Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading

Section: Factors That Affect Climate

1. The average weather conditions for an area over a long period of time are referred to as _____.
2. The condition of the atmosphere at a particular time, such as temperature, humidity, wind, and precipitation is called _____.

TEMPERATURE AND PRECIPITATION

_____ **3.** Climates are chiefly determined by using
- **a.** average wind velocity.
- **b.** average temperature.
- **c.** average temperature and precipitation.
- **d.** average wind velocity and precipitation.

_____ **4.** Adding the high and low temperatures of the day and dividing by two determines the average
- **a.** monthly temperature range.
- **b.** weekly temperature range.
- **c.** yearly temperature range.
- **d.** daily temperature range.

_____ **5.** Precipitation is described by using
- **a.** monthly averages.
- **b.** monthly and yearly averages.
- **c.** yearly averages and ranges.
- **d.** monthly and yearly averages and ranges.

_____ **6.** In describing climate, what is important to consider in addition to averages in precipitation and temperature?
- **a.** extremes in temperature and precipitation
- **b.** local weather conditions
- **c.** seasonal averages
- **d.** yearly fluctuations in temperature and precipitation

_____ **7.** The factors that have the greatest influence on both temperature and precipitation are heat absorption and release,
- **a.** location, and latitude.
- **b.** season, and location.
- **c.** latitude, and topography.
- **d.** season, and topography.

LATITUDE

8. One of the most important factors that determines a region's climate is _____.

9. Temperature and wind patterns are determined by _____.

10. The higher the _____ of an area is, the smaller the amount of solar energy received by the area is.

11. The sun's rays hit Earth at a 90° angle at the _____, so temperatures are high.

12. The sun's rays hit Earth at a smaller angle at the _____, so temperatures are low.

13. In the Northern Hemisphere, the northern half of Earth is tilted away from the _____ during winter.

14. In the Northern Hemisphere, how does the tilt of Earth's axis and the way the sun's rays hit an area while Earth orbits the sun affect climate?

_____

_____

15. Because Earth receives different amounts of solar energy at different latitudes, belts of cool, dense air form near the _____, while belts of warm, less dense air form at the equator.

16. Because cool air is dense, it forms regions of _____ pressure.

17. Warm air forms regions of _____ pressure.

18. Differences is air pressure create _____.

19. In the equatorial belt of low pressure called the _____, air rises and cools, and water vapor condenses, creating precipitation.

20. In regions between 20° and 30° latitude, known as the _____, air sinks, warms, and dries, so little precipitation occurs.

21. In the middle latitudes, between 45° to 60°, warm tropical air meets cold polar air, which leads to belts of _____ precipitation.

22. In high-pressure areas, above 60° latitude, air masses are dry and cold, and average precipitation is _____.

HEAT ABSORPTION AND RELEASE

23. What two factors affect the amount of solar energy that an area receives?

24. Why does land heat faster than water?

25. What does the temperature of the land or water influence?

26. What does the temperature of the air affect?

27. Define the term *specific heat.*

28. In addition to specific heat, what causes the average temperatures of land and water at the same latitude to vary?

Name _____ Class _____ Date _____

Directed Reading *continued*

29. What influences the amount of heat absorbed or released by the air?

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **30.** El Niño-Southern Oscillation (ENSO)

_____ **31.** El Niño

_____ **32.** La Niña

_____ **33.** monsoon

a. a seasonal wind that blows toward the land in the summer, bringing heavy rains, and that blows away from the land in the winter, bringing dry weather

b. a cool-water phase of ENSO that affects weather patterns

c. the warm-water phase of ENSO; a periodic occurrence in the eastern Pacific Ocean in which the surface-water temperature becomes unusually warm

d. a cycle of changing wind and water-current patterns in the Pacific Ocean

34. What may occur in the Pacific Ocean region and southeastern United States during El Niño?

35. What may occur in Indonesia and Australia during El Niño?

36. What causes monsoon climates such as that in southern Asia?

37. In what other areas do monsoon conditions occur?

TOPOGRAPHY

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **38.** topography

_____ **39.** rain shadow

_____ **40.** foehn

_____ **41.** chinook

a. a process that affects climate on both sides of a mountain

b. the surface features of the land

c. the warm, dry wind that forms as part of a rain shadow on the eastern slopes of the Rocky Mountains

d. a dry wind that flows down the slopes of the Alps

42. How does elevation affect temperature?

Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading

Section: Climate Zones

1. Name Earth's three major types of climate zones.

_____

_____

_____

2. Why does each of these zones have several types of climates?

_____

_____

TROPICAL CLIMATES

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **3.** tropical climate

_____ **4.** tropical rain-forest climate

_____ **5.** tropical desert climate

_____ **6.** savanna climate

a. characterized by warm and dry temperatures; annual rainfall of less than 25 cm

b. characterized by wet summers and dry winters; annual rainfall of 50 cm

c. characterized by high temperatures and heavy precipitation during at least part of the year; typical of equatorial regions

d. characterized by warm and humid temperatures; annual rainfall of 200 cm

7. What regions are characterized by tropical rain-forest climates?

_____

_____

8. What regions are characterized by savanna climates?

_____

_____

9. What regions are characterized by tropical desert climates?

_____

_____

MIDDLE-LATITUDE CLIMATES

_____ **10.** What climate does the Pacific Northwest of the United States have?
- **a.** marine west coast
- **b.** humid continental
- **c.** steppe
- **d.** Mediterranean

_____ **11.** What climate is found in the Great Plains of the United States?
- **a.** humid continental
- **b.** humid subtropical
- **c.** steppe
- **d.** mediterranean

_____ **12.** What climate is found in the southeastern United States?
- **a.** humid subtropical
- **b.** steppe
- **c.** humid continental
- **d.** mediterranean

_____ **13.** What climate is found in the northeastern United States?
- **a.** humid subtropical
- **b.** humid continental
- **c.** steppe
- **d.** marine west coast

_____ **14.** What climate is located along the coast of central and southern California?
- **a.** humid continental
- **b.** steppe
- **c.** mediterranean
- **d.** humid subtropical

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **15.** middle-latitude climate

_____ **16.** marine west coast climate

_____ **17.** steppe climate

_____ **18.** humid continental climate

_____ **19.** humid subtropical climate

_____ **20.** mediterranean climate

a. a dry climate with a large annual temperature range; annual precipitation of less than 40 cm

b. a mild climate with a low annual temperature range between summer and winter; annual precipitation of about 40 cm

c. a climate with a low annual temperature range; annual precipitation of 60 to 150 cm

d. a climate with a large annual temperature range; annual precipitation of 75 to 165 cm

e. a climate with a maximum average temperature of 8°C in the coldest month and a minimum average temperature of 10°C in the warmest month

f. a climate with a large annual temperature range; annual precipitation of greater than 75 cm

POLAR CLIMATES

In the space provided, write the letter of the description that best matches the term or phrase.

_____ **21.** polar climate

_____ **22.** subarctic climate

_____ **23.** tundra climate

_____ **24.** polar icecap climate

a. has average temperatures below 4°C; annual precipitation of 25 cm

b. has average temperatures that are near or below freezing; typical of polar regions

c. has average temperatures below 0°C; low annual precipitation

d. has the largest annual temperature range (63°C); annual precipitation of 25 to 50 cm

25. Treeless plains and nine months of temperatures below freezing characterize the _____ climate.

26. Little or no life, temperatures below freezing year-round, and high winds characterize the _____ climate.

27. Evergreen trees and brief, cool summers with long, cold winters characterize the _____ climate.

LOCAL CLIMATES

28. Define *microclimate.*

29. What influences microclimates?

30. Why might the average temperature of a city be a few degrees higher than that of the surrounding rural area?

31. How does elevation affect local climate?

32. Describe the *highland climate.*

Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading

Section: Climate Change

1. What two questions do scientists work to answer?

_____

_____

_____

2. Define *climatologist.*

_____

_____

_____

STUDYING CLIMATE CHANGE

3. What practice helps climatologists make predictions about future climates?

_____

_____

Use the terms from the list below to complete the sentences that follow. Each term may be used only once.

sea-floor sediment	ice cores	general circulation models (GCMs)
fossils	tree rings	

4. When scientists find high ^{18}O levels in _____, they know that the water was cool in the past.

5. Thin _____ indicate cool weather and low precipitation in the past.

6. High levels of CO_2 found in _____ indicate warmer climate in the past, whereas ice ages follow decreases in CO_2.

7. By studying _____, scientists can learn how animals adapted to changing climates.

8. Computer-generated climate models that simulate changes in one variable when other variables remain unchanged are called _____.

9. What four climate conditions can computer models be used to predict?

_____

_____

_____

_____

10. Complex computer models can model interactions between what five elements?

_____

_____

_____

_____

POTENTIAL CAUSES OF CLIMATE CHANGE

11. What four factors might cause climate changes?

_____

_____

_____

_____

12. The movement of continents over millions of years caused by _____ may affect climate changes.

13. According to the Milankovitch theory, what three factors can lead to climate changes?

_____

_____

_____

14. The shape of Earth's orbit changes from _____ to circular, affecting Earth's distance from the sun and therefore Earth's temperature and climate.

15. Decreasing _____ decreases temperature differences between seasons.

16. The wobble of Earth on its axis changes the direction of Earth's tilt and can reverse the _____.

17. What human activities are responsible for releasing carbon dioxide, CO_2, into the atmosphere?

_____

_____

18. What can increases in CO_2 levels lead to?

_____

_____

19. Sulfur and ash from _____ can decrease temperatures by reflecting sunlight back into space.

POTENTIAL IMPACTS OF CLIMATE CHANGE

20. Climate change can affect what three life-forms?

_____

_____

_____

21. What are three potential climate changes that could make survival of life on Earth more difficult for both humans and other species?

_____

_____

_____

22. Define *global warming.*

_____

_____

_____

_____

_____