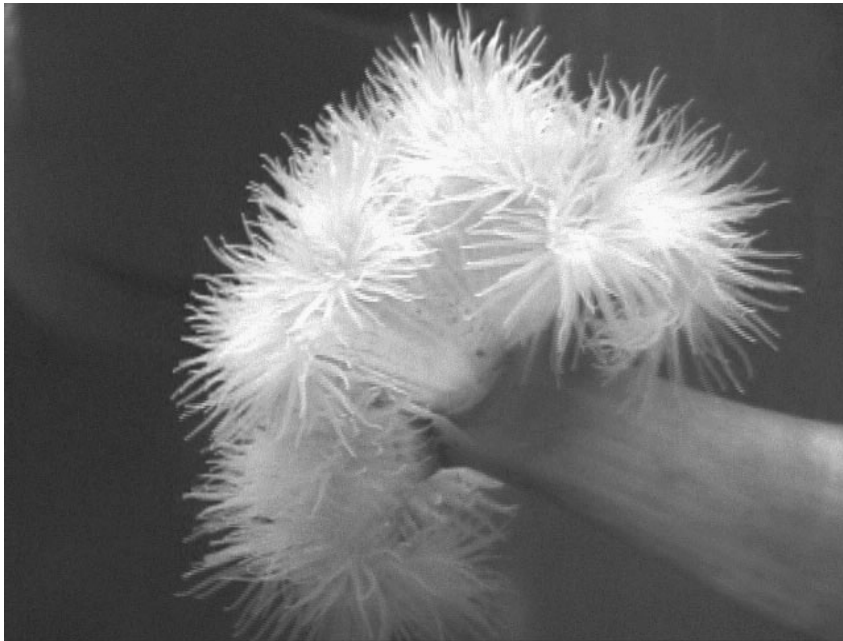


Water

Teacher's Guide Middle School



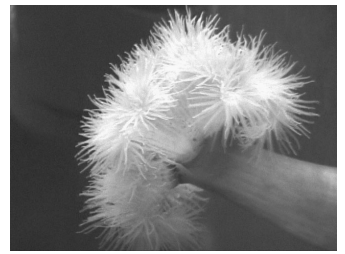
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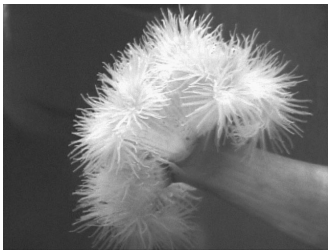
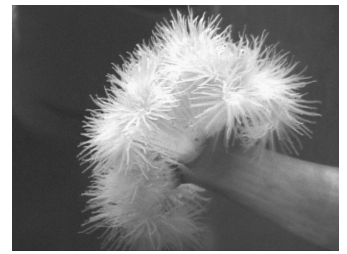


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Viewing Clearances

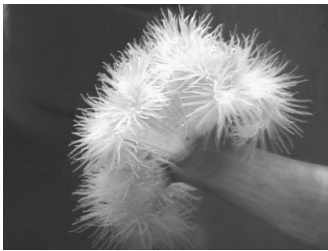
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A Message from our Company ...

Dear Educator:

Thank you for your interest in the educational videos produced by the *Visual Learning Company*. We are a Vermont-based, family owned and operated business specializing in the production of quality educational science videos and materials.

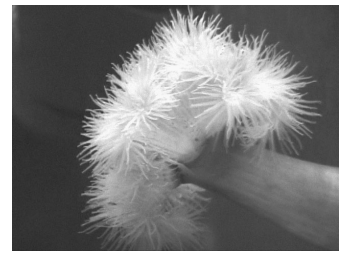
We have a long family tradition of education. Our grandmothers graduated from normal school in the 1920's to become teachers. Brian's mother was an elementary teacher and guidance counselor, and his father was a high school teacher and superintendent. This family tradition inspired Brian to become a science teacher, and to earn a Ph.D. in education, and lead Stephanie to work on science educational programs at NASA.

In developing this video, accompanying teacher's guide, and student activities, our goal is to provide educators with the highest quality materials, thus enabling students to be successful. In this era of more demanding standards and assessment requirements, supplementary materials need to be curricular and standards based - this is what we do!

Our videos and accompanying materials focus on the key concepts and vocabulary required by national and state standards and goals. It is our mission to help students meet these goals and standards, while experiencing the joy and thrill of science.

Sincerely,

Brian and Stephanie Jerome



Standards Correlations

National Science Education Standards

(Content Standards: 5-8, National Academy of Sciences, c. 1996)

Science as Inquiry - Content Standard A:

As a result of activities in grades 5-8, all students should develop:

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Life Science- Content Standard C:

As a result of their activities in grades 5-8, all students should develop an understanding that:

- The number of organisms an ecosystem can support depends on the resources available and abiotic factors, such as quantity of light and water, range of temperatures, and soil composition. Lack of resources and other factors, such as predation and climate, limit the growth of populations in specific niches in the ecosystem.
- Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.

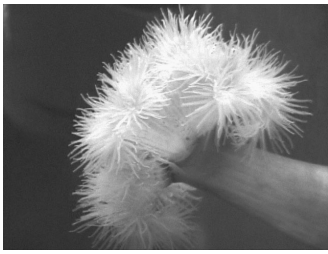
Benchmarks for Science Literacy

(Project 2061 - AAAS, c. 1993)

The Living Environment - Interdependence of Life (5D)

By the end of the 8th grade, students should know that:

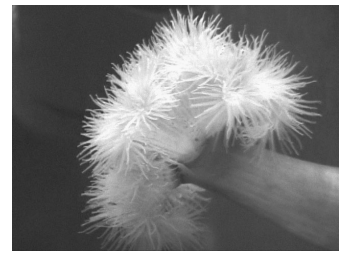
- In all environments - freshwater, marine, forest, desert, grassland, mountain, and others - organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter. In any particular environment, the growth and survival of organisms depends on their physical conditions.



Student Learning Objectives

Upon viewing the video and completing the enclosed student activities, students should be able to do the following:

- List the characteristics of the two water biomes: marine and aquatic;
- Explain the distribution of water on the earth's surface;
- Differentiate between and provide examples of the three major groups of marine life: benthos, plankton, and nekton;
- Describe the location and characteristics of the three major ocean zones: intertidal, neritic, and open ocean;
- Understand that an estuary is a place where the marine and aquatic biomes meet, and is therefore an area of high biological productivity;
- Describe general characteristics of the two major types of freshwater biomes: running water and standing water;
- Differentiate between ponds, lakes, and swamps; and
- Provide examples of plants and animals that live in the marine and aquatic biomes.



Assessment

Preliminary Test:

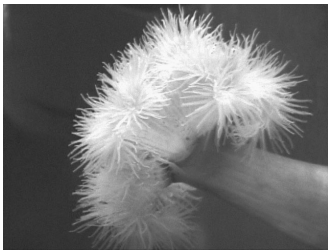
The Preliminary Test, provided in the Student Masters section, is an assessment tool designed to gain an understanding of student preexisting knowledge. It can also be used as a benchmark upon which to assess student progress based on the objectives stated on the previous pages.

Video Review:

The Video Review, provided in the Student Masters section, can be used as an assessment tool or as a student activity. There are two main parts. The first part contains questions titled “You Decide” that can be answered during the video. The second series of ten questions consists of a video quiz to be answered at the conclusion of the video.

Post-Test:

The Post-Test, provided in the Student Masters section, can be utilized as an assessment tool following student completion of the video and student activities. The results of the Post-Test can be compared against the results of the Preliminary Test to assess student progress.



Introducing the Video

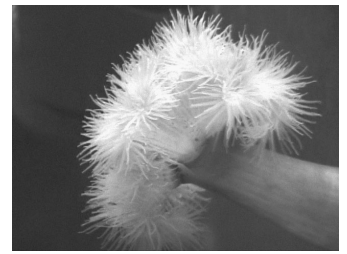
Ask students to bring to class something that lives in or originates from a water biome. Examples may include bottled water, salt, a can of tuna, a cattail from a nearby swamp, or a photo of a shark. Have each student present their object to the class. Next, ask students to group themselves according to the type of water biome represented by their object. You may need to help divide the students into groups. Once the groups are established, ask each group to describe their water biome: saltwater or freshwater, running water or standing water, size, other organisms found in the biome, etc. Have the groups present their descriptions to the class. After each presentation, help the class name the biome just described. Tell students to watch the video closely to learn more about the earth's water biomes.

Video Viewing Suggestions

The Student Master "Video Review" is provided for distribution to students. You may choose to have your students complete this Master while viewing the program or to do so upon its conclusion.

The program is approximately 20-minutes in length and includes a ten-question video quiz. Answers are not provided to the Video Quiz on the video, but are included in this teacher's guide. You may choose to grade student quizzes as an assessment tool or to review the answers in class.

The video is content-rich with numerous vocabulary words. For this reason you may want to periodically stop the video to review and discuss new terminology and concepts.



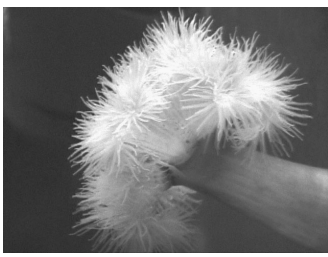
Student Assessments And Activities

Assessment Masters:

- Preliminary Test
- Video Review
- Post-Test

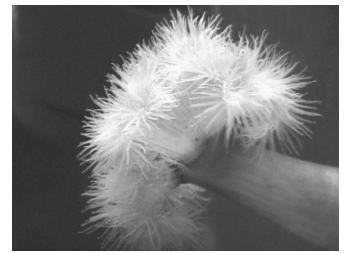
Student Activity Masters:

- Water Meals
- Biotic Indicators
- Locating Marine Animals
- Vocabulary of *Water*



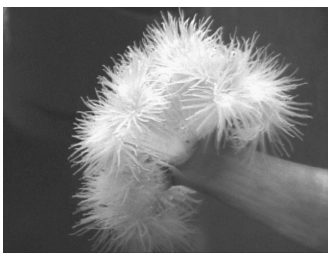
Video Script: Water

1. What is one of the most precious natural resources on Earth?
2. Here are some hints. We use it nearly everyday.
3. It often falls from the sky.
4. Many different kinds of plants and animals call it their home.
5. Human survival depends on it.
6. It covers over 70% of the earth's surface.
7. And it even flows into our homes.
8. If you haven't guessed what it is yet, this valuable natural resource is water.
9. The water biome is the largest biome on Earth.
10. During the next few minutes, we are going to explore some of the general characteristics of the water biome.
11. We'll also take a look at the different types of water biomes...
12. ...and explore some of the plants and animals that live in water.
- 13. Graphic Transition – Water Biomes**
14. When viewed from space, the earth looks like a large blue marble.
15. This is because Earth is covered mostly with water.
16. Most of the water is in the earth's oceans.
17. In fact, about 70% of the water on the earth's surface is ocean water.
18. Ocean biomes are referred to as marine biomes. The water in marine biomes is salty.
19. The water is so salty that drinking it will make you even thirstier.
20. Thousands of different kinds of plants and animals live in marine water.
21. We will discuss marine biomes in more detail shortly.
22. The other major type of aquatic biome is the freshwater biome.
23. Freshwater is found in running streams or rivers,...
24. ...while standing water is found in lakes and ponds.
25. We will discuss freshwater biomes a little later.
- 26. Graphic Transition – Marine Biomes**
27. The vast majority of saltwater lies in the earth's oceans,...
28. ...but some saltwater lies in seas...
29. ...and in saltwater lakes, such as Mono Lake, seen here.
30. But we'll spend most of our time talking about the oceans.
31. Ocean conditions vary depending on location,...
32. ...but some general similarities do exist.
33. For example, oceans absorb heat during the warm seasons and hold it during colder seasons.
34. Therefore, ocean temperatures remain fairly steady, unlike the large temperature fluctuations found on land.



Script (cont.)

35. The temperature of ocean water does tend to vary by latitude, with tropical water being warmer...
 36. ...than Arctic waters.
 37. The depth of ocean water also has a great effect on temperature, as does the amount of light that filters through the water.
 38. As depth increases, the amount of light decreases. Generally speaking, as depth increases, temperature decreases as well.
 39. The salt content, or salinity, of ocean water can also vary depending on location.
 40. All these factors have a great influence on where different types of organisms live in the ocean.
 - 41. Graphic Transition – Ocean Life**
 - 42. You Decide!** Is this a plant or an animal?
 43. Even though this looks like a plant, it is actually an animal called a sea anemone.
 44. Sea anemones are hollow-bodied animals that capture prey, such as fish, with their tentacles.
 45. Located on the tips of their tentacles are chemicals that have the ability to paralyze prey.
 46. Sea anemones are just one example of the thousands of fascinating organisms that live in the ocean.
 47. Ocean organisms can be divided into three main groups based on where they live in the ocean.
 48. Organisms that live on the ocean floor are called benthos or benthic organisms.
 49. What is the benthic organism seen here?
 50. That's right, this rock crab is a benthic organism.
 51. It moves across the ocean floor in search of food, capturing prey with its claws.
 52. Snails are benthic organisms,...
 53. ...as are starfish.
 54. Organisms that float in the ocean and are carried by ocean currents are called plankton.
 55. Jellyfish are one type of plankton.
 56. These small crustaceans are another type of plankton called zooplankton.
 57. Large animals such as whales depend on zooflagellates for food.
 - 58. You Decide!** What do you call these plant-like organisms?
 59. These microscopic plant-like plankton are called phytoplankton.
 60. Phytoplankton create food from the sun's energy and are a very important
-



Script (cont.)

organism in the ocean, serving as the base of the food chain.

61. Phytoplankton are also a major contributor to Earth's oxygen supply.

62. The third major group of free swimming organisms are called nekton.

63. Some examples of nekton include fish,...

64. ... seals,...

65. ...and sharks.

66. Graphic Transition – Zones of the Ocean

67. You wouldn't expect to see a whale in a shallow pool along the ocean shore.

68. Nor would you find this crab in the deep ocean.

69. Factors such as the amount of sunlight, temperature, water pressure...

70. ...and the movement of water determine where organisms live in the ocean.

71. The area along the shoreline is rich with life.

72. This area, called the intertidal zone, is covered by water at high tide,...

73. ...but is not covered by water at low tide.

74. Therefore, organisms that live in the intertidal zone must be able to cope with a constantly changing environment.

75. Changes in temperature, salinity, wave action, and water levels are all threats to the survival of intertidal organisms,...

76. ...as are exposure to sun, wind, and predators, such as this gull.

77. For example, organisms that live on sandy beaches must be able to cope with constantly moving sand.

78. Therefore, animals such as this razor clam burrow deep into the sand to maintain their position.

79. On rocky shores that are subject to the pounding of ocean surf,...

80. ...brown algae, such as this rockweed, attach themselves to the rocks.

81. As the tide goes out, intertidal pools provide a place where animals,...

82. ...such as crabs, can take refuge until the tide rises.

83. Beyond the intertidal zone is the neritic zone.

84. The neritic zone consists of shallow water above the continental shelf and is generally less than 300 meters deep.

85. This zone is full of life. Nutrients from the land wash into coastal waters, providing needed nutrients for plant-like algae, such as kelp,...

86. ...and for microscopic plant-like phytoplankton.

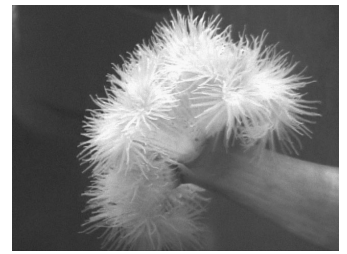
87. Organisms such as starfish,...

88. ...scallops,...

89. ...and lobsters live in this zone,...

90. ...as do hundreds of different fish species.

91. Beyond the continental shelf lies the open ocean.



Script (cont.)

92. At its deepest point, the open ocean contains water that is nearly 7 miles, or over 11 kilometers, deep.
93. Light penetrates the upper portion of the open ocean.
94. However, at depths below 200 meters, the ocean world is dominated by darkness, cold temperatures, and great pressure.
95. This means the deep ocean is not as biologically productive as coastal waters, but many different kinds of organisms do live there.
96. And scientists exploring these waters are still learning a great deal about life that lives in this deep, dark, cold part of the ocean.

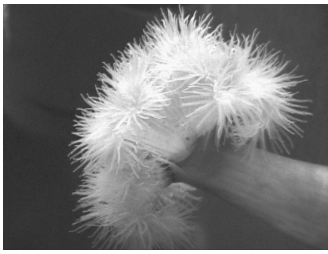
97. Graphic Transition - Estuaries

98. You Decide! What is an estuary?

99. An estuary is an area where a river or stream meets the ocean.
100. It is the place where freshwater and saltwater mix.
101. Estuaries tend to be areas of high biological productivity, providing an abundance of food for a wide range of animals.
102. The Chesapeake Bay, pictured here in a satellite image, is quite large,...
103. ...as is the St. Lawrence River Estuary in Quebec, Canada.
104. But this estuary, in which a small stream flows into the ocean, is quite small.
105. Regardless of the size of an estuary, they are fascinating places with a wide variety of plants and animals.
106. Estuaries also are extremely important sources of food, providing us with crabs,...
107. ...shrimp, ...
108. ...and many different kinds of fish.

109. Graphic Transition – Freshwater

110. While the oceans cover more than 70 percent of the earth's surface,...
111. ...freshwater covers much less of the surface.
- 112. You Decide!** What percentage of the earth's surface does freshwater cover?
113. Freshwater only covers between 2 and 3 percent of the earth's surface.
114. Even though freshwater covers a limited part of the earth, it is extremely important to us.
115. Much of the water we drink comes from lakes and rivers.
116. Lakes and rivers also serve as transportation routes for ships,...
117. ...and are great places to recreate.
118. Freshwater biomes can be divided into two main types -...
119. ...running water, which includes streams and rivers,...
120. ...and standing water, such as lakes and ponds.



Script (cont.)

121. Graphic Transition – Running Water

122. This mountain stream is moving rapidly downhill.
123. The cool water holds large amounts of oxygen, enabling fish, such as trout, to thrive.
124. An abundance of aquatic insects and their larva serve as a source of food for fish,...
125. ...as well as amphibians, such as frogs,...
126. ...and invertebrate animals, such as crayfish.
127. Rivers are larger bodies of running water.
128. The Connecticut River is a large river and serves as a major shipping route and water source.
129. Like many rivers, it provides a home to otters,...
130. ...many species of fish,...
131. ...turtles,...
132. ...and hundreds of different kinds of invertebrate animals.

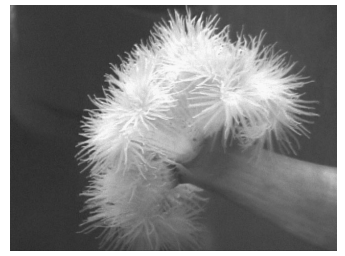
133. Graphic Transition – Ponds, Lakes, and Swamps

134. Perhaps you have taken a swim in a lake or pond.
135. Unlike streams and rivers, these bodies of water do not have a strong current.
136. Ponds tend to be smaller than lakes, and light penetrates to the bottom.
137. Plants, such as these cattails, take root close to the shore in ponds.
138. Other plants, such as these water lilies, thrive further from the shore.
139. Some examples of pond animals include crayfish,...
140. ...fish,...
141. ...frogs,...
142. ...and turtles.
143. Lakes tend to be larger bodies of water.
144. They are also deeper than ponds and therefore light does not penetrate to the bottom.
145. This wetland area is a swamp.

146. You Decide! What is a swamp?

147. Swamps are wetland areas in which shrubs and even trees grow.
148. Cypress swamps in the southeastern United States are dominated by cypress trees and are home to a wide variety of...
149. ...birds,...
150. ...turtles,...
151. ...as well as the American alligator.

152. Graphic Transition – Summing Up

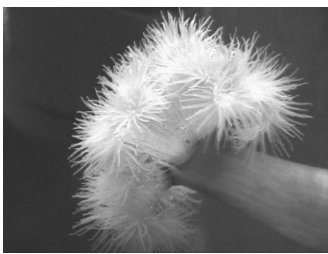


Script (cont).

153. During the past few minutes, we have taken a look at the different types of water biomes,...
154. ...beginning with the ocean.
155. We took a look at some of the different characteristics of the ocean biome,...
156. ...as well as some of the plants and animals that live in different parts of the ocean.
157. We also took a quick look at some of the characteristics of freshwater biomes, such as streams,...
158. ...rivers,...
159. ...ponds and lakes,...
160. ...as well as swamps.
161. So the next time you swim in the ocean,...
162. ...sail in a boat...
163. ...or paddle down a river,...
164. ...think about some of the characteristics of water biomes.
165. You just might look at water a little differently.

166. Video Quiz

167. Fill in the correct word when you hear this tone. Good luck and let's get started.
1. The oceans cover about _____ of the earth.
 2. Ocean water temperature remains relatively _____.
 3. As depth increases, the amount of light _____.
 4. Organisms that live on the ocean floor are called _____.
 5. _____ are organisms that float in the ocean.
 6. The _____ zone consists of water above the continental shelf.
 7. An _____ is the area where a river or stream meets the ocean.
 8. Estuaries are areas high in _____.
 9. In _____, light penetrates to the bottom.
 10. Swamps are wetland areas that have _____.



Answers to Student Assessments

Preliminary Test

1. intertidal
2. water
3. ocean
4. 70
5. anemones
6. benthic
7. phytoplankton
8. river
9. current
10. salinity
11. true
12. false
13. false
14. true
15. false
16. true
17. true
18. false
19. false
20. true

Video Review

You Decide:

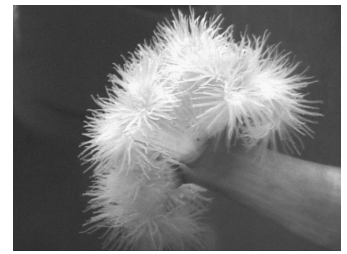
- A. The organism is an animal called a sea anemone.
- B. The plant-like organisms are called phytoplankton.
- C. An estuary is an area where a river or stream meets the ocean.
- D. 2-3% of Earth's surface is freshwater.
- E. Swamps are wetland areas in which shrubs and trees grow.

Video Quiz:

1. 70%
2. constant
3. decreases
4. benthos
5. plankton
6. neritic
7. estuary
8. biological productivity
9. ponds
10. shrubs and/or trees

Post Test

1. false
2. true
3. false
4. true
5. true
6. false
7. true
8. false
9. false
10. true
11. ocean
12. river
13. benthic
14. intertidal
15. phytoplankton
16. current
17. 70
18. salinity
19. water
20. anemones



Answers to Student Activities

Water Meals

Answers will vary.

Biotic Indicators

1. Answers will vary.
2. Answer will vary.
3. Answers will vary.
4. To maintain healthy water, it is important not to dump any harmful substances, such as used oil or cleaners, into storm drains or onto the street, or bodies of water. Limiting the use of lawn fertilizers and pesticides also prevents local water pollution.

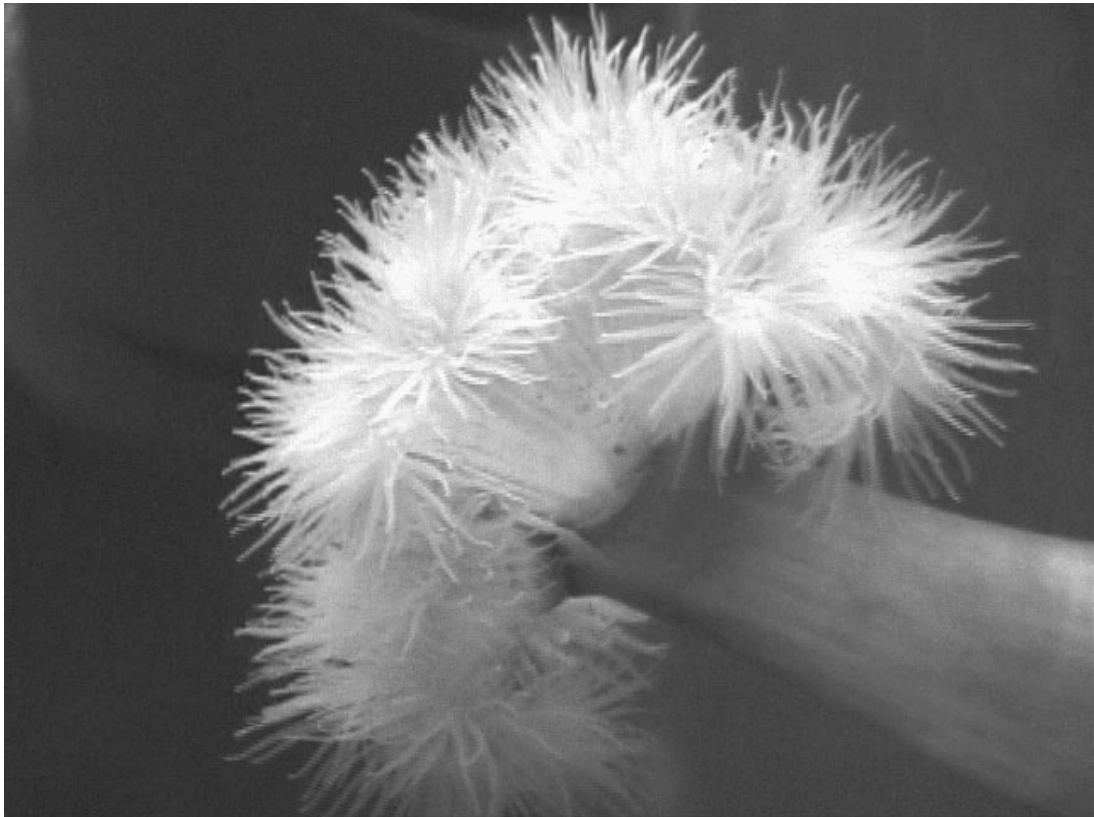
Vocabulary

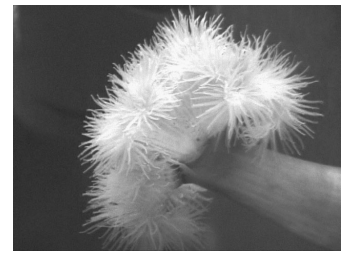
1. lake, e
2. benthos, a
3. open ocean, j
4. estuary, f
5. plankton, d
6. neritic zone, i
7. marine biome, c
8. intertidal zone, b
9. stream, g
10. nekton, h

Exploring Marine Animals

1. rock crab - benthos; neritic and intertidal
2. starfish - benthos; neritic and intertidal
3. sandpiper - not a marine animal; intertidal
4. orca whale - nekton; neritic and open ocean
5. jellyfish - plankton; neritic and open ocean
6. blue mussel- benthos; neritic and intertidal
7. porpoise - nekton; open ocean and neritic
8. seals - nekton; neritic
9. brown algae - plankton; neritic and intertidal
10. small fish - nekton; neritic and open ocean

Assessment and Student Activity Masters



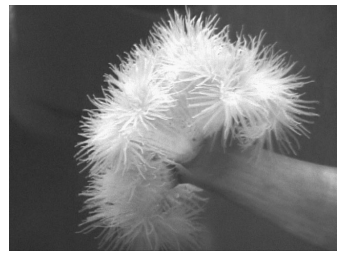


Preliminary Test

Directions: Fill in the blank with the correct word. A list of possible answers is provided at the bottom of the page.

1. The _____ zone is covered by water at high tide but is not covered at low tide.
2. The _____ biome is the largest biome on Earth.
3. Most of the water on Earth is _____ water.
4. Oceans cover approximately ____ percent of the earth's surface.
5. Sea _____ capture their prey by paralyzing them.
6. Crabs are categorized as _____ organisms because they live on the ocean floor.
7. _____ are microscopic plant-like organisms.
8. A _____ is a large body of running water.
9. Lakes and ponds do not have a strong _____.
10. The salt content, or _____, of ocean water varies according to location.

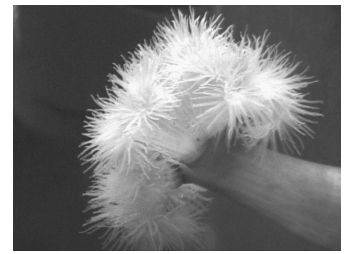
- | | |
|---------------|------------|
| current | 70 |
| ocean | salinity |
| water | intertidal |
| river | neritic |
| phytoplankton | benthic |
| 35 | anemones |



Preliminary Test

Directions: Decide whether the answer is True (T) or False (F).

- | | | |
|---|---|---|
| 11. Whales are categorized as nekton. | T | F |
| 12. Saltwater is only found in the oceans. | T | F |
| 13. About 40% of Earth's surface water is ocean water. | T | F |
| 14. All of Earth's oceans are connected to one another. | T | F |
| 15. Like the land, the ocean experiences large temperature fluctuations. | T | F |
| 16. An estuary is an area where a river or stream meets the ocean. | T | F |
| 17. Freshwater covers between 2 and 3 percent of Earth's surface. | T | F |
| 18. Light usually does not reach the bottom of ponds. | T | F |
| 19. Plankton have the ability to swim against the ocean current. | T | F |
| 20. The neritic zone consists of shallow water above the continental shelf. | T | F |



Video Review

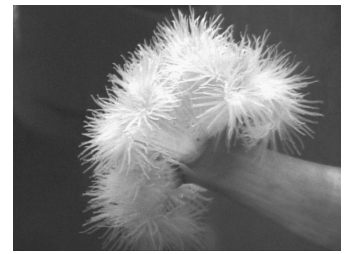
Directions: During the course of the program, answer the “You Decide” questions as they are presented in the video. Answer the Video Quiz questions at the end of the video.

You Decide:

- A. Is this a plant or an animal? Answer _____
- B. What do you call these plant-like organisms? Answer _____
- C. What is an estuary? Answer _____
- D. What percentage of the earth’s surface does freshwater cover? Answer _____
- E. What is a swamp? Answer _____

Video Quiz:

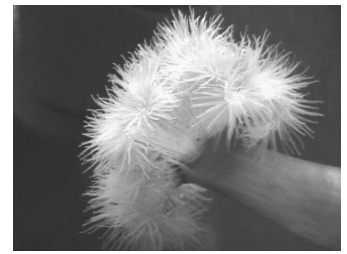
1. The oceans cover about _____ of the earth.
2. Ocean water temperature remains relatively _____.
3. As depth increases, the amount of light _____.
4. Organisms that live on the ocean floor are called _____.
5. _____ are organisms that float in the ocean.
6. The _____ zone consists of water above the continental shelf.
7. An _____ is the area where a river or stream meets the ocean.
8. Estuaries are areas high in _____.
9. In _____ light penetrates to the bottom.
10. Swamps are wetland areas that have _____.



Post Test

Directions: Decide whether the answer is True (T) or False (F).

- | | | |
|--|---|---|
| 1. Light usually does not reach the bottom of ponds. | T | F |
| 2. The neritic zone consists of shallow water above the continental shelf. | T | F |
| 3. Saltwater is only found in the oceans. | T | F |
| 4. An estuary is an area where a river or stream meets the ocean. | T | F |
| 5. All of Earth's oceans are connected to one another. | T | F |
| 6. Plankton have the ability to swim against the ocean current. | T | F |
| 7. Whales are categorized as nekton. | T | F |
| 8. Like the land, the ocean experiences large temperature fluctuations. | T | F |
| 9. About 40% of Earth's surface water is ocean water. | T | F |
| 10. Freshwater covers between 2 and 3 percent of Earth's surface. | T | F |



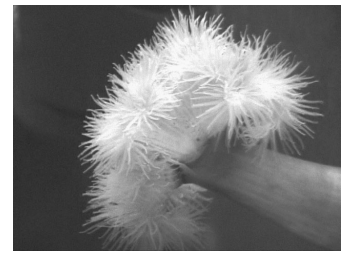
Post Test

Directions: Fill in the blank with the correct word. Choose from the list of possible answers at the bottom of the page.

11. Most of the water on Earth is _____ water.
12. A _____ is a large body of running water.
13. Crabs are categorized as _____ organisms because they live on the ocean floor.
14. The _____ zone is covered by water at high tide but is not covered at low tide.
15. _____ are microscopic plant-like organisms.
16. Lakes and ponds do not have a strong _____.
17. Oceans cover approximately ____ percent of the earth's surface.
18. The salt content, or _____, of ocean water varies according to location.
19. The _____ biome is the largest biome on Earth.
20. Sea _____ capture their prey by paralyzing them.

current
ocean
water
river
phytoplankton
35

70
salinity
intertidal
neritic
benthic
anemones



Water Meals

Objective: In this activity, students will identify common foods that are derived from aquatic environments.

Background: Have you ever thought about how many foods come from water biomes? Both freshwater and marine environments provide us with many different types of food. Trout, salmon, lobster and tuna are all popular foods that originated in either a marine or freshwater environments. In some cultures, snails and octopus are considered to be delicacies. In fact, many restaurants devote an entire section of their menu to seafood!

Have you ever noticed the ingredients used in toothpaste? One of the key ingredients is carrageenan, a substance that comes from red algae. It is used to give icecream, pudding, and toothpaste their creamy texture. Not only is seaweed used as an ingredient in products that we use every day, it is also consumed directly by humans. As you can see, there are many examples, both obvious and not so obvious, of ways in which humans consume water organisms.

Materials:

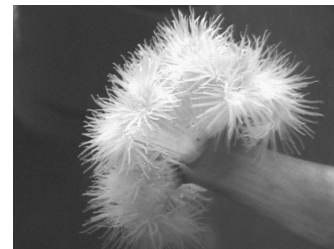
grocery store flyers or newspaper advertisements
poster board
scissors
glue

Procedure:

1. Divide into groups of four or five.
2. Each group needs at least two grocery store flyers.
3. Go through the flyers and cut out any product that is either an organism that lives in water or contains an ingredient that originated in a water biome.
4. Creatively arrange and glue all clippings to the poster board.
5. Answer the questions below.

Questions:

1. What percentage of food advertised in the flyer is seafood?
2. Name five different products that contain at least one ingredient derived from either marine or freshwater environments.
3. Name five different foods derived directly from a water biome. Identify whether they come from a freshwater or a saltwater environment.



Biotic Indicators

Objective: In this activity, students will examine organisms in a nearby body of water to determine the quality of water.

Background: Water quality is very important to our daily lives. It influences the diversity of plants and animals that live in an area, and determines the ways we can use water. Did you know that organisms can be used to assess the quality of a body of water? A water habitat that contains a large and diverse group of organisms indicates high quality water. On the other hand, water with few organisms usually indicates a low quality of water. While some organisms can survive in low quality water, others cannot. **Indicator species** are aquatic organisms whose presence or absence is used to reveal the health of a body of water. Using these species, we can determine the water's level of contamination and take action to improve its health.

Materials:

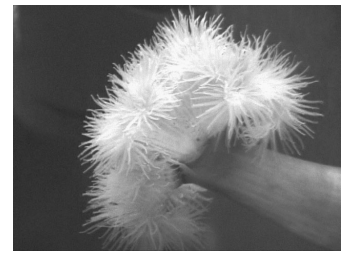
2 buckets or large containers	dissecting microscope
fish tank net	magnifying lens
masking tape or other labeling materials	

Procedure:

1. Your teacher will select a nearby body of freshwater, preferably a river or stream, to test. He/she will divide you into groups and assign each group to a particular area.
2. Using the net, skim the water's surface in a few different areas. Place any insects that you find into a bucket containing water. Label the bucket "surface water."
3. Next, use the net to gather insects beneath the surface of the water. Place the insects in a separate bucket and label.
4. Once you return to the classroom, examine the insects using a magnifying lens and dissecting microscope. Use the identification guide, provided on the following page, to identify the organisms. Record the number of each insect type.
5. Finally, use the chart on the following page to determine the health of the water. The chart divides organisms into two groups, based on their ability to survive in unhealthy water. If your water sample contains significantly more organisms with a low ability, the water is healthy. If it contains more insects with a high ability, the water is unhealthy.
6. After completing the activity, return the organisms to the body of water from which they were collected.

Discussion:

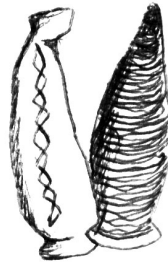
1. Which organisms were most abundant in your water supply? Which organisms were least abundant?
2. Describe the health of your water sample.
3. Write a paragraph describing the importance of having a healthy water supply.
4. Describe what can be done to maintain healthy water, and to improve the conditions of unhealthy water.



Biotic Indicators (cont).



Caddis Fly



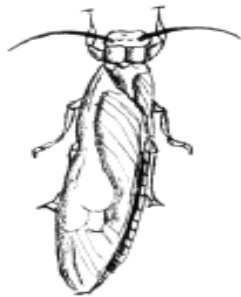
Leeches



Stonefly Larva



Caddisfly Larva



Stonefly

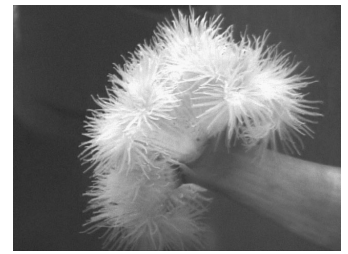


Mayfly Larva



Midge Larva

Tolerance to Poor Water Quality	
Low Tolerance	High Tolerance
stonefly stonefly larva mayfly caddisfly larva caddisfly	midge larvae leech



Locating Marine Animals

Objective: In this activity, students will learn about the different types of marine animals and where they live in the ocean.

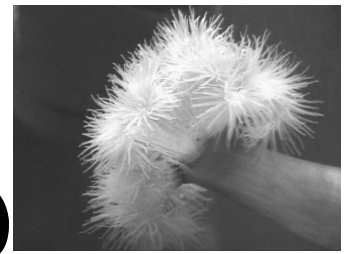
Background:

Ocean water covers over 70% of the earth's surface. Because all oceans are interconnected, they are considered to form one biome - the marine biome. The marine biome is home to a diverse population of animal species.

Organisms that inhabit the ocean are usually not found throughout the ocean, but within particular zones. The ocean is divided into three major zones according to depth. The **intertidal zone** is located along the shore. It is covered by water at high tide and is uncovered at low tide. Therefore, organisms that inhabit the intertidal zone must be able to deal with living in a constantly changing environment. Beyond the intertidal zone is the **neritic zone**. This zone is generally less than 300 meters deep and includes the water above the continental shelf. Because it is relatively shallow, the sun reaches the ocean floor, enabling a wide variety of organisms to flourish in this zone. The third zone is the **open ocean**, which can reach depths of over 7 miles, or 11 kilometers.

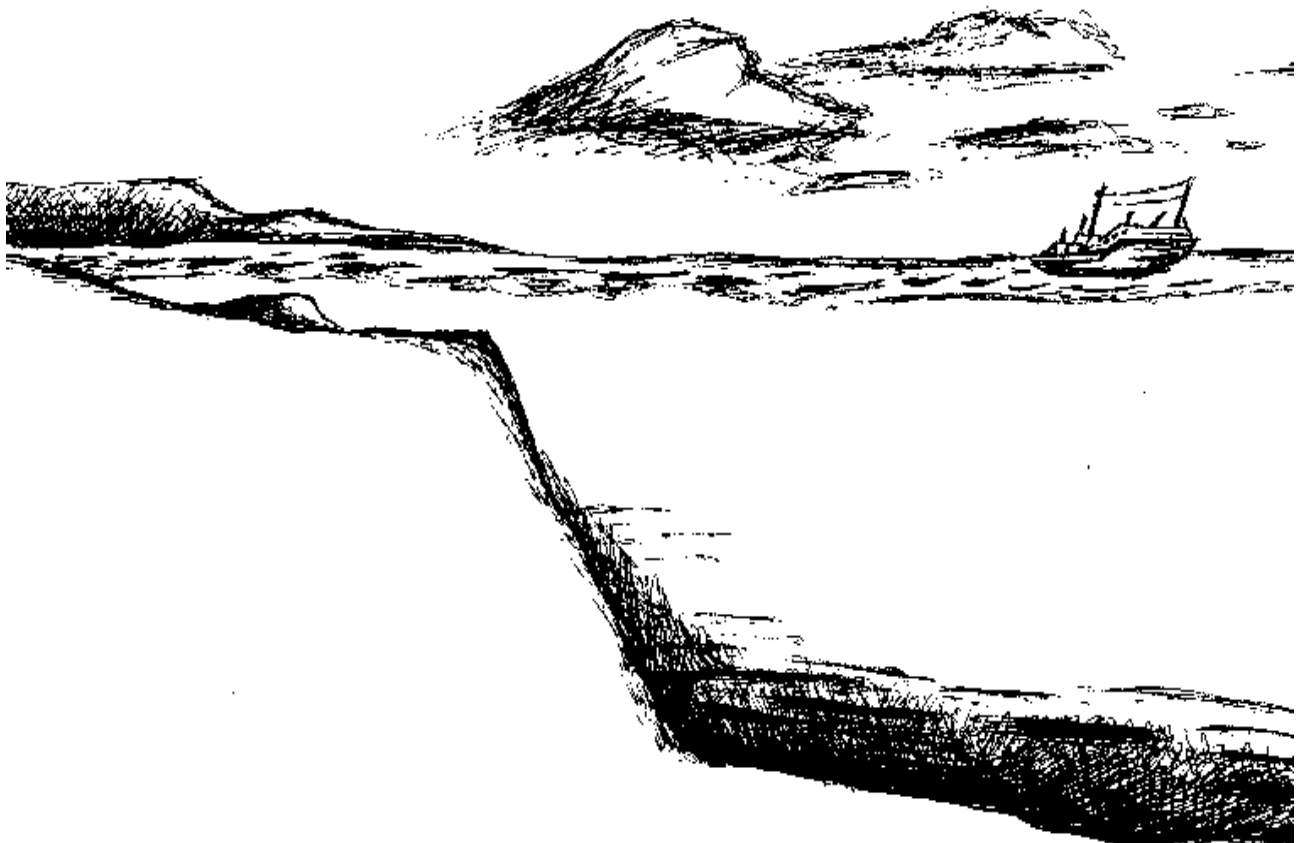
Marine animals are also classified according to where they are found within these zones. Organisms that live on the ocean floor are called **benthos**, or **benthic organisms**. **Plankton** are organisms that float near the surface of the ocean and are carried by ocean currents. **Nekton** are free-swimming organisms that can travel freely throughout the zone.

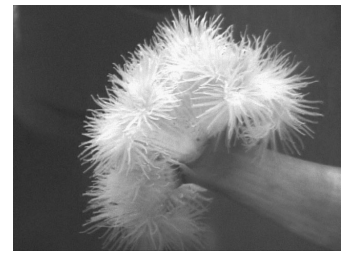
Directions: The table on the following page lists animals found in or near the marine biome. Use resources in your classroom or library to research these animals. For each organism, determine the type of animal that it is and the zones in which can be found, along with an interesting fact about that organism. Use this information to complete the table. Be aware that some organisms live in more than one zone. Below the table is a diagram of the ocean. Label the zones and then draw each animal in the correct zone. Pay attention to the type of animal in order to draw it at the appropriate depth.



Locating Marine Animals (cont.)

Organism	Type	Zone	Interesting Fact
rock crab			
starfish			
sand piper			
orca whales			
jellyfish			
blue mussels			
porpoise			
seals			
brown algae			
small fish			





Vocabulary of Water

- _____ 1. alek
- _____ 2. hbonste
- _____ 3. pneo oanec
- _____ 4. tyaeerus
- _____ 5. klnptano
- _____ 6. nrtciie nzeo
- _____ 7. mrniae mbeio
- _____ 8. dtnrrelaii nzeo
- _____ 9. esratm
- _____ 10. knnoet

- a. organisms that live on the ocean floor
- b. oceanic zone located close to shore that is covered by water at high tide, but is not covered at low tide
- c. saltwater biome
- d. organisms that float in the ocean and are carried by currents
- e. large body of water with little or no current
- f. area where a river or stream meets the ocean
- g. relatively small body of running water
- h. type of organism that swims freely in water
- i. oceanic zone consisting of relatively shallow water above the continental shelf
- j. oceanic zone beyond the continental shelf; many parts receive little or no sunlight