

Chapter 18 Climate and Climate Change

Study Guide

1. What Causes **Climate**?
 - a. Factors Affecting Temperature
 - i. Latitude
 1. **Tropical Zone**
 2. **Polar Zone**
 3. **Temperate Zone**
 - ii. Altitude
 - iii. Distance From Large Bodies of Water
 1. **Marine Climates**
 2. **Continental Climates**
 - iv. Ocean Currents
 - b. Factors Affecting Precipitation
 - i. Prevailing Winds
 - ii. Mountain Ranges
 1. **Windward**
 2. **Leeward**
 - c. **Microclimates**
 - d. The Seasons
 - i. Tilted Axis
 - ii. Winter or Summer
2. Climate Regions
 - a. Classifying Climates
 - b. Tropical Rainy Climates
 - i. Tropical Wet
 1. **Rain Forests**
 - ii. Tropical Wet-and-Dry
 1. **Savannas**
 - c. Dry Climates
 - i. Arid
 1. **Deserts**

ii. Semiarid

1. **Steppe**

d. Temperate Marine Climates

i. Marine West Coast

ii. Mediterranean

iii. **Humid Subtropical**

e. Temperate Continental Climates

i. Humid Continental

ii. **Subarctic**

f. Polar Climates

i. Ice Cap

ii. **Tundra**

1. **Permafrost**

g. Highlands

3. Long-Term Changes in Climate

a. Studying Climate Change

b. **Ice Ages**

c. Causes of Climate Change

i. Earth's Position

ii. Solar Energy

1. **Sunspots**

iii. Movement of Continents

4. Global Changes in the Atmosphere

a. Global Warming

i. The Greenhouse Effect

1. **Greenhouse Gases**

2. **Global warming**

ii. Another hypothesis

iii. Possible Effects

b. Ozone Depletion

i. **Chlorofluorocarbons**

SECTION 18-1

REVIEW AND REINFORCE

What Causes Climate?

◆ Understanding Main Ideas

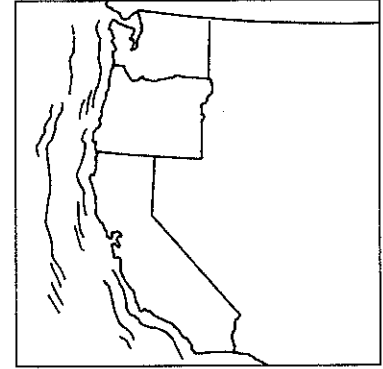
On a separate sheet of paper, identify the climate factor(s) that influence the climate in each picture. Indicate whether the climate factors are affecting temperature, precipitation, or both. Then answer the questions that follow.



1. Alaska



2. Rocky Mountains



3. West Coast

4. Explain how Earth's tilted axis causes the seasons.
5. At what times of the year do both of Earth's hemispheres receive the same amount of energy from the sun? Explain why this occurs.

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

- _____ 6. leeward
- _____ 7. polar zones
- _____ 8. climate
- _____ 9. windward
- _____ 10. tropical zone
- _____ 11. microclimate
- _____ 12. temperate zones

- a. the average year-after-year conditions of temperature, precipitation, winds, and clouds
- b. an area near the equator that receives direct sunlight all year round
- c. the side of a mountain that faces the oncoming wind
- d. a small area with specific climate conditions
- e. areas that extend from about 66.5° to 90° north and south latitudes
- f. the side of a mountain that is downwind
- g. areas located from about 23.5° to 66.5° north and south latitudes

SECTION 18-2

REVIEW AND REINFORCE

Climate Regions

◆ Understanding Main Ideas

Complete the table below by filling in the climate regions.

Characteristics of Climate Regions

Climate Region	Precipitation	Temperature
1.	Heavy	Hot
2.	Low	Hot or Cold
3.	Heavy	Mild
4.	Moderate	Warm to Cold
5.	Low to Moderate	Cold

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term in the left column.

_____ 6. permafrost

_____ 7. subarctic

_____ 8. savanna

_____ 9. humid subtropical

_____ 10. desert

_____ 11. tundra

_____ 12. rain forest

_____ 13. steppe

a. arid regions that get less than 25 centimeters of rain every year

b. forests in which plenty of rain falls all year-round

c. climate that is wet and warm, but not as constantly hot as the tropics

d. climate that lies north of the humid continental climates

e. tropical grassland

f. permanently frozen tundra soil

g. semiarid region, also called a prairie or grassland

h. climate region north of the subarctic, with short, cool summers and bitterly cold winters

SECTION 18-3

REVIEW AND REINFORCE

Long-Term Changes in Climate

◆ Understanding Main Ideas

Answer the following questions in the spaces provided.

1. What principle do scientists follow when they study ancient climates?

2. List three sources of information scientists use to learn about ancient climates.

3. How does Earth's surface change during an ice age?

4. Why is Earth's sea level lower during an ice age?

5. What are three possible causes of climate change?

◆ Building Vocabulary

Fill in the space to complete each sentence.

6. Dark, cooler regions on the surface of the sun, called _____, have been linked to short-term climate changes.

7. Over millions of years, warm climate periods have alternated with cold climate periods known as _____, or glacial episodes.

SECTION 18-4 REVIEW AND REINFORCE

Global Changes in the Atmosphere

◆ Understanding Main Ideas

Fill in the spaces in the table below.

Global Changes in the Atmosphere

Atmospheric Change	Cause	Possible Negative Effects
1. _____	Increase in greenhouse gases	Fertile farmland dries up 2. _____ 3. _____
Ozone depletion	4. _____	Eye damage Higher risk of sunburn 5. _____

◆ Building Vocabulary

Fill in the space to complete each statement.

6. A gradual increase in the temperature of Earth's atmosphere is called _____.

7. A group of chlorine compounds called _____ is the main cause of ozone depletion.

8. Gases in the atmosphere that trap heat are called _____.

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Name: _____

Class: _____

Choose the letter of the correct answer.

1. For every kilometer that you go up, the temperature
[A] decreases about 16.5 Celsius degrees. [B] decreases about 6.5 Celsius degrees.
[C] decreases about 1.6 Celsius degrees. [D] decreases about 10.6 Celsius degrees.

2. Permafrost and mosses, lichens, and wildflowers are common in the
[A] tundra climate. [B] temperate climate. [C] subtropical climate. [D] ice cap climate.

3. The seasons are caused by
[A] Earth's varying distance from the sun. [B] the tilt of Earth's axis.
[C] Earth's changing rate of rotation. [D] shifting climates on Earth's surface.

4. The prevailing winds that affect the Sahara Desert are
[A] northeast trade winds. [B] from the west.
[C] doldrum winds. [D] prevailing westerlies.

5. Humid continental and subarctic climates are examples of
[A] polar climates. [B] temperate marine climates.
[C] tropical rainy climates. [D] temperate continental climates.

6. Clues to what ancient climates were like come from
[A] satellite pictures using infrared light.
[B] very old weather records.
[C] glacial deposits.
[D] fossil trees, fossil tree rings, and ancient plant pollen.

7. As many as four ice ages have occurred on Earth during the past
[A] 200,000 years. [B] 4 million years. [C] 2 million years. [D] 10,000 years.

8. One theory to explain short-term changes in Earth's climate is based on
[A] long periods of extensive cloud cover. [B] changes in the sun's energy output.
[C] changes in Earth's rotational speed. [D] changing periods of earthquake activity.

Choose the letter of the correct answer.

9. Regions that receive less than 25 centimeters of rain annually are called
[A] arid climates. [B] semiarid climates. [C] subtropical climates. [D] subarid climates.

Fill in the word or phrase that best completes the statement(s).

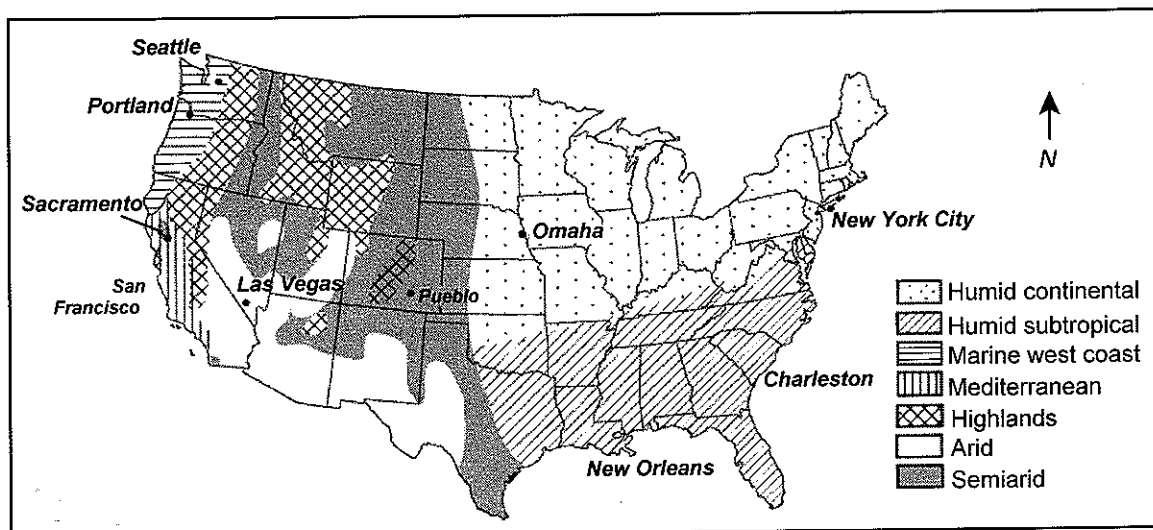
10. _____ are forests in which plenty of rain falls all year.
11. The gradual increase in the temperature of the atmosphere is known as _____.
12. Streams of water called ocean _____ move warm or cold water, warming or cooling the nearby land.
13. People add the greenhouse gas _____ to the atmosphere by burning wood and coal.
14. Plant _____ found in lake bottoms provides scientists with evidence about ancient climates.
15. _____ temperature zones occur between tropical and polar zones.
16. Because of its high _____, Mount Kilimanjaro has a cool climate all year.
17. The _____ Hemisphere receives fewer direct rays from the sun in January than in July.
18. The land on the _____ side of a mountain range is in a rain shadow.
19. Because Earth's axis is _____, the hemispheres receive different amounts of solar energy at different times.

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

20. When the glaciers that covered large parts of Earth melted after the last ice age, the sea level became higher.
21. Oceans make the temperatures of nearby land more extreme.
22. Scientists assume that an organism's ancestors required a climate similar to the climate required by the present-day organism.

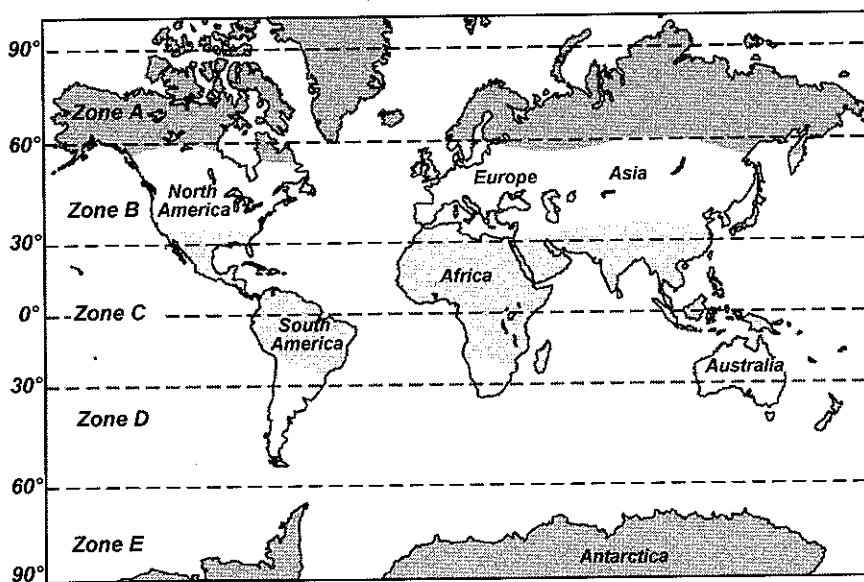
Use the map to answer the question(s).

Climates of the Continental United States



24. Which climate regions would you cross if you traveled from west to east across the widest part of Texas?
 25. Compare the climates of Las Vegas and New Orleans.
 23. What is the climate of New York City?
- Use the map to answer the question(s).

Temperature Zones



26. Which zones are polar zones?
27. Which zones are temperate zones?
28. Give the names of the zones in which South America lies.

Write an answer to the following question(s).

29. Briefly describe two hypotheses for the cause of global warming.
30. Explain how the ozone layer has changed and why this is dangerous to humans.

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