

LESSON PLAN

Step 2

DINNERTIME ON THE REEF

Objectives

- Identify the main parts of a coral reef.
- Describe a coral reef food chain.

Materials

- Copies of Activity Page 2, page 11.
- Additional reference books with pictures of coral reefs.

Subject

- Science

Procedure

1. Using the Introduction as a guide, present the coral reef as an example of a dynamic ecosystem. Within every ecosystem, physical conditions such as temperature and the amount of sunlight affect and are affected by the organisms in an environment, such as plants, animals, and microscopic organisms. Ask students if they have ever visited a coral reef or seen pictures of one. Perhaps they can name some of the fish that live there. (*Angelfish and barracuda might be two fish that students can recognize.*) If an aquarium or fish supply store is nearby, you might arrange for a class visit. You might also refer students to one of the many reference books with colorful photographs of coral reefs.

2. Tell your students that each dynamic ecosystem consists of many interacting parts, each using energy and producing wastes. Ask them to speculate why coral reefs host an abundance of marine life. (*The key is that the coral reef receives a wealth of sunlight, which causes algae within the reef to produce an abundance of food. The waves crashing over the reef distribute oxygen and food*

throughout the ecosystem, creating a hospitable environment for animals). Tell your students that many kinds of living things make up the coral reef community: producers (plants), filter feeders (animals that take in microscopic plants and animals from the water), grazers (algae eaters), predators (animals that eat other animals), and scavengers (animals that eat the remains of dead creatures). A complex food web connects all of these living things. *You might wish to write the five organism types on the blackboard and ask students to suggest an animal that fits into each type.*

3. Give each student a copy of Activity Page 2. Tell the class to examine carefully the diagram as you describe some of the following organisms found along a coral reef:

□ At the highest point (crest) of the reef, large, dome-shaped, brain coral forms huge boulders. Colorful parrotfish, their large front teeth fused together like a parrot's beak, scrape algae off the coral rock. (*Refer to the Introduction to remind students that coral grows with the help of algae.*) Nearby, the queen angelfish sports an electric-blue, crown-like growth and eats sponges, which in turn feed on microscopic life.

□ On the outer reef, Elkhorn coral extends its branches like sign posts and withstands the constant pounding of the waves. Sea fans expose themselves to the prevailing current to receive food, while predators like the barracuda ready themselves for the hunt.

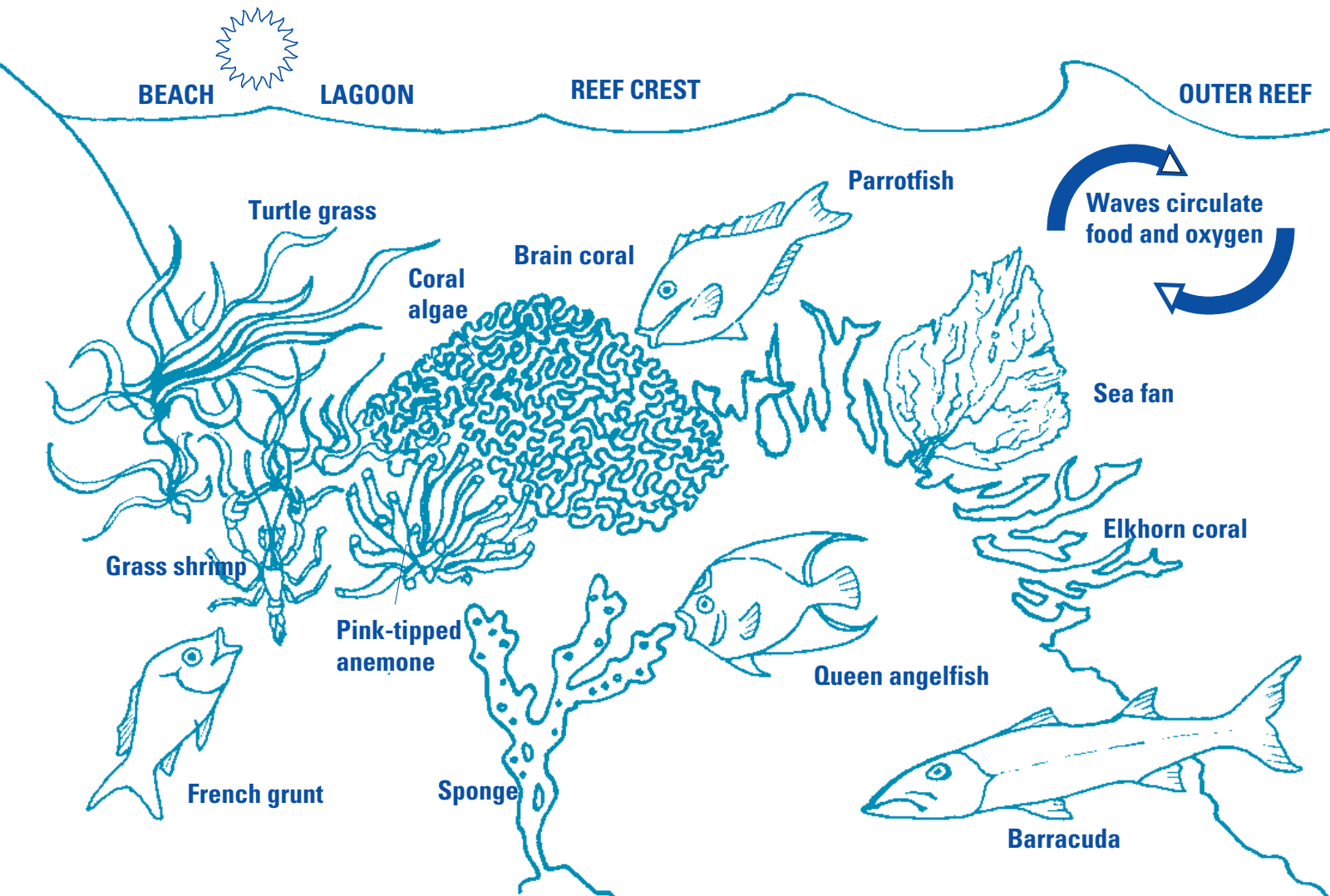
□ Between the reef and the shore is a quieter environment known as the lagoon. Here the turtle grass is dense, protecting the young members of reef species. Schools of French grunts who stay among the corals all day move to the grass beds at night to hunt for small crustaceans like grass shrimp. Nearby, a pink-tipped anemone floats food its way by waving its tentacles.

4. Ask your students to complete Activity Page 2 by writing their answers on a blank piece of paper. When they finish, discuss the correct answers with them. Be sure to emphasize that all of the organisms depicted in the diagram are related to each other in a vast food web.

ACTIVITY PAGE 2

**It's always
dinnertime for
some animals
on the coral reef.
Fill in the missing
words as you
observe what's on
the menu for these
reef organisms.**

Corals such as the 1 coral live in the highest part of the reef, the 2. Corals are tiny animals that live together in large, stony colonies as big as boulders. Inside the coral are 3 that produce food and oxygen using sunlight. A 4 grazes on the coral to get food. The crashing waves circulate 5 and 6. A nearby 7 is a filter feeder that uses waves to capture its dinner. The 8 is a predator that patrols the 9 reef, looking for other fish. In the calmer waters of the 10, a little 11 scavenges through the lagoon. Watch out! A hungry 12 is coming closer. Nearby, a 13 waves its tentacles to take in its food.



GLOSSARY AND ANSWER KEYS

GLOSSARY

Algae A large group of simple plants that are mostly aquatic and lack true stems, leaves, and roots. This group includes the microscopic zooxanthellae that live in the tissues of coral and the twenty-foot-tall kelp that thrive in colder water habitats.

Ecosystem Communities of plants, animals, and microbes interacting with each other and their environment. The term ecosystem describes both the living and nonliving components of an area that interact with one another.

Food chain The transfer of energy, in the form of food, through a chain of organisms, starting with producers and ending with consumers. Every time an organism in the chain is eaten, some of its energy is transferred to the organism that has eaten it.

Food web A series of interconnected, interlocking food chains. Food chains become interconnected because most organisms eat more than one kind of food and therefore are involved in more than one food chain.

Habitat The place where an organism lives.

Invertebrate An animal without a backbone.

Plankton The small floating or weakly swimming plants (phytoplankton) and animals (zooplankton) that are carried by the currents and serve as a food source.

Vertebrate An animal with a backbone.

Zooxanthellae The tiny, single-celled algae that live symbiotically with corals.

Splash zone Portion of rocky shoreline above the high-tide mark that is splashed by waves rather than submerged underwater.

Intertidal zone Portion of rocky shoreline that is submerged during high tide and exposed during low tide.

Subtidal zone Portion of rocky shoreline that is always underwater.

Lagoon Area of shallow water between a coral reef and shore.

Exoskeleton Hard outer covering of an animal without a backbone, such as a crab.

ANSWER KEY TO TAKE-HOME PAGE

Latitude

Coral reef: twenty-five degrees north latitude; Maine coast: forty-five degrees north latitude.

Temperature

Coral reef: about twenty-seven degrees C (eighty degrees F) all year. Temperatures of twenty-four to thirty degrees C (seventy-five to eighty-five degrees F) are best for coral reefs worldwide. Maine: fifteen degrees C (fifty-nine degrees F) in summer and four degrees C (39 degrees F) in winter.

Ocean currents

The Gulf Stream and the North Equatorial Current help keep coral reefs warm. The surrounding cool Labrador and East Greenland Currents as well as Maine's high latitude make the coast of this state relatively cold.

Questions

1. Maine, because it has a higher latitude and winter is severe.
2. The Caribbean Islands, because they are closer to the equator. This location makes for a climate that does not differ from winter to summer, so there is a lot of sunlight all year.
3. If your school's latitude is shown on the map, help students locate it. If not, provide a suitable map so students may learn their latitude. Briefly discuss climate in your region.

ANSWER KEY TO ACTIVITY PAGE 2

1. brain
2. reef crest
3. algae
4. parrotfish
5. food
6. oxygen
7. sea fan
8. barracuda
9. outer
10. lagoon
11. grass shrimp
12. French grunt
13. pink-tipped anemone

ANSWER KEY TO ACTIVITY PAGE 3

1. low
2. rough periwinkles
3. green crab
4. shell, sun, water
5. intertidal
6. kelp
7. sea star, subtidal
8. lobster