Contents

TEACHER GUIDE

STUDENT HANDOUTS

NAME: _____

Before You Read

Changes In Saltwater Aquatic Ecosystems Caused By Human Activity

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

a) Where is most of Earth's water located?

- ○ **A** in rivers
- ○ **B** in oceans
- ○ **C** in glaciers
- ○ **D** underground

b) What is a "dead zone"?

- ○ **A** a place where fish go to die
- ○ **B** a place known for shipwrecks
- ○ **C** a place that cannot support aquatic life
- ○ **D** a place in the ocean where there is no wind

c) What is "debris"?

- ○ **A** discarded trash
- ○ **B** an aquatic plant
- ○ **C** an extinct species of fish
- ○ **D** shallow marine ecosystems

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

a) All the oceans are connected.
TRUE **FALSE**

b) A coral is a species of fish.
TRUE **FALSE**

c) Invasive species from freshwater lakes are taking over marine ecosystems.
TRUE **FALSE**

d) Most salt water is located in inland salt lakes.
TRUE **FALSE**

e) Floating plastic endangers sea life.
TRUE **FALSE**

Reading Passage

NAME: _____

Changes In Saltwater Aquatic Ecosystems Caused By Human Activity

In the last section we learned about problems in freshwater ecosystems caused by human activities. Ocean ecosystems have some of the same problems, but they are free of others.

Competition between native and foreign species is not much of a problem in the ocean. Since the oceans are all connected, species are free to live in the habitat in which they survive best.

The volume of water in the oceans is much greater than the volume of fresh water—about 35 times greater. Because of the great volume of ocean water, some pollutants reach a toxic level more slowly than they do in lakes and rivers.

Marine Debris

Agricultural fertilizer runoff is a pollution problem similar to the problem caused in fresh water. This pollution can lead to algae growth that eventually causes dead zones along coastlines. Overfishing is another problem common to both fresh and saltwater ecosystems.

Pollution in the form of floating **debris** is a much greater problem in the ocean than in freshwater ecosystems. Some of the material is discarded or lost by boats, some is washed down streams, and some is blown from landfills. Lost fishnets and similar debris can trap and kill seabirds, turtles, dolphins, sharks, and many other marine animals. Small plastic pellets, called **nurdles**, are often eaten by marine wildlife because they look like fish eggs. Animals often die of starvation or poisoning after eating nurdles.

Coral reefs are unique ocean ecosystems that are endangered by human activity. Reefs are located in shallow tropical ocean waters and are formed by animals with hard **calcium carbonate exoskeletons**. As the discarded exoskeletons accumulate over thousands of years, they form large structures that support a varied and colorful ecosystem. Algae caused by agricultural runoff can damage reefs. Increased ocean acidity caused by greenhouse gas emissions may cause the calcium carbonate in reefs to dissolve. Some fishing practices, such as dynamiting, also damage many reefs.

STOP

Explain why invasive species are less of a problem in oceans than in freshwater ecosystems.

_____

_____

NAME: _____

After You Read

Changes In Saltwater Aquatic Ecosystems Caused By Human Activity

1. Fill in each blank with a word or group of words from the list. Use each word or group of words once.

exoskeleton	fertilizer	debris	dead zone	nurdles	coral reef

a) _____ runoff from fields can create an ocean _____.

b) The accumulation of the _____s of dead sea animals forms _____s.

c) The small bits of plastic called _____ endanger sea life because they resemble fish eggs.

d) Floating plastic objects are one of the most hazardous forms of marine _____.

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

a) What is the main structural material of coral reefs?

- ○ **A** carbon dioxide
- ○ **B** sodium chloride
- ○ **C** potassium nitrate
- ○ **D** calcium carbonate

b) How does the volume of water in the ocean compare to the volume of all fresh water?

- ○ **A** About 35 times as much ocean water
- ○ **B** About 35% more ocean water
- ○ **C** About 35 times as much fresh water
- ○ **D** About 35% more fresh water

After You Read

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Changes In Saltwater Aquatic Ecosystems Caused By Human Activity

3. Answer the questions in complete sentences.

a) Describe two human activities that endanger coral reefs.

1) _____

_____

2) _____

_____

Extensions & Applications

Explain how agricultural practices can cause an area of an ocean to lose its ability to support life.

_____

_____

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Hands-On Activity # 1

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.

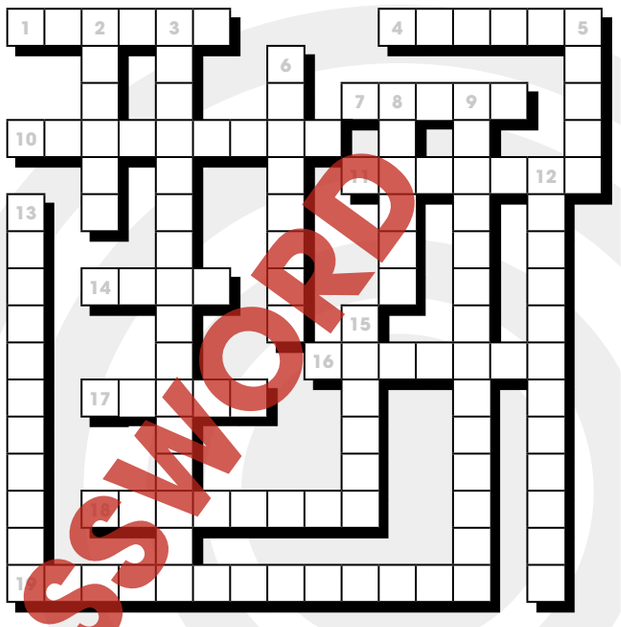
You may also want to take some pictures and include them in a notebook or in a written report.

NAME: _____ After You Read

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.)

NAME: _____ After You Read

Comprehension Quiz

25

7

Part A

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.

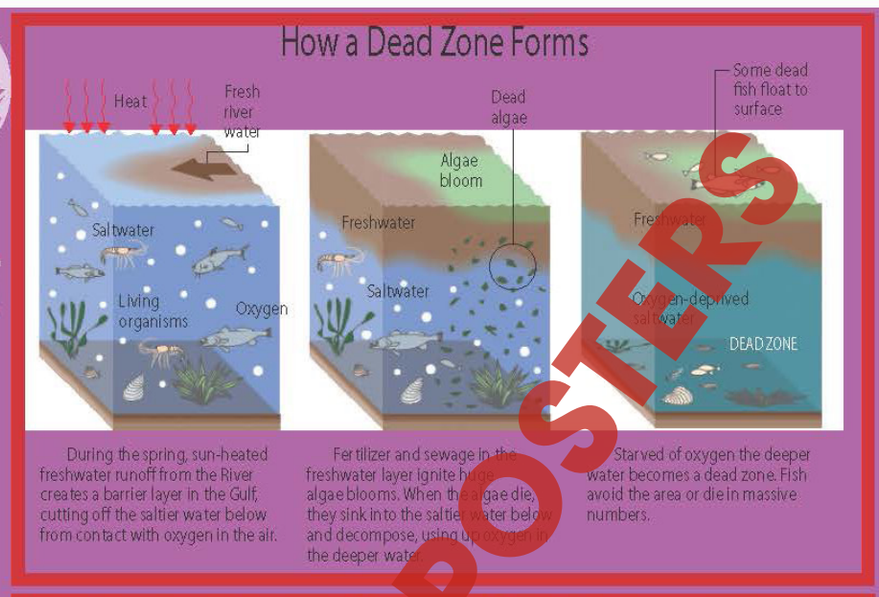
a) Which is a product of photosynthesis?
- ○ **A** oxygen
- ○ **B** nitrogen
- ○ **C** carbon dioxide
- ○ **D** sodium chloride

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

SUBTOTAL: /10

Marine Dead Zones



Algae blooms off the US coast of the Gulf of Mexico

Image courtesy of NASA

After You Read

NAME: _____

Changes In Saltwater Aquatic Ecosystems Caused By Human Activity

3. Answer the questions in complete sentences.

a) Describe two human activities that endanger coral reefs.

1) _____

_____

2) _____

_____

Extensions & Applications

Explain how agricultural practices can cause an area of an ocean to lose its ability to support life.

_____

_____

_____

_____

_____

_____

_____

_____

3.

a) (Answers will vary.) Coral reefs are endangered by… Any two of the following: burning fossil fuels (which raises acidity), dynamiting, agricultural runoff, fishing methods.

Extensions & Applications

Answers will vary: runoff in irrigation water enters the water and encourages algae growth. When the algae dies, the microscopic organisms that decompose the algae take oxygen from the water because they are animals. At some point, there is no longer enough oxygen to support aquatic animals.

Crossword Puzzle!