# Aquatic Biomes 4





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### What on Earth is a Biome?

A biome is a large geographical area of the world characterized by similar climate, animals, and plants. Some biomes are terrestrial (land-based), and some are aquatic. **Aquatic** biomes can be freshwater biomes or marine biomes. "**Marine**" biomes refer to saltwater biomes. In other words, biomes can be categorized like this:

#### **Terrestrial (land)**

#### **BIOMES**

#### **Aquatic (water)**

- Tundra
- Forest (includes rainforest, temperate forest, chaparral, and taiga)
- Grassland (includes temperate grassland and savanna)
- Alpine
- Desert

- Freshwater (includes freshwater wetlands and estuaries)
- Marine (saltwater; includes oceans and coral reefs)

#### Classify the areas below as either terrestrial or aquatic:

1. The Great Barrier Reef:
2. Arctic Ocean:
3. Gobi Desert:
4. Lake Tahoe:
5. Florida Everglades:
6. Swiss Alps:
7. Amazon River:
8. North American Prairie:
Which type of biome, terrestrial or aquatic, is bested suited for human survival? Explain your reasoning.

### Freshwater vs. Saltwater

Biomes are regions that have similar climate, animals, and plants. Let's take a closer look at the two types of aquatic biomes: **freshwater** and **marine**.

#### FRESHWATER BIOMES

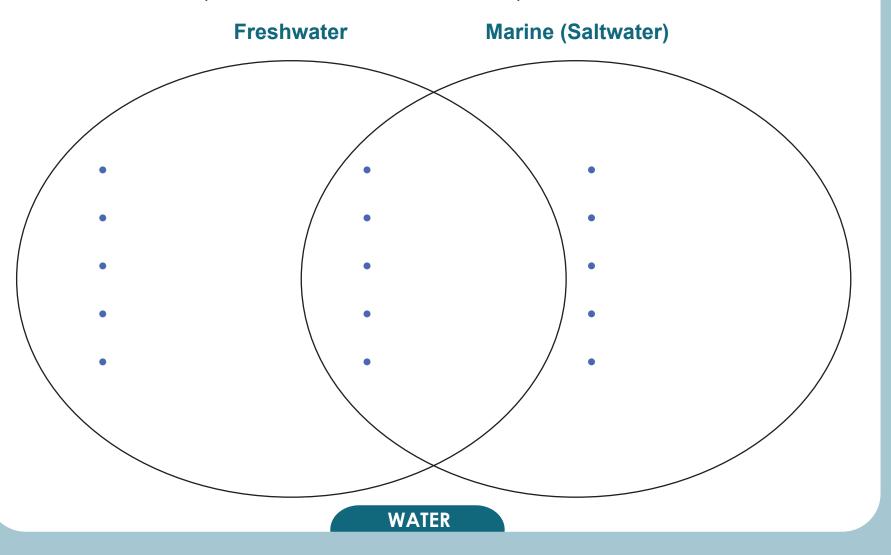
Freshwater is defined as having less than 1% salt in it. Freshwater biomes contain either moving water, like rivers, streams, or creeks, or standing water, like ponds, wetlands, or lakes. Less than 1% of the Earth's water is in freshwater lakes. Both the temperature and the depth of the freshwater determine what plants and animals can live there. The amount of movement in the water also affects the types of life that can survive there. Freshwater animals can be large or small—some organisms that live there are only made up of a single cell. That's pretty small! The animals that live in freshwater environments depend on the water for food and survival. Some plants also live in freshwater. You may see moss growing in or near freshwater biomes. Moss often grows in freshwater environments. Many freshwater organisms rely on moss for food.

#### **MARINE BIOMES**

Marine biomes are sometimes called saltwater biomes. Marine biomes have more than 1% salt in them. Very large bodies of water, such as oceans and seas, are marine biomes. Marine biomes cover about three-fourths of the Earth! Coral reefs and estuaries are also considered marine environments. Just like in freshwater environments, the types of plants and animals that live in marine biomes depend on the depth, temperature, and movement of the water. Marine biomes support very large as well as very small animals. Marine algae supply most of the world's oxygen and take in huge amounts of carbon dioxide. Evaporation of marine water ultimately provides rainwater for our crops, snow for our mountains, and fresh water for our lakes and streams.

## Venn Diagram

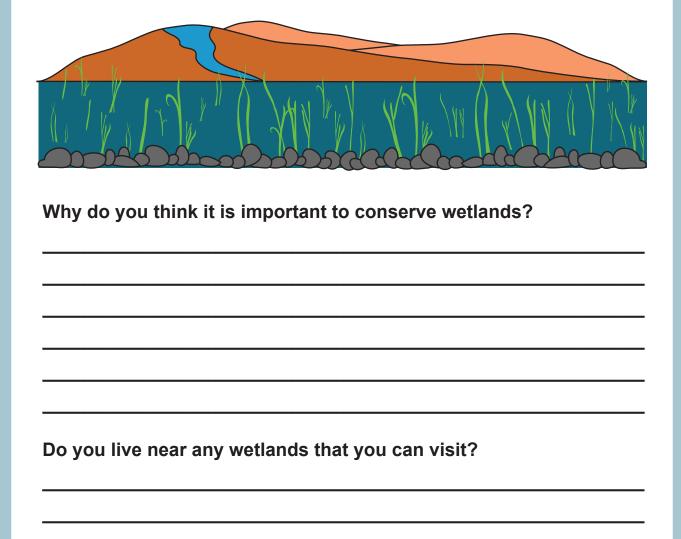
Compare and contrast freshwater and marine biomes. Record the similarities in the center, where the two circles overlap. Record the differences in the outer parts of the circles.



### Wetlands

Wetlands are areas that are inundated with water for all or part of the year. What distinguishes wetlands from just a wet area are plants that are adapted specifically to live in the wet soil year-round. While wetlands provide important habitats for plants and animals, wetlands also serve important purposes to people.

Wetlands act like a sponge during flooding, absorbing large amount of water and slowing the advance of the floodwaters. They also filter and clean water that passes through them, removing excess nutrients and waste.

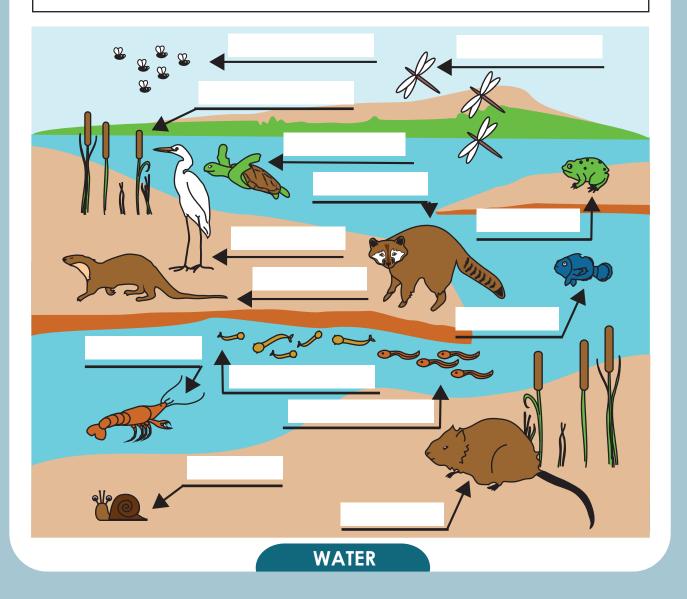


## Life in the Marsh: A Freshwater Biome

A marsh is one of the three types of wetlands. The other two types are bogs and swamps.

**Directions:** Use the words in the word bank to label the animals in the marsh. If you aren't sure, do the ones you know first, and then look up the others in a dictionary.

muskrat dragonflies egret marsh flies turtle frog cattails crayfish snail river otter raccoon fish tadpoles mosquito larvae



### Swamp Things!

#### The Swamp: A Freshwater AND a Marine Biome



Some made-up stories have made people think that monsters live in swamps! The truth is, there are no swamp monsters, and many fascinating plants and animals call the swamp their home. Swamps are a type of wetland. Swamps are areas of land that have been permanently saturated, or filled up, by water. Swamps are usually found in warm, wet climates, and are characterized by being heavily forested. The thick, black, nutrient-rich soil in swamps can support the growth of water-tolerant trees and shrubs. Some swamp creatures live below the surface, and some live on the soft, spongy land that surrounds the swamp. Other swamp animals, such as alligators and nutrias, spend time both in and out of the swamp, depending on the time of day and activity. Many plants, fish, birds, and invertebrates, like freshwater shrimp, clams, and crayfish, and the American Crocodile, require the swamp's particular ecosystem to remain balanced to ensure their survival. Swamps are usually freshwater environments, but some saltwater swamps can be found connected to tropical coastlines.

**Directions:** Put the names of these wetland plants in alphabetical order.

Cattail	
Silver Maple	
Winterberry Holly	
Marsh marigold	
Bulrush	
Water lily	
Duckweed	
Pondweed	
Red Maple	
Cranberry shrub	

### Super Swamp

### The Florida Everglades



The Florida Everglades is one of the largest swamp areas in the United States. This freshwater swamp is commonly referred to as the "River of Grass" because of how it looks from high above. These wetlands are actually made from a 60-mile wide, slow-moving river that flows for 100 miles, from the Kissimmee River to the Straits of Florida, Wildlife in the Everglades ranges from alligators to panthers, manatees to pythons, and egrets to wood storks. While swamps were once thought to be useless or dangerous wastelands, the Everglades actually have great ecological value to humans. The freshwater from the Everglades supports nearby agriculture and provides drinking water for south Florida. Wetlands also naturally improve water quality by absorbing excess nutrients and filtering out pollutants. The Everglades also replenish aguifers and reduce the chance of flooding. In addition to being a great natural resource, the Everglades are a recreation area for boating, fishing, and other outdoor activities. People travel from all over the world to experience the Everglades' environments and wildlife firsthand.

**Directions:** Use the information above to answer the following questions.

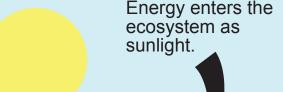
1.	Name at least three animals that live in the Everglades.
2.	Which animal were you most surprised to learn lives in the Everglades?
3.	Describe two ways that humans use the Everglades.
4.	Why do you think it is important to protect the Everglades' ecosystem?

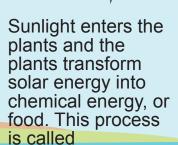
### **Ecosystems**

An **ecosystem** is a community of living things where organisms exchange energy and food among themselves and with the environment around them. One way of thinking about an ecosystem is who eats whom.

Here's how an ecosystem works:

Energy is transferred from organisms back into the environment through heat loss. The decomposers also put energy back into the environment by breaking down the last pieces of dead plant and animal matter, and returning the simple chemicals back into the environment.





photosynthesis.
Plants are known as producers because they can make their own food.

The "cleanup crew," or decomposers, such as insects and microorganisms, come in and eat the last bits of dead plants and animals for food.



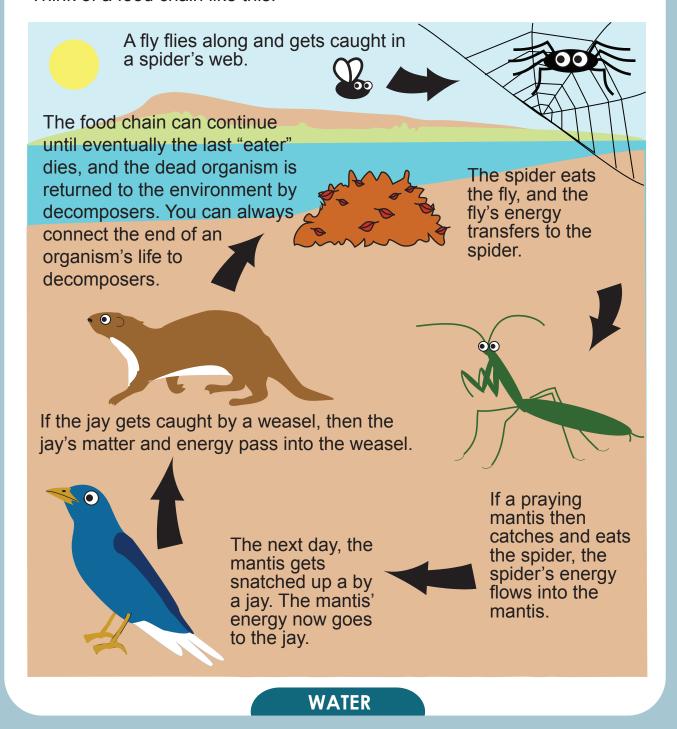
Herbivores are eaten by secondary consumers (carnivores and omnivores). Carnivores are animals that eat other animals, and omnivores are animals that eat both plants and other animals for food.

Green plants are eaten by primary consumers (herbivores).
Consumers are all organisms that eat other organisms for food.

### **Ecosystems**

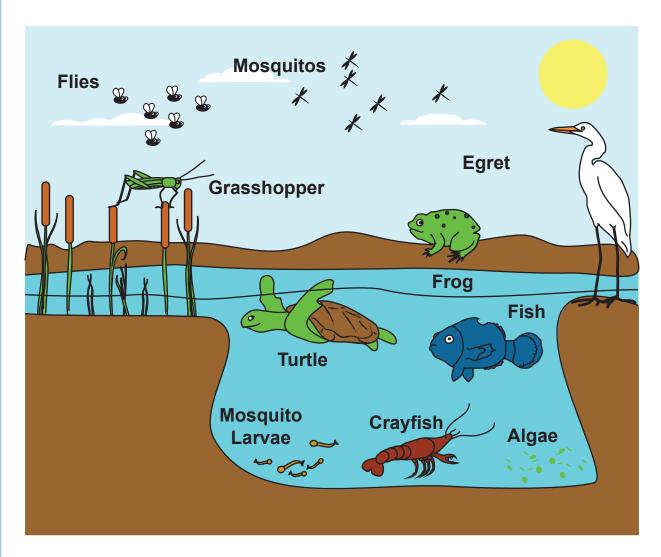
There are many feeding relationships within an ecosystem. These relationships form food chains, as each organism draws energy from the one before.

Think of a food chain like this:



## Swamp Survival: The Food Chain

**Directions**: Use the lines to try to make at least 3 food chains by connecting the swamp organisms below with arrows. See the example for help.



*Example*: sunlight  $\rightarrow$  algae  $\rightarrow$  mosquito larvae  $\rightarrow$  fish

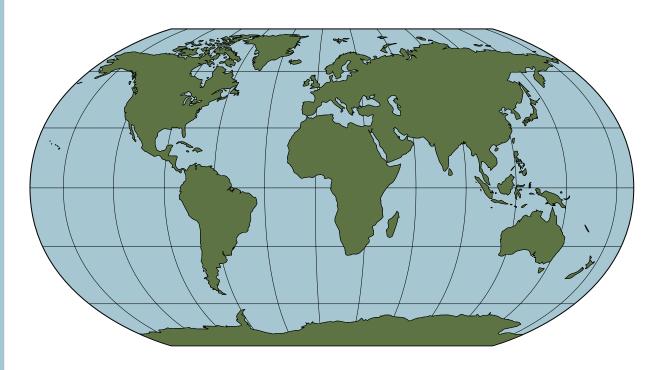
1.	 	· · · · · · · · · · · · · · · · · · ·	 	
2.				

3. \_\_\_\_\_

### Oceans

An ocean is a large body of saltwater. Although each ocean has its own name, all oceans are connected to each other.

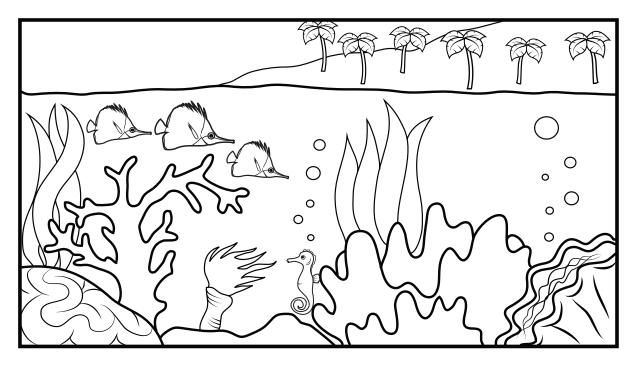
Approximately 71% of the Earth's surface is covered in ocean, and oceans account for 97% of all water on Earth! Oceans surround each continent and countless islands.



Can you name all five major oceans?					
Which one is the largest?					

### Reefs

A reef is a deposit of limestone built up over a long period of time by corals. Some get tall enough to break the surface of the ocean and become islands!



**Directions**: Find each of these reef organisms in the word search below.

#### **Reef Organisms**

Clam

**Fireworm** 

**Flatworm** 

**Frogfish** 

Manatee

**Manta Ray** 

Nudibranch

Sea Lion

Sea Snake

Whale

Shrimp

N U D I B R A N C H K L Z Z N S E A L I O N S H

YYYFTWAFYNSE

VOAGGSOANIKM

F L A I W U K M F A K N F P F S H A A G N O F O

E P F S H A A G N U E Q T E N O T I O S W E E C

PYBNCRAETLTW

MAAIFERAAIRW

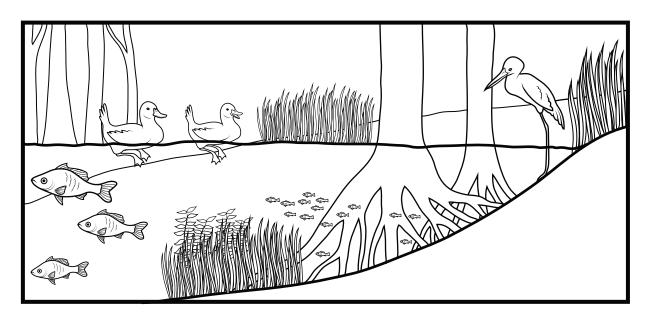
X M B J S I N H F E I A

VSLCMSHRIMPT

### **Estuaries**

An estuary is a transitional zone where a freshwater river or stream flows into the ocean. Tides and river currents affect the salt level in estuaries, to make the water *brackish*, meaning the water is a mix of salt water and freshwater.

There are many different kinds of estuaries. Many estuaries are highly productive ecological zones that play an important role in the life cycles of wildlife. Estuaries act as nurseries for many ocean fish, birds, and are even visited by sharks and marine mammals such as dolphins, seals, and sea lions.



What types of bodies of freshwater flow into an estuary?

What is the definition of the word brackish?

\_\_\_\_\_

What are three types of wildlife that can inhabit estuaries?

\_\_\_\_\_

### All About Our Earth's Ecosystems!

## ROPICAL OCEANS

#### **About Tropical Oceans:**

Tropical oceans are known mainly for one thing: coral reefs. Coral reefs are often referred to as the rainforests of the ocean because of the high diversity of animals that make them their home. Many species of fish, such as barracuda, clownfish, angelfish, sharks, rays, triggerfish, butterflyfish, and gobies live in reefs, as well as reptiles such as sea turtles, mammals such as dolphins and whales, invertebrates such as lobsters, crabs, and shrimp, and molluscs such as clams, octopus, cuttlefish, and squid. Even coral is actually a colony of many tiny animals living together!





YELLOW LONGNOSE BUTTERFLYFISH

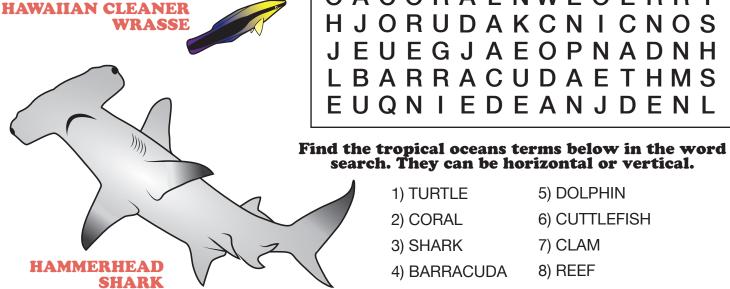
#### **Tropical Oceans Stats:**

- Tropical oceans are found between the Tropic of Cancer and the Tropic of Capricorn along the Equator.
- There are few true plants found in tropical oceans, the most common being seagrass. Everything else is either coral, which are animals, or algae such as seaweed and kelp.
- Many of the creatures that call tropical ocean their home are highly adapted to survive, especially those who live in densely populated reefs! Camouflage plays a big part of life in the reefs.
- The largest reef is the Great Barrier reef off the coast of Australia. It is the largest structure made by living organisms (corals) and can be seen from space!

### **Word Search**

LSFDTUTGOJFRJSK AHKPRNCLNEJAKLR HALLDOLPHI LREEAEARRN EKLHNKMHAD OMSNREFAMREUW NTNREEFOGUHRH AKISLSUOIST TOUUGBMTOUA OACORALNWE EUEGJAEOPNADNH BARRACUDAETHMS EUQNIEDEANJDENL

FIREFISH



- 1) TURTLE 5) DOLPHIN
- 2) CORAL 6) CUTTLEFISH
- 3) SHARK 7) CLAM 4) BARRACUDA 8) REEF

## **Coral Reefs**

**Directions:** Use the words in the box below to solve the crossword puzzle.

coral stomach sun mollusks soft cay exoskeletons polyp reef ecosystems Great Barrier Reef				
Across  3. Coral have some organs, including the, in common with many other living organisms—including us!  5. A is a sedentary type of animal form with a fixed base, columnar body, and free end with mouth and tentacles.  8. The coral reef is one of the most diverse on earth.  9. The is the largest coral reef in the world.  11. Coral reefs get their energy from the				
<ol> <li>1. Hard coral polyps make to support and protect their bodies.</li> <li>2. A is a small, sandy island that forms on the surface of a coral reef.</li> <li>4. Coral reefs contain twenty-five percent of all ocean life, including organisms such as fish, worms, crustaceans, and</li> <li>6. There are two kinds of coral: and hard.</li> </ol>				
7 is a sedentary invertebrate living in warm and tropical seas.  10. A coral is a ridge made of coral, existing just below the surface of the sea.				

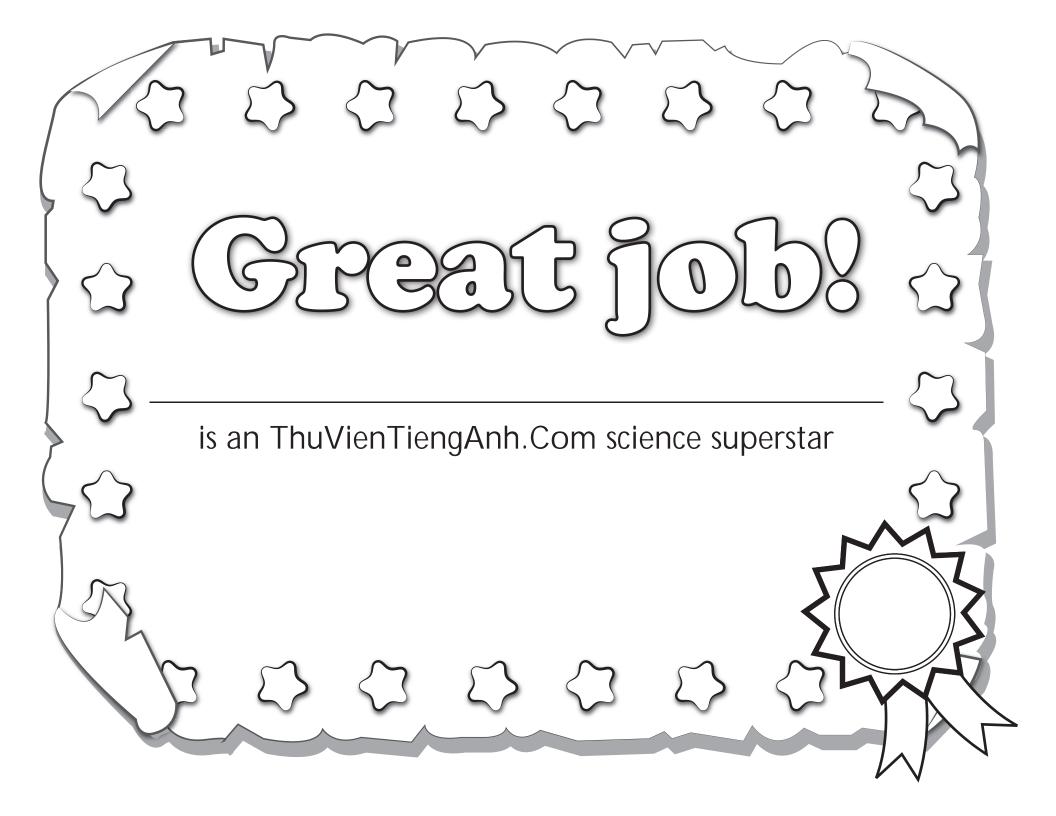
## Life in the Reef

**Directions:** Match the numbers in the picture to the names in the word bank. Label and color each coral reef organism. Be sure to check your spelling and write neatly.

	Cone snail Sea urchin Crab Sea anemone	Spinner dolphin Seahorse Reef shark Hawksbill turtle	Branching coral Starfish Clownfish Hermit crab		
_		7 8			
4		10			
_		12.			
	3 (3				
			4		
5		7	. 11		
8		9	10		
WATER					

## Reflection

Think about all that you have learned about aquatic biomes and their ecosystems. Write a paragraph about what you have learned, and include reasons why you think aquatic biomes and their wildlife should be protected. You may want to include details about a type of aquatic biome that you would like to visit or study further, and tell why it interests you. Conclude your paragraph with at least one idea for how YOU can help protect aquatic biomes.
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### **Aquatic Biomes**

#### What on Earth is a Biome?

#### **Answers**

A biome is a large geographical area of the world characterized by similar climate, animals, and plants. Some biomes are terrestrial (land-based), and some are aquatic. **Aquatic** biomes can be freshwater biomes or marine biomes. "**Marine**" biomes refer to saltwater biomes. In other words, biomes can be categorized like this:

#### **Terrestrial (land)**

#### **BIOMES**

#### **Aquatic (water)**

- Tundra
- **Forest** (includes rainforest, temperate forest, chaparral, and taiga)
- Grassland (includes temperate grassland and savanna)
- Alpine
- Desert

- Freshwater (includes freshwater wetlands and estuaries)
- Marine (saltwater; includes oceans and coral reefs)

#### Classify the areas below as either terrestrial or aquatic:

1.	The Great Barrier Reef: _	aquatic
2.	Arctic Ocean:	aquatic
3.	Gobi Desert:	terrestrial
4.	Lake Tahoe:	aquatic
5.	Florida Everglades:	aquatic
6.	Swiss Alps:	terrestrial
7.	Amazon River:	aquatic
8.	North American Prairie:	terrestrial

Which type of biome, terrestrial or aquatic, is bested suited for human survival? Explain your reasoning.

(answers will vary)

### **Venn Diagram**

#### **Answers**

Compare and contrast freshwater and marine biomes. Record the similarities in the center, where the two circles overlap. Record the differences in the outer parts of the circles.

#### **Freshwater**

#### **Marine (Saltwater)**

- Less than 1% salt
- Less than 1% of the Earth's water is in freshwater lakes
- Moss may grow in or near freshwater bodies
- Many freshwater organisms depend on moss for food

- Support large and small animals
- Types of organisms depend on temperature, depth, movement of water
- Animals depend on water for food and survival
- Plants also depend on unique conditions of biome

- More than 1% salt
- Very large bodies of water
- Algae supply most of the world's oxygen
- Evaporation of marine water provides rainwater, snow, and fresh water for lakes and streams.

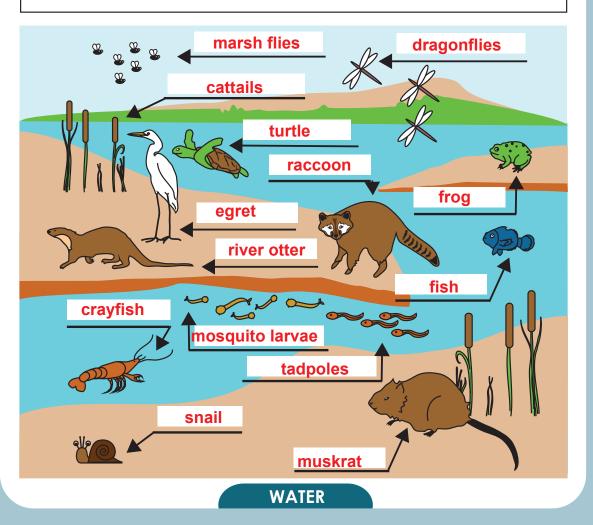
### Life in the Marsh: A Freshwater Biome

A marsh is one of the three types of wetlands. The other two types are bogs and swamps.

**Directions:** Use the words in the word bank to label the animals in the marsh. Color each animal as you label it. If you aren't sure, do the ones you know first, and then look up the others in a dictionary

muskrat dragonflies egret marsh flies turtle frog cattails crayfish snail river otter raccoon fish

tadpoles mosquito larvae



### **Swamp Things!**

#### **Answers**

The Swamp: A Freshwater AND a Marine Biome



Some made-up stories have made people think that monsters live in swamps! The truth is, there are no swamp monsters, and many fascinating plants and animals call the swamp their home. Swamps are a type of wetland. Swamps are areas of land that have been permanently saturated, or filled up, by water. Swamps are usually found in warm, wet climates, and are characterized by being heavily forested. The thick, black, nutrient-rich soil in swamps can support the growth of water-tolerant trees and shrubs. Some swamp creatures live below the surface, and some live on the soft, spongy land that surrounds the swamp. Other swamp animals, such as alligators and nutrias, spend time both in and out of the swamp, depending on the time of day and activity. Many plants, fish, birds, and invertebrates, like freshwater shrimp, clams, and crayfish, and the American Crocodile, require the swamp's particular ecosystem to remain balanced to ensure their survival. Swamps are usually freshwater environments, but some saltwater swamps can be found connected to tropical coastlines.

**Directions:** Put the names of these wetland plants in alphabetical order.

cattail bulrush Silver Maple cattail Winterberry Holly cranberry shrub Marsh Marigold duckweed bulrush Marsh Marigold Water Lily pondweed duckweed **Red Maple** pondweed Silver Maple **Red Maple** Water Lilv Winterberry Hollv cranberry shrub

### Super Swamp The Florida Everglades



The Florida Everglades is one of the largest swamp areas in the United States. This freshwater swamp is commonly referred to as the "River of Grass" because of how it looks from high above. These wetlands are actually made from a 60-mile wide, slow-moving river that flows for 100 miles, from the Kissimmee River to the Straits of Florida. Wildlife in the Everglades ranges from alligators to panthers, manatees to pythons, and egrets to wood storks. While swamps were once thought to be useless or dangerous wastelands, the Everglades actually have great ecological value to humans. The freshwater from the Everglades supports nearby agriculture and provides drinking water for south Florida. Wetlands also naturally improve water quality by absorbing excess nutrients and filtering out pollutants. The Everglades also replenish aquifers and reduce the chance of flooding. In addition to being a great natural resource, the Everglades are a recreation area for boating, fishing, and other outdoor activities. People travel from all over the world to experience the Everglades' environments and wildlife firsthand.

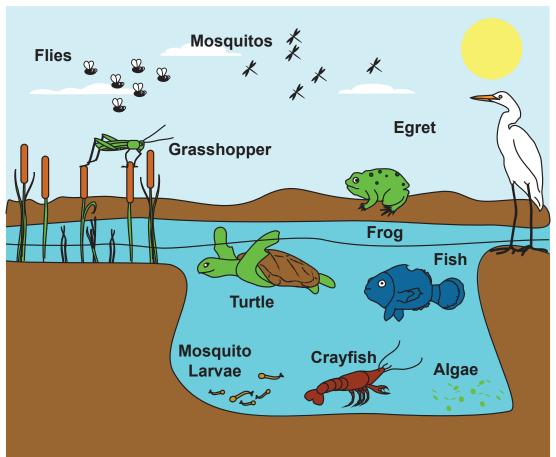
**Directions:** Use the information above to answer the following questions.

- 1. Name at least three animals that live in the Everglades. Any of the following are correct: alligators, panthers, manatees, pythons, egrets, wood storks
- 2. Which animal were you most surprised to learn lives in the Everglades? (any answer is correct)
- 3. Describe two ways that humans use the Everglades. Any of the following are correct: agriculture, drinking water, absorb excess nutrients and filter out pollutants, replenish aquifers, reduce chance of flooding, recreation.
- 4. Why do you think it is important to protect the Everglades' ecosystem? (various possible answers)

### Swamp Survival: The Food Chain

#### **Answers**

**Directions**: Use the lines to try to make at least 3 food chains by connecting the swamp organisms below with arrows. See the example for help.



**Example**:  $sunlight \rightarrow algae \rightarrow mosquito larvae \rightarrow fish$ 

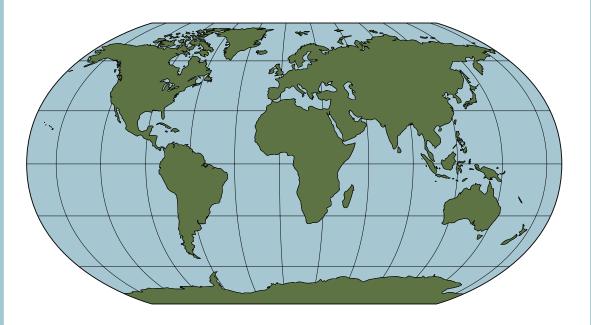
Some possible answers:  $\begin{array}{ll} \text{sunlight} \to \text{algae} \to \text{mosquito larvae} \to \text{fish} \\ \text{sunlight} \to \text{cattails} \to \text{grasshopper} \to \text{frog} \\ \text{sunlight} \to \text{algae} \to \text{fish} \to \text{egret} \\ \text{sunlight} \to \text{algae} \to \text{crayfish} \to \text{turtle} \\ \text{flies} \to \text{frog} \to \text{egret} \\ \text{mosquitoes} \to \text{frog} \to \text{egret} \end{array}$ 

### Oceans

#### **Answers**

An ocean is a large body of saltwater. Although each ocean has its own name, all oceans are connected to each other.

Approximately 71% of the Earth's surface is covered in ocean, and oceans account for 97% of all water on Earth! Oceans surround each continent, and countless islands.



#### Can you name all five major oceans?

Pacific
Atlantic
Indian
Southern
Arctic

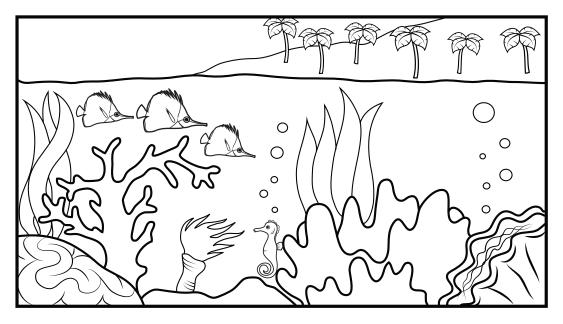
Which one is the largest?

**Pacific** 

### Reefs

#### **Answers**

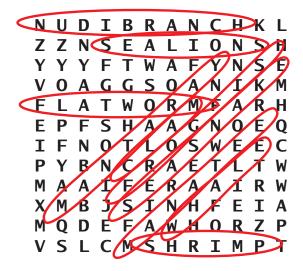
A reef is a deposit of limestone built up over a long period of time by corals. Some get tall enough to break the surface of the ocean and become islands!



**Directions**: Find each of these reef organisms in the word search below.

#### **Reef Organisms**

Clam
Fireworm
Flatworm
Frogfish
Manatee
Manta Ray
Nudibranch
Sea Lion
Sea Snake
Whale

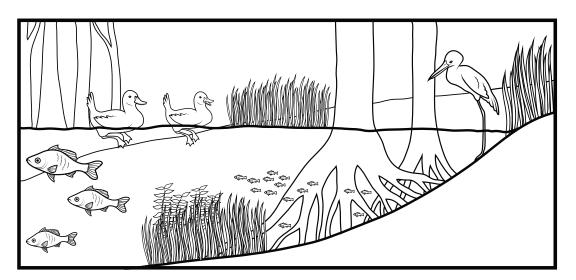


### **Estuaries**

#### **Answers**

An estuary is a transitional zone where a freshwater river or stream flows into the ocean. Tides and river currents affect the salt level in estuaries, to make the water *brackish*, meaning the water is a mix of salt water and freshwater.

There are many different kinds of estuaries. Many estuaries are highly productive ecological zones that play an important role in the life cycles of wildlife. Estuaries act as nurseries for many ocean fish, birds, and are even visited by sharks and marine mammals such as dolphins, seals, and sea lions.



What types of bodies of freshwater flow into an estuary? rivers, streams

What is the definition of the word *brackish*? Brackish water is a mix of freshwater and salt water.

What are three types of wildlife that can inhabit estuaries? Any of the following are correct: ocean fish, birds, sharks, dolphins, seals, and sea lions.

#### All About Our Earth's Ecosystems!

## TROPICAL OCEAN

#### **About Tropical Oceans:**

Tropical oceans are known mainly for one thing: coral reefs. Coral reefs are often referred to as the rainforests of the ocean because of the high diversity of animals that make them their home. Many species of fish, such as barracuda, clownfish, angelfish, sharks, rays, triggerfish, butterflyfish, and gobies live in reefs, as well as reptiles such as sea turtles, mammals such as dolphins and whales, invertebrates such as lobsters, crabs, and shrimp, and molluscs such as clams, octopus. cuttlefish, and squid. Even coral is actually a colony of many tiny animals living together!





#### **YELLOW LONGNOSE** BUTTERFLYFISH

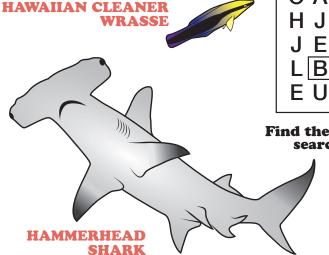
**FIREFISH** 

#### **Tropical Oceans Stats:**

- Tropical oceans are found between the Tropic of Cancer and the Tropic of Capricorn along the Equator.
- There are few true plants found in tropical oceans, the most common being seagrass. Everything else is either coral, which are animals, or algae such as seaweed and kelp.
- Many of the creatures that call tropical ocean their home are highly adapted to survive, especially those who live in densely populated reefs! Camouflage plays a big part of life in the reefs.
- The largest reef is the Great Barrier reef off the coast of Australia. It is the largest structure made by living organisms (corals) and can be seen from space!

#### **Word Search**





Find the tropical oceans terms below in the word search. They can be horizontal or vertical.

> 1) TURTLE 5) DOLPHIN

2) CORAL 6) CUTTLEFISH

3) SHARK 7) CLAM 8) REEF

4) BARRACUDA

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Coral Reefs <u>Answers</u>
<b>Directions:</b> Use the words in the box below to solve the crossword puzzle.
coral stomach sun mollusks soft cay exoskeletons polyp reef ecosystems Great Barrier Reef  1. © 2. C 3. S to mach 3. S to mach 3. S to mach 3. S to mach 4.
7. C 8. ECOSYSTEMS 0 10. K 9. Greatbarrierreef 11. sun a e t e o f
3. Coral have some organs, including the, in common with many other living organismsincluding us!  5. A is a sedentary type of animal form with a fixed base, columnar body, and free end with mouth and tentacles.  8. The coral reef is one of the most diverse on earth.  9.The is the largest coral reef in the world.  11. Coral reefs get their energy from the
<ol> <li>1. Hard coral polyps make to support and protect their bodies.</li> <li>2. A is a small, sandy island that forms on the surface of a coral reef.</li> <li>4. Coral reefs contain twenty-five percent of all ocean life, including organisms such as fish, worms, crustaceans, and</li> <li>6. There are two kinds of coral: and hard.</li> <li>7 is a sedentary invertebrate living in warm and tropical seas.</li> <li>10. A coral is a ridge made of coral, existing just below the</li> </ol>
surface of the sea.  WATER

### Life in the Reef

#### **Answers**

**Directions:** Match the numbers in the picture to the names in the word bank. Label and color each coral reef organism. Be sure to check your spelling and write neatly.

Cone snailSpinner dolphinBranching coralSea urchinSeahorseStarfishCrabReef sharkClownfishSea anemoneHawksbill turtleHermit crab

1.	Starfish	7	<b>Hermit Crab</b>	
2.	Spinner Dolphin	8.	Cone Snail	
3.	Reef Shark	9.	Sea Urchin	
4.	Hawksbill Turtle	10.	Crab	
5.	Seahorse	 11.	Clownfish	
6.	Branching Coral	 12.	Sea Anemone	

