



CORAL REEF ECOLOGY

Concepts

Coral polyp feeding and functions.

HCPS III Benchmarks

SC 4.6.1

Duration

1 hour

Source Material

PRISM

MARE

Vocabulary

Body wall

Calyx

Nematocyst cells

Pharynx

Polyp

Tentacle

Background Reading and Coral Dramas

Summary

Students will be able to work cooperatively and with the teacher to ask questions about the function of a coral polyp. Students will perform dramas of coral polyp functions.

Objectives

- Students will learn vocabulary pertaining to polyp anatomy
- Students will learn how polyps feed
- Students will perform dramas on the functions of a polyp

Materials

Background article (1 per student)

Polyp-anatomy worksheet (1 per student)

Dramas/skits items (see drama descriptions on pg. 2)

Making Connections

Students will build upon their existing knowledge of corals. They will act like a polyp, thereby making a connection between the functions humans need to survive to how coral polyps use their anatomy (structure) and functions to survive.

Teacher Prep for Activity

Copy the background article and coral anatomy worksheet for each student. Copy coral anatomy worksheet onto a transparency and have a hard copy of the answer key handy. Familiarize yourself with the coral dramas for this lesson to be the lead polyp.

Background

See background article below.

Procedure

1. Pass out background reading article and coral anatomy worksheet. Have students read the background article out loud as class.
2. Work through the coral anatomy worksheet together using the reading as a guide.
3. Next, break the students up into groups and divide up paragraphs among each group.
4. Have the groups write down what they learned from their paragraph.
5. Discuss the reading as a class. Ask one student from each group to share what they learned from their paragraph.
6. To end the discussion, ask the class if they have any



additional questions based on the reading. Record these questions on chart paper/board and revisit them at the end of the activity. **30 minutes**

7. Next, have the students reform their reading groups. Explain that they will now have the chance to be actors and actresses and pretend they are coral polyps feeding.
8. Perform the 6 coral dramas below as a class or in groups:

NOTE: It may be helpful to write out these skits on individual cards for each group. Laminating the cards will ensure reuse in the future.

a. Polyp

Two hands together; connected at wrist and elbow; wriggling fingers.

b. Polyp eating plankton

Stiffen fingers to simulate stinging nematocyst catching plankton (zzzittt sound effect); fold fingers (like fist) one at a time to simulate tentacles feeding the mouth of the plankton. (Make gulping “yum, yum” sound effect sound effect.)

c. Polyp using sun’s energy

Have green dots all over your palm of your hand to symbolize the zooxanthellae. Open palms wide (photosynthesis) as can be and spread out fingers in a reaching position. Sway arms with elbows connected to display soaking in the sun’s rays. (“Aaaah!” sound effect).

d. Frightened polyp

Close tight fists. (“Huh” -suck in air- sound effect)

e. Colony of polyps

Kids “glue” their ‘*okole* (butts) together with everyone’s hands acting like polyps.

f. Plankton

Drift, twirl, swirl around (“la, la, la, la, la, la”- sound effect) to simulate ocean current drifting.

30 minutes

Assessments

Completed Drama

Completed worksheets

Resources

Coral Reefs in the South Pacific: handbook by Michael King



Coral Polyp Background Article

Polyps are the body form of the coral animal. Polyps have radial symmetry with some coral polyps having eight tentacles and others having six. Radial symmetry occurs when an object can be divided equally into two. A polyp consists of a **mouth**, **stinging nematocyst cells** to sting, paralyze and catch prey, and a one-way digestive tract (there is no 'okole) called the **pharynx**. The outer layer of the polyp is called the **body wall** and on its surface contains cells such as nematocyst and sensory cells.

The polyps of stony coral species secrete a calcareous, hard, protective shell out of calcium carbonate around their soft body. These hard protective shells form cups called **calices** (singular = calyx). When a polyp dies, a new polyp will grow on top of the old skeleton closing off the old calyx, and new skeletal cups will be created (see picture below). The protective cups are similar to a skeleton providing the coral animal with protection.

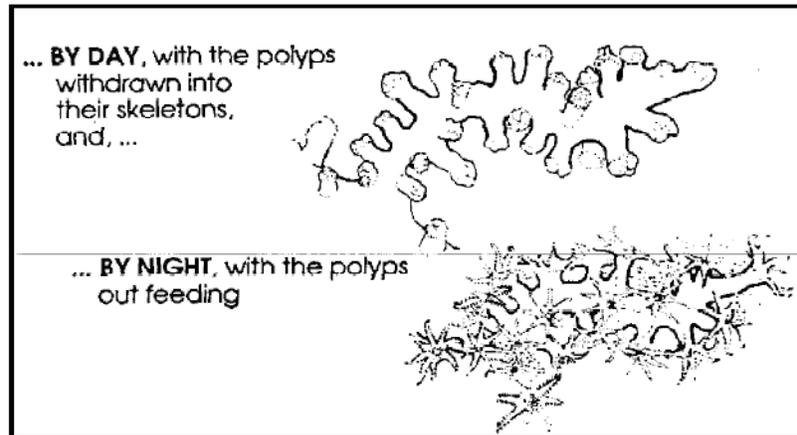


Cross section of Colony skeleton (Side View)

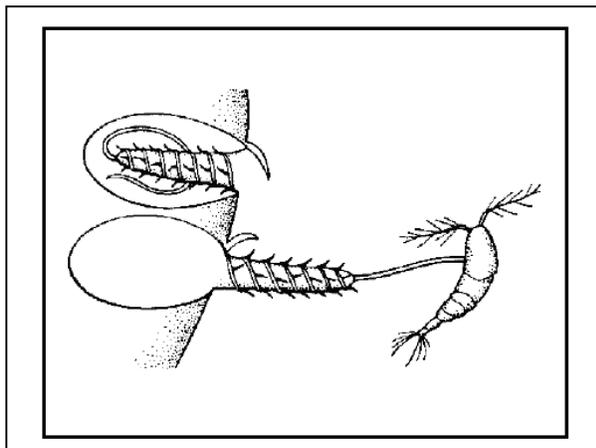
The majority of reef-building corals feed on small planktonic (floating) organisms or dissolved organic matter in the water column. Polyps feed mostly at night by using nematocyst cells on their **tentacles** to sting and capture food. Once the food has been caught, it goes to the stomach where digestive chemicals are secreted to break food down into small chunks. Any



undigested material will exit the same way that it came in, through the mouth. Besides capturing food drifting in the water currents, coral polyps get their food from small plant cells (called zooxanthellae) which live inside their tissue. These plant cells use sunlight and nutrients in the sea water to produce food which is shared with the coral. During the day, or when threatened, the polyps withdraw into their protective cups. Part of a coral branch is shown here below:



The drawing below shows an enlargement of a coral tentacle. Two **nematocyst cells** are



shown. The top cell has not fired its poison spear. The bottom cell has fired its poison spear into a small floating animal.

Source: Pictures on this page are from **Coral Reefs in the South Pacific Handbook**. Produced by Dr. Michael King, illustrated by S. Belew and M. King. © 1993 South Pacific Regional Environment Programme, P.O. Box 240, Apia, Western Samoa. Reproduction authorized.

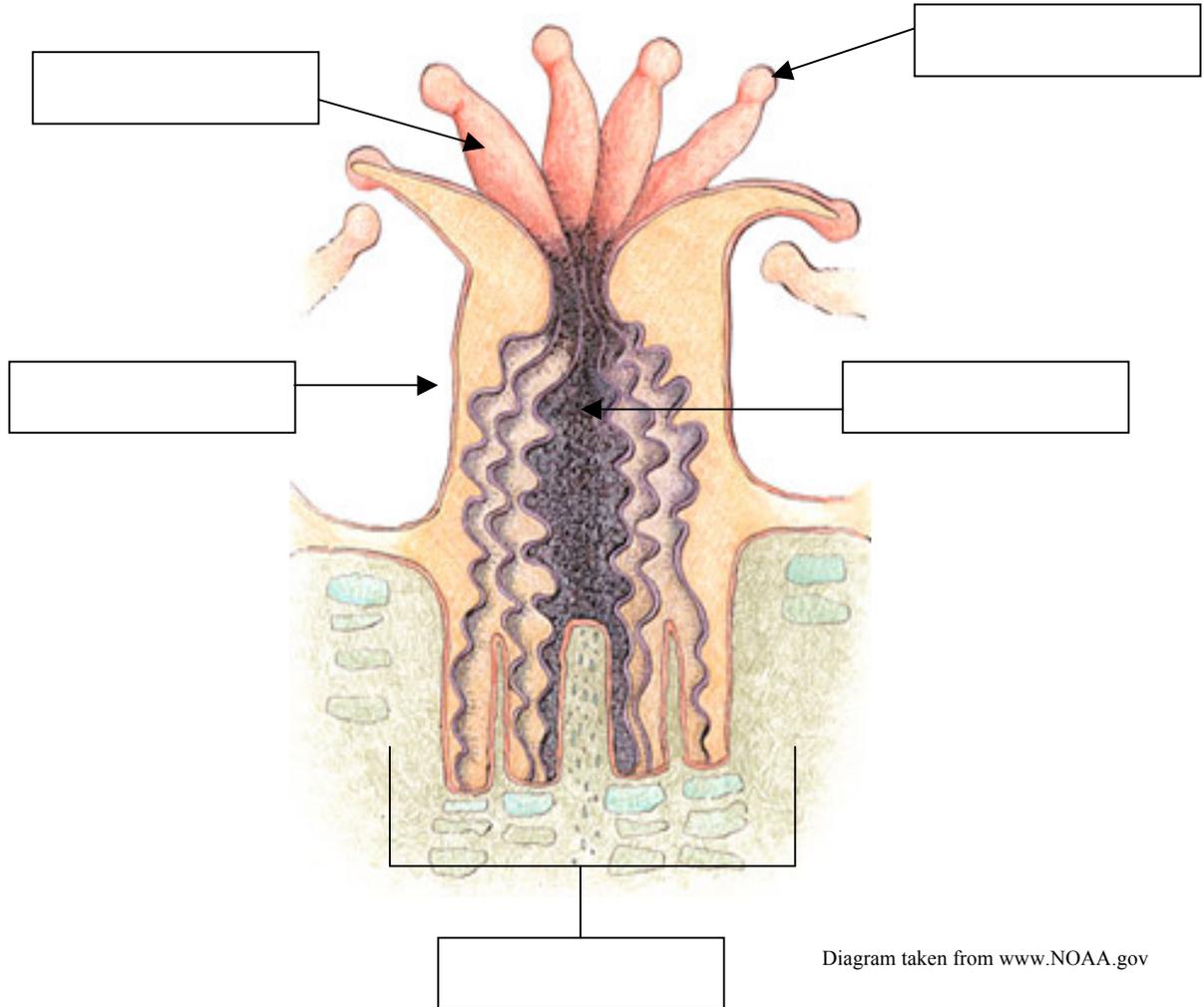


Coral Polyp Anatomy

Name _____

Directions

- 1) Identify and label the boxed parts of the polyp, using the vocabulary below.
- 2) Use the background lesson to write the definitions to the vocabulary below.



Vocabulary

Nematocysts-

Calyx-

Tentacle-

Body wall-

Pharynx-



Coral Polyp Anatomy Answer Key

