Climate Short Study Guide
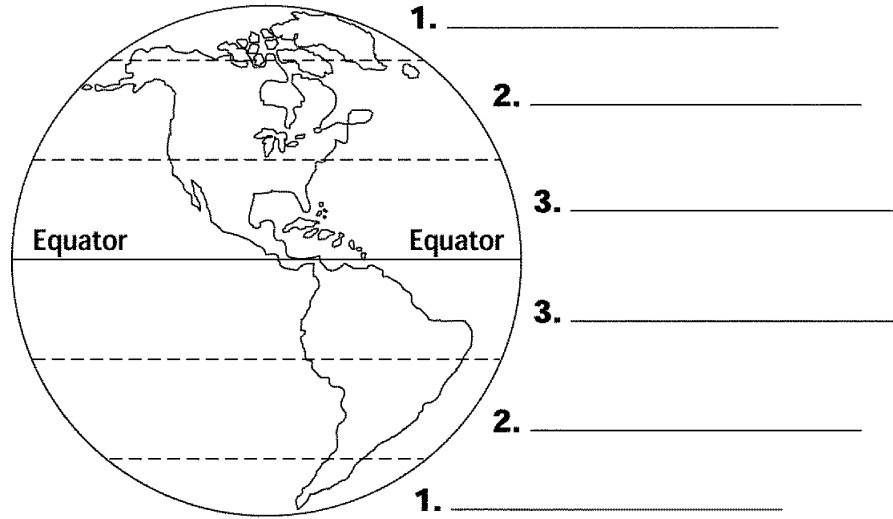
Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. In addition to average weather conditions, climatological data also describes annual variations and fluctuations of temperature, precipitation, ____, and other variables.
    a. cloud height   c. ocean temperature
    b. wind speed   d. soil moisture

____ 2. The following are true about climatological normals EXCEPT:
    a. They represent the standard values for a location.
    b. They are averaged on a monthly or annual basis.
    c. They describe normal weather conditions.
    d. The information applies only to the place where the data were collected.

____ 3. A widely used climate classification system is the ____ system.
    a. Maunden   c. Koeppen
    b. Topographic   d. Korten

____ 4. Studies indicate that periods of low sunspot activity, like the ____, correspond to unusually cold climate conditions.
    a. Maunder minimum   c. Maunder divide
    b. Maunder ice age   d. Maunder maximum

____ 5. The burning of fossil fuels releases large amounts of ____ into the atmosphere, which contributes to global warming.
    a. carbon monoxide   c. carbon dioxide
    b. calcium carbonate   d. sulfur dioxide

____ 6. Types of climate data include annual variations in temperature, precipitation, and ____.
    a. air pollution   c. wind
    b. water cycle   d. topography

____ 7. Two climates that are at the same latitude may be different because of ____.
    a. bodies of water   c. Earth's magnetic field
    b. distance from the poles   d. soil type

____ 8. When moist winds approach a mountain, they often drop rain as they rise over the mountain, and come down the other side of the mountain much ____.
    a. cooler and drier   c. warmer and drier
    b. cooler and wetter   d. warmer and wetter

____ 9. The climatic zone that receives the least solar radiation and has the coldest climate is the ____.
    a. polar zone   c. equatorial zone
    b. tropical zone   d. temperate zone

Matching

Using the diagram below, match each climate zone with its correct location on Earth.

a. temperate
b. tropical
c. polar

_____ 10. Zone 1
_____ 11. Zone 2
_____ 12. Zone 3

Match each item with the correct statement below.

a. dry   d. temperate
b. polar   e. tropical
c. subtropical

_____ 13. Constant high temperatures
_____ 14. Divided into two subtypes: humid and dry summer
_____ 15. Precipitation is low and vegetation is scarce
_____ 16. Summer and winter temperatures can be extreme
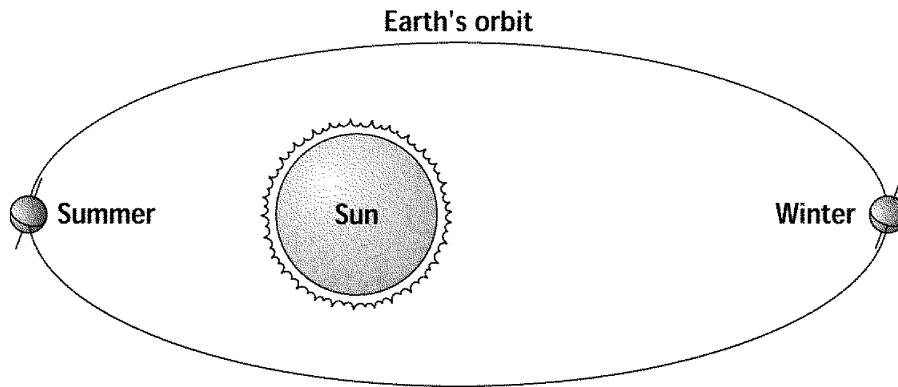_____ 17. Constant cold temperatures and generally low precipitation

Match each item with the correct statement below.

a. season   c. climatology
b. ice age   d. El Niño

_____ 18. Period when much of Earth's surface was covered by vast sheets of ice
_____ 19. A warm ocean current that develops off the west coast of South America

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Short Answer

20. Why is it useful to collect annual variations in climatological data in addition to average weather conditions?

21. Describe how the El Niño current causes changes in weather patterns along the northwestern coast of South America.

22. Explain the effect that Earth's wobble will have on future winters and summers in the northern hemisphere.

23. In the diagram below, Earth's elliptical orbit around the sun is shown. Does the position of Earth during winter represent what occurs currently with the axis tilted toward Polaris? Or does it represent what is theorized to occur by the year 14 000 when the axis will tilt toward Vega? Explain.

Earth's orbit

Summer   Sun   Winter

24. Why would planting trees help reduce global warming?

Compare and contrast each pair of related terms or phrases.

25. climate, normal

26. List two major reasons for climate variation.

27. Why can't you use normals to predict the daily weather?

28. How would seasonal climatic changes be different if Earth were not tilted on its axis?

29. How might taking a bus instead of driving a car help ease global warming?

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Answer Section

MULTIPLE CHOICE

  1. B
  2. C
  3. C
  4. A
  5. C
  6. C
  7. A
  8. C
  9. A

MATCHING

  10. C
  11. A
  12. B

  13. E
  14. C
  15. A
  16. D
  17. B

  18. B
  19. D

SHORT ANSWER

  20. Annual variations give a more accurate view of the temperature fluctuations in an area. This information can be useful in designing buildings or in locating new facilities. It can also help people who have medical conditions that require them to live in certain climates.
  21. The warm water brought by El Niño heats the air near the surface of the ocean. Convection currents become stronger and as a result, the normally cool and dry northwestern coast of South America becomes much warmer and wetter.
  22. By the year 14 000, Earth's axis will point toward the star Vega instead of Polaris. Currently, the northern hemisphere experiences winter when Earth is tilted away from and is closest to the sun. Summer occurs when Earth is tilted toward and is farthest from the sun. With the axis tilted toward Vega, winter in the northern hemisphere will occur when Earth is tilted away from and is farthest from the sun. Summer will occur when Earth is tilted toward and is closest to the sun. Consequently, summers will be warmer and winters will be colder.

23. The diagram shows Earth's orbit in the year 14 000. Then, the change in tilt will cause winter and summer to be reversed. Winter will occur in the northern hemisphere in July when Earth is farthest from the sun. Summer will occur in the northern hemisphere in January when Earth is closest to the sun.

24. During photosynthesis, trees remove carbon dioxide from the atmosphere. By planting more trees, or by replacing those removed during deforestation, atmospheric carbon dioxide would be decreased. Since global warming is largely a result of increased atmospheric carbon dioxide, planting trees would help reduce global warming.

25. Both terms involve long-term weather patterns. Climate is the long-term weather pattern of an area, while a normal is a standard value (such as daily high and low temperature and amount of rainfall) that describes an area's climate.

26. Students can list any two of the following: location on Earth's surface in either the tropical, temperate, or polar zone; location near or far from a large body of water; altitude.

27. Normals are standard values for weather in an area. They include average readings for characteristics such as temperature and rainfall. On any given day, the temperature or amount of precipitation can vary greatly from that average.

28. There would be scarcely any seasonal climatic changes if Earth were not tilted because each part of Earth's surface would receive the same amount of solar radiation all year round.

29. Vehicles run on gasoline, a fossil fuel that produces carbon dioxide emissions when burned. The buildup of carbon dioxide in the atmosphere is one cause of global warming. If many people left their cars at home and took buses instead, the number of vehicles on the road would be reduced and thus the amount of carbon dioxide emissions would decrease.

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