

# CHAPTER

# STUDY GUIDE

## CLIMATE

### SECTION 14.1 Defining Climate

**In your textbook, read about climate and different types of climate data.**

*Put a check (✓) next to the types of data that describe climate.*

- |                                |  |
|--------------------------------|--|
| _____ 1. annual wind speed     | _____ 4. average air temperature         |
| _____ 2. average ocean depth   | _____ 5. average thickness of atmosphere |
| _____ 3. average precipitation | _____ 6. one day's temperature           |

**In your textbook, read about what causes climate variation.**

*Answer the following questions.*

7. How does latitude affect climate?

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8. Explain how the presence of a large body of water can affect climate.

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9. How do mountains affect climate?

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10. Describe the effect that air masses can have on climate and give an example.

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### SECTION 14.2 Climate Classification

**In your textbook, read about the Köppen classification system.**

*Write the name of the types of climate in the Köppen classification system described by each group of terms below. Choose from the following: dry climate, polar climate, mild climate, continental climate, tropical climate.*

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|-------|---|
| _____ | 1. Continental tropical air dominates, precipitation is low, vegetation is scarce, solar radiation is intense, and clouds are few |
| _____ | 2. Located between the polar zones and the tropics, violent weather changes occur, and summer and winter temperatures are extreme |
| _____ | 3. Prevails in the southeastern United States, summers are warm and muggy, and winters are dry and cool                           |
| _____ | 4. Mean temperature of warmest month is less than 10°C and precipitation is generally low   |
| _____ | 5. Characterized by constant high temperatures, up to 600 cm of rain falls each year, and lush rain forests predominate           |

**In your textbook, read about microclimates.**

*Use each of the terms below just once to complete the passage.*

**heat island**

**microclimate**

**precipitation**

**temperatures**

A localized climate that differs from the main regional climate is called a (6) \_\_\_\_\_.

A (7) \_\_\_\_\_ is a place in a city where the climate is warmer than in the surrounding countryside. This added heat can cause strong convection currents, increased cloudiness, and more total (8) \_\_\_\_\_. Buildings can also change the surrounding climate by casting shadows that lower (9) \_\_\_\_\_.

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## SECTION 14.3 Climatic Changes

In your textbook, read about different types of climatic changes.

For each statement below, write true or false.

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|-------|---|
| _____ | 1. During ice ages, Earth's climate was colder and much of its surface was covered by vast sheets of ice.                               |
| _____ | 2. Earth is currently experiencing a warm period between ice ages, called an interglacial period.                                       |
| _____ | 3. Seasons are short-term periods of climatic change caused by regular variations in daylight, temperature, and the curvature of Earth. |
| _____ | 4. During El Niño, cold ocean currents along the western coast of South America are replaced by warm waters from the western Pacific.   |
| _____ | 5. El Niño can bring stormy weather to areas that are normally dry and drought conditions to areas that are normally wet.               |
| _____ | 6. Some scientists think that changes in the angle of Earth's tilt caused ice ages.   |
| _____ | 7. Europe's "Little Ice Age" of 1645 to 1716 is believed to have been the result of an elongation of Earth's orbit.                     |

Answer the following questions.

8. How does the tilt of Earth affect climate?

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9. How will seasons on Earth change when Earth's axis points away from Polaris and toward Vega in 13,000 years?

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## SECTION 14.3 Climatic Changes, continued

In your textbook, read about why climatic changes occur.

Circle the letter of the choice that best completes the statement.

7. English astronomer E. W. Maunder discovered that changes in Earth's climate have coincided with cycles of low activity for
- a. tidal changes.
  - b. El Niño activity.
  - c. occurrence of tornadoes.
  - d. sunspot activity.
11. Each cycle of low activity referred to in question 10 is called the Maunder minimum and closely corresponds to an unusually
- a. cold period.
  - b. dry period.
  - c. warm period.
  - d. wet period.
12. Climatic changes may be triggered by changes in Earth's axis and
- a. orbit.
  - b. continents.
  - c. circumference.
  - d. density.
13. The shape of Earth's orbit changes over a 100,000-year cycle, becoming more circular, and then more
- a. parabolic.
  - b. elliptical.
  - c. straight-lined.
  - d. spiral-shaped.
14. When its orbit elongates, Earth passes closer to the Sun and climates become
- a. colder.
  - b. warmer.
  - c. wetter.
  - d. drier.
15. When its orbit is more circular, Earth is farther from the Sun and its climates become
- a. drier.
  - b. warmer.
  - c. colder.
  - d. wetter.
16. Some scientists hypothesize that changes in the angle of Earth's tilted axis cause
- a. volcanic eruptions.
  - b. ice ages.
  - c. high winds.
  - d. droughts.
17. Warmer summers and colder winters in the northern hemisphere could occur in several thousand years because
- a. Earth's orbit reverses direction.
  - b. sunspot activity increases.
  - c. Earth's axis points to the Moon.
  - d. Earth wobbles on its axis.
18. A lowering of global temperatures caused by dust blocking solar radiation can be triggered by
- a. blizzards.
  - b. El Niño.
  - c. hurricanes.
  - d. volcanic eruptions.

**SECTION 14.4 Impact of Human Activities**

**In your textbook, read about the greenhouse effect and global warming.**

*For each item in Column A, write the letter of the matching item in Column B.*

**Column A**

- \_\_\_\_\_ 1. One possible effect of global warming
- \_\_\_\_\_ 2. The main source of Earth's energy
- \_\_\_\_\_ 3. Natural heating of Earth's surface caused by certain atmospheric gases
- \_\_\_\_\_ 4. A rise in global temperatures
- \_\_\_\_\_ 5. A major greenhouse gas

**Column B**

- a. greenhouse effect
- b. carbon dioxide
- c. global warming
- d. flooded coastal cities
- e. the Sun

*Circle the letter of the choice that best completes the statement.*

- 6. Most scientists agree that global warming is occurring, though some disagree about
  - a. how much has occurred.
  - b. whether there are greenhouse gases.
  - c. what global warming really is.
  - d. what is causing it.
- 7. Scientists hypothesize that an increase in atmospheric carbon dioxide leads to an increase in Earth's absorption of
  - a. solar radiation.
  - b. water vapor.
  - c. gamma rays.
  - d. volcanic ash.
- 8. If the global-warming trend continues, the effects on the planet could include
  - a. a rise in sea level.
  - b. a colder climate like that of Mars.
  - c. the loss of Earth's atmosphere.
  - d. increase in the size of polar ice caps.

**SECTION 14.4 Impact of Human Activities, continued**

**CHAPTER 14 STUDY GUIDE**  
In your textbook, read about human impacts on climate.

*In the space at the left, write true if the statement is true; if the statement is false, change the italicized word or phrase to make it true.*

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|-------|--|
| _____ | 9. The burning of <i>fossils</i> releases the greenhouse gas carbon dioxide into the atmosphere.                                 |
| _____ | 10. <i>Automobile exhaust</i> and industrial emissions are major sources of carbon dioxide.                                      |
| _____ | 11. The mass removal of trees, or <i>desertification</i> , plays a role in increasing levels of atmospheric carbon dioxide.      |
| _____ | 12. Trees decrease atmospheric levels of carbon dioxide by using the gas during <i>photosynthesis</i> .                          |
| _____ | 13. Because global warming is linked to human activities, <i>maintaining</i> those activities could work to reduce their impact. |
| _____ | 14. During the past 200 years, there has been a gradual increase in world air <i>pressure</i> levels.                            |

*Use complete sentences to answer the following question.*

Describe three ways that individuals can combat global warming.

15. \_\_\_\_\_  
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16. \_\_\_\_\_  
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17. \_\_\_\_\_  
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