



TEACHER GUIDE

• Assessment Rubric	4
• How Is Our Resource Organized?	5
• Bloom’s Taxonomy for Reading Comprehension	6
• Vocabulary	6



STUDENT HANDOUTS

• Reading Comprehension	
1. <i>What Are Aquatic Ecosystems?</i>	7
2. <i>Where Are Aquatic Ecosystems?</i>	
3. <i>How Climate Change Can Affect Aquatic Ecosystems</i>	
4. <i>Changes in Freshwater Aquatic Ecosystems Caused By Human Activity</i> ...	
5. <i>Changes in Saltwater Aquatic Ecosystems Caused By Human Activity</i>	
6. <i>Predictions for Aquatic Ecosystems</i>	
7. <i>Conservation: What We Can Do</i>	
8. <i>Graphic Organizers</i>	11
• Hands-on Activities	13
• Crossword	17
• Word Search	18
• Comprehension Quiz	19



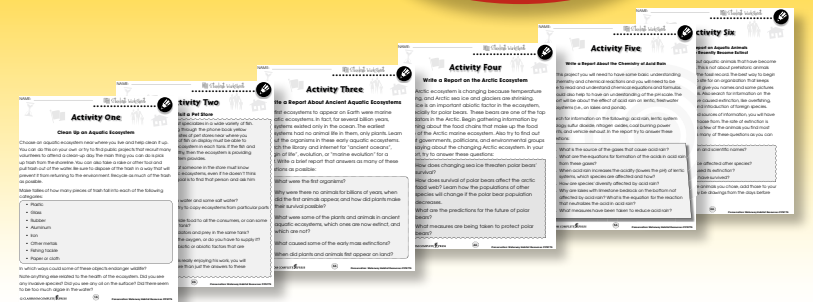
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What Are Aquatic Ecosystems?

1. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

- a) Only fresh water can support life.
TRUE FALSE
- b) An ecosystem is made up of both living and non-living things.
TRUE FALSE
- c) Parts of a system are independent of each other.
TRUE FALSE
- d) Some rivers contain only salt water.
TRUE FALSE
- e) Some lakes contain only salt water.
TRUE FALSE

2. Put a check mark (✓) next to the answer that is most correct.

- a) What is an ecologist?
 - A a fish
 - B a plant
 - C a system
 - D a scientist
- b) Fresh water has very little
 - A depth
 - B life
 - C mud
 - D soil
- c) All of these are living things, except
 - A water
 - B plants
 - C insects
 - D bacteria



What Are Aquatic Ecosystems?

First, we must understand what an **ecosystem** is. An ecosystem is made up of all the living things in an area of the natural world, along with the non-living resources that they depend on. The living things are called **biotic** factors, and the non-living things are called **abiotic** factors.



An ecosystem is a **system** because the parts interact with each other. Changing one factor can have an effect on many of the other factors. For example, if one of the plants is removed, it affects the animals that eat those plants and then the animals that eat the plant eaters. Eventually, most of the plants, animals, and some of the abiotic factors will be affected.

An ecosystem is usually thought of as being isolated from factors outside its area. This is usually not completely true because few areas of the world are completely isolated from all other ecosystems. **Ecologists** think of ecosystems as being isolated to make it easier to study and understand them. An island or a lake is an example of an area that can easily be studied as a separate ecosystem.

STOP

Identify the two types of factors that interact in an ecosystem.

An **aquatic** ecosystem is an ecosystem located in a body of water. Most aquatic ecosystems can be classified as either **marine** ecosystems or **freshwater** ecosystems. **Marine** ecosystems are located in oceans and in salt lakes. **Freshwater** ecosystems are located in ponds, lakes, streams, and rivers. Some aquatic ecosystems are also in places where salt and fresh water mix, as at the mouth of a river that flows into an ocean.



What Are Aquatic Ecosystems?

1. Put a check mark (✓) next to the answer that is most correct.

- a) Which of these is an **abiotic** factor?
 - A bacteria
 - B fish
 - C grass
 - D precipitation
- b) Which of these is a **biotic** factor?
 - A air
 - B bears
 - C sunlight
 - D temperature
- c) Which of these could be the location of a **marine** ecosystem?
 - A The Great Lakes
 - B The Arctic Ocean
 - C The Mississippi River
 - D The Rocky Mountains

2. Use the words below to complete the sentences. Use each word once.

abiotic aquatic biotic ecosystem freshwater marine

- a) _____s are made up of _____ factors and _____ factors.
- b) _____ ecosystems are located in oceans.
- c) _____ ecosystems are located in inland bodies of water.
- d) _____ ecosystems are classified as either freshwater or marine.



What Are Aquatic Ecosystems?

3. Answer the questions in complete sentences.

- a) Define the term "ecosystem."

- b) Explain what makes an ecosystem a system.

Extensions & Applications

Factors in an aquatic ecosystem are listed below.

air	algae	dolphins	light	lobsters	whales	seagulls
seaweed	shellfish	soil	temperature	tuna	water	wind

Classify each factor as biotic or abiotic by writing its name in the appropriate box of the graphic organizer below.

Biotic Factors	Abiotic Factors



Activity One

Visit an Aquatic Ecosystem

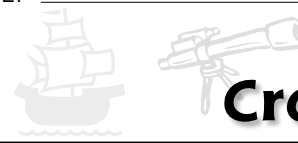
Visit an aquatic ecosystem near your home. The ecosystem can be any size from a puddle to an ocean. A small, still body of water, like a pond or a swamp, will be easiest to observe and understand.

Take notes on the ecosystem with the goal of answering the following questions:

1. Is the ecosystem lentic or lotic?
2. Which are the producers?
3. Which are the consumers?
4. Which consumers are predators?
5. Can you tell what the consumers eat?
6. Can you see any predators hunting prey?
7. Are any of the organisms part of both the aquatic ecosystem and the surrounding land ecosystem?
8. Are there any signs of pollution or debris?

The object is to learn as much as you can by careful observations. You may want to learn more by making observations at different times of day and during different seasons.

You may also want to take some pictures and include them in a notebook or in a written report.



Crossword Puzzle!



Word List

- ABIOTIC
- ACID RAIN
- ADAPT
- DEBRIS
- EVOLUTION
- EXTINCT
- FISH
- FRESH
- GREENHOUSE GAS
- INVERTEBRATE
- LOTIC
- MARINE
- MUSSEL
- NATURAL SELECTION
- OVERFISHING
- OXYGEN
- PHOTOSYNTHESIS
- PRODUCER
- RUNOFF

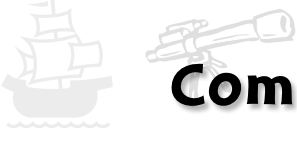
Across

1. The type of ecosystem located in the ocean.
4. Zebra _____s have invaded the Great Lakes.
7. What a species must do to survive an environmental change.
10. Gradual change of a species over time.
11. The nonliving factors in an ecosystem.
14. _____ ladders are installed at some dams.
16. What can happen to a species if it can't do 7 across.
17. The type of water that is less than 1% salt.
18. The result of releasing nitrous oxide and sulfur dioxide.
19. These compounds in the atmosphere help hold Earth's heat.

Down

2. Water leaving a farm field and entering a stream.
3. The process that allows 10 across to happen.
5. The word to describe an ecosystem in flowing water.
6. The role of plants in an ecosystem.
8. Ocean trash.
9. The process that only 6 down can do.
12. Spineless creatures.
13. Catching fish faster than they can reproduce.
15. A product of 9 down that all animals need.

(Note: For answers of more than one word, do not put a space between the words.)



Comprehension Quiz



Part A

25

Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

1. Biotic and abiotic factors cannot share the same ecosystem.
TRUE FALSE
2. The first ecosystems were in the ocean.
TRUE FALSE
3. Oxygen is a greenhouse gas.
TRUE FALSE
4. Melting sea ice has made it easier for polar bears to adapt to the Arctic.
TRUE FALSE
5. Burning some fossil fuels can cause acid rain.
TRUE FALSE
6. Human activities brought most invasive species to freshwater ecosystems.
TRUE FALSE
7. Coral reefs are endangered by human activities.
TRUE FALSE

Part B

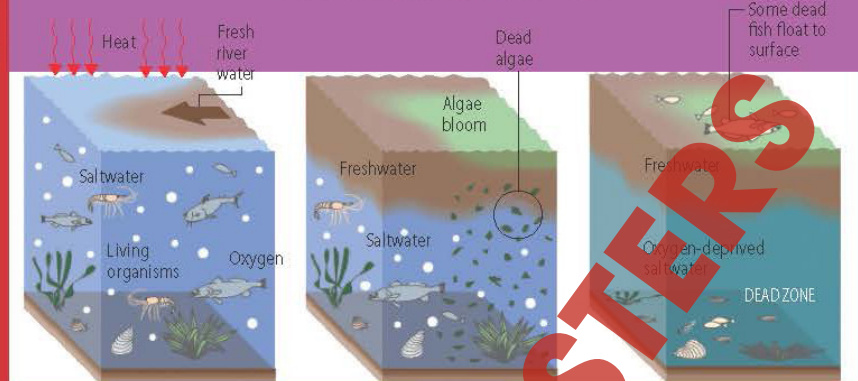
3

Put a check mark (✓) next to the answer that is most correct.

- a) Which is a product of photosynthesis?
- A oxygen
 - B nitrogen
 - C carbon dioxide
 - D sodium chloride
- b) Which are the most important producers in most aquatic ecosystems?
- A algae
 - B bacteria
 - C fish
 - D invertebrates
- c) What is the basic cause of most extinctions?
- A predators
 - B overpopulation
 - C natural disasters
 - D failure to adapt to change

Marine Dead Zones

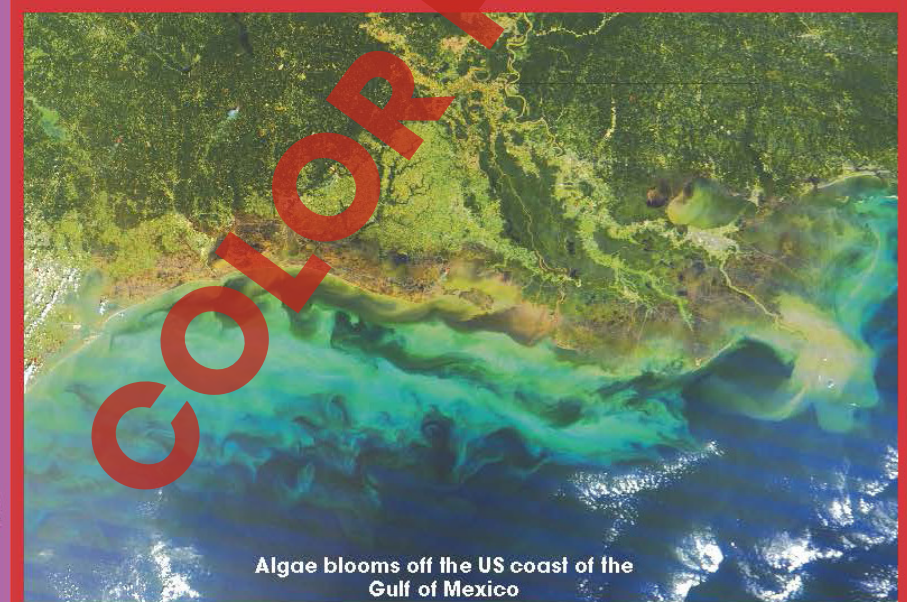
How a Dead Zone Forms



During the spring, sun-heated freshwater runoff from the River creates a barrier layer in the Gulf, cutting off the saltier water below from contact with oxygen in the air.

Fertilizer and sewage in the freshwater layer ignite huge algae blooms. When the algae die, they sink into the saltier water below and decompose, using up oxygen in the deeper water.

Starved of oxygen the deeper water becomes a dead zone. Fish avoid the area or die in massive numbers.



Algae blooms off the US coast of the Gulf of Mexico

Image courtesy of NASA



What Are Aquatic Ecosystems?

3. Answer the questions in complete sentences.

a) Define the term "ecosystem."

b) Explain what makes an ecosystem a system.

Extensions & Applications

Factors in an aquatic ecosystem are listed below.

air	algae	dolphins	light	lobsters	whales	seagulls
seaweed	shellfish	soil	temperature	tuna	water	wind

Classify each factor as biotic or abiotic by writing its name in the appropriate box of the graphic organizer below.

EASY MARKING

Biotic Factors	Abiotic Factors

3.

a) An ecosystem is all the interacting biotic and abiotic factors in an area.

b) An ecosystem is a system because the factors interact and affect each other.

Extensions & Applications

Biotic Factors	Abiotic Factors
dolphins	air
lobsters	light
whales	temperature
seagulls	soil
seaweed	water
shellfish	wind
tuna	

Crossword Puzzle!

ANSWER KEY

