

Ch. 11
The Oceans • Guided Reading and Study

Exploring the Ocean

1. 1 gallon of H₂O = _____ pounds

Learning About the Ocean (pp. 351-353)

1. Circle the letter of the sentence that is true about the Phoenicians.
 - a. They were one of the earliest cultures to explore the oceans.
 - b. They sailed to Hawaii.
 - c. They established sea routes for trade by 2000 B.C.
 - d. They lived on islands in the Indian Ocean.
2. Is the following sentence true or false? Captain Cook's voyages of exploration marked the beginning of the modern science of oceanography. _____

3. Why has the deep ocean floor been explored only recently?

4. Is the following sentence true or false? To study the deep ocean floor, scientists have relied on direct methods of gathering information.

5. Circle the letter of each sentence that is true about sonar.
- a. It measures distance.
 - b. It uses sound waves.
 - c. It is an indirect way of gathering data.
 - d. It uses X rays.

4. Sonar Math
 Formula:

$$\frac{\# \text{ of seconds} \times 1520 \text{ m}}{2}$$

The Ocean Floor (pp. 354-355)

6. Circle the letter of each sentence that is true about the ocean floor.
 - a. It is flat and sandy.
 - b. It is rocky and uneven.
 - c. It has the biggest mountains on Earth.
 - d. It has deep canyons.

How deep is the ocean in meters if the sonar blip comes back in 10 seconds?

Solution = $\frac{10 \times 1520}{2}$
 = _____
 = _____
 = _____

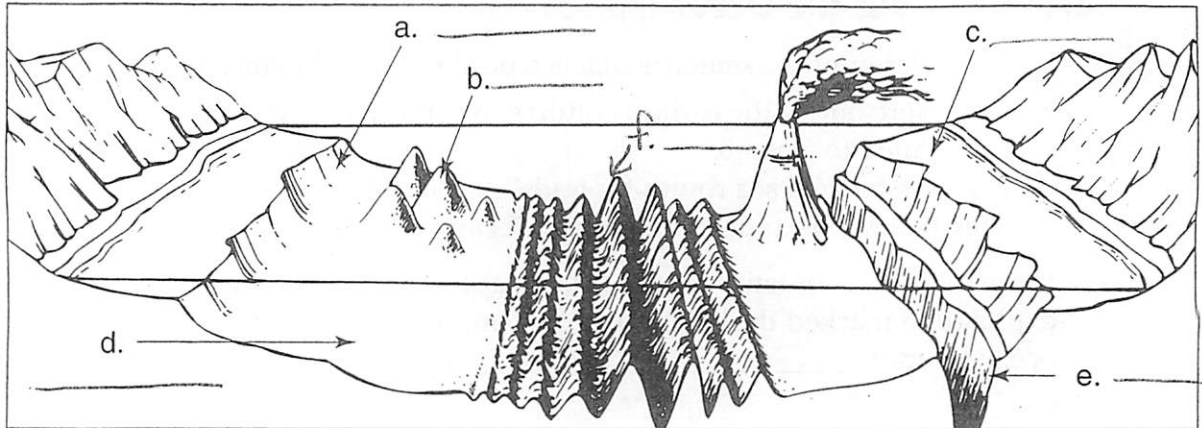
2. SCUBA

S = _____
 C = _____
 U = _____
 B = _____
 A = _____

3. Mariana Trench
 Ocean
 Deepest Trench
 at _____ km deep

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- 7 Find and label each of the following ocean floor features in the drawing: continental shelf, continental slope, seamount, abyssal plain, and trench.



Match each feature of the ocean floor with its description.

Feature	Description
___ 8. continental shelf	a. Smooth and nearly flat region of the ocean floor
___ 9. continental slope	b. Mountain on the ocean floor that is completely under water
___ 10. seamount	c. Range of mountains on the ocean floor
___ 11. abyssal plain	d. Incline at the edge of the continental shelf
___ 12. mid-ocean ridge	e. Canyon in the ocean floor
___ 13. trench	f. Shallow area of the ocean floor extending outward from land

14. Is the following sentence true or false? The mid-ocean ridge is made up of a mountain range that winds through the oceans. _____

Ocean Zones (p. 356)

15. The part of the ocean that extends from the high-tide line to the low-tide line is called the _____.
16. The part of the ocean that extends from the low-tide line to the edge of the continental shelf is called the _____.
17. The part of the ocean that extends beyond the edge of the continental shelf is called the _____.
18. The open-ocean zone is divided into the surface zone, the transition zone, and the _____ zone.

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4. Circle the letter of each choice that determines the size of a wave.
- a. Strength of the wind
 - b. How long the wind blows
 - c. How far the wind blows
 - d. Amount of water the wave carries
5. Is the following sentence true or false? Water is moved toward shore by a wave. _____
6. Circle the letter of the sentence that describes what happens to water particles near the surface when a wave passes by.
- a. The water particles move toward shore.
 - b. The water particles move in circles.
 - c. The water particles move randomly.
 - d. The water particles move little if at all.
7. Circle the letter of the sentence that describes what happens to water particles in deep water when a wave passes by.
- a. The water particles move away from shore.
 - b. The water particles move in large circles.
 - c. The water particles move randomly.
 - d. The water particles move little if at all.

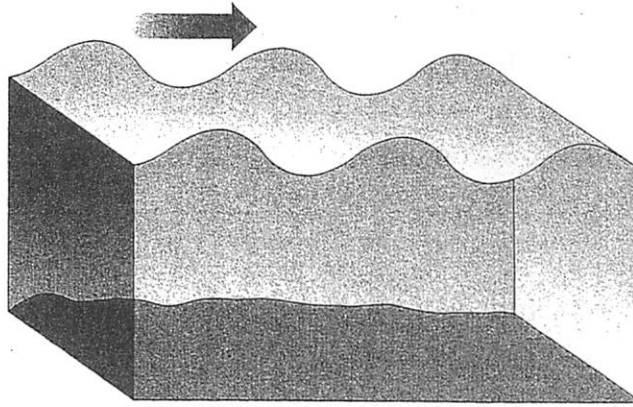
Match the term with its definition.

Term	Definition
___ 8 wavelength	a. Horizontal distance between crests
___ 9 frequency	b. Vertical distance from crest to trough
___ 10 wave height	c. Number of waves that pass a point in a certain amount of time

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Wave Action (continued)

11. Label a crest and a trough in the drawing of waves.



14. How is surf formed?

15. Water that moves up the beach in a wave flows back out to sea due to _____.

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16. Circle the letter of the sentence that is true about tsunamis.

- a. They are waves.
- b. They are most common in the Atlantic Ocean.
- c. They are felt most in deep water.
- d. They cause earthquakes.

How Waves Affect the Shore (p. 363)

Match the term with its description.

Term	Description
___ 17. longshore drift	a. Underwater ridge of sand
___ 18. sandbar	b. Movement of sand along a beach
___ 19. rip current	c. Rapid rush of water out to sea

Waves and Beach Erosion (pp. 364-365)

20. How do waves shape a beach?

21. A wall of rocks or concrete built outward from a beach to stop longshore drift is called a(n) _____.

22. Hills of wind-blown sand are called _____.

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① The daily rise and fall of Earth's water on its coastlines are called _____ change every _____ hours p.172

⑤ Circle the letter of each sentence that is true about high tides.

- a. They occur twice a day.
- b. They occur later in the west.
- c. They occur six hours apart.
- d. They occur more often than low tides.

6. Is the following sentence true or false? High tides occur about twelve and a half hours apart. _____

⑦ What factors affect the height of the tide in any particular location?

8. Is the following sentence true or false? The sun's gravity affects Earth's tides. _____

⑨ Complete the compare/contrast table with the following terms: least, greatest, neap tide, spring tide.

Monthly Tide Cycle		
Type of Tide	Position of Sun and Moon	Difference Between High and Low Tides
a.	Sun and moon in straight line	b.
c.	Sun and moon at right angles	d.

⑩ Circle the letter of each sentence that is true about spring tides.

- a. They occur twice a month.
- b. They occur only in spring.
- c. They occur during a new moon.
- d. They occur during a full moon.

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⑬ Describe how a tidal power plant captures tidal energy.

14. Circle the letter of the sentence that is true about tidal energy.

- a. It is clean.
- b. It is nonrenewable.
- c. It can be used on any coast.
- d. It cannot be harnessed.

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Ocean Water Chemistry (pp. 372–377)

This section describes the saltiness of ocean water and the gases that ocean water contains. The section also describes how temperature, pressure, and other properties of ocean water change as you go deeper in the ocean.

Use Target Reading Skills

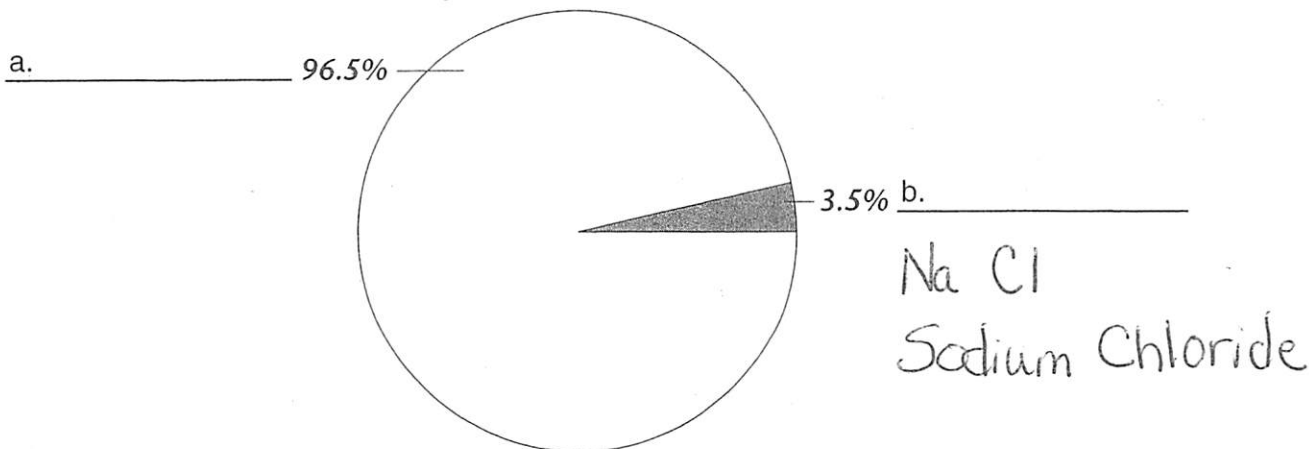
Preview the red headings in your textbook. In the graphic organizer, ask a how or what question for each heading. As you read, answer your questions.

Ocean Water Chemistry	
Question	Answer
How salty is the ocean?	One kilogram of ocean water has . . .

The Salty Ocean (pp. 373–374)

1. The total amount of dissolved salts in water is called _____.
2. Label the two parts of the circle graph.

Composition of Ocean Water



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Ocean Water Chemistry *(continued)*

- ③ Circle the letter of each place in the ocean where salinity is likely to be relatively low.
- a. Near melting ice
 - b. Near the mouth of a large river
 - c. Where the climate is hot and dry
 - d. Near the poles
- ④ Circle the letter of the sentence that is true about the effect of salinity on ocean water.
- a. Salinity increases the freezing point of ocean water.
 - b. Salinity decreases the density of ocean water.
 - c. Salinity decreases the mass of ocean water.
 - d. Salinity increases the buoyancy of ocean water.

Other Ocean Properties (pp. 375–376)

- ⑤ List two gases found in ocean water that are necessary for living things.
- a. _____ b. _____
6. Is the following sentence true or false? There is more oxygen in seawater than in air. _____
- ⑦ Why does warm water stay at the surface of the ocean?
- _____
- _____
8. Is the following sentence true or false? Warm water contains more dissolved oxygen than does cold water. _____

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Changes with Depth (p. 377)

9. A vertical section of the ocean is called the _____.

10. Complete the compare/contrast table.

Depth of Ocean Zones	
Zone	Depth
a.	Extends from about 1 kilometer below the surface to the ocean floor
b.	Extends from the surface to about 200 meters below
c.	Extends from about 200 meters below the surface to about 1 kilometer below the surface

11. Circle the letter of each sentence that is true about temperature in the ocean.

- a. Temperature decreases as depth increases.
- b. Temperature is highest in the transition zone.
- c. Temperature drops quickly in the surface zone.
- d. Temperature is lowest in the deep zone.

12. Is the following sentence true or false? Below the surface zone, the salinity of ocean water remains fairly constant. _____

13. Circle the letter of each sentence that is true about pressure in the ocean.

- a. Pressure is the weight of the water above pressing down.
- b. Pressure rises continuously as depth increases.
- c. Pressure on the ocean floor is twice as great as pressure at sea level.
- d. A diver can safely withstand pressure at 1 kilometer below sea level.

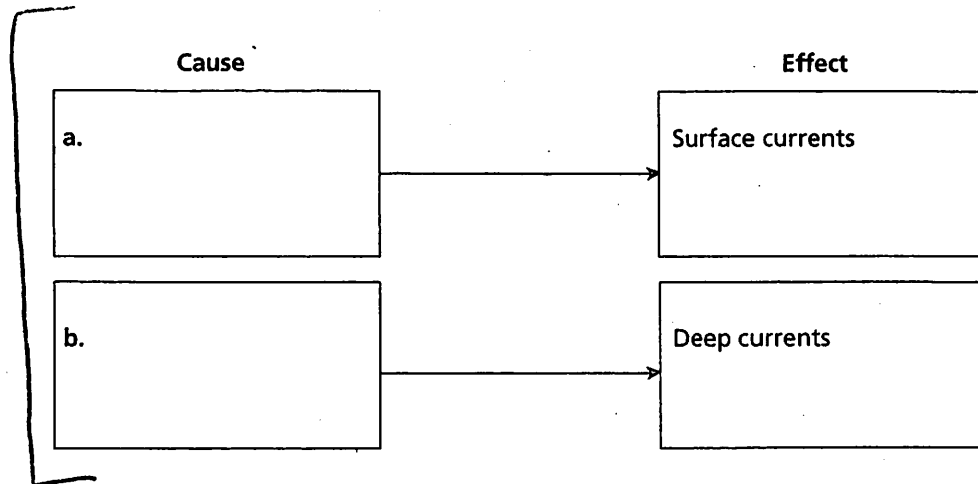
14. An underwater vehicle built to resist pressure is called a(n) _____.

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Currents and Climate (pp. 380–385)

This section describes surface and deep ocean currents and explains how they affect climate.

Use Target Reading Skills



Introduction (p. 380)

- ① A large stream of moving water that flows through the oceans is a(n) _____.
2. Is the following sentence true or false? Currents carry water from one place to another. _____

Surface Currents (pp. 381–383)

- ③ Circle the letter of each sentence that is true about surface currents.
 - a. They affect water down to 1 kilometer.
 - b. They are driven mainly by winds.
 - c. They move in circular patterns.
 - d. They occur only in the Pacific Ocean.

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4. The effect of Earth's rotation on the direction of winds and currents is called the _____.

5. Is the following sentence true or false? In the Northern Hemisphere, surface currents curve to the left. _____

6. The largest and most powerful surface current in the North Atlantic Ocean is the _____.

7. Circle the letter of the sentence that is true about the Gulf Stream.

- a. It is caused by strong winds from the north.
- b. It carries more water than the Mississippi River.
- c. It is a cold-water current.
- d. It curves westward due to the Coriolis effect.

8. Is the following sentence true or false? In the Southern Hemisphere, surface currents curve to the left. _____

9. The pattern of temperature and precipitation typical of an area over a long period of time is called _____.

10. An abnormal climate event that occurs every 2 to 7 years in the Pacific Ocean is called _____.

11. How does El Niño begin?

12. Circle the letter of each sentence that is true about El Niño.

- a. It can prevent upwelling.
- b. It can affect weather worldwide.
- c. It is fully understood.
- d. Its impact can be reduced.

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13. How does the Gulf Stream influence the climate along the western coast of Norway?

16. The density of water depends on its _____ and its _____.

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Upwelling (pp. 384–385)

- 19. The movement of cold water upward from the deep ocean is referred to as _____.
- 20. Is the following sentence true or false? Upwelling is caused by tides.

- 22. Why are upwelling zones usually home to enormous schools of fish?

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Key Terms

Use the clues to help you unscramble the key terms from the chapter. Then put the numbered letters in order to find the answer to the riddle.

Clues

Key Terms

- | | | |
|---|------------|---------|
| 1. Structure that reduces erosion | rongi | 1 _____ |
| 2. Highest point of a wave | tecsr | 2 _____ |
| 3. Ridge of sand near shore | nasdrab | 3 _____ |
| 4. Distance between two crests | telegawvnh | 4 _____ |
| 5. Daily rise and fall of water | sdeit | 5 _____ |
| 6. Saltiness of water | lstainyi | 6 _____ |
| 7. Number of waves passing by in a given time | curenqefy | 7 _____ |

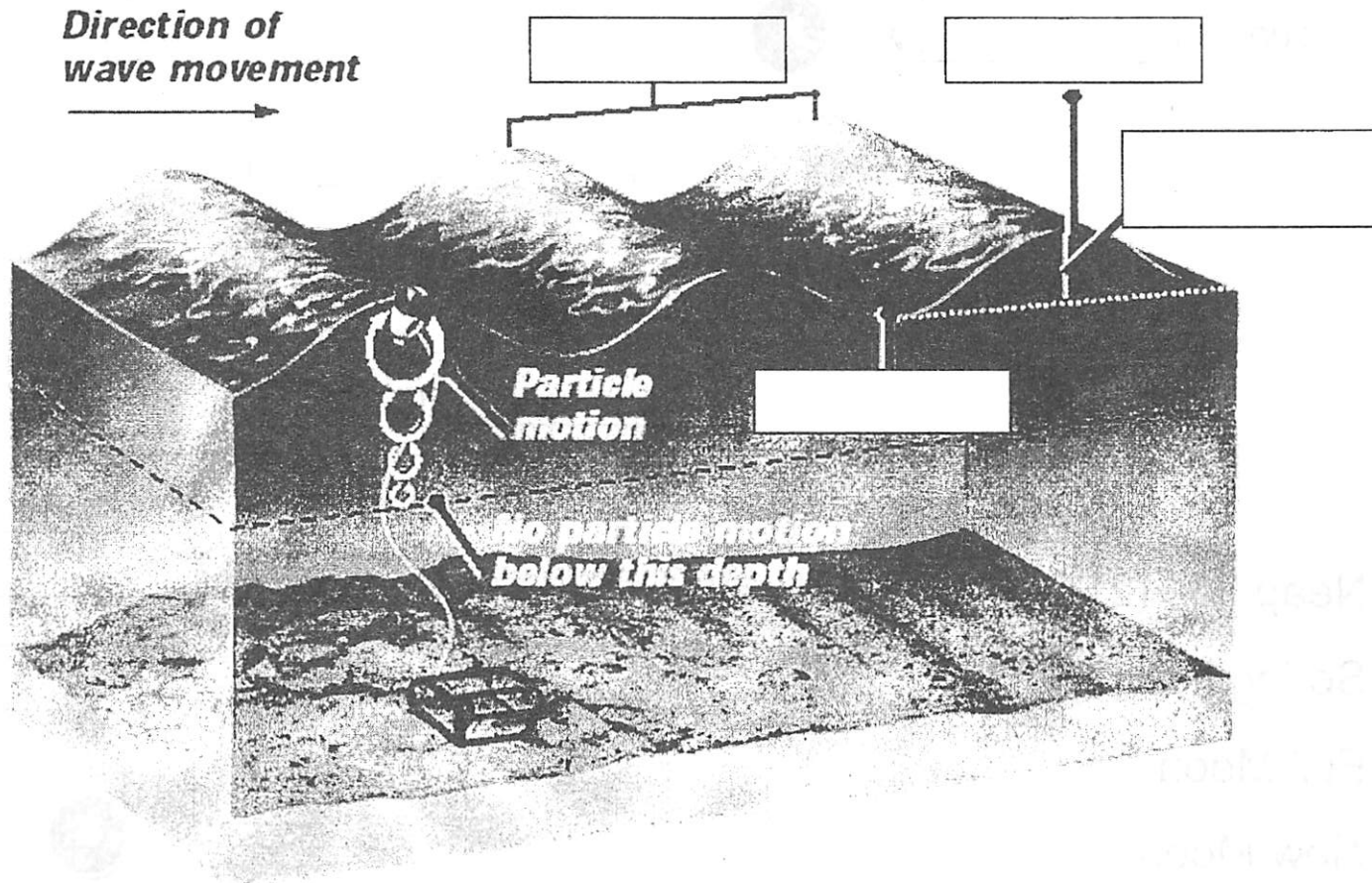
Riddle: What causes tides?

Answer: 1 2 3 4 5 6 7

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Student _____
 Date _____ Class _____

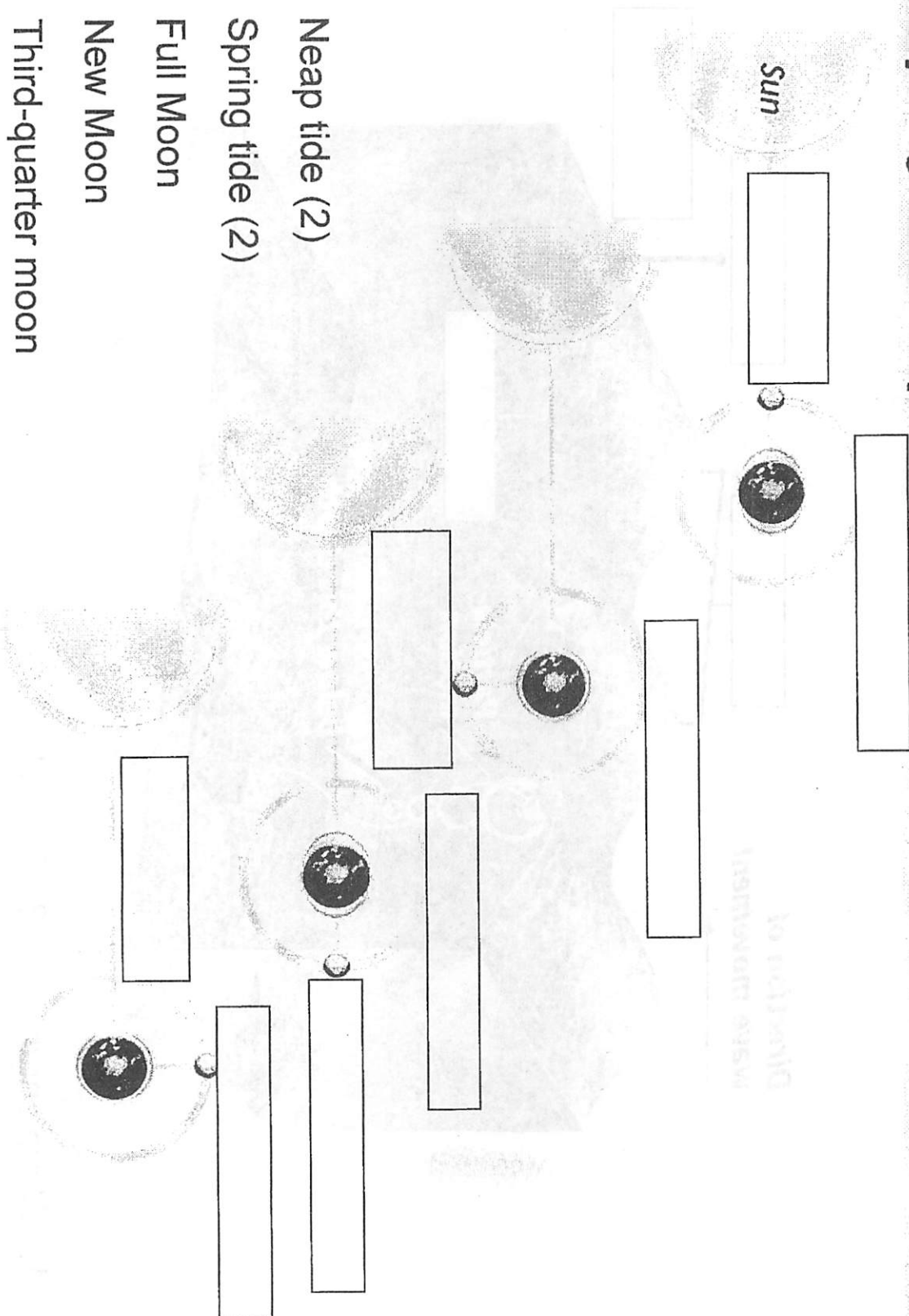
57 Parts of a Wave



- | | |
|----------------|-----------|
| 1. Wavelength | 3. Trough |
| 2. Wave height | 4. Crest |



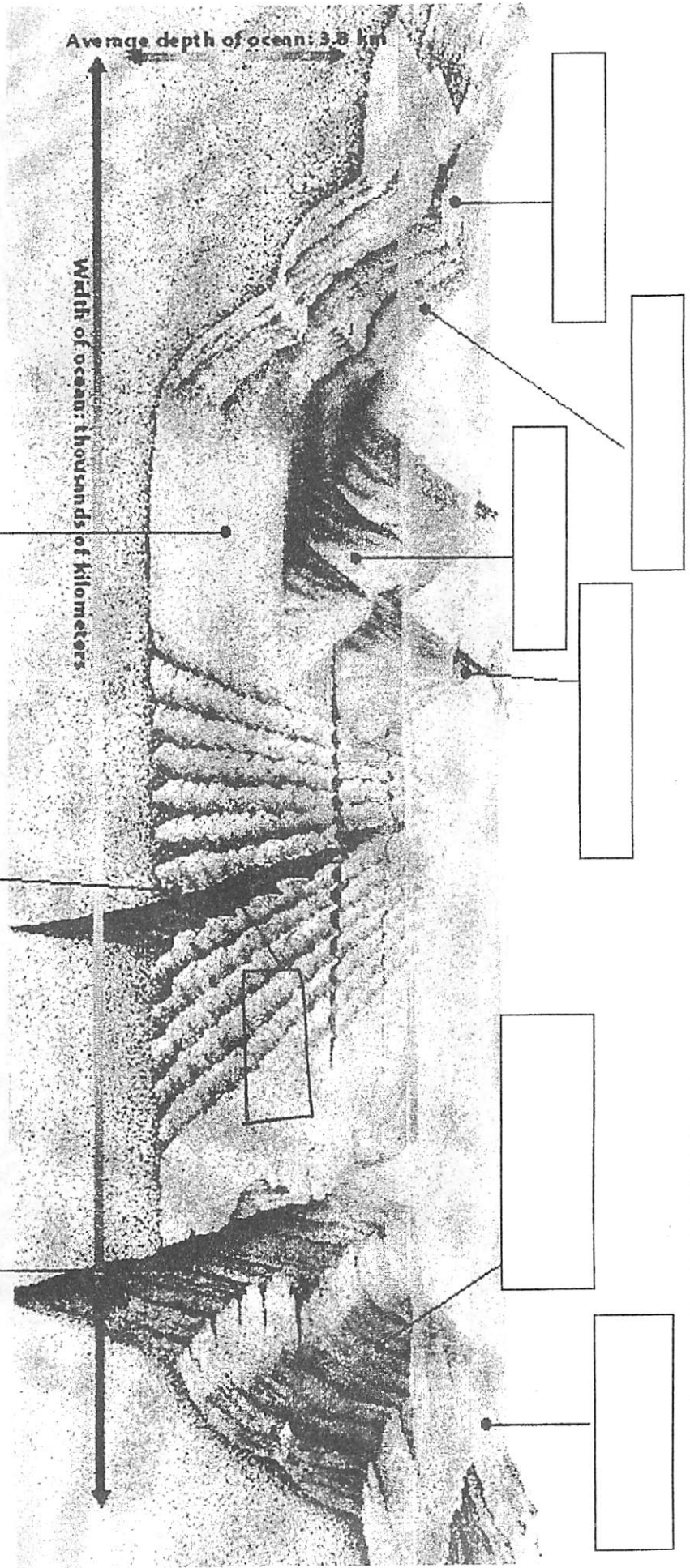
59 Spring and Neap Tides



1. Neap tide (2)
2. Spring tide (2)
3. Full Moon
4. New Moon
5. Third-quarter moon
6. First-quarter moon



62 Exploring the Ocean Floor

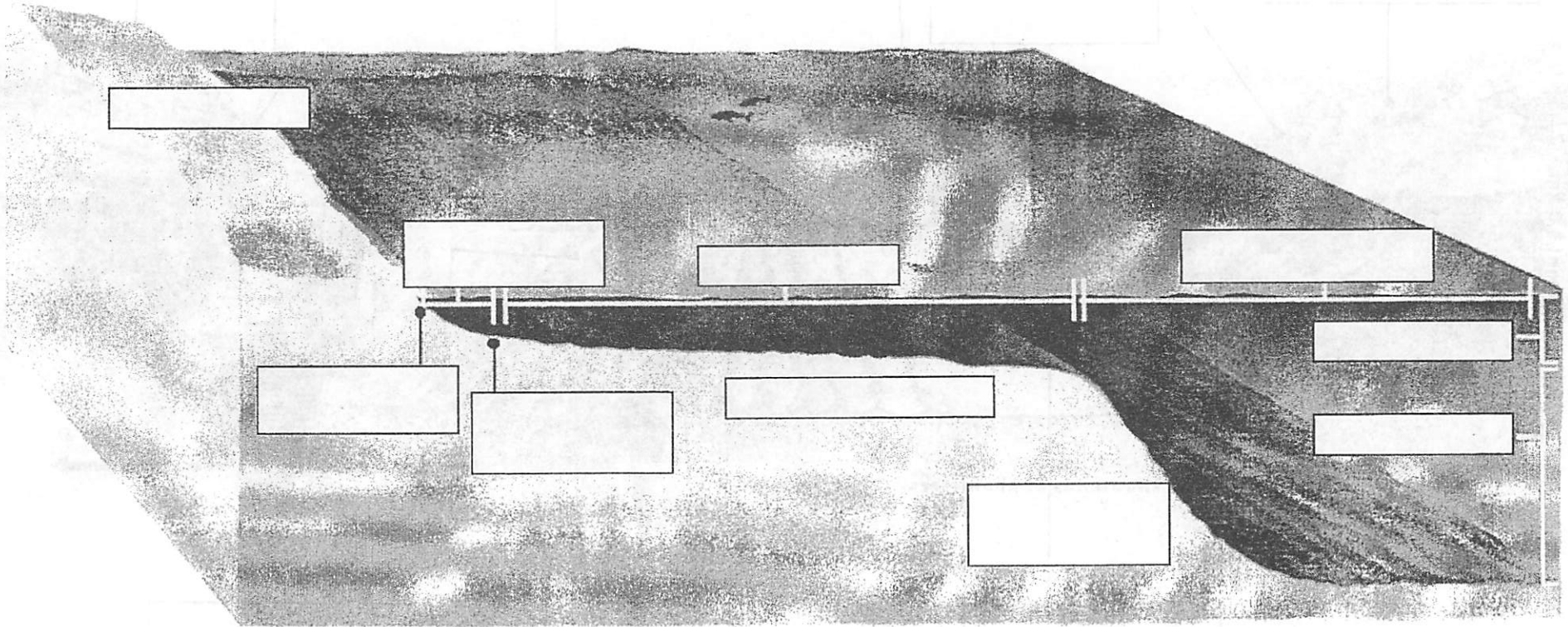


- 1. Mid-ocean ridge
- 2. Volcanic island
- 3. Continental shelf
- 4. Trench
- 5. Sea mount
- 6. Continental slope
- 7. Abyssal plain
- 8. Rift Valley

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All

63 Ocean Zones



- | | | | |
|----------------------|--------------------|-------------------|------------------|
| 1. Continental shelf | 4. Intertidal zone | 7. Low-tide zone | 10. Neritic zone |
| 2. Deep zone | 5. Beach | 8. Surface zone | |
| 3. Continental slope | 6. Open-ocean zone | 9. High-tide line | |

Ocean Extras

Name _____

Date _____ Science _____

1. Sonar can also be called _____.
Sonar – sound travels _____ meters per second in ocean water
10 seconds x _____ / 2 = 7605 meters = distance to the bottom
2. The Ocean Floor is sometimes called the Ocean _____
3. There is really only one large ocean on Earth
Map makers separate it into five _____
 - a. Pacific Ocean – _____
 - b. Atlantic Ocean
 - c. Indian Ocean
 - d. _____ Ocean
 - e. _____ Ocean
4. The mid ocean ridge has mountains that are rise _____ meters.
5. The _____, where parts of Earth's crust pull apart, is in the middle of the mid ocean ridge.
6. Wave energy is _____ when the waves are calm or still.
7. Wave energy is _____ when the waves are wild.
8. Wind energy is transferred to water by _____
9. The amount of energy in the wind depends on the
 - a. _____ of the wind
 - b. Length of the _____ the wind blows
 - c. _____ the wind blows
10. The ocean is _____ salt and _____ water
11. Ocean Water is _____ of salt per 1000g of ocean water
12. Sodium Chloride is _____ (NaCl)
13. _____ currents are moved by the prevailing winds.
14. The prevailing winds blow in _____ directions almost all of the time.

