

Food Webs

FRAMEWORK

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| I. Scientific and Engineering Practices
1. Asking questions
2. Developing and using models
6. Constructing Explanations |
| II. Cross-Cutting Concepts
4. Systems and system models |
| III. Physical Sciences
PS 3. Energy |

SKILLS/OBJECTIVES

Background: The students will be learning about food webs. The main focus will be **nutrient cycling** (all energy comes from the sun and cycles through different species) + **dependency** (everything in an ecosystem depends on the other organisms/resources in the ecosystem).

MATERIALS

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| <ul style="list-style-type: none">○ Animals cards for each student
Set 1 = Connecticut (white cards)
Set 2 = ecosystems (colored cards)○ Poster for each ecosystem○ String○ 3 jars with lids○ 1 piece of Nylon○ 1 rubber band○ 1 pear |
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NOTES

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| <ul style="list-style-type: none">● For Connecticut food web, this will be best in a big area – gym, outside, etc)● For activity 4, if schools don't have a place outside to leave the jars, we can bring them back to Wes and leave them outside, but must remember to bring them back the following week to show the students!) |
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BACKGROUND

Introduction:

- What is a food web?
 - **Sun** – all energy comes from the sun
 - **Primary producers** – all green plants, they use energy from the sun to make their own food
 - **Consumers** – anything that eats something else
 - Herbivores (primary consumers) – animals that eat plants
 - Carnivores (secondary consumers) – animals that eat other animals
 - Parasites – animals that live off of other organisms by harming it
 - Scavengers – animals that eat dead animals carcasses
 - **Decomposers** – bacteria + fungi that convert dead matter into nutrients to be used again by primary producers (they recycle nutrients like carbon and nitrogen)

Activity # 1	Connecticut Food Web
Materials	<ul style="list-style-type: none">○ CT animal cards (white)○ String
Worksheet	No

Connecticut food web (this will be best in a big area – gym, outside, etc)

- **Pass out CT animal cards (WHITE CARDS)** – make sure to pass out **the most plants, lots of caterpillars, some birds, a few foxes, and some worms**
- **Call up all the producers. Then call up the primary consumers. Which are there more of? (Producers.) Repeat calling up groups and assessing which organisms have the most individuals until all students are standing.** Explain that lower levels have more individuals (makes a pyramid).
- Give a piece of string to each of the producers. **Have each producer hold one end of their string and pass the other end to an animal that eats them.** (Some students will hold 2 or more strings.) These animals will then pass all of their strings to an animal that eats them. Repeat until everyone is part of the food web.
- Food web activities:
 - **Ask the worms where they get their energy** (from the foxes). Keep going down the web until each animal group gets asked – all energy initially comes from the **sun**.

- Explain that everything in an ecosystem depends on the other resources + species in the ecosystem. The animals are all **interdependent**.
 - **Make this point by having one student tug gently on their string.** Any student who feels their string get pulled should make a quiet sound. The whole group should eventually be making noise.
 - Repeat this having students with different animals tug the string. This will show that animals at all levels depend on all the other animals.
- Ask what would happen to the food web if humans built an apartment complex over the foxes' den? Cut the strings held by one fox and watching the web fall apart.

Activity # 2	Food web rocks/paper/scissor game
Materials	○ None
Worksheet	No

- To reinforce the ideas of the food web, teach the kids to play rocks/paper/scissors with the CT food web.
- Everyone **starts as plants. Players pair up and play rocks/paper/scissor with the food web.** (Come up with motions for caterpillar, bird, and fox; birds eat caterpillars, foxes eat birds, and caterpillars eat decomposed foxes.) The winner of that round becomes a caterpillar and must find another caterpillar to play rocks/paper/scissor with. The loser remains a plant and must find another plant to play rocks/paper/scissor. Players work their way up the food chain, and when a fox player beats a fox player, that player wins and becomes a decomposer and cheers on the rest of the players.
- **After playing once or twice** (as much as the students want), we'll teach about food webs in different ecosystems. Have the students sit down in a big group for another brief introduction.
- What's an **ecosystem**? Everything that exists in an environment (living and nonliving) and all the interactions between them. Size doesn't matter – ocean vs. puddle.
- **What are some types of ecosystems?** Rainforest, coral reef, African savannah, dessert, Arctic tundra, lake, deciduous forest, etc.
- Are *you* an ecosystem?

Activity # 3	Ecosystem Activity
Materials	○ Animal cards (Colored cards) ○ 3 Ecosystem posters
Worksheet	No

- Pass out ecosystem animal cards (COLORED CARDS)

- Have Wes students be “ecosystem leaders,” each holding an ecosystem poster (**Rainforest, African Savannah, Great Lakes**)
- Have students **go to the ecosystem that their animal belongs to**
- Discuss: talk with the group about why those animals live in the ecosystems that they live in
 - What are some properties of the habitat? (wet, dry, sunny, hot, cold, etc)
 - What animals live there?
 - Where do the animals live?
 - What do the animals eat?
 - What role does each of their animals play in the food web?
 - What role is missing in these webs? (decomposers – they exist in all these ecosystems, but they’re hard to see so didn’t make cards...)
- After you discuss the ecosystem, **plan a skit acting out your ecosystem’s food web to present to the whole group to teach everyone else about your ecosystem.**
- When all groups are ready, bring everyone together and share presentations.

Activity # 4	Decomposition Activity
Materials	<ul style="list-style-type: none"> ○ Pair ○ Knife (to be used by instructor only) ○ 3 jars ○ 1 jar lid ○ Piece of nylon ○ Rubber bands
Worksheet	No

Decomposition activity (have each ecosystem group set up 1 jar)

- Cut up the **pear into 3 equal pieces**
- Place **1 piece of pear in each jar**
- **Cover one jar with the lid** (screw on tight!), **one jar with a piece of nylon secured by a rubber band, and leave one jar open**
- Question/hypothesis: Which jar will decompose fastest? Why?
- Place all 3 jars outside in the **same place and observe them daily for a few weeks. Where do the bugs congregate?**

CONCLUSION

- What is a food web? What are some animals you might find in a food web?
- What were some of the ecosystems we explored today?
- Where might we, humans, fall on the food web?

ECOSYSTEMS

Connecticut

- Plant, caterpillar, bird, fox, worm

Rainforest

- Banana tree, monkey, jaguar

African Savannah

- Grass, zebra, cheetah

Great Lakes

- Algae, fish, heron