NATIONAL GEOGRAPHIC

**RESOURCE LIBRARY**
LESSON

# Marine Ecosystems and Biodiversity

Students explore major marine ecosystems by locating them on maps. Students use marine examples to learn about energy transfer through food chains and food webs. They discuss how food webs can illustrate the health and resilience of an ecosystem.

**GRADES**

9 - 12+

**SUBJECTS**

*Biology, Ecology, Earth Science, Oceanography, Geography, Physical Geography*

**CONTENTS**



## ACTIVITY 1: OCEAN ABIOTIC FACTORS | 45 MINS

## DIRECTIONS

**1. Build background on the abiotic and biotic components of ecosystems.**

State that the root of the word *ecology* is the Greek word *oikos*, meaning "house." *Ecosystem* literally means a "system of houses." Ecology is the study of nature's houses and the organisms living in them. Ask: *Does anyone know the scientific term for the "living" components of an ecosystem?* Elicit from students that a *biotic factor* is any living component of the environment and ask for examples, such as plants, animals, fungi, algae, and bacteria. Ask: *Does anyone know the scientific term for the "non-living" components of an ecosystem?* Elicit from students that an *abiotic factor* is any non-living component of the environment and ask for examples, such as sunlight, temperature, moisture, wind or water currents, soil type, and

nutrient availability. Display the illustration of ocean abiotic factors. Tell students that the interaction of multiple biotic and abiotic, or physical, factors determines which species can survive in a particular ecosystem.

**2. Have students define abiotic factors and physical processes that impact ocean ecosystems.**

Explain to students that, in this activity, they will learn more about abiotic factors and physical processes that impact ocean ecosystems. Arrange students in small groups and give each group two or three index cards and a copy of the Ocean Abiotic Factors handout. Read aloud the directions. Explain that students will use the handout to create concept map vocabulary cards and learn the terms. Assign two or three terms to each group. On one side of each card, have students use a pencil to divide the card into three sections. For each section, have them record the following information:

- a definition of the term in their own words
- a symbol or drawing to represent the term
- one example of how the term affects organisms living in the ocean

After they finish, collect the cards and post them on the board. As a class, go over each card and match it to its corresponding term/definition. Address students' questions.

**3. Have students investigate the abiotic factors and physical processes of different ocean ecosystems.**

Tell students that they will next learn about three different ocean ecosystems (rocky shore, coral reef, and open ocean) and identify abiotic factors that affect the organisms living in them. Distribute a copy of Ocean Ecosystem Descriptions to each small group. You can also distribute copies of Ocean Ecosystem Illustrations, or you can project the Ecosystem Illustration gallery instead. Assign each group one of the three ecosystems. Have groups read their assigned ecosystem's brief description and look at its matching illustration to learn what abiotic factors or physical processes impact organisms in the ecosystem. Ask groups to label all of the abiotic factors they see in the illustration. Next, ask groups to list other abiotic factors that are not seen in the illustration. Then provide each group with a copy of the Ocean Abiotic Factors Chart. Have students decide which abiotic factors are impacting the organisms in each of the ecosystems and place check marks next to those factors. Then have

students write one or more examples of how that factor is impacting organisms in the ecosystem. Facilitate as needed, giving students about 15 minutes for their small-group work. Finally, as a class, facilitate a discussion in which students share what they learned about each ecosystem. As examples of abiotic-biotic interactions are given, ask volunteers to fill in the Ocean Abiotic Factors Chart projected on the board.

**4. Have students discuss how humans can impact the abiotic factors and processes of ocean ecosystems.**

Emphasize that humans should be listed as a biotic factor and that they can impact the abiotic factors and processes of ocean ecosystems. In their small groups, have students identify and discuss different ways humans are impacting the abiotic factors in their assigned ecosystem. After a few minutes of small-group discussions, bring the class together for further discussion. Ask: *What are ways in which humans can impact the abiotic factors in these ocean ecosystems?* Elicit and discuss student responses. For example, over half of the American population lives within 50 miles of the coast (NOAA, 2008). Ask: *How could this impact coastal ecosystems?* Elicit from students that this could destroy coastal habitat, increase pollution, strain water resources, and increase non-native species. Encourage students to list impacts due to the Gulf oil spill, ocean warming, and land-based runoff from nutrients/fertilizers, soil, and pollution. Explain that all biotic and abiotic factors are important because they are all interacting to maintain the health and balance of an ecosystem.

# Informal Assessment

Lead a discussion in which students compare and contrast the abiotic factors and physical processes impacting the three different marine ecosystems. Ask students to analyze and discuss which marine ecosystem is the most inhospitable in terms of its abiotic characteristics.

# Extending the Learning

Use the National Geographic MapMaker Interactive and the temperature, chlorophyll, and surface currents layers to demonstrate how one ocean biotic factor, like chlorophyll concentration, is affected by two abiotic factors, like sea surface temperature and currents.

## OBJECTIVES

# Subjects & Disciplines

**Earth Science**

- Oceanography

**Geography**

- Physical Geography

# Learning Objectives

Students will:

- list abiotic factors of ocean ecosystems
- identify and describe abiotic factors and physical processes that impact ocean ecosystems
- list ways humans interact with and impact ocean ecosystems

# Teaching Approach

- Learning-for-use

# Teaching Methods

- Cooperative learning
- Discussions
- Hands-on learning
- Information organization

# Skills Summary

This activity targets the following skills:

- 21st Century Themes
  - Global Awareness
- Critical Thinking Skills
  - Analyzing
  - Understanding

- Geographic Skills
  - Acquiring Geographic Information
  - Analyzing Geographic Information

# National Standards, Principles, and Practices

## NATIONAL GEOGRAPHY STANDARDS

• **Standard 1:**
How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

## NATIONAL SCIENCE EDUCATION STANDARDS

• **(9-12) Standard B-4:**
Motions and forces
• **(9-12) Standard C-4:**
Interdependence of organisms
• **(9-12) Standard C-6:**
Behavior of organisms

## OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

• **Principle 1c:**
Throughout the ocean there is one interconnected circulation system powered by wind, tides, the force of the Earth's rotation (Coriolis effect), the Sun, and water density differences. The shape of ocean basins and adjacent land masses influence the path of circulation.
• **Principle 5f:**
Ocean habitats are defined by environmental factors. Due to interactions of abiotic factors such as salinity, temperature, oxygen, pH, light, nutrients, pressure, substrate and circulation, ocean life is not evenly distributed temporally or spatially, i.e., it is "patchy". Some regions of the ocean support more diverse and abundant life than anywhere on Earth, while much of the ocean is considered a desert.
• **Principle 6f:**
Coastal regions are susceptible to natural hazards (such as tsunamis, hurricanes, cyclones, sea level change, and storm surges).

**Preparation**

BACKGROUND & VOCABULARY

# Background Information

Marine ecosystems are comprised of the living organisms that have adapted to the abiotic factors and physical processes that characterize each ecosystem. Biotic factors include plants, animals, fungi, algae, and bacteria. Abiotic factors include sunlight, temperature, moisture, wind or water currents, soil type, and nutrient availability. Ocean ecosystems are impacted by abiotic factors in ways that may be different from terrestrial ecosystems. Humans are biotic components of marine ecosystems and have a significant impact on the maintenance of healthy, well-balanced ocean ecosystems.

# Prior Knowledge

[]

# Recommended Prior Activities

- None

# Vocabulary

| Term | Part of Speech | Definition |
|---|---|---|
| **abiotic** | *adjective* | lacking or absent of life. |
| **biotic factor** | *noun* | effect or impact of an organism on its environment. |
| **current** | *noun* | steady, predictable flow of fluid within a larger body of that fluid. |
| **ecosystem** | *noun* | community and interactions of living and nonliving things in an area. |
| **nutrient** | *noun* | substance an organism needs for energy, growth, and life. |
| **oxygen** | *noun* | chemical element with the symbol O, whose gas form is 21% of the Earth's atmosphere. |
| **salinity** | *noun* | saltiness. |
| **substrate** | *noun* | base of hard material on which a non-moving organism grows. Also called substratum. |
| **temperature** | *noun* | degree of hotness or coldness measured by a thermometer with a numerical scale. |

| Term | Part of Speech | Definition |
|---|---|---|
| **tide** | *noun* | rise and fall of the ocean's waters, caused by the gravitational pull of the moon and sun. |
| **wave** | *noun* | moving swell on the surface of water. |

# FUNDER

ORACLE

# ACTIVITY 2: MARINE FOOD CHAINS AND BIODIVERSITY | 50 MINS

# DIRECTIONS

**1. Define the role of marine microbes.**

Explain to students that, in a single drop of salt water, thousands of microbes (tiny organisms), including bacteria and phytoplankton (tiny floating plants), are interacting to form the base of the food web for the entire ocean. The oxygen and biomass they produce also sustains terrestrial life. Tell students that phytoplankton (algae) take in sunlight, nutrients, carbon dioxide, and water to produce oxygen and food for other organisms. Ask: *What is this process called?* (photosynthesis) Explain that other microbes, like many bacteria, play a role at the other end of the food chain by breaking down dead plant and animal material and changing it into a form that can be re-used as nutrients by phytoplankton and other organisms. Ask: *What is this process called?* (decomposition)

**2. Watch the National Geographic video "Tiny New Sea Species Discovered."**

Show students the National Geographic video (2 minutes, 30 seconds) "Tiny New Sea Species Discovered." Ask:

- *What is the goal of the Census of Marine Life?* (for scientists to try to uncover as much as possible about diversity, distribution, and abundance of life in the ocean within ten years)
- *What have scientists learned about the importance of microbes in the ocean?* (Microbes play a key role in the way nutrients move through the ocean.)
- *What do all microbes in the global ocean collectively weigh?* (the equivalent of 240 billion African elephants, or about 90 percent of all the ocean's biomass)

Summarize that microbes, including phytoplankton and bacteria, are the beginning and end, respectively, of ocean food chains and are therefore essential components of marine ecosystems.

**3. Introduce trophic level vocabulary.**
Ask: *What is a food chain?* Ask students to list the organisms in a terrestrial or aquatic food chain that they are familiar with. Explain to students that the trophic level of an organism is the position it occupies on the food chain. An organism's trophic level is measured by the number of steps it is away from a primary producer/autotroph (photosynthesizer). Write the trophic levels and definitions listed below on the board, leaving off the examples provided. Have students try to identify the trophic level for each of the organisms on their list. Invite volunteers to share their answers with the class. Discuss the correct answers. Next ask students to brainstorm ocean examples of each trophic level and write their correct responses on the board. Eventually, add all of the examples listed below.

- **primary producer/autotrophs**—organisms, like plants, that produce food. Examples: phytoplankton, algae
- **primary consumer/heterotroph**—an animal that eats primary producers. Examples: mussels, oysters, krill, copepods, shrimp
- **secondary consumer/heterotroph**—an animal that eats primary consumers. Examples: blue claw crab, lobster, seastar, humpback whale, silverside
- **tertiary consumer/heterotroph**—an animal that eats secondary consumers. Examples: shark, dolphin
- **apex predator/heterotroph**—an animal at the top of the food chain with no predators. Examples: shark, dolphin
- **decomposer/detritivores**—organisms that break down dead plant and animal material and wastes and release it again as energy and nutrients in the ecosystem. Examples: bacteria, fungi, worms, crabs

**4. Have students watch the National Geographic video "Krill."**
Explain to students they are going to watch a video that highlights a marine food chain. Tell students that while they are watching the film, they are going to write examples of organisms from each trophic level. When the film is over, they will identify each organism's trophic level

using the information from the board. Show students the National Geographic video (2 minutes) "Krill." After the video is over, allow students a couple of minutes to properly identify the trophic levels of each of the organisms shown in the film. Ask:

- *What is the ultimate source of energy in this ecosystem?* (the sun; photosynthesis)
- *What is the primary producer in the video?* (phytoplankton and other algae)
- *What is the primary consumer in the video? Is it an herbivore or carnivore?* (krill; herbivore)
- *What secondary and tertiary consumers are shown in the video? Are they herbivores or carnivores?* (anchovies, sardines, birds, salmon, tuna, humpback and blue whales; carnivores)

**5. Have students create food chains.**

Remind students that food chains connect organisms through energy transfer among producers, consumers, and decomposers. These energy levels are called trophic levels. A significant amount of energy is lost between trophic levels. Divide students into five groups. Assign each group one of the following marine ecosystems:

- Coral Reef
- Kelp Forest
- Open Ocean
- Rocky Shore
- Sandy Shore

Have groups identify the geographic locations of their marine ecosystems on their World Physical Tabletop Maps, included in the Physical World MapMaker Kit. Then give each group its assigned Marine Ecosystem Cards Handout, and each student a Feeding Frenzy worksheet. Have students cut out the ecosystem cards, discuss the activity as a group, and then individually complete the Feeding Frenzy worksheet.

**6. Have a whole-class discussion about the marine ecosystems and food chains.**

Invite small groups to share their completed Feeding Frenzy worksheets with the whole class. Review each of the five food chains, as well as the ecosystems in which each food chain is likely to be found. Ask:

- *Looking across the different food chains, which of the organisms can make their own food through photosynthesis?*
- *Compare the food chains to terrestrial food chains you may know. How are the marine food chains the same? How are they different?*
- *How might humans be a part of the food chains?*

# Modification

In Step 1, use a local food chain example to cement student comprehension.

# Modification

In Step 5, instead of small group work and discussions, you may choose to turn the Feeding Frenzy activity into a game format with rules and points.

# Informal Assessment

Use the provided Feeding Frenzy Answer Key to assess students' comprehension.

# Extending the Learning

Have students use their food chain cards to create food webs. Discuss the role each organism plays in the food web.

## OBJECTIVES

# Subjects & Disciplines

**Biology**

- Ecology

**Earth Science**

- Oceanography

**Geography**

- Physical Geography

# Learning Objectives

Students will:

- summarize the role of photosynthesis and decomposition within food chains
- distinguish between different trophic levels and describe examples of food chains in major marine ecosystems
- order organisms in a food chain by trophic levels

# Teaching Approach

- Learning-for-use

# Teaching Methods

- Brainstorming
- Cooperative learning
- Discussions
- Hands-on learning
- Multimedia instruction

# Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
- Critical Thinking Skills
  - Analyzing
  - Understanding
- Geographic Skills
  - Acquiring Geographic Information
  - Answering Geographic Questions

# National Standards, Principles, and Practices

### NATIONAL GEOGRAPHY STANDARDS

- **Standard 8:**

The characteristics and spatial distribution of ecosystems and biomes on Earth's surface 

### NATIONAL SCIENCE EDUCATION STANDARDS

• **(9-12) Standard C-4:**
Interdependence of organisms
• **(9-12) Standard D-1:**
Energy in the earth system

### OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

• **Principle 5a:**
Ocean life ranges in size from the smallest virus to the largest animal that has lived on Earth, the blue whale.
• **Principle 5b:**
Most life in the ocean exists as microbes. Microbes are the most important primary producers in the ocean. Not only are they the most abundant life form in the ocean, they have extremely fast growth rates and life cycles.
• **Principle 5d:**
Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (such as symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.

**Preparation**

## BACKGROUND & VOCABULARY

# Background Information

Marine microbes include tiny photosynthetic phytoplankton (algae) and bacteria that form the base of marine food chains, becoming food for primary and secondary consumers like zooplankton, small fish, and filter feeders. Tertiary consumers and apex predators, including big fish, marine mammals, and humans, form the top trophic levels. Decomposers, including bacteria, complete the food chain by breaking down organic material and releasing it as nutrients and energy. Marine biodiversity and trophic relationships define a variety of marine food chains and interconnect them in complex oceanic food webs.

# Prior Knowledge

[]

# Recommended Prior Activities

- Mapping Marine Ecosystems
- Marine Food Webs

# Vocabulary

| Term | Part of Speech | Definition |
|---|---|---|
| **apex predator** | *noun* | species at the top of the food chain, with no predators of its own. Also called an alpha predator or top predator. |
| **autotroph** | *noun* | organism that can produce its own food and nutrients from chemicals in the atmosphere, usually through photosynthesis or chemosynthesis. |
| **coral reef** | *noun* | rocky ocean feature made up of millions of coral skeletons. |
| **decomposer** | *noun* | organism that breaks down dead organic material; also sometimes referred to as detritivores |
| **decomposition** | *noun* | separation of a chemical compound into elements or simpler compounds. |
| **detritivore** | *noun* | organism that consumes dead plant material. |
| **ecosystem** | *noun* | community and interactions of living and nonliving things in an area. |
| **food chain** | *noun* | group of organisms linked in order of the food they eat, from producers to consumers, and from prey, predators, scavengers, and decomposers. |
| **food web** | *noun* | all related food chains in an ecosystem. Also called a food cycle. |
| **heterotroph** | *noun* | organism that cannot make its own nutrients and must rely on other organisms for food. |
| **hydrothermal vent** | *noun* | opening on the seafloor that emits hot, mineral-rich solutions. |
| **kelp forest** | *noun* | underwater habitat filled with tall seaweeds known as kelp. |
| **marine ecosystem** | *noun* | community of living and nonliving things in the ocean. |
| **microbe** | *noun* | tiny organism, usually a bacterium. |
| **open ocean** | *noun* | area of the ocean that does not border land. |
| **photosynthesis** | *noun* | process by which plants turn water, sunlight, and carbon dioxide into water, oxygen, and simple sugars. |
| **phytoplankton** | *noun* | microscopic organism that lives in the ocean and can convert light energy to chemical energy through photosynthesis. |

| Term | Part of Speech | Definition |
|---|---|---|
| **trophic level** | *noun* | one of three positions on the food chain: autotrophs (first), herbivores (second), and carnivores and omnivores (third). |

# FUNDER

ORACLE

# ACTIVITY 3: MARINE FOOD WEBS | 1 HR

# DIRECTIONS

**1. Build background about marine trophic pyramids and food webs.**

Review with students that food chains show only one path of food and energy through an ecosystem. In most ecosystems, organisms can get food and energy from more than one source, and may have more than one predator. Healthy, well-balanced ecosystems are made up of multiple, interacting food chains, called food webs. Ask volunteers to come to the front of the room and draw a pyramid and a web. Explain that the shapes of a pyramid and a web are two different ways of representing predator-prey relationships and the energy flow in an ecosystem. Food chains are often represented as food pyramids so that the different trophic levels and the amount of energy and biomass they contain can be compared. In the Marine Pyramids gallery, display the Marine Food Pyramid. Ask: *Based on this food pyramid, do you think there are more top predators (gray reef sharks, bluefin tuna) than producers (phytoplankton, seagrass, algae)? Why or why not?* Then display the Marine Ecological Pyramid and ask the same question. Lead students to observe the differences between the two graphics. The ecological pyramid should help them to see that while the traditional food pyramid displays the trophic levels and specific organisms, it does not accurately display the proportion of energy loss and biomass required between trophic levels. Finally, display the What We Eat Makes A Difference graphic and explain that on average, only 10 percent of energy and biomass in one trophic level is passed to the next higher level.

**2. Have students analyze a marine food web example.**

Display the Coral Reef Food Web gallery. Scroll through the illustrations and have students read the captions. Ask: *How are food webs similar to or different from food pyramids? Why do food webs have arrows between organisms and not just straight lines?* (Arrows represent the flow of energy and biomass between trophic levels.) Be sure to point out the role of decomposers and provide examples. Although decomposers are included in food webs, they are absent in food pyramids.

**3. Have students research marine organisms.**

Tell students that they will build their own marine food web for two interrelated ecosystems: mangroves and coral reefs. Have students work in pairs or individually. Assign each pair an organism, and have them use the mangrove and coral reef ecosystem illustrations in the Marine Ecosystems gallery for reference. Distribute a copy of the Marine Organism Notetaking worksheet. Have student pairs use the school computer lab and/or provided Internet resources to research their organism and complete the worksheet. After checking the worksheets for completion and accuracy, give each student pair an index card to illustrate its organism and record the following information:

- common name of organism
- list of predators, if applicable
- list of prey, if applicable

If time is limited, let students print images of their organisms rather than drawing them.

**4. Have students create a whole-class food web display.**

After all students have completed their worksheets and made their organism index cards, ask students to present their organisms one trophic level at a time, gradually building the whole-class food web display. After all the cards are correctly placed on the display, have students connect interdependent species (predator-prey relationships) using string or thread. If possible, turn the string or thread into arrows and remind students that they represent the flow of energy and biomass from one organism (trophic level) to another. Prompt students to recognize trophic relationships between the mangrove and coral reef ecosystems.

**5. Have a whole-class discussion about the food web display.**

Allow plenty of time for discussion. Analyze the food web display as you discuss the interconnectedness of species within and between the mangrove and coral reef ecosystems. Ask:

- *What two ecosystems are represented in this interconnected food web?*
- *Which species are only predators? Which are only prey? Which are both?*
- *What would happen to the food web if one species were to become endangered or extinct? Which species would be affected? Which ecosystem would be affected?*
- *Why is phytoplankton so important to marine food webs?*
- *What happens to the amount of energy/biomass that is transferred from one trophic level to the next?*
- *What roles do humans play in marine food webs?*
- *How can human actions upset the balance of an ocean ecosystem?*

# Informal Assessment

Students' ecosystems can be evaluated on the placement of each organism into the proper trophic level and on the labeling of how energy moves through the ecosystem. During the class discussion the teacher should prompt students to talk about the amount of energy that is lost between trophic levels using their organisms as examples. The key point of this activity is how much energy is retained and lost between each level of the food web.

# Extending the Learning

As homework or an independent project, have students research a different marine ecosystem and construct a food web or food pyramid to represent that ecosystem.

## OBJECTIVES

# Subjects & Disciplines

**Biology**

- Ecology

**Earth Science**

- Oceanography

**Geography**

- Physical Geography

# Learning Objectives

Students will:

- create a food web display to illustrate the trophic relationships between marine organisms
- identify common organisms living in a marine ecosystem
- research ecological facts about marine organisms
- prepare illustrated cards depicting marine organisms and their predator-prey relationships

# Teaching Approach

- Learning-for-use

# Teaching Methods

- Brainstorming
- Cooperative learning
- Discussions
- Information organization
- Research

# Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
- Critical Thinking Skills
  - Analyzing

- Creating
- Understanding
- Geographic Skills
  - Acquiring Geographic Information
  - Analyzing Geographic Information
  - Organizing Geographic Information

# National Standards, Principles, and Practices

## NATIONAL GEOGRAPHY STANDARDS

• **Standard 8:**
The characteristics and spatial distribution of ecosystems and biomes on Earth's surface 

## NATIONAL SCIENCE EDUCATION STANDARDS

• **(9-12) Standard C-4:**
Interdependence of organisms
• **(9-12) Standard C-5:**
Matter, energy, and organization in living systems
• **(9-12) Standard C-6:**
Behavior of organisms
• **(9-12) Standard D-1:**
Energy in the earth system

## OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

• **Principle 5d:**
Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (such as symbiosis, predator-prey dynamics and energy transfer) that do not occur on land.
• **Principle 6b:**
From the ocean we get foods, medicines, and mineral and energy resources. In addition, it provides jobs, supports our nation’s economy, serves as a highway for transportation of goods and people, and plays a role in national security.

**Preparation**

BACKGROUND & VOCABULARY

# Background Information

Every living thing in the ocean depends on energy. When an ecosystem is in balance, all organisms have sufficient energy and food to survive. When an imbalance occurs, every organism in the food web suffers. Food pyramids and food webs are used to represent these relationships and show how energy and food (biomass) is transferred and lost between trophic levels.

# Prior Knowledge

["food webs and trophic levels"]

# Recommended Prior Activities

- Mapping Marine Ecosystems
- Marine Food Chains and Biodiversity

# Vocabulary

| Term | Part of Speech | Definition |
|---|---|---|
| **biomass** | *noun* | living organisms, and the energy contained within them. |
| **common name** | *noun* | non-scientific name of a species, or what the organism is usually called. |
| **decomposer** | *noun* | organism that breaks down dead organic material; also sometimes referred to as detritivores |
| **ecosystem** | *noun* | community and interactions of living and nonliving things in an area. |
| **food chain** | *noun* | group of organisms linked in order of the food they eat, from producers to consumers, and from prey, predators, scavengers, and decomposers. |
| **food pyramid** | *noun* | diagram of a healthy diet that shows the number of servings of each food group a person should eat every day. |
| **food web** | *noun* | all related food chains in an ecosystem. Also called a food cycle. |
| **habitat** | *noun* | environment where an organism lives throughout the year or for shorter periods of time. |

| Term | Part of Speech | Definition |
| --- | --- | --- |
| **predator** | *noun* | animal that hunts other animals for food. |
| **prey** | *noun* | animal that is hunted and eaten by other animals. |
| **producer** | *noun* | organism on the food chain that can produce its own energy and nutrients. Also called an autotroph. |
| **scientific name** | *noun* | the name, usually in Latin, of an organism's genus and species. |
| **trophic level** | *noun* | one of three positions on the food chain: autotrophs (first), herbivores (second), and carnivores and omnivores (third). |

FUNDER

ORACLE

NATIONAL GEOGRAPHIC