

Living Coast Discovery Center Virtual Field Trip Resource Packet

Eat, Don't Get Eaten

In this packet you will find lessons and resources related to your Living Coast virtual field trip. The first two activities are intended to bookend your virtual trip, followed by additional resources.

Here is the link to our virtual field trip playlist:

<https://www.youtube.com/watch?v=UbzyQrqVVUY>

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Food Chain Introduction

Lesson Objectives:

- Students will be able to describe a food chain and how different producers and consumers are interconnected in an ecosystem
- Students will be able to define producer, consumer, carnivore, herbivore, omnivore and decomposer

Standards:

- **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-LS2-3** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- **MS-LS2-4** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Materials:

- Whiteboard (for teacher)
- Computers to access <http://plattebasintimelapse.com/ed/chapter/activities-food-chain-food-web/>

Outline:

Begin the lesson with the question: "What did you eat for dinner last night?" Break responses down into individual ingredients (separate lasagna into pasta, beef, tomatoes, and cheese) and write them on the board.

Once you have a broad sampling, begin categorizing the ingredients into producers, and consumers. Use questions such as:

- Which of these foods come from plants?
- Which of these foods don't come from plants? (If mushrooms are on the board, remember that technically mushrooms are fungi not plants!)

At this point, introduce the idea of producers as plants, or more scientifically, as organisms that make their own food through photosynthesis. Introduce the idea of consumers as animals, or more scientifically, as organisms that eat producers or other consumers.

Break down the consumer category further into herbivore, carnivore, omnivore, and decomposer. Use questions such as:

- Of the consumers, which are animals that eat plants?
- Which are animals that eat other animals?
- Which eat both?
- Are there any decomposers? (Mushrooms, crab, shrimp, and lobster are likely to be the only decomposers.)

Introduce the vocabulary words herbivore, carnivore, omnivore, and decomposer at this point and give the formal definitions.

Have students go to <http://plattebasintimelapse.com/ed/chapter/activities-food-chain-food-web/> to complete an online activity with an introduction to simple food chains and food webs.

Sweetwater Marsh Food Web

Lesson Objectives:

- Students will be able to describe a food chain and how different producers and consumers are interconnected in an ecosystem
- Students will be able to explain how an animal missing in their food chain will affect the health of an ecosystem

Standards:

- **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-LS2-3** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- **MS-LS2-4** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Materials:

- Sweetwater marsh animal list
- Paper and pencil

Outline:

Have students construct two food chains, using the animal list and the “what eats what” document to assist. They should make one aquatic and one terrestrial food web. Food chains can be as simple as written animal names on a sheet of paper. Students could also look up the animals that they use in their web and cutout or draw pictures to include.

Extension:

Present students with a natural disaster or human impact situation. Brainstorm how it might affect the ecosystem (ex. An earthquake could destroy burrows, habitat loss would get rid of trees/bushes) Have them look back at their food webs and discuss how their webs would change.

What Eats What?

Sweetwater Marsh

Invertebrates

| Animal | Food |
|-------------------|---|
| Anemone | Small fish, crabs, shrimp |
| Bent-nose clam | Detritus |
| Blue mud shrimp | Detritus and plankton |
| Yellow shore crab | Detritus, algae |
| Innkeeper Worm | Detritus |
| Fiddler Crab | Detritus |
| Ghost Shrimp | Detritus and plankton |
| Horn Snail | Algae and detritus |
| Jack knife clam | Plankton and detritus |
| Moon snail | Clams (as a parasite) |
| Octopus | Shrimp, lobsters, crabs, small fish |
| Scallop | Plankton |
| Sea Slug | Anemones, worms, crabs, shrimp, clams |
| Spiny lobster | Snails, sand dollars, shellfish, detritus |
| Swimming crab | Sand crabs |
| Butterfly | Nectar from flowers |
| Cricket | Flies, leaves |
| Dragonfly | Insects |
| Flies | Fruit |
| Harlequin bug | Leaves |
| Mosquito | Nectar from flower, blood of mammals or birds |
| Spider | Other insects |

Fish

| Animal | Food |
|----------------|--|
| Arrow Goby | Worms, clams, small crabs |
| Bat ray | Clams, crabs, innkeeper worms |
| Leopard shark | Large crabs, shrimp, fish, worms, clams, octopus |
| Mudsucker | Worms, clams, crabs, fish |
| Perch | Shrimp, crabs, worms |
| Pipefish | Shrimp, crabs, crayfish |
| Round stingray | Flatfish, crabs, shrimp, worms |
| Scorpion fish | Crabs, fish, octopus, shrimp, pebbles |

Amphibians and Reptiles

| Animal | Food |
|---------------------------|--|
| Fence lizard | Insects |
| California legless lizard | insects |
| Alligator lizard | Insects |
| Gopher snake | Mice, squirrels, rabbits, bird eggs |
| King snake | Mice, squirrels, rabbits, rattlesnakes |
| Western rattlesnake | Mice, squirrels, rabbits |

Mammals

| Animal | Food |
|---------------|--|
| Coyote | Rabbits, mice, birds, berries, other small animals |
| Mouse | Seeds and young plants |
| Opossum | Anything! |
| Raccoon | Insects, bird eggs, fruit, berries, nuts, shellfish, mice, lizards |
| Sea lion | Fish, crabs, scallops |
| Squirrel | Plants, seeds, insects |

Birds

| Animal | Food |
|------------------|---|
| Blackbirds | Seeds, berries, worms, insects |
| Clapper rail | Snails, insects, small fish, shrimp, earthworms |
| Mourning dove | Seeds |
| Ducks | Eelgrass, algae, fish, crabs, clams |
| Egret | Fish, clams, crabs, scallops |
| Great blue heron | Fish, lizards, gophers, clams, crabs, snakes, octopus |
| Hummingbirds | Nectar from flowers |
| Kestrel | Large insects, mice, lizards |
| Marsh hawk | Rabbits, mice, squirrels, smaller birds |
| Mocking bird | Insects, spiders, snails, berries |
| Osprey | Fish |
| Pelican | Fish |

| | |
|---------------|--|
| Red tail hawk | Rabbits, mice, squirrels, lizards, snakes, small birds |
| Seagulls | Anything! |
| Sparrow | Seeds |
| Swallows | Insects |
| Terns | Fish |

Producers

| Producer | Product |
|-----------------|-----------------|
| Algae | Algae |
| Bladder pod | Leaves |
| Boxthorn | Berries, seeds |
| Bush sunflower | Seeds |
| Detritus | Detritus |
| Lemonade berry | Leaves, berries |
| Marsh lavender | Flowers, seeds |
| Monkey flower | Flowers |
| Pickleweed | Leaves, seeds |
| Plankton | Plankton |
| Saltbush | Leaves, seeds |
| Toyon berry | Berries |

Ecosystems Out of Balance

Assign a "fuzzy situation" to a group of students (see below) to solve. Encourage students to be creative, but let them know they need to back up their choices. For example, if they want to invent a plant that doesn't need the sun for energy they can, but they must say what the plant will use instead.

Fuzzy Situation #1:

You are an astronaut who helped set up a new community on the dark side of the moon where it is very cold and dark. You need food to survive, but it is very expensive to ship food from Earth. Design an ecosystem to meet your needs.

- What problem do you need to solve first? (Hint: Why do things not grow on the moon already?)
- Be creative: Design specific producers, primary consumers, and secondary consumers. Remember to describe any special non-living factors in your ecosystem.

Fuzzy Situation #2:

You are an ecologist who has been called in for an emergency situation in Fox Mountain, USA. Their annual Fox Festival is coming up and the town is in a panic! All of the foxes are dying, and they want your help. After conducting a preliminary investigation, you find that the song sparrow population, on which the foxes feed, is dying as well.

- What could be the cause of this catastrophe?
- What other problems could result if this isn't fixed?
- How do you propose to solve it?

Fuzzy Situation #3:

You are scuba diving in the Gulf of Mexico on vacation with your family when you come across a fish graveyard in a very cold spot of water. There are tons of dead fish – but the weird part is that they are perfectly preserved and have not rotted. You bring a few samples on shore, have them tested at a nearby lab, and conclude that they all died at the same time – 10 years ago!

- What catastrophic event could have caused the massive death? Be specific!

After swimming around a little more, you find more fish graveyards containing fish that died at various times throughout the last 10 years. The ocean floor is littered with dead fish bodies!

- What things could be missing in this ecosystem?
- How are you going to fix this situation?

Fuzzy Situation #4:

The world's population is growing at a very rapid rate (that's TRUE!). Meanwhile, as cities develop, farmland is getting harder and harder to find (also TRUE!). You are a new farmer who is out to earn a buck...

- What will you farm? Animals? Plants? Both? What are the advantages and disadvantages of each?
- What things in your ecosystem do you want to control?

Food Chain Vocab List

Abiotic Nonliving material

Adaptation The process by which plants and animals change their structure, form or behavior to increase their chances of survival in a given habitat.

Camouflage The appearance of an animal that enables it to hide or blend in with its surroundings.

Consumer An animal that eats plants or other animals for food.

Community A group of plants and animals living in the same area and depending on one another for survival.

Competition When two or more organisms attempt to use the same limited resources. Organisms often compete for food and space.

Decomposer Organisms such as bacteria that obtain energy by breaking down dead plants and animals into abiotic material.

Ecology The study of how organisms interact with living and nonliving parts of their environment.

Ecosystem A unit consisting of a community interacting with its physical environment.

Environment The combination of all factors that affect and influence the growth, development and reproduction of organisms – water, air, vegetation, animals, human elements, climate and location.

Food Chain The transfer of food energy for the source in plants through a series of animals, with repeated eating and being eaten

Food Web An interlocking pattern of food chains.

Habitat The place in which a plant or animal lives.

Niche The specific role played by an organism in a community.

Organism A single living plant or animal.

Predator An animal that eats other animals; a carnivore,

Prey An animal eaten by another animal,

Producer An organism that uses sunlight to convert carbon dioxide, water, and nutrients into food,

Scavenger An animal that eats the remains and wastes of plants and other animals.

Encyclopedia Articles

Encyclopedia Britannica articles related to food chains and ecology.

ecology

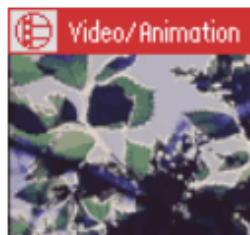
Children's Encyclopedia

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Learn how groups of plants and animals live together in ecosystems. *Encyclopædia Britannica, Inc.*

Ecology is the study of the relationships between [living things](#) and their surroundings, or [environment](#). Scientists who work in ecology are called ecologists. Ecologists examine how living things depend on one another for survival. They also study how living things use such natural resources as air, soil, and water to stay alive.

More Information:

- › [Journals And Magazines](#)
- › [The Web's Best Sites](#)



An ecologist studies pitcher plants as they grow in a nature preserve in North Carolina. *Lynda Richardson/Corbis*

Some ecologists work in laboratories. Laboratory experiments allow ecologists to study things under controlled conditions. For instance, they can experiment to see how plants react to different amounts of light or water. Such studies are harder in a natural setting because weather and other natural conditions cannot be controlled.

However, many ecologists do work in natural, outdoor settings. They look at all the different factors that affect [ecosystems](#), or communities of living things. Studies in the outdoors are useful because they show what is actually happening in the environment.

Ecology is important because it shows how changes in the environment affect the survival of living things. For example, when pollution kills certain living things, the animals that feed on them also may die. The work of ecologists has convinced many people to protect the environment and all the ecosystems that it supports.

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"ecology." *Britannica Junior Encyclopedia. Britannica Online for Kids.*
Encyclopædia Britannica, Inc., 2015. Web. 22 July 2015.
<<http://kids.britannica.com/elementary/article-9353082/ecology>>.

food chain

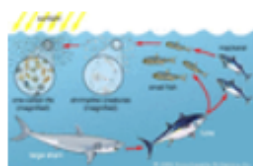
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A food chain in the ocean begins with tiny one-celled organisms called diatoms. They make their own ...

Encyclopædia Britannica, Inc.

The term food chain describes the order in which organisms, or living things, depend on each other for food. Every ecosystem, or community of living things, has one or more food chains.

More Information:

- > [Journals And Magazines](#)
- > [The Web's Best Sites](#)

Most food chains start with organisms that make their own food, such as plants. Scientists call them producers. Organisms that eat other living things are known as consumers. A squirrel that feeds on plants is called a primary consumer. A hawk that eats the squirrel and other primary consumers is called a secondary consumer.

Decomposers are often the final link in a food chain. Decomposers are bacteria and other organisms that cause decay. When plants and animals die, decomposers break down their tissues. This adds nutrients to the soil so that new plants may grow. Then the food chain begins again.



The diagram shows how a single food chain is linked within a group of food chains called a food web.

Encyclopædia Britannica, Inc.

A food web is a group of food chains within an ecosystem. Most living things eat more than one type of animal or plant. So their food chains overlap and connect. For example, the hawk that ate the squirrel also may eat fish. This makes the hawk a part of two food chains, or a food web.

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"food chain." *Britannica Junior Encyclopedia. Britannica Online for Kids.*
Encyclopædia Britannica, Inc., 2015. Web. 22 July 2015.
<<http://kids.britannica.com/elementary/article-9353141/food-chain>>.

plankton

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An almost transparent zooplankton is seen in an enlarged view.

Robert
Arnold—Taxi/Getty
Images

Countless tiny living things float and drift in the world's oceans and other bodies of water. These living things, or organisms, are known as **plankton**. They include plants, animals, and other kinds of organisms. **Plankton** have an important place in the [food chain](#) that supports fish and other sea creatures—and the people who eat them.

More Information:

› [Journals And Magazines](#)

Types of Plankton

Plankton that is made up of plants or plantlike organisms is called **phytoplankton**. These organisms are often no larger than a single cell. For example, a single-celled type of [algae](#), called a diatom, is a common form of **phytoplankton**. **Phytoplankton** floats near the surface of the water. Like other plants it uses sunlight to produce energy and then releases the gas oxygen. This process is called [photosynthesis](#).

Plankton that is made up of animals or animal-like organisms is called **zooplankton**. Some of these organisms, such as miniature [crustaceans](#) and [protozoans](#), are very small. Others, such as jellyfish, are larger. Some fishes and shellfish begin their lives as eggs or tiny larvae. These eggs and larvae are also **zooplankton**.

Besides **phytoplankton** and **zooplankton**, bacteria and fungi float in the world's waters. These living things may also be considered **plankton**.

Importance

Plankton is very important to life on Earth. **Phytoplankton** produces much of the oxygen that people and animals need to survive. **Plankton** is also a major source of food. **Zooplankton** feeds on **phytoplankton**. In turn, fish and other larger animals eat the **zooplankton**. Many types of whale feed on **zooplankton**. The huge whales catch the tiny **plankton** by using a series of filters, called baleen, in their mouths.

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Wildlife Conservation



A sandhill crane chick stands in a marsh in the Yukon Flats National Wildlife Refuge in Alaska. The ...
U.S. Fish and Wildlife Service

The preservation of wildlife greatly depends upon water and soil conservation. The native [plants](#) and [animals](#) constitute the wildlife of a region and are a product of the land resources and habitat conditions. But, like humans, wild animals must have food, water, and shelter. Destroying the forests, marshes, ponds, and grasslands alters their food and water supplies and the places in which they live, hibernate, and reproduce.

More Information:

- › [Journals And Magazines](#)
- › [The Web's Best Sites](#)
- › [Additional Readings](#)

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Environmental Impact

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Encyclopædia Britannica, Inc., 2015. Web. 23 July 2015.
<<http://kids.britannica.com/comptons/article-199117/conservation>>.

Useful Links

Food Chain Introduction Videos

To videos about food chains from PBS

<https://www.pbslearningmedia.org/resource/idptv11.sci.life.oate.d4kfch/food-chain/>

<https://www.pbslearningmedia.org/resource/thnkgard.sci.ess.chain/think-garden-whats-a-food-chain/support-materials/>

Website Resource

Website with ecosystem-specific printables

<https://www.exploringnature.org/db/view/Food-Web-Activities>

Mountain Scramble

More complex ecosystem game that gets into population numbers and balance.

https://pbskids.org/plumlanding/games/ecosystem/mountain_scramble.html

Decomposers and Scavengers

Extension videos about decomposers and scavengers and their importance to the ecosystem.

<https://www.pbs.org/video/natureworks-decomposers-and-scavengers/>

Food Chain Art Project

Art project to make a visual representation of a simple food chain

<https://www.youtube.com/watch?v=85780-m9B9s>