

CHAPTER 9

SPONGES

CNIDARIANS

WORMS



Chapter 9 OBJECTIVES

Sponges, Cnidarians, Worms

Section 1: What is an Animal?

1. Describe the levels of organization in animal bodies
2. Identify four functions that enable animals to meet their basic needs
3. Explain how animals are classified

Section 2: Animal Symmetry

1. Define symmetry
2. Infer general characteristics of an animal based on its symmetry

Section 3: Sponges and Cnidarians

1. Identify the characteristics of sponges
2. Describe the difference of cnidarians
3. Explain the importance of coral reefs

Section 4: Worms

1. Identify the three main phyla of worms
2. Describe the characteristics of each worm phylum

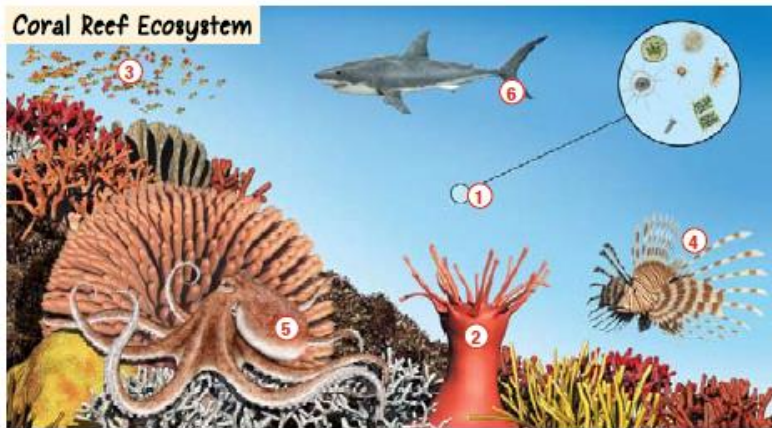
ACTIVITY: Chapter Introduction

Directions: Use your Language of Science guide to define the following prefixes, suffixes for Chapter 9.

1. Bi- _____
2. Lateral- _____
3. A- _____
4. Oss- _____
5. Epi- _____
6. -gene- _____
7. Cnid- _____
8. Nem- _____
9. Gastro- _____
10. Ventr- _____
11. Cysts- _____

FOOD WEB The reefs created by corals are the basis for a rich oceanic ecosystem. The corals are part of a complex food web, or interconnected system, in which animals eat other animals to survive. If one organism in a food web were to disappear, it could disrupt the entire system. To learn more, study the coral reef ecosystem in the illustration below, and then do the activity that follows.

Coral Reef Ecosystem



Ecosystem Key:

1. Ocean currents bring a constant supply of drifting plankton into a coral reef.
2. Corals are made up of tiny animals called polyps. Polyps eat plankton.
3. Small fish like fairy basslets feed mainly on plankton floating in the ocean water.
4. Lionfish hunt for small fish and crustaceans, mostly during the night.
5. Octopuses hunt the seafloor for crabs and fish.
6. Shark feed on larger fish and invertebrates, such as octopuses.

Activity On a separate piece of paper draw a food web of this coral reef ecosystem. Your food web should show how each organism in the ecosystem relates to the other organisms according to what they eat. Each organism should have arrows going from it to organisms that rely upon it for food.

Question When you have completed your food web, answer the following: What would happen to your food web if plankton were to disappear?

What is an Animal?

Directions: Complete the flow chart to show how cells are organized in animals

Animal cells are grouped together to form a(n) _____, which has a specific job in the body



Tissues combine to form a _____, which performs a more complex job than each tissue by itself.



Organs combine to form a _____, which has a broad function in the body

Directions: Answer the following questions.

1. What are the 4 major functions of animals?

2. What is an adaptation?

3. Why must animals maintain a stable environment within their bodies?

4. What are most animal movements related to?

a. _____

b. _____

5. What is sexual reproduction?

6. The joining of an egg cell and a sperm cell is called _____

7. What is asexual reproduction?

8. Biologists classify animals in the animal kingdom into 35 major groups, each of which is called a(n)

_____.

9. Based on the branching animal phyla diagram, which of the following group is most closely related to birds?

- a. Insects
- b. Mammals
- c. Amphibians
- d. Reptiles

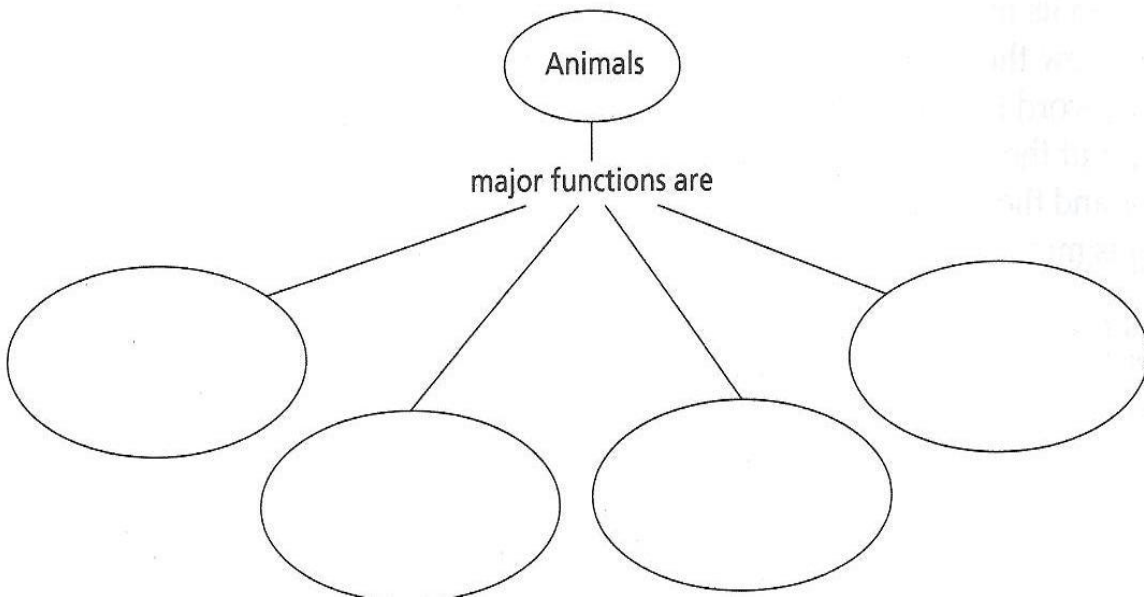
10. What do biologists consider when they classify an animal?

- a. _____
- b. _____
- c. _____

11. Which of the following is a vertebrate?

- a. Bird
- b. Jellyfish
- c. Spider
- d. Crab

Directions: Fill in the concept map.



WHAT IS AN ANIMAL?

Find the words in the grid. Words can go horizontally, vertically and diagonally in all eight directions.

G R V Y Q N T Y L Z L J J Y
N N E T A R B E T R E V N I
J O R L D Y N P C R W C S L
C I T N N M L M W W Q N L V
L T E F Y H Z Q L M O K Y M
T A B N G Z V P D I C P S J
R Z R K N O V L T J A X L R
L I A N M W R A F S X X L L
L L T M X K T G E G L T E J
V I E L N P V X A R T B C C
R T S L A Z U M N N F B R Y
F R Z D N A Q C B M P X M D
N E A M L K B C L Q R T K R
N F N T G J P H Y L A L N Z

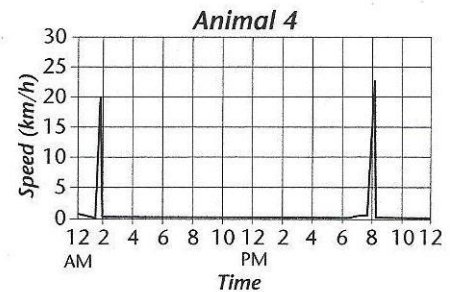
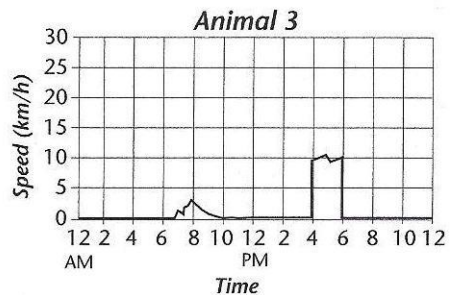
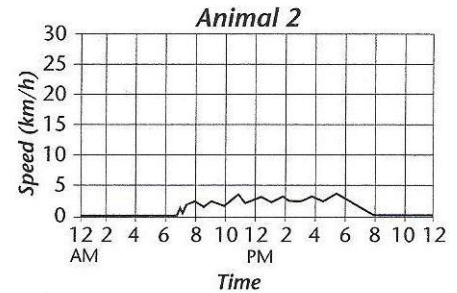
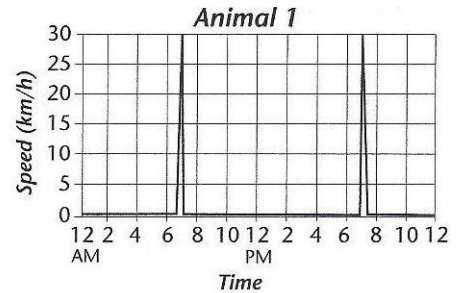
1. A group of several different tissues is called a(n) _____.
2. Biologists classify animals into major groups called _____.
3. _____ is the joining of an egg cell and a sperm cell.
4. _____ are animals that have a backbone.
5. _____ are the basic units of structure and function in living things.
6. Structures or behaviors that allow animals to perform the basic functions in their environment are called _____.
7. An animal without a backbone is called a(n) _____.
8. _____ reproduction is the process by which a single organism produces a new organism identical to itself.

RUSHING TO EAT

Movement and feeding are characteristics of animals, and animals have different methods of getting food. The amount of time an animal spends moving around and the speed with which it moves depend on its method for obtaining food. The graph shows the kind of data you might get if you were to record the speed at which an animal moves throughout the day. The x-axis shows the hours of the day, and the y-axis shows the speed at which the animal is moving.

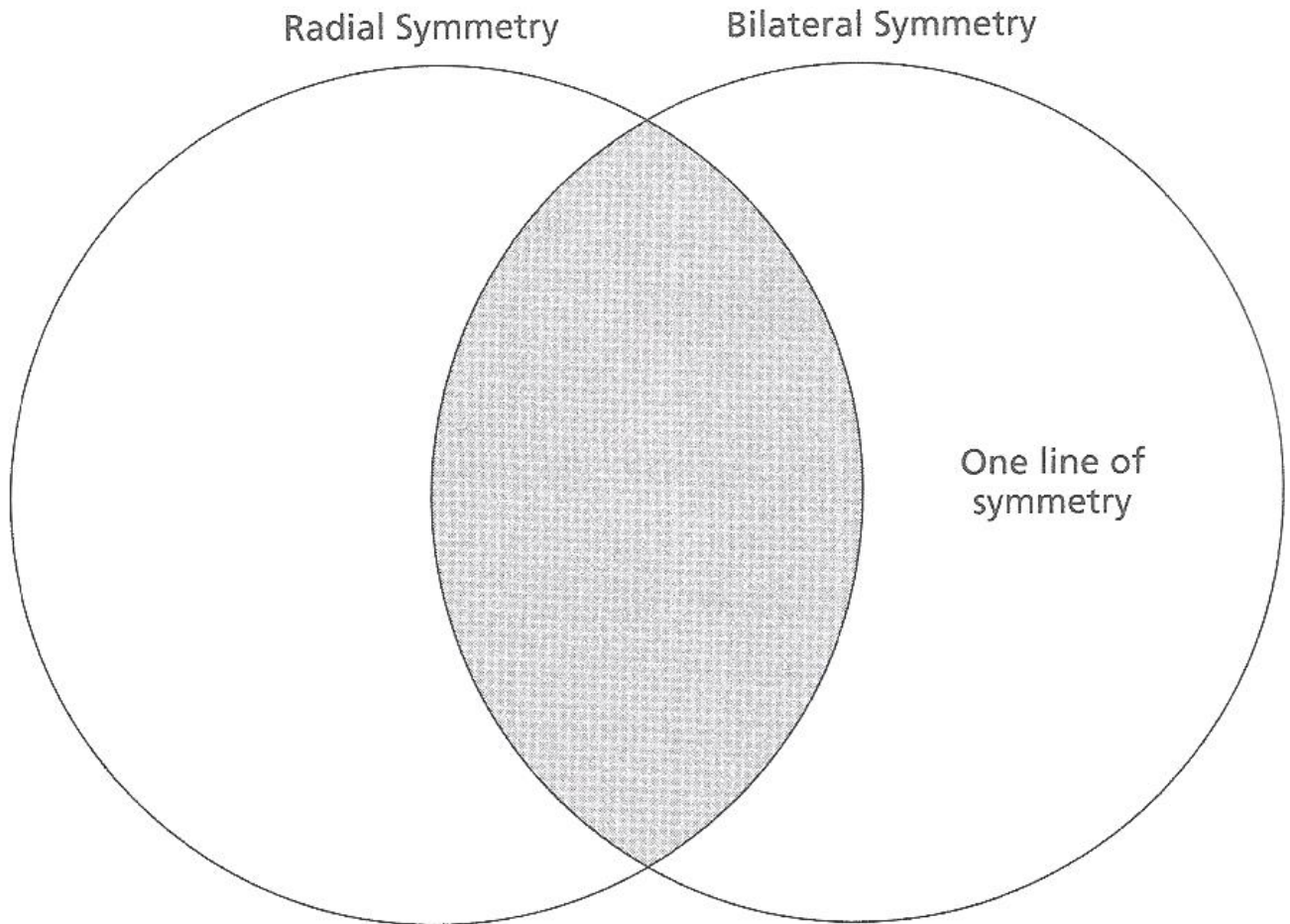
Directions: Answer the following questions

1. At what speed was Animal 1 moving most of the time? What seems to be its top speed? Did it move at this speed for very long?
2. About how fast did Animal 2 move when it was active? Was it most active during the day or during the night? How often did it stop to rest?
3. Is Animal 3 active during the day or night? Was it usually moving at high speed? What was its top speed? For approximately how long did it move at this speed? How far would it have traveled during this time?
4. Which of the 4 animals was mostly active at night? Which one remained active through the heat of the afternoon?
5. Match the 4 animals with the feeding method that they most likely used.
 - a. Animal 1 _____
 - b. Animal 2 _____
 - c. Animal 3 _____
 - d. Animal 4 _____
 1. Sit-and-wait predator
 2. Predator that pursues its prey long distances
 3. Herbivore or omnivore



ANIMAL SYMMETRY

Directions: Compare and contrast animals with radial and bilateral symmetry. In the shaded region, put characteristics that are shared by both animals.

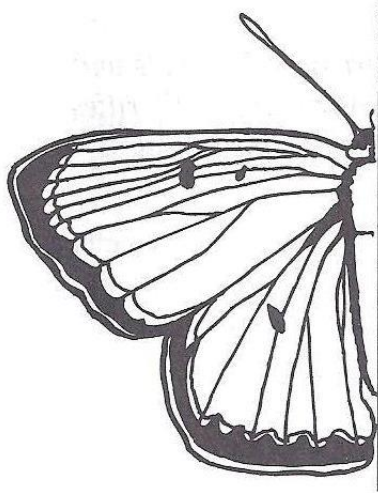


Directions: Fill in the blank with the appropriate term

1. If an animal has a head end and a tail end, it has _____.
2. All animals with _____ live in the water.
3. Animals with radial symmetry have _____ line(s) of symmetry that go(es) through a central point.
4. Animals with bilateral symmetry have _____ line(s) of symmetry that divide(s) them into two parts.

REVIEW: Animal Symmetry

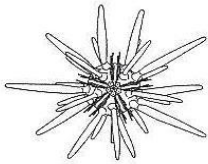
Directions: Complete the drawing of the butterfly's body on the other side of the line of symmetry



Directions:

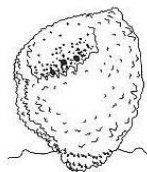
Classify the following as **HAVING NO SYMMETRY**, **BILATERAL SYMMETRY**, or **RADIAL SYMMETRY**. If the animal has a line(s) of symmetry, draw them.

1.



Sea Urchin

2.



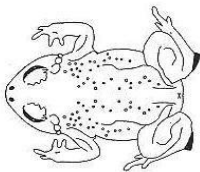
Sponge

3.



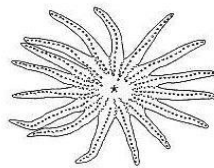
Beaver

4.



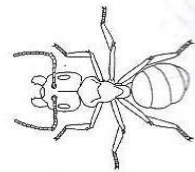
Frog

5.



Sea Star

6.

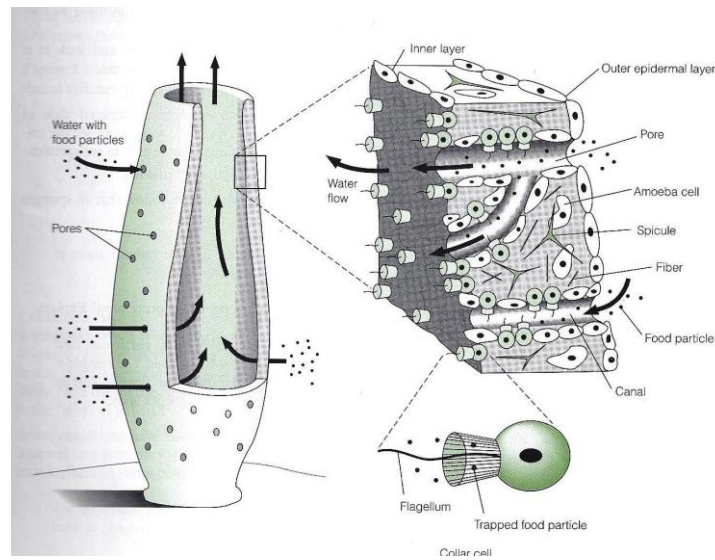


Ant

ACTIVITY: Sponges

Introduction:

There are approximately 9,000 species of sponges. All sponges are aquatic and most of them are marine. The figure below shows a typical sponge. The body is composed of two layers: an outer epidermal layer and an inner layer of collar cells. Sponges are filter feeders. Their bodies contain pores and water flows into the sponge via these pores. Once the water enters the body of the sponge, it continues through the canals called collar cells, where the water is filtered. These collar cells separate food particles from the water so the sponge can feed. Then, the water is brought into the central chamber, called the osculum, where it is expelled from the body. Below, is a diagram of a *Grantia*, a small marine sponge, found in coral reefs in the ocean.



Directions: Determine the function of the following structures:

1. Pores- _____
2. Collar Cells- _____
3. Osculum- _____
4. Central Canal- _____

ANALYSIS QUESTIONS:

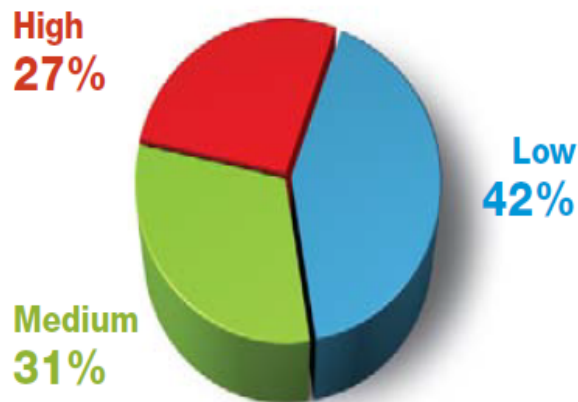
1. Given that all sponges are filter feeders, why does it follow that all sponges are aquatic?
2. Would mobility improve the ability of sponges to capture food? Explain.

CORAL Crisis

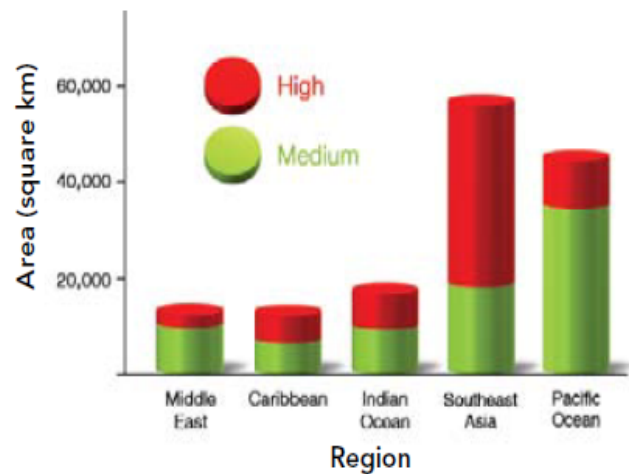
More than 1 million plants and animals live in the world's coral reefs. Coral reefs protect coastlines from storm damage, and organisms that live in them have been used to develop drugs to treat diseases.

Many of the world's coral reefs are at risk. The threats include destructive fishing practices and pollution. Global warming is also threatening reefs. Scientists have found that warming ocean waters are killing off many coral plants. Use the graphs to answer questions about the threats to coral reefs.

PERCENTAGE OF THE WORLD'S REEFS THAT ARE AT RISK OF DISAPPEARING



TOTAL AREA OF CORAL REEFS THAT ARE AT MEDIUM TO HIGH RISK OF DISAPPEARING



1. According to the pie chart, what percentage of the world's reefs are at high or medium risk of disappearing?

2. There are approximately 255,000 square kilometers of coral reefs in the world. Look at the pie chart. Roughly what area of coral reef is at low risk?

3. In which region of the world is the largest area of coral reef at risk?

4. Approximately what area of coral reef in the Caribbean and the Indian Ocean is at risk?

5. The Coral Triangle in Southeast Asia holds the greatest diversity of coral in the world. Based on the bar graph, are the reefs in the Coral Triangle at risk?

6. Do you think the reefs in the Coral Triangle and other places should be protected? Why or why not?

HOT SPOT

The Coral Triangle is an area of the oceans between Southeast Asia and the northern tip of Australia containing 53% of the world's coral reefs. Read below and study the map to discover more about this important ocean region. Then answer the questions that follow on a separate sheet of paper.



More than 75 percent of the world's species of coral are found in the Coral Triangle.



The region is home to more than 3,000 species of fish and acts as a breeding ground for many sea organisms.



Its beaches serve as nesting grounds for five of the world's seven species of sea turtles.



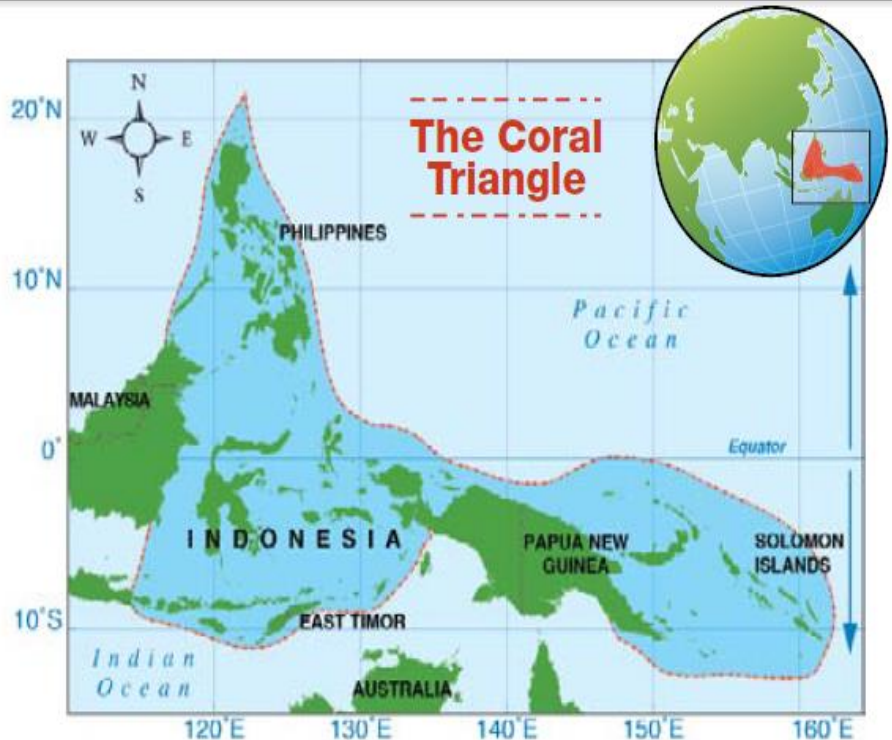
The reefs in the Coral Triangle are being threatened by human activities. Destructive fishing methods, such as the use of explosives, can destroy reefs.



More than 150 million people call the Coral Triangle home. Many of these people rely on the coral reefs for food and jobs.



Rising levels of carbon dioxide are harming the coral. Carbon dioxide causes Earth's temperatures to rise, warming the oceans and harming some ocean life.



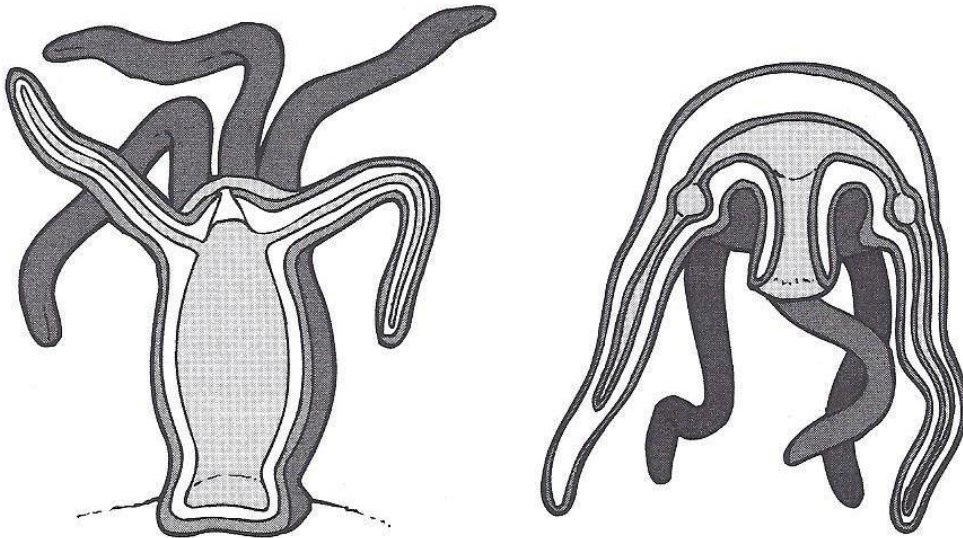
1. In which hemisphere is most of the Coral Triangle located: Northern or Southern?
2. Which of the following countries do not border or are not within the Coral Triangle: Australia, Philippines, Indonesia, Malaysia?
3. How does an increasing amount of carbon dioxide in the air affect coral reefs in the Coral Triangle?
4. What do you think would happen to the populations of fish and animals like sea turtles if the reefs in the Coral Triangle disappeared?
5. Conservation organizations are working with people who live in the region to try to protect the Coral Triangle. Why might it be beneficial for local people to protect the reefs?

SPONGES VS. CNIDARIANS

Directions: Fill in the chart that compares and contrasts the following organisms

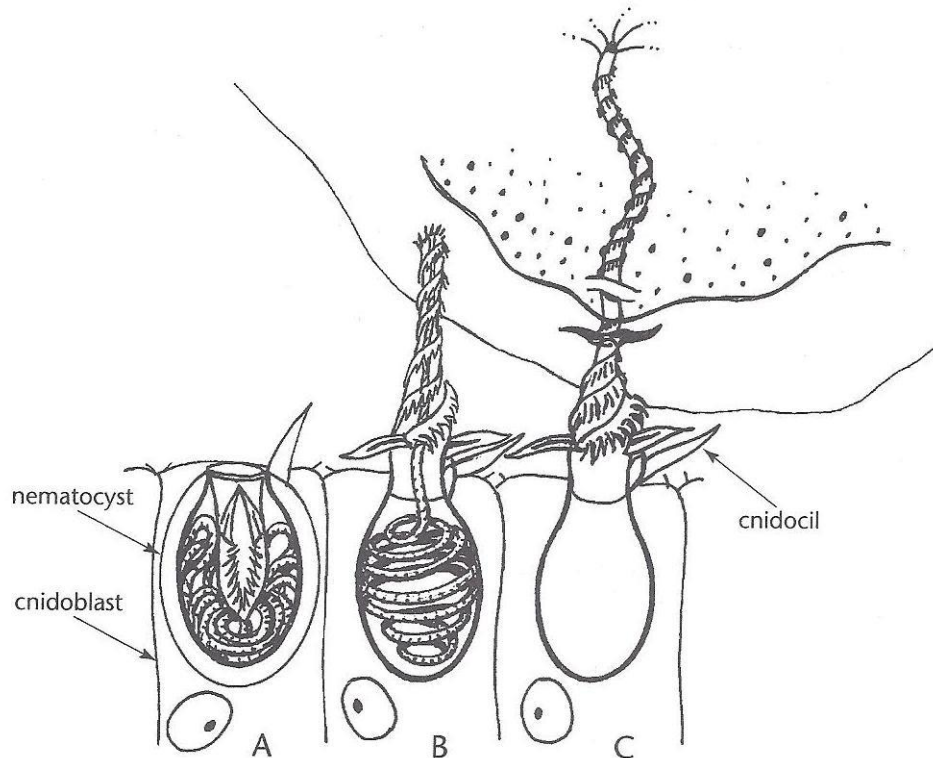
FEATURE	SPONGE	CNIDARIAN
Body Structure		
Cell Type that traps Food		
Method(s) of Reproduction		

Directions: In this diagram, identify which body form is a **polyp** and which is a **medusa**. Then label the **mouth** and the **central cavity** for each.



Cnidarians and Nematocysts

Cnidarians have specialized cells in their tentacles called cnidoblasts. Within the cnidoblasts are tiny stinging capsules called nematocysts. Inside the nematocyst capsule is a coiled thread. This thread injects venom into anything that brushes against the capsule's trigger. The capsule's trigger is called a cnidocil. The diagram below will help you understand how this occurs.

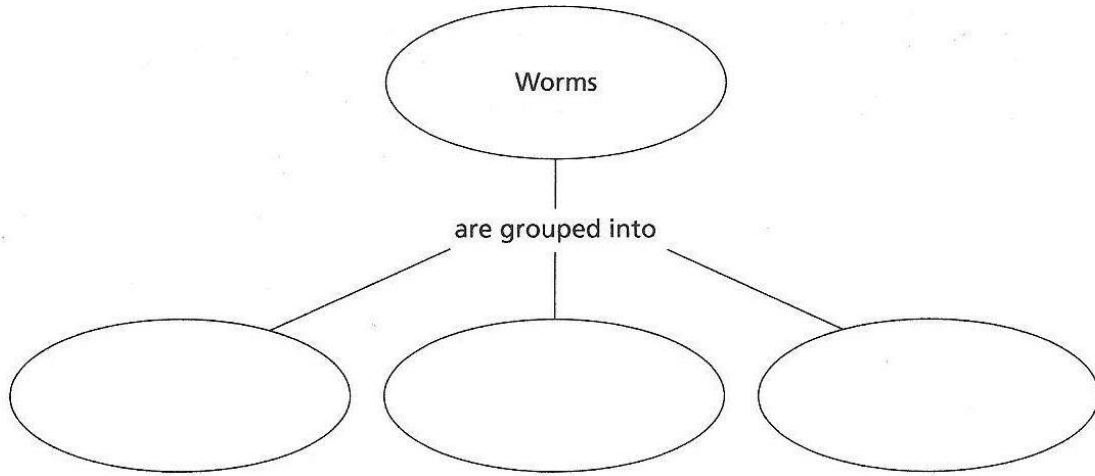


Directions: Answer the following questions.

1. List and describe the steps that occur in A, B, and C when a cnidarians captures food. You will need to include a D step as well. [HINT: What does the cnidarians do with its food after it stings it?]
2. People may be stung if they step on a dead jellyfish washed up on the beach. Why do you think this is so?
3. What functions do the stinging cells of a cnidarians serve?

PRACTICE: WORMS

Directions: Complete the following concept map about worms

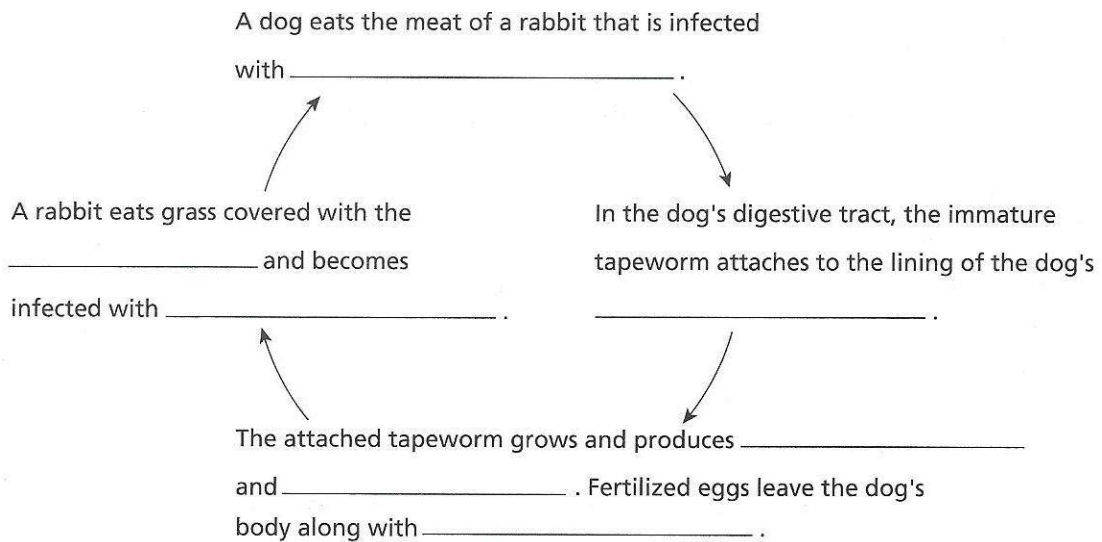


Directions: Answer the following questions about worms

List five characteristics shared by all worms.

1. _____
2. _____
3. _____
4. _____
5. _____

Directions: Complete the cycle diagram to show the life cycle of a dog tapeworm



REVIEW: WORMS

Directions: Decide whether the statement is true or false. If it is false, correct the underlined portion of the statement in order to make it true.

1. _____ Three major phyla of worms are flatworms, roundworms, and tube worms.
2. _____ Worms reproduce only through sexual reproduction.
3. _____ Worms are the simplest organism with a brain.
4. _____ Planarians are non-parasitic flatworms.
5. _____ Tapeworms are parasitic segmented worms.
6. _____ Planarians have one opening in their digestive system.
7. _____ Roundworms have a two-way digestive system.
8. _____ Worms have bilateral symmetry.
9. _____ Earthworms are segmented worms.
10. _____ Earthworms have a(n) open circulatory system.
11. _____ Earthworms must keep their skin moist.

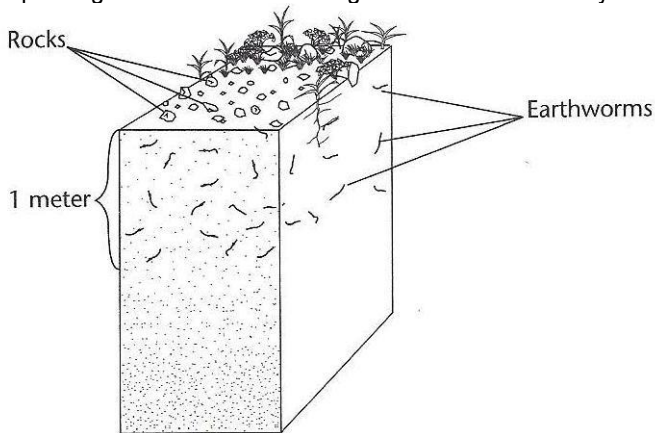
Directions: Match the following terms to their definitions

- | | |
|--------------------------------|--|
| 12. _____ scavenger | a. Organism that gets its food from living in or on another organism |
| 13. _____ anus | b. Organism that feeds on dead or decaying material |
| 14. _____ parasite | c. Organism in or on which another organism lives and gets its food from |
| 15. _____ free-living organism | d. An organism that does not live in or on other organism |
| 16. _____ host | e. Opening through which waste exits in a one-way digestive system |

The Mighty Earthworm

As a young man, Charles Darwin noticed that over the space of several years, all the rocks in a field near his house in England seemed to be sinking into the ground. Eventually he inferred that earthworms were causing this. Earthworms tunnel through the top meter or so of soil. They feed by taking in dirt and dead plant matter through their mouths. The dirt passes through the earthworms' bodies and is deposited in their tunnels and on the surface of the soil. The little piles of deposited dirt are called castings. As the worms remove soil from beneath the rocks, the rocks sink. Eventually, the rocks become buried in castings.

The diagram below represents the beginning of a simple experiment that Darwin performed. He spread a small layer of small, white rocks on the surface of a field. Twenty-nine years later, the rocks could not be seen. Darwin dug a trench in the field to see what had happened to the white rocks. From their location, Darwin calculated that the earthworms in his field were depositing about 5.5mm of castings on the surface each year.



Directions: Answer the following questions.

1. After 29 years, about how far below the surface were the bottoms of the rocks?
2. Next to the diagram above, draw a diagram showing a cross section of the soil representing what Darwin would have seen in his trench.
3. Assuming that the rate of burial stayed the same, how long would it take for the rocks to be buried 50cm deep?
4. Scientists speculate that the rocks would never be buried more than a meter deep. Explain why this might be so.

REVIEW: KEY TERMS

Directions: Answer the following questions by writing the correct key term in the blanks. Unscramble the circled letters from each term to find the hidden key terms. Then, write a definition for the hidden key terms.

1. What is an animal without a backbone?

— — — — — — — — — — — — — —

2. What is a bowl-shaped cnidarian that is adapted for swimming?

— — — — — — — —

3. What is a basic unit of structure and function found in all living things?

 — — — —

4. What is the symmetry shown by objects if there is one line that divides the object into halves that are mirror images?

— — — — — — — — — — — — — — — — — — — — — — — — — — — — — —

5. What does a group of different tissues form?

— — — — — — — — — — — —

6. What is an animal that has a backbone?

 — — — — — — — — — — — — — — — —

7. What is an organism that lives inside or on another organism?

— — — — — — — — — — — — — — — — — — — — — — — —