem. (California State Board of Education, 1999).

Objectives:

Throughout this lesson, students will:

1. Observe how organisms rely on one another to survive.
2. Demonstrate the difference between food webs and food chains.
3. Build upon previous problem solving and group collaboration skills by working together to find solutions.

Lesson plan (45 minutes maximum):

- Introduction (5 min)
- Student work with Ecolonization (15-20 min)
- Student activity – creation of their own food webs and food chains (10 min)
- Fill out feedback forms (10 min)

Introduction:

What would it be like to live on another planet? Where would we get our food? From Earth? Or would we somehow produce our own? What sort of problems would we face if we tried to produce food on other planets?

Student work with Ecolonization:

1. Break the class into “teams” of 2-3. It is suggested to divide groups by common gender (all female or all male). Research indicates that same sex groupings promote a more equal working environment around computers.
2. While students are playing the game, have them keep a log of what they’re doing so they can “Report back to the Command Team on Earth”. See below for a better description of logs.
3. Let students play the game.
4. While the students are playing, walk around and scaffold their learning by asking questions about their logs and what they’ve been observing such as:
 - Why did they put a particular organism in the Biodome?
 - Why do they put some organisms in but not others?
 - Why did they harvest certain organisms over others (grey vs blue)?
 - Did the number of predators in the game (grey fish) affect what happened?
 - Did the order in which organisms were released affect the outcome?
 - What kind of interactions are they seeing between the organisms? Do they compete for the same food? What happens when you get too many of one type of organism?

Student activity – creation of their own food webs and food chains:

1. Have the students stop playing the game.
2. Hand each team a card with a new organism. For instance, the card might have a red fish or some zooplankton. These cards will have a description of what the organism eats (its prey) and what eats them (predators). For a list of available cards, see the following link: <http://www.ecolonization.com/cards.htm>
3. Using the cards they've been given, ask each group draw their organism's food chain. If the students have trouble understanding what a food web or chain is, have them refer back to "Lt. Laura's Link" in the game.
4. Have each group draw what the Biodome's food web would look like if they added their organism to it. Make sure that they remember to add the colonists into the food web!!

Conclusion

1. Have the students stop their current activities and have each student (not each group) fill out a feedback form.
2. Once they've completed the forms, students can continue working on their food webs and food chains.
3. When the students are done, they can tape their logs and pictures on the wall and read the logs of other teams.

Logs

The idea behind the logs has its basis in real science. In real scientific investigations, many groups of scientists may be working towards finding a solution to the same problem. By publishing their results (or logs), scientists can collectively work to discover which methods do and do not work for a particular problem. In their results, scientists also look back to see what they might have done differently and recommend different ways to try things in the future.

In this lesson, each student group will be working as a team who will be reporting their findings to the rest of their "community" (in the form of the Command Team back on Earth). As they work their way through the game, student teams should be keeping a log of what they're doing so that they can share their experiences with other teams. At the end of their game, each team should look back through their log and decide if they would try anything differently and then write a summary explain what they think they should do in the future and why they think their new solution will work.

By posting their logs on a wall, student will be able to compare their results and suggestions with other teams and collectively think of a solution of how to solve the food supply problem.

Extensions:

1. Students hypothesized in their logs what they thought they might have done differently. Have them test their ideas by replaying the game. Did it work? What might they have done differently this time? This constant testing and retesting of ideas is what happens in most science.
2. Have the students think about the following question: If they were going to take real organisms from Earth to another planet, what would they take with them and what would that organism need to survive? Have the students do research on their organism(s) and explore the type of world they would have to create to support that organism(s) on another planet. What sort of food would they need? What sort of environment would they need to live in (water, land, hot, cold, etc.)?