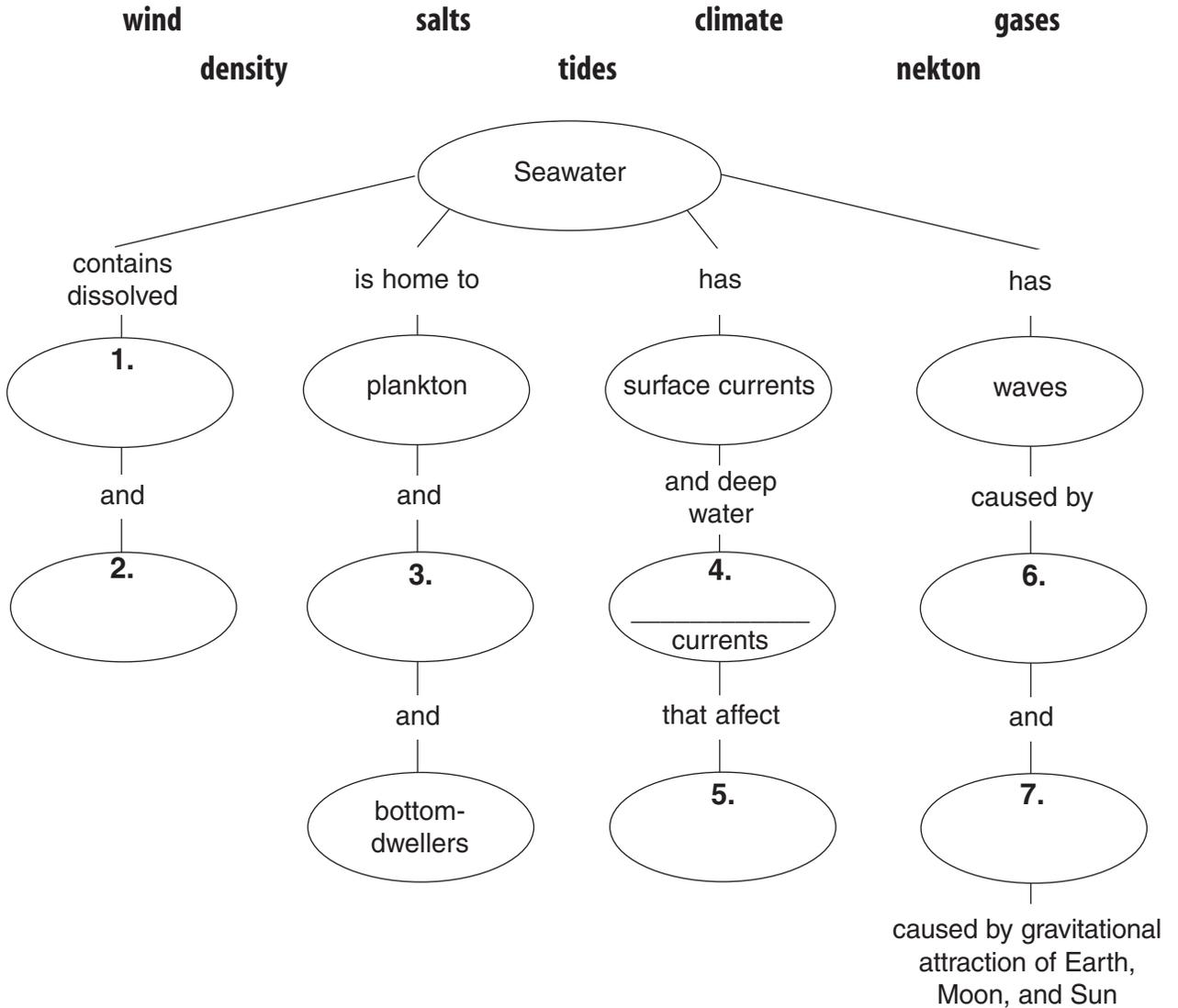




**Directed Reading for
Content Mastery**

**Overview
Oceans**

Directions: Use the following terms to complete the concept map below.



Directions: Answer the following questions on the lines provided.

8. Why is ocean water salty?

9. Describe a tide.



Directed Reading for
Content Mastery

Section 1 ■ Ocean Water
Section 2 ■ Ocean Currents
and Climate

Directions: Complete the following sentences using the correct terms listed below.

nutrients	photosynthesis	cold	density current
salinity	Coriolis	atmosphere	upwelling
Gulf Stream	surface	nitrogen	chloride

- The two most abundant elements in seawater are _____ and _____.
- _____ is the measure of the amount of dissolved salts in seawater.
- Living organisms use sunlight, water, and carbon dioxide in a process called _____ to make food and oxygen.
- The most abundant dissolved gas in the ocean is _____.
- The _____ is a warm current that originates near the equator.
- A current called an _____ brings deep cold water to the ocean surface.
- The _____ effect causes ocean currents to curve to the right or the left.
- The ocean layer called the _____ layer receives solar energy and is the warmest layer.
- An _____ is the pressure exerted on a surface at sea level by the column of air above it.
- A _____ forms when seawater that is more dense sinks beneath seawater that is less dense.
- Upwellings bring _____ to the surface, causing plankton and fish to flourish.
- The California Current is a _____ surface current.



Directions: Circle the term in parentheses that correctly completes the sentence.

1. The (crest/trough) is the highest point of a wave.
2. The difference between sea level at high tide and at low tide is the (tidal range/neap tide).
3. Organisms that make their own food are (producers/consumers).
4. (Plankton/Nekton) are usually one-celled organisms, such as diatoms.
5. Coral reefs are ecosystems that require clear (cold, warm) water.
6. A wave that runs parallel to shore is a (breaker/longshore current).
7. The (horizontal/vertical) distance between crests or troughs of two waves is one wavelength.
8. At (every/most) stage(s) of the food chain, organisms provide energy for other organisms.
9. Organisms that eat producers and other organisms are called (decomposers/consumers).
10. An ecosystem is composed of (living/living and nonliving) plants, animals, nutrients, sediments, and gases.
11. As a wave breaks against a shore, its top is moving (faster/slower) than its bottom.
12. All food chains depend on (consumers/producers) for survival.
13. Organisms that can actively swim, rather than drift in the currents, are called (plankton/nekton).
14. Coral reefs generally form in (tropical/cold) water.



Directed Reading for
Content Mastery

Key Terms Oceans

Directions: *Unscramble the terms in italics to complete the sentences below. Write the terms on the lines provided.*

- _____ 1. The amount of dissolved sodium and chloride in seawater determine its *tinysali*.
- _____ 2. The process that uses sunlight, water, and carbon dioxide to make food and oxygen is *tnosispohhtyse*.
- _____ 3. The velocity of the wind, the distance over which the wind blows, and the length of time the wind blows affect the height of a *vewa*.
- _____ 4. The gravitational attraction of the Earth, Moon, and Sun creates *stedi*.
- _____ 5. Organisms that float in the upper layers of oceans are *nktlopan*.
- _____ 6. Fish, whales, shrimp, turtles, and squid are *nmkteo*.
- _____ 7. The *rmlteinhoce* is a layer of cold water found between the surface layer and the deepest layer.
- _____ 8. In water where sunlight does not penetrate, producers make food by *ycshismesthoen*.
- _____ 9. Currents powered by wind are called *earscuf* currents.
- _____ 10. A(n) *nilwugelp* brings deep, cold water to the ocean surface.
- _____ 11. Energy is transferred from producers to consumers and decomposers through *dofo shinca*.
- _____ 12. More dense seawater sinking below less dense seawater forms a(n) *stydinen truncer*.
- _____ 13. Waves breaking on a shoreline can cause *snoorie*.

SECTION
1

Reinforcement

Ocean Water

Directions: In number 1 below, a code letter has been substituted for each letter of the alphabet. To find what the phrase says, use the following key to decode it. In the key, each code letter is shown directly below the alphabet letter it stands for. Write the correct letter above each code letter, then read the phrase aloud.

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

A better name for Earth?

1.
- N U T S X N T E Y Q X Z T N

Directions: Find the mistakes in the statements below. Rewrite each statement correctly on the lines provided.

2. Below the thermocline lies the surface layer, which contains extremely cold water.

3. Many organisms take magnesium from seawater to make bones or shells.

4. Nearly 70% of the world's nitrogen is produced in the oceans.

5. The pH of an ocean is a measure of the amount of the salts dissolved in it.

6. Rivers, volcanoes, and the atmosphere add materials to the oceans that change their composition.

7. Organisms that use chemosynthesis to convert sunlight, water, and carbon dioxide into food and oxygen are found in the upper 200 m of the oceans.

SECTION
2**Reinforcement****Ocean Currents and Climate**

Directions: Identify each statement as true or false. If the statement is true, write **true** on the line. If the statement is false, rewrite it to make it correct.

1. Surface currents are caused by the wind.

2. The Gulf Stream cools the climate of the states on the east coast of the United States.

3. The California Current warms the climate of the west coast of the United States.

4. Because of the rotation of Earth, surface currents in the northern hemisphere bend to the right.

5. Sailors depended on surface currents to transport them.

6. Surface currents usually move in a few thousand meters of ocean.

7. If the Iceland density current stopped flowing, the east coast of the United States might be warmer.

8. The density of warm water is less than that of cold water.

9. Where cool dense water sinks, it becomes more dense.

10. Density currents flow faster than surface currents.

Directions: Complete the following sentences using the correct terms.

11. The curving of winds and currents caused by Earth's rotation is called the _____.

12. Evaporation of water at the ocean's surface makes the water _____ dense.

13. Currents deep in the ocean are caused by differences in water _____.

Directions: Answer the following question on the lines provided.

14. Describe the two steps of upwelling.

SECTION 3

Reinforcement

Waves

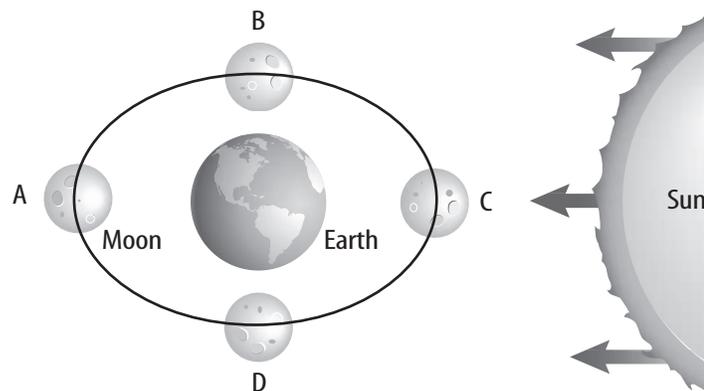
Directions: Complete the following sentences using the correct terms.

- The particles in a water wave move _____.
- When a wave approaches the shore, its _____ moves ahead of its _____.
- Surface waves are caused by _____.
- When the Earth, Moon, and Sun line up together, they create _____ tides with high tidal ranges.
- When cliffs are pounded by wind and water, _____ takes place.

Directions: Select the term from the following list that matches each description.

- | | |
|--|----------------------|
| _____ 6. the highest part of a wave | a. breaker |
| _____ 7. a large ocean wave caused by the gravitational pull of the Moon | b. crest |
| _____ 8. a collapsed wave on the beach | c. longshore current |
| _____ 9. the distance between two wave crests | d. tidal range |
| _____ 10. the distance between high and low tides | e. tide |
| _____ 11. the lowest point of a wave | f. trough |
| _____ 12. water that runs parallel to the shore | g. wavelength |

Directions: Use the diagram to answer questions 13 and 14.



13. In which position(s) of the Moon will the high tide be the highest? Why?

14. In which position(s) of the Moon will the low tide be the highest? Why?

SECTION
4**Reinforcement****Life in the Oceans**

Directions: Answer the following questions on the lines provided.

1. List three factors that could be considered part of an ecosystem.

2. Organisms in the ocean are divided loosely into three large groups. What are they?

3. Producers are usually the most plentiful organisms in an ecosystem. Describe how producers that live above the thermocline make food.

4. What is chemosynthesis?

5. What would happen if there were no decomposers?

6. Describe one path a nitrogen molecule might follow through the ocean ecosystem.

7. What is transferred from producers to consumers and decomposers through food chains?

8. Why isn't all the energy from one level of a food chain passed on to the next level?

9. Which kind of ocean life do humans most often use for food? Give three examples.



Section 1 Ocean Water

- A. _____ are important because they provide homes to many organisms; provide resources such as food, salt, transportation; provide water for precipitation; and provide oxygen produced by ocean organisms.
- B. Billions of years ago oceans formed from volcanic _____ that collected in the atmosphere and then fell as torrential rains.
- C. Ocean water contains many _____ substances that make it taste salty.
1. _____—measure of the amount of salts dissolved in sea water
 2. _____ enter the ocean from the atmosphere.
 - a. _____—enters from the atmosphere and **photosynthesis** of ocean organisms
 - b. _____—enters from the atmosphere and from respiration of ocean organisms; forms carbonic acid, which controls ocean acidity
 - c. _____—provides nutrients for plants and is used in plant and animal tissues
- D. Water temperature and pressure _____ with depth.
1. Three layers of water _____
 - a. Warm _____ layer
 - b. _____—begins at about 200 m with temperatures rapidly dropping with increasing depth
 - c. _____ layer—extremely cold
 2. Pressure or force per unit area increases about 1 atmosphere for every _____ increase in depth.

Section 2 Ocean Currents and Climate

- A. _____—wind that moves only the upper few hundred meters of water
1. _____—100-km-wide current of warm water flowing east across the North Atlantic Ocean

Note-taking Worksheet (continued)

2. Surface currents influence _____.

 - a. Warm currents keep northern climates _____.
 - b. Cold currents _____ excessive summer warming.

B. _____—forms when more dense sea water sinks beneath less dense water

1. North of Iceland a density current flows along the ocean floor toward the Atlantic Ocean and spreads into the _____ and _____ oceans; warm Gulf Stream water replaces this cold current.
2. Density currents help _____ global rainfall patterns and temperatures.

C. _____—current bringing deep, cold water to the surface; occurs where winds blow surface water away from land

1. Cold water brings _____ to enrich fishing grounds.
2. Affects _____ of coastal areas

Section 3 Waves

A. Formed by wind, a _____ is a rhythmic movement that carries energy through water.

1. Waves have _____.

 - a. _____—highest point of wave
 - b. _____—lowest point of wave
 - c. Vertical distance between crest and trough is _____.
 - d. _____—horizontal distance between crests or troughs

2. Wave _____—water particles do not move forward unless the wave is breaking on shore.
3. _____—collapsing waves near the shore caused by the wave bottom being slowed by friction with the ocean floor

B. _____—rising and falling of sea level caused by gravity from Earth, Moon, and Sun

1. _____—high tides higher and low tides lower than normal due to Moon, Earth, and Sun lining up
2. _____—high tides lower and low tides higher than normal due to Sun, Moon, and Earth forming a right angle

C. Wave _____—wears away both rocky shores and beaches

Note-taking Worksheet (continued)**Section 4 Life in the Oceans**

- A. Types of life are classified by _____ organisms live.
1. Tiny marine animals that float in the upper ocean layers are called _____.
 2. _____—animals that swim rather than drift in the currents
 3. _____—can burrow in sediments, walk or swim on the bottom, or be attached to the seafloor
- B. Ocean _____—community of organisms and nonliving factors such as sunlight, water, nutrients, sediment, and gases
1. _____—organisms that make their own food through photosynthesis or **chemosynthesis**
 2. _____—eat producers to get energy
 3. _____—break down materials and release them back into the ecosystem
 4. Energy is transferred from producers to consumers and decomposers through _____ and complex food webs.
- C. Ocean nutrients—recycled through the ecosystem, particularly in _____

Chapter Review (continued)**Part B. Concept Review**

Directions: Circle the term in parentheses that correctly completes the sentence.

1. The oceans produce (20%, 50%, 70%) of the world's oxygen.
2. Ocean water at the mouth of a large river would have a salinity (greater than, less than, the same as) the water in the middle of the ocean.
3. If you have ever walked into a lake, or even a swimming pool, and noticed cold water around your feet while there was warm water around your arms and shoulders, you have experienced (a density current, an isotherm, a thermocline).
4. Surface currents are caused by (wind, tides, density).
5. The California Current makes the city of San Francisco (colder than, warmer than, the same temperature as) the interior of the state.
6. Fishermen hope for (density currents, upwellings, El Ninos) because they cause fish to thrive.
7. Waves carry (energy, force, matter).
8. Tides are caused by (the wind, density currents, the Moon's gravitational forces).
9. A collection of organisms and the nonliving factors that affect them is (an ecosystem, a community, a population).
10. Twenty-five percent of all marine species live around (the Gulf Stream, coral reefs, deep water trenches).

Directions: Complete the following sentences using the correct terms.

11. _____ live on or near the ocean floor and eat partially decomposed material.
12. A(n) _____ is a rhythmic disturbance that carries energy.
13. Steep cliffs are carved out by _____.
14. Surface currents bend to the right in the northern hemisphere because of the _____.
15. _____ is a measure of the amount of salts dissolved in seawater.
16. The highest point of a wave is its _____, and the lowest point is its _____.



Chapter Test

Oceans

I. Testing Concepts

Directions: Match the terms in Column I with the definitions in Column II. Write the letter of the correct definition in the blank at the left.

Column I

- _____ 1. chemosynthesis
- _____ 2. consumers
- _____ 3. decomposers
- _____ 4. density current
- _____ 5. ecosystem
- _____ 6. food chains
- _____ 7. nekton
- _____ 8. photosynthesis
- _____ 9. plankton
- _____ 10. producers
- _____ 11. salinity
- _____ 12. surface currents
- _____ 13. thermocline
- _____ 14. tide
- _____ 15. upwelling
- _____ 16. waves

Column II

- a. organisms that swim freely
- b. organisms that get food by eating producers or consumers
- c. process for making food that does not require chlorophyll
- d. the rise and fall in sea level
- e. rhythmic disturbances that carry energy
- f. systems in which energy is transferred from producers to consumers and decomposers
- g. organisms that make their own food
- h. community of organisms and the nonliving factors that affect them
- i. process for making food and oxygen using chlorophyll, sunlight, carbon dioxide, and water
- j. ocean layer that experiences rapid temperature change with increasing depth
- k. current that brings to the surface cold, deep seawater
- l. tiny marine producers
- m. currents in deep water that form when dense seawater sinks
- n. measure of the amount of salts dissolved in the ocean
- o. organisms that break down dead organisms and return nutrients to the ecosystem
- p. currents caused by wind

Directions: Write the letter of the term or phrase that best completes each sentence.

- _____ 17. Most of Earth's rain and snow comes from _____.
 - a. groundwater
 - b. rivers and lakes
 - c. the stratosphere
 - d. the oceans
- _____ 18. Salinity is a measure of _____.
 - a. dissolved salts
 - b. density
 - c. sodium carbonate
 - d. dissolved gases

Chapter Test (continued)

- _____ 19. Many animals use _____ to form bones or shells.
- | | |
|-----------|----------------|
| a. sulfur | c. calcium |
| b. sodium | d. phosphorous |
- _____ 20. Producers containing chlorophyll _____.
- | | |
|---------------------------|-------------------------------------|
| a. perform photosynthesis | c. are at the top of the food chain |
| b. eat consumers | d. are nekton |
- _____ 21. A zone in the ocean where temperatures change rapidly is the _____.
- | | |
|----------------|------------------------|
| a. thermopause | c. temperature barrier |
| b. thermocline | d. temperature zone |
- _____ 22. An ocean current only a few hundred meters deep and powered by the wind is a _____.
- | | |
|--------------------|--------------------|
| a. density current | c. tidal current |
| b. wind current | d. surface current |
- _____ 23. The tidal range is affected by _____.
- | | |
|-----------------------------|-----------------------------|
| a. the wind | c. frequency of the waves |
| b. the position of the Moon | d. temperature of the water |

II. Understanding Concepts

Skill: Sequencing

1. Place the following steps in the formation of Earth's oceans in the proper order by writing the numbers 1 through 4 on the lines provided

- | | |
|----------|--|
| _____ a. | Water accumulated in the lowest parts of Earth's surface. |
| _____ b. | Water vapor condensed to form clouds. |
| _____ c. | Volcanoes erupted, releasing lava, ash, and gases including water vapor. |
| _____ d. | Torrential rains began to fall from the clouds. |

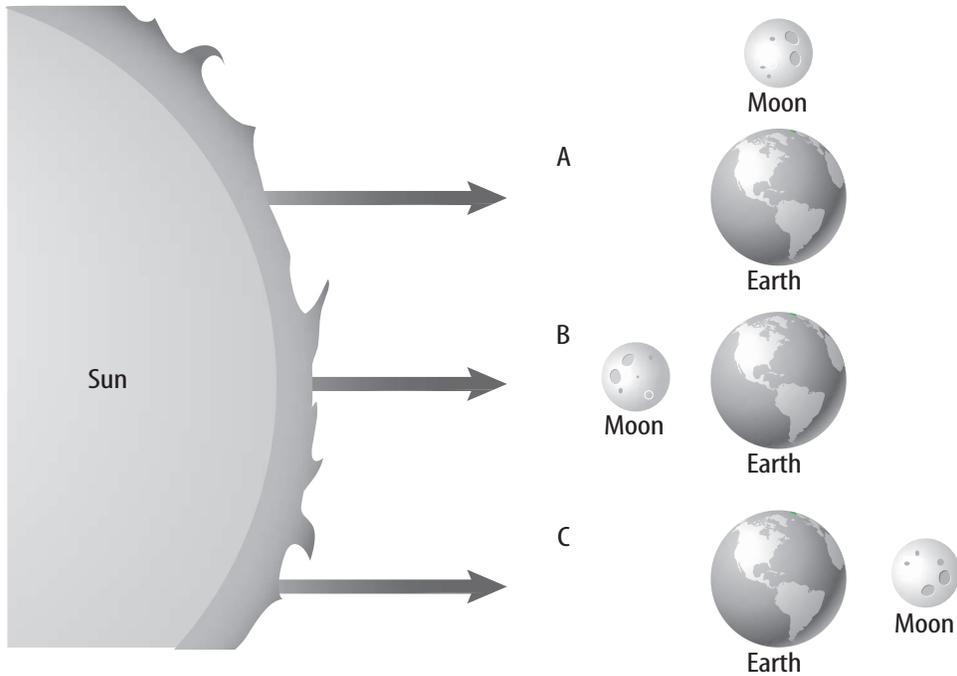
Skill: Comparing and Contrasting

2. Compare and contrast the roles of producers and consumers in the ocean.

Chapter Test (continued)

Skill: Using a Diagram

Directions: Study the following diagram. Then answer questions 3 and 4.



3. Which position(s) of the Moon would cause higher high tides and lower low tides? Why?

4. Which position(s) of the Moon would cause lower high tides and higher low tides? Why?

III. Applying Concepts

Writing Skills

Directions: Answer the following questions using complete sentences.

1. Arthur C. Clarke, the science fiction author, said it is inappropriate to call our planet Earth, when clearly it is Ocean. Why would he say that?

Chapter Test (continued)

2. Would you expect water off the beaches of southern California to be warmer or cooler than water off the beaches of Florida. Why?

3. How did the steep cliffs along the coast of England form?

4. Follow one molecule of nitrogen from the atmosphere through a nitrogen cycle that ends up back in the atmosphere.

5. Explain upwelling and tell why fishermen look forward to it.

6. You visited the seashore one summer and there was a wide beach. When you visited the next year the sand was gone and there was nothing but rocks. How do you explain this?

7. How do breakers form?
