

**Hudson River Food Web**

Grades 3-5

1 hour

Program Description: Students will explore the Hudson River Food web to discover the interdependence of plants and animals in the watershed. This interactive activity will introduce students to the concepts of producers, consumers, and decomposers, as well as specific plants and animals living in the estuary, and how pollution can affect the energy transfer process.

**Supplies**

2 balls of different colored yarn

Food web cards printed, laminated and made into a “necklace” with yarn (or students can just hold them, or pin to shirts, etc.)

**NGSS standards**

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| **Crosscutting Concepts** | **Science and Engineering Practices** | **Disciplinary Core Ideas** |
| Cause and Effect  Systems and system models  Energy and matter | Developing and Using Models  Engaging in Argument from Evidence | 3-LS2.C: Ecosystem Dynamics, Functioning, and Resilience  4-LS1.A: Structure and Function  5-LS2: Ecosystems: Interactions, Energy, and Dynamics  5-LS1: From Molecules to Organisms: Structures and Processes |

**ENGAGEMENT**

Hudson River introduction (5 minutes): Where are we? What is an estuary? How do we get salt water from the ocean? What causes tidal changes?

**EXPLORATION**

What’s inside the Hudson River? What makes it their home? Who eats whom? Let’s find out together. (5 minutes)

Invite or suggest specific answers and write them on the board: plankton (phyto and zoo), striped bass, Atlantic silverside, hogchoker (flatfish), worms, blue crabs, soft shell clams, Atlantic sturgeon, American eel, cormorant, wood duck, seaweed

**EXPLANATION**

How do these organisms get their energy? (10 minutes)

Invite students to discuss the following, write the vocabulary words on the board:

Plants make their own energy, and are called **producers**. They use the chemical process of photosynthesis to take in sunlight and carbon dioxide, and produce glucose and oxygen. (In fact, plants underwater produce up to 50% of the world’s oxygen, meaning we breathe air made largely by them!). Which organisms on this list are the producers?

So what about everything else? They’re mostly **consumers** - organisms that consume other organisms. Primary consumers eat the producers themselves, and secondary producers eat those organisms, etc. Which organisms here are consumers?

There are also some other organisms on this list - **decomposers**. Decomposers eat things that have died and sink to the bottom of the river. They are an important part of the food chain because a lot of consumers eat them, so they help recycle energy. Which organisms here are decomposers?

What do we call an organism that eats only plants? **Herbivore** Only animals? **Carnivore** Both? **Omnivore.** Which organisms on our list fit into these categories?

**ELABORATION**

(5 minutes) Everyone takes an organism card (examples below) and reads it to themselves. Does anyone have a card that wasn’t on our list? (The sun! Why is this important for the food web?)

(15 minutes) Have the students stand in a large circle at the back of the room. Place the Sun in the middle of the circle with the ball of yarn. Ask them who gets their energy from the sun. They can refer to their cards, and will eventually call out phytoplankton or seaweed. Have the sun throw the yarn ball to the plant carrier, while the sun still holds on to a piece of the yarn. When they catch the yarn, they need to share one fact about their organism with the group. Then ask who eats the plant? They throw the yarn to that person. Keep going. At some point, ask who would eat an organism that has died, and make sure to refer to decomposers, and then who eats decomposers. Send the yarn back to the sun after the apex predators have been reached and keep going until everyone is holding some yarn.

**EVALUATION**

Ask students to gently tug on the string they are holding. Ask any students who feel the tug to begin tugging on their string, very quickly, all of the students begin feeling their string being pulled. Then discuss the effects of even one small organism dying out in an ecosystem. What if we cut that thread?

What happens if pollution is added to the system? Where would that travel? Take out another ball of yarn that is a different color to represent the way pollution travels through the food web as well.

How does pollution move through the ecosystem? What effect does it have on the animals? How might it affect humans?