OCEAN CLASSROOM LIVE!

Food Webs, from Plankton to You (S2, E1)

EDUCATOR SUPPORT MATERIALS

THE UNIVERSITY OF RHODE ISLAND GRADUATE SCHOOL OF OCEANOGRAPHY

All ocean life is linked through what it eats and what eats it. These food chains combine into an interconnected marine food web. But what role do humans play in these complex webs? Join GSO student Kristin Huizenga and postdoctoral fellow Matthew Ramirez as they discuss the interwoven world of marine food webs—everything from microscopic plankton, lobsters, sea turtles...to you!

Discussion Questions

- What is a marine food web? What are examples of a marine food web?
- What roles do humans play in a marine food web?
- How can human actions upset the balance of an ocean ecosystem?

Resources

Graduate School of Oceanography
As one of the nation's premier academic oceanographic institutions, the University of Rhode Island's Graduate School of Oceanography (GSO) educates marine scientists, students, policymakers, business leaders and citizens and helps develop the knowledge and skills necessary to address present and future marine challenges.

- GSO: https://web.uri.edu/gso/
- Inner Space Center: http://innerspacecenter.org/
- Rhode Island Teachers At Sea:
  https://web.uri.edu/gso/research/outreach/rhode-island-teachers-at-sea-program/
- GSO Ocean Classroom: https://web.uri.edu/gso/outreach/ocean-classroom/
- GSO Facebook: https://www.facebook.com/URIGSO/
- GSO YouTube: https://www.youtube.com/c/URIGraduateSchoolofOceanography
- GSO Twitter: https://twitter.com/urigso

Other Resources
- Meet Matthew Ramirez (GSO Post-doc): https://www.mdramirez.com
- Rhode Island NSF EPSCOR: https://web.uri.edu/rinsfepscor/
- NOAA Aquatic Food Webs:
  https://www.noaa.gov/education/resource-collections/marine-life/aquatic-food-webs
- Science Friday, Engineering a Fix for the Great Pacific Garbage Patch:
  https://www.sciencefriday.com/educational-resources/engineering-a-fix-for-the-great-pacific-garbage-patch/
- Science Daily, *Lobster digestion of microplastics could further foul the food chain*
  https://www.sciencedaily.com/releases/2020/04/200408104929.htm

Suggested Standards

Next Generation Science Standards K-12 Performance Expectations relating to Food Webs.

Elementary School

K: From Molecules to Organisms: Structures and Processes
- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.

K: Earth's Systems
- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

Grade 1: From Molecules to Organisms: Structures and Processes
- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.*

Grade 1: Heredity: Inheritance and Variation of Traits
- 1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Grade 2: Biological Evolution: Unity and Diversity
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

Grade 3: From Molecules to Organisms: Structures and Processes
- 3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death.

Grade 3: Ecosystems: Interactions. Energy and Dynamics
- 3-LS2-1. Construct an argument that some animals form groups that help members survive.

Grade 3: Heredity: Inheritance and Variation of Traits
- 3LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

Grade 3: Biological Evolution: Unity and Diversity
- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change

Grade 5: Energy
- 5-PS3-1. Use models to describe that energy in animal's food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

Grade 5: Ecosystems: Interactions, Energy and Dynamics
- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Middle School

MS: Ecosystems: Interactions, Energy, and Dynamics
- MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- MS-LS2-5 Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*

MS: Earth and Human Activity
- MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.*
- MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

High School

HS: Ecosystems: Interactions, Energy and Dynamics
- HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
- HS-LS2-6. Evaluate claims, evidence and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.
- HS-LS2-7. Design, evaluate and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS: Biological Evolution: Unity and Diversity
- HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.
- HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity

Ocean Literacy Principles

OLP5: The ocean supports a great diversity of life and ecosystems

OLP6: The ocean and humans are inextricably interconnected