

## Chapter 15: Weather and Climate

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. The short-term state of the atmosphere is called
- a. climate.
  - b. weather.
  - c. water cycle.
  - d. dew point.
- \_\_\_\_\_ 2. What happens when the rate of evaporation equals the rate of condensation?
- a. Precipitation occurs.
  - b. The dew point is reached.
  - c. The humidity decreases.
  - d. Clouds form.
- \_\_\_\_\_ 3. The most common form of precipitation is
- a. sleet.
  - b. hail.
  - c. rain.
  - d. snow.
- \_\_\_\_\_ 4. The sun's energy causes water to change states through
- a. relative humidity.
  - b. ice crystals.
  - c. weather.
  - d. the water cycle.
- \_\_\_\_\_ 5. Changes in weather are caused by the interaction of
- a. cyclones.
  - b. anticyclones.
  - c. fronts.
  - d. air masses.
- \_\_\_\_\_ 6. How does a warm front form?
- a. Warm air becomes caught between cold air masses.
  - b. Two air masses meet and stay separated.
  - c. Warm air moves over cold air and replaces it.
  - d. Cold air moves under warm air and pushes it up.
- \_\_\_\_\_ 7. What is an area in which two or more air masses meet?
- a. front
  - b. air mass
  - c. tornado
  - d. storm surge
- \_\_\_\_\_ 8. Which of the following statements describes an anticyclone?
- a. It is an area of low pressure.
  - b. It is an area of high pressure.
  - c. It has air masses that meet and rise.
  - d. It moves in the direction of Earth's rotation.
- \_\_\_\_\_ 9. A rise in sea level during a storm that causes property damage and endangers lives is a(n)
- a. air mass.
  - b. tornado.
  - c. storm surge.
  - d. hurricane.
- \_\_\_\_\_ 10. Which of the following is the cause of the change of seasons?
- a. the process called rain-shadow effect
  - b. the sizes and shapes of land-surface features
  - c. the tilt of Earth's axis
  - d. the rotation of Earth
- \_\_\_\_\_ 11. Which of the following statements explains the rain-shadow effect?
- a. Mountains force air to rise; air cools and releases moisture as it rises.

- b. The atmosphere gets denser as elevation increases, causing snow to fall.
  - c. Temperatures are higher on one side of a mountain than on the other.
  - d. Wind patterns cause precipitation.
- \_\_\_\_\_ 12. What helps keep temperatures along the West Coast cooler than inland temperatures all year long?
- a. solar energy
  - b. rain-shadow effect
  - c. topography
  - d. surface currents
- \_\_\_\_\_ 13. Which of the following statements is NOT true about winds?
- a. Winds carry evaporated water away from the ocean surface.
  - b. Winds carry solar energy to and from different locations.
  - c. Winds move in unpredictable patterns across Earth's surface.
  - d. Winds blow from areas of high pressure to areas of low pressure.
- \_\_\_\_\_ 14. Earth's three major climate zones are
- a. polar, tropical, and rain forest.
  - b. tropical, temperate, and polar.
  - c. tundra, temperate, and tropical.
  - d. polar, savanna, and rain forest.
- \_\_\_\_\_ 15. The Milankovitch theory states that
- a. ice ages are caused by volcanic eruptions.
  - b. continental drift causes ice ages.
  - c. changes in the Earth's orbit cause ice ages.
  - d. Earth's orbit never changes.
- \_\_\_\_\_ 16. How would an asteroid most likely change Earth's climate?
- a. Debris from an asteroid hitting Earth could block sunlight.
  - b. The asteroid would block the sun during its orbit, chilling Earth.
  - c. The asteroid would change Earth's orbit, causing an ice age.
  - d. If the asteroid fell in the ocean, it would make the sea level rise.
- \_\_\_\_\_ 17. Which of the following is NOT a cause of an increase in carbon dioxide in the atmosphere?
- a. burning fuels for transportation
  - b. clearing forests for farming
  - c. burning fuels for industry
  - d. planting trees
- \_\_\_\_\_ 18. During glacial periods,
- a. large sheets of ice get smaller.
  - b. large sheets of ice advance.
  - c. large sheets of ice retreat.
  - d. large sheets of ice melt.
- \_\_\_\_\_ 19. What is the water cycle?
- a. air masses meeting
  - b. air pressure sinking and then rising
  - c. water droplets forming on surfaces
  - d. water moving between the atmosphere, the land, and the oceans
- \_\_\_\_\_ 20. What causes changes in weather?
- a. Air masses interact.
  - b. The air gets more humid.
  - c. Water evaporates.
  - d. Clouds form.
- \_\_\_\_\_ 21. What kind of air pressure is in a cyclone?
- a. very dense
  - b. higher than surrounding areas
  - c. sinking and then rising
  - d. lower than surrounding areas
- \_\_\_\_\_ 22. What causes lightning?
- a. thunder
  - c. rising warm air

- b. an electric discharge    d. air masses meeting
- \_\_\_ 23. Which of the following describes relative humidity?  
a. a measure of how close air is to the dew point  
b. the condition of the atmosphere at a certain time  
c. the movement of air masses  
d. a gradual increase in Earth's temperatures
- \_\_\_ 24. Which of the following helps to keep California's temperatures moderate?  
a. the rain-shadow effect    c. the Great Lakes  
b. the sun    d. the ocean
- \_\_\_ 25. Where does a cold front form?  
a. where cold air moves under warm air  
b. where warm air moves over cold air  
c. where two air masses remain separated  
d. where warm air masses move quickly
- \_\_\_ 26. When temperatures fall below 0°C, what forms in a cloud?  
a. ice crystals    c. water droplets  
b. gases    d. dew
- \_\_\_ 27. What is a cloud made of?  
a. gases    c. snow  
b. water droplets    d. warm air
- \_\_\_ 28. Which of the following is a rapidly spinning column of air that touches the ground?  
a. air mass    c. tornado  
b. thunder    d. hurricane
- \_\_\_ 29. Which of the following weather conditions causes the most deaths?  
a. thunderstorm    c. cyclone  
b. flash flood    d. hail
- \_\_\_ 30. What kind of weather does a stationary front bring?  
a. drizzly rain followed by clear weather                          c. many days of cloudy, wet weather  
b. severe storms    d. cold, dry weather
- \_\_\_ 31. Finding a high place to wait is a safety measure during a(n)  
a. thunderstorm.    c. cyclone.  
b. tornado.    d. flash flood.
- \_\_\_ 32. When it touches the ground, a funnel cloud becomes a(n)  
a. hurricane.    c. anticyclone.  
b. thunderstorm.    d. tornado.
- \_\_\_ 33. Lightning is an electric discharge between a positively charged area and  
a. a rising air mass.    c. another positively charged area.  
b. a stationary front.    d. a negatively charged area.
- \_\_\_ 34. Why does the equator experience high temperatures year round?  
a. It has a high latitude.    c. The sun's rays hit it at a lesser angle.  
b. It has no large bodies of water.                                  d. The sun's rays hit it directly.
- \_\_\_ 35. Global warming may be caused by

- a. changes in weather patterns.
  - b. an increase in carbon dioxide concentrations.
  - c. a decrease in carbon dioxide concentrations.
  - d. the tilt of Earth's axis.
- \_\_\_ 36. Changes in weather are the interaction of
- a. clouds.
  - b. tornadoes.
  - c. storm surges.
  - d. air masses.
- \_\_\_ 37. What do scientists use to express the amount of water vapor in the air?
- a. relative humidity
  - b. vapor pressure
  - c. elevation
  - d. dew point
- \_\_\_ 38. When droplets in a cloud reach a certain size, they
- a. form a cold front.
  - b. fall as precipitation.
  - c. cause an electric discharge.
  - d. change the climate of an area.
- \_\_\_ 39. Which of the following is NOT true of an ice age?
- a. Ice forms in high latitudes and moves toward lower latitudes.
  - b. There are periods of cold and periods of warmth.
  - c. There have been few major ice ages.
  - d. Ice sheets advance and get bigger.
- \_\_\_ 40. Earth's natural heating process is called
- a. the greenhouse effect.
  - b. global warming.
  - c. an ice age.
  - d. the Milankovitch theory.
- \_\_\_ 41. Which of the following decreases as elevation increases?
- a. latitude
  - b. clouds
  - c. precipitation
  - d. temperature
- \_\_\_ 42. As surface currents move,
- a. they release heat quickly.
  - b. they influence the amount of solar energy an area receives.
  - c. they carry warm or cool water to different locations.
  - d. they bring warm temperatures to the West Coast.
- \_\_\_ 43. The distance north or south from the equator is called
- a. the rain-shadow effect.
  - b. elevation.
  - c. topography.
  - d. latitude.
- \_\_\_ 44. Seasons are caused by
- a. ocean currents.
  - b. the greenhouse effect.
  - c. the rain-shadow effect.
  - d. the tilt of Earth's axis.
- \_\_\_ 45. Humidity is
- a. the amount of water vapor in the air.
  - b. the temperature below dew point.
  - c. when a gas becomes a liquid.
  - d. the continuous movement of water.
- \_\_\_ 46. Streamlike movements of water that have a large affect on an area's climate are
- a. water vapor.
  - b. dew.
  - c. surface currents.
  - d. storm surges.
- \_\_\_ 47. At higher elevations,
- a. there is no rain-shadow effect.
  - b. the dew point is lower.
  - c. the dew point is higher.
  - d. there is no rain-shadow effect.

- b. the temperature of the air is lower.                      d. the temperature of the air is higher.
- \_\_\_\_\_ 48. Temperature and amount of precipitation are used to describe  
 a. latitude.    c. clouds.  
 b. surface currents.    d. climate.
- \_\_\_\_\_ 49. When air is nearly saturated and temperature drops, what is reached?  
 a. dew point    c. precipitation  
 b. condensation    d. humidity
- \_\_\_\_\_ 50. Global warming is caused in part by  
 a. increases in carbon dioxide concentrations.  
 b. volcanic eruptions.  
 c. glacial and interglacial periods.  
 d. the tilt of Earth's axis.
- \_\_\_\_\_ 51. One reason for global warming may be  
 a. decreasing global gases.    c. increasing greenhouse gases.  
 b. increasing global gases.    d. decreasing greenhouse gases.

**Completion**

*Complete each statement.*

Use the terms from the following list to complete the sentences below.

condensation                                      greenhouse effect                                      global warming

52. When a gas changes to a liquid, it is called \_\_\_\_\_.
53. Earth's natural heating process is called \_\_\_\_\_.
54. When the global temperature rises bit by bit it is called \_\_\_\_\_.

Use the terms from the following list to complete the sentences below.

ice age    front    elevation

55. The height of surface landforms above sea level is the \_\_\_\_\_.
56. Ice forms in high latitudes and moves toward lower latitudes during a(n) \_\_\_\_\_.
57. The boundary between different air masses is called a \_\_\_\_\_.

Use the terms from the following list to complete the sentences below. Each term may be used only once. Some terms may not be used.

elevation	greenhouse effect	relative humidity
air masses	precipitation	latitudes
condensation	weather	humidity

58. A measure of how close the air is to dew point is \_\_\_\_\_.
59. The day-to-day change in temperature and precipitation makes up an area's \_\_\_\_\_.
60. Gases in the atmosphere absorb and reradiate thermal energy, causing the \_\_\_\_\_.
61. People use coasters when setting cold drinks on furniture to protect the surface from \_\_\_\_\_.
62. The curve of Earth affects the amount of direct solar energy at different \_\_\_\_\_.
63. Hail is a less common form of \_\_\_\_\_.

Use the terms from the following list to complete the sentences below.

greenhouse effect	global warming
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64. A gradual increase in the average global temperature is called \_\_\_\_\_.
65. The Earth's natural heating process, in which gases in the atmosphere trap thermal energy, is called the \_\_\_\_\_.

Use the terms from the following list to complete the sentences below.

cold front	warm front
stationary front	occluded front

66. A front formed when a cold air mass and a warm air mass move toward each other is a(n) \_\_\_\_\_.
67. The front that would most likely produce clear and warm weather after a period of drizzly rain is a(n) \_\_\_\_\_.
68. Large amounts of snow would most likely be caused by a(n) \_\_\_\_\_.
69. A front caused by three different air masses is a(n) \_\_\_\_\_.

Use the terms from the following list to complete the sentences below.

hurricane	thunderstorm
tornado	

70. Lightning is one of the most dangerous parts of a(n) \_\_\_\_\_.
71. Strong spinning winds are the most dangerous part of a(n) \_\_\_\_\_.

72. Flooding caused by high waves would most likely occur during a(n) \_\_\_\_\_.

### Matching

Match each item with the correct statement below.

- |                  |                      |
|------------------|----------------------|
| a. precipitation | d. relative humidity |
| b. condensation  | e. dew               |
| c. humidity      |                      |

- \_\_\_\_ 73. the ratio of the amount of water vapor in the air to the amount of water vapor needed to reach saturation  
\_\_\_\_ 74. the change of state from a gas to a liquid  
\_\_\_\_ 75. water droplets that form on things near the ground when air cools to below the dew point  
\_\_\_\_ 76. the amount of water vapor in the air  
\_\_\_\_ 77. any form of water that falls to Earth's surface from the clouds

Match each item with the correct statement below.

- |              |            |
|--------------|------------|
| a. thunder   | c. tornado |
| b. lightning | d. cyclone |

- \_\_\_\_ 78. an electric discharge that takes place between two oppositely charged surfaces  
\_\_\_\_ 79. an area in the atmosphere that has lower pressure than the surrounding areas, with winds that spiral toward the center  
\_\_\_\_ 80. the sound caused by the rapid expansion of air along an electrical strike  
\_\_\_\_ 81. a rotating column of air that has very high wind speeds and that may be visible as a funnel-shaped cloud

Match each item with the correct statement below.

- |                    |              |
|--------------------|--------------|
| a. surface current | c. elevation |
| b. latitude        | d. climate   |

- \_\_\_\_ 82. the height of a surface landform above sea level  
\_\_\_\_ 83. a horizontal movement of ocean water that is caused by wind  
\_\_\_\_ 84. the average weather conditions over a long period of time  
\_\_\_\_ 85. the distance north or south from the equator

Match each item with the correct statement below.

- |                      |                   |
|----------------------|-------------------|
| a. ice age           | c. global warming |
| b. greenhouse effect |                   |

- \_\_\_\_ 86. when water vapor, carbon dioxide, and other gases absorb and reradiate thermal energy  
\_\_\_\_ 87. a long period of climate cooling during which the continents are glaciated repeatedly  
\_\_\_\_ 88. a gradual increase in the average global temperature

Match each item with the correct statement below.

- |            |              |
|------------|--------------|
| a. climate | c. dew point |
| b. weather | d. latitude  |

- \_\_\_\_ 89. the temperature at which air is saturated

- \_\_\_ 90. average weather in an area for a long time
- \_\_\_ 91. distance from the equator
- \_\_\_ 92. the condition of the atmosphere at a certain time and place

Match each item with the correct statement below.

- a. precipitation
- b. surface current
- c. humidity
- d. thunder

- \_\_\_ 93. the sound caused by air rapidly expanding along an electrical strike
- \_\_\_ 94. the amount of water vapor in the air
- \_\_\_ 95. streamlike movement of water on the top of the ocean's surface
- \_\_\_ 96. water that falls to Earth's surface

Match each item with the correct statement below.

- a. dew point
- b. thunder
- c. humidity
- d. front
- e. condensation
- f. cyclone

- \_\_\_ 97. the amount of water vapor in the air
- \_\_\_ 98. the sound caused by the release of energy
- \_\_\_ 99. the temperature at which the rate of evaporation equals the rate of condensation
- \_\_\_ 100. the process in which water vapor turns to liquid
- \_\_\_ 101. an area of low pressure where air masses meet and rise
- \_\_\_ 102. an area in which two kinds of air masses meet

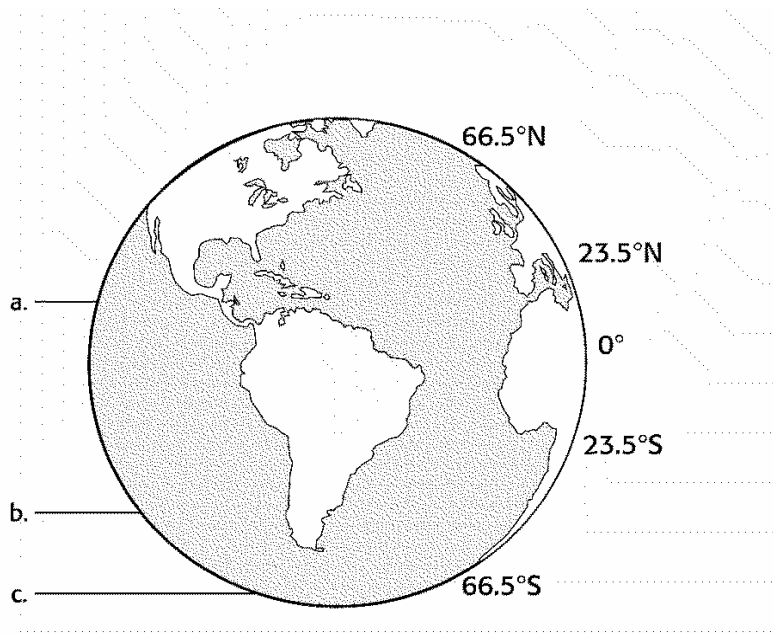
Match each item with the correct statement below.

- a. climate
- b. weather

- \_\_\_ 103. the short-term state of the atmosphere
- \_\_\_ 104. the average weather condition in an area over a long period of time

Match the labels to the map. Write the letters in the spaces provided.





- \_\_\_ 105. temperate
- \_\_\_ 106. polar
- \_\_\_ 107. tropical

Match each item with the correct statement below.

- |                    |              |
|--------------------|--------------|
| a. surface current | d. weather   |
| b. biome           | e. latitude  |
| c. climate         | f. elevation |

- \_\_\_ 108. large region with one kind of climate and certain kinds of plant and animal life
- \_\_\_ 109. water movements like streams on the top of the ocean's surface
- \_\_\_ 110. condition of the atmosphere that change from day to day
- \_\_\_ 111. distance north or south from the equator
- \_\_\_ 112. how high a mountain rises above sea level
- \_\_\_ 113. average weather in an area for a long time

**Short Answer**

- 114. Explain how lightning and thunder form.
- 115. Explain what happens during a storm surge.
- 116. How does a cloud form?
- 117. What season is it in the Northern Hemisphere when it is spring in the Southern Hemisphere?

118. Why are the poles colder than the equator?
119. Can a climate zone contain more than one biome?
120. Why does the sea level fall during glacial periods?
121. How might a major volcanic eruption have brought about an ice age?
122. How might global warming affect coastal areas?
123. According to the Milankovitch theory, would there be more or less seasonal change when Earth's axis tilted more? Explain your answer.
124. Why are temperatures mild in California?
125. What do you think is the best way to prevent global warming?
126. Your area has had a warmer winter than usual for three years in a row. Explain whether this is evidence of global warming or not.
127. Would a volcano and an asteroid have similar or different effects on Earth's climate? Explain your answer.
128. A cold front often brings intense weather changes such as thunderstorms while a warm front often brings light rain or drizzle. Why is this the case?
129. A hurricane has struck your area and you are staying indoors with your family. Suddenly the winds calm down and the sun comes out. Would it be a good idea to go outside and continue your normal activities? Explain your answer.
130. Explain how a cold front develops.
131. What kind of weather is associated with a stationary front?
132. What is the relationship between lightning and thunder?
133. Why don't hurricanes form over land?

### **Essay**

134. Most hurricanes that form in the North Atlantic Ocean occur from June to November, with most hurricanes occurring in September. What facts about hurricane formation help explain this?
135. What happens during an ice age?
136. Briefly describe three causes of climate change on Earth.

### **Other**

137. Use the following terms to complete the concept map below.

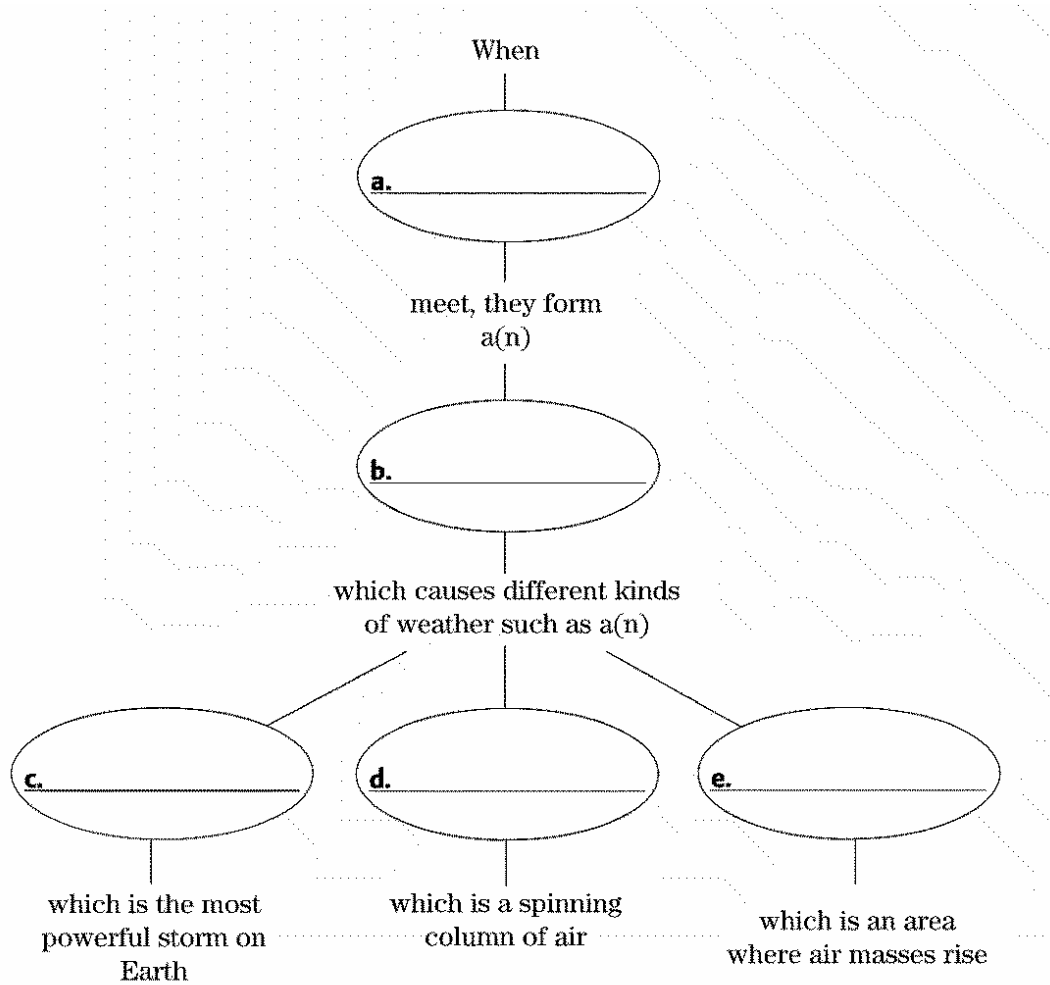
cyclone

tornado

hurricane

front

air masses



## Chapter 15: Weather and Climate Answer Section

### MULTIPLE CHOICE

1. ANS: B                   PTS: 1                   KEY: weather           MSC: SQ.1.6
2. ANS: B                   PTS: 1                   KEY: dew point        MSC: SQ.1.7
3. ANS: C                   PTS: 1                   KEY: precipitation    MSC: SQ.1.8
4. ANS: D                   PTS: 1                   KEY: water cycle     MSC: SQ.1.9
5. ANS: D                   PTS: 1                   KEY: air mass         MSC: SQ.2.5
6. ANS: C                   PTS: 1                   KEY: front            MSC: SQ.2.6
7. ANS: A                   PTS: 1                   KEY: air mass | front
- MSC: SQ.2.7
8. ANS: B                   PTS: 1                   KEY: anticyclone     MSC: SQ.2.8
9. ANS: C                   PTS: 1                   KEY: storm surge     MSC: SQ.2.9
10. ANS: C                  PTS: 1                  KEY: seasons         MSC: SQ.3.5
11. ANS: A                  PTS: 1                  KEY: rain-shadow effect
- MSC: SQ.3.6
12. ANS: D                  PTS: 1                  KEY: surface current
- MSC: SQ.3.7
13. ANS: C                  PTS: 1                  KEY: wind            MSC: SQ.3.8
14. ANS: B                  PTS: 1                  KEY: climate zone    MSC: SQ.3.9
15. ANS: C                  PTS: 1                  KEY: Milankovitch theory
- MSC: SQ.4.4
16. ANS: A                  PTS: 1                  KEY: asteroid        MSC: SQ.4.5
17. ANS: D                  PTS: 1                  KEY: global warming
- MSC: SQ.4.6
18. ANS: B                  PTS: 1                  KEY: glacial period
- MSC: SQ.4.7
19. ANS: D                  PTS: 1                  KEY: water cycle     MSC: CTA.0.1
20. ANS: A                  PTS: 1                  KEY: air mass         MSC: CTA.0.2
21. ANS: D                  PTS: 1                  KEY: cyclone         MSC: CTA.0.3
22. ANS: B                  PTS: 1                  KEY: lightning        MSC: CTA.0.4
23. ANS: A                  PTS: 1                  KEY: relative humidity
- MSC: CTA.0.5
24. ANS: D                  PTS: 1                  KEY: surface current
- MSC: CTA.0.6
25. ANS: A                  PTS: 1                  KEY: front            MSC: CTA.0.7
26. ANS: A                  PTS: 1                  KEY: cloud            MSC: CTA.0.8
27. ANS: B                  PTS: 1                  KEY: cloud            MSC: CTA.0.9
28. ANS: C                  PTS: 1                  KEY: tornado         MSC: CTA.0.10
29. ANS: B                  PTS: 1                  KEY: flash flood     MSC: CTA.0.11
30. ANS: C                  PTS: 1                  KEY: front            MSC: CTB.0.7
31. ANS: D                  PTS: 1                  KEY: flash flood     MSC: CTB.0.8
32. ANS: D                  PTS: 1                  KEY: tornado         MSC: CTB.0.9
33. ANS: D                  PTS: 1                  KEY: lightning        MSC: CTB.0.10
34. ANS: D                  PTS: 1                  KEY: latitude         MSC: CTB.0.11

35. ANS: B                      PTS: 1                      KEY: global warming  
MSC: CTB.0.14
36. ANS: D                      PTS: 1                      KEY: air mass                      MSC: CTB.0.15
37. ANS: A                      PTS: 1                      KEY: relative humidity
- MSC: CTB.0.16
38. ANS: B                      PTS: 1                      KEY: precipitation                      MSC: CTB.0.17
39. ANS: C                      PTS: 1                      KEY: ice age                      MSC: CTB.0.18
40. ANS: A                      PTS: 1                      KEY: greenhouse effect
- MSC: CTB.0.19
41. ANS: D                      PTS: 1                      KEY: elevation                      MSC: CTB.0.20
42. ANS: C                      PTS: 1                      KEY: surface current
- MSC: CTB.0.21
43. ANS: D                      PTS: 1                      KEY: latitude                      MSC: CTB.0.22
44. ANS: D                      PTS: 1                      KEY: seasons                      MSC: CTC.0.7
45. ANS: A                      PTS: 1                      KEY: humidity                      MSC: CTC.0.8
46. ANS: C                      PTS: 1                      KEY: surface current
- MSC: CTC.0.9
47. ANS: B                      PTS: 1                      KEY: elevation                      MSC: CTC.0.10
48. ANS: D                      PTS: 1                      KEY: climate                      MSC: CTC.0.11
49. ANS: A                      PTS: 1                      KEY: dew point                      MSC: CTC.0.12
50. ANS: A                      PTS: 1                      KEY: global warming
- MSC: CTC.0.13
51. ANS: C                      PTS: 1                      KEY: global warming
- MSC: NEW

## COMPLETION

52. ANS: condensation
- PTS: 1                      KEY: condensation                      MSC: CTA.0.20
53. ANS: greenhouse effect
- PTS: 1                      KEY: greenhouse effect                      MSC: CTA.0.21
54. ANS: global warming
- PTS: 1                      KEY: global warming                      MSC: CTA.0.22
55. ANS: elevation
- PTS: 1                      KEY: elevation                      MSC: CTA.0.23
56. ANS: ice age
- PTS: 1                      KEY: ice age                      MSC: CTA.0.24
57. ANS: front
- PTS: 1                      KEY: front                      MSC: CTA.0.25
58. ANS: relative humidity
- PTS: 1                      KEY: relative humidity                      MSC: CTC.0.1

59. ANS: weather  
 PTS: 1 KEY: weather MSC: CTC.0.2
60. ANS: greenhouse effect  
 PTS: 1 KEY: greenhouse effect MSC: CTC.0.3
61. ANS: condensation  
 PTS: 1 KEY: condensation MSC: CTC.0.4
62. ANS: latitudes  
 PTS: 1 KEY: latitude MSC: CTC.0.5
63. ANS: precipitation  
 PTS: 1 KEY: precipitation MSC: CTC.0.6
64. ANS: global warming  
 PTS: 1 KEY: global warming MSC: NEW
65. ANS: greenhouse effect  
 PTS: 1 KEY: greenhouse effect MSC: NEW
66. ANS: stationary front  
 PTS: 1 KEY: front MSC: NEW
67. ANS: warm front  
 PTS: 1 KEY: front MSC: NEW
68. ANS: cold front  
 PTS: 1 KEY: front MSC: NEW
69. ANS: occluded front  
 PTS: 1 KEY: front MSC: NEW
70. ANS: thunderstorm  
 PTS: 1 KEY: thunderstorm MSC: NEW
71. ANS: tornado  
 PTS: 1 KEY: tornado MSC: NEW
72. ANS: hurricane  
 PTS: 1 KEY: hurricane MSC: NEW

## MATCHING

73. ANS: D PTS: 1 KEY: relative humidity  
 MSC: SQ.1.1
74. ANS: B PTS: 1 KEY: condensation MSC: SQ.1.2
75. ANS: E PTS: 1 KEY: dew MSC: SQ.1.3

76.	ANS: C	PTS: 1	KEY: humidity	MSC: SQ.1.4
77.	ANS: A	PTS: 1	KEY: precipitation	MSC: SQ.1.5
78.	ANS: B	PTS: 1	KEY: lightning	MSC: SQ.2.1
79.	ANS: D	PTS: 1	KEY: cyclone	MSC: SQ.2.2
80.	ANS: A	PTS: 1	KEY: thunder	MSC: SQ.2.3
81.	ANS: C	PTS: 1	KEY: tornado	MSC: SQ.2.4
82.	ANS: C	PTS: 1	KEY: elevation	MSC: SQ.3.1
83.	ANS: A MSC: SQ.3.2	PTS: 1	KEY: surface current	
84.	ANS: D	PTS: 1	KEY: climate	MSC: SQ.3.3
85.	ANS: B	PTS: 1	KEY: latitude	MSC: SQ.3.4
86.	ANS: B MSC: SQ.4.1	PTS: 1	KEY: greenhouse effect	
87.	ANS: A	PTS: 1	KEY: ice age	MSC: SQ.4.2
88.	ANS: C MSC: SQ.4.3	PTS: 1	KEY: global warming	
89.	ANS: C	PTS: 1	KEY: dew point	MSC: CTA.0.12
90.	ANS: A	PTS: 1	KEY: climate	MSC: CTA.0.13
91.	ANS: D	PTS: 1	KEY: latitude	MSC: CTA.0.14
92.	ANS: B	PTS: 1	KEY: weather	MSC: CTA.0.15
93.	ANS: D	PTS: 1	KEY: thunder	MSC: CTA.0.16
94.	ANS: C	PTS: 1	KEY: humidity	MSC: CTA.0.17
95.	ANS: B MSC: CTA.0.18	PTS: 1	KEY: surface current	
96.	ANS: A	PTS: 1	KEY: precipitation	MSC: CTA.0.19
97.	ANS: C	PTS: 1	KEY: humidity	MSC: CTB.0.1
98.	ANS: B	PTS: 1	KEY: thunder	MSC: CTB.0.2
99.	ANS: A	PTS: 1	KEY: dew point	MSC: CTB.0.3
100.	ANS: E	PTS: 1	KEY: condensation	MSC: CTB.0.4
101.	ANS: F	PTS: 1	KEY: cyclone	MSC: CTB.0.5
102.	ANS: D	PTS: 1	KEY: front	MSC: CTB.0.6
103.	ANS: B	PTS: 1	KEY: weather	MSC: CTB.0.12
104.	ANS: A	PTS: 1	KEY: climate	MSC: CTB.0.13
105.	ANS: B MSC: CTB.0.23	PTS: 1	KEY: climate zone   temperate	
106.	ANS: C MSC: CTB.0.24	PTS: 1	KEY: climate zone   polar	
107.	ANS: A MSC: CTB.0.25	PTS: 1	KEY: climate zone   tropical	
108.	ANS: B	PTS: 1	KEY: biome	MSC: NEW

109. ANS: A                      PTS: 1                      KEY: surface current  
 MSC: NEW
110. ANS: D                      PTS: 1                      KEY: weather                      MSC: NEW
111. ANS: E                      PTS: 1                      KEY: latitude                      MSC: NEW
112. ANS: F                      PTS: 1                      KEY: elevation                      MSC: NEW
113. ANS: C                      PTS: 1                      KEY: climate                      MSC: NEW

**SHORT ANSWER**

114. ANS:  
 Answers may vary. Sample answer: Lightning forms when an electric discharge happens between a positively charged area and a negatively charged area, such as between a cloud and the ground or between two clouds or between two parts of the same cloud. When lightning strikes, the air along its path becomes superheated. The air vibrates and releases energy as sound waves. The result is thunder, which is the sound caused by the fast expansion of air along the lightning strike.

PTS: 1                      KEY: lightning | thunder                      MSC: CTC.0.14

115. ANS:  
 Answers may vary. Sample answer: During a storm, there is a rise in sea level, which forms a storm surge. The storm surge crashes onto shore, endangering lives and causing property damage.

PTS: 1                      KEY: storm surge                      MSC: CTC.0.15

116. ANS:  
 Answers may vary. Sample answer: When air rises and cools to below the dew point, millions of tiny water droplets or ice crystals form a cloud.

PTS: 1                      KEY: cloud                      MSC: CTC.0.16

117. ANS:  
 fall

PTS: 1                      KEY: seasons                      MSC: NEW

118. ANS:  
 The sun's rays strike Earth's surface at a less direct angle than at the equator, so solar energy is spread over a larger area.

PTS: 1                      KEY: climate                      MSC: NEW

119. ANS:  
 A climate zone may contain several different biomes.

PTS: 1                      KEY: climate zone | biome                      MSC: NEW

120. ANS:  
 because much of Earth's water is frozen during a glacial period

PTS: 1                      KEY: glacial period                      MSC: NEW

121. ANS:  
 Dust, smoke, and ash from a volcanic eruption enter the atmosphere and act as a shield, blocking out many of the sun's rays and causing Earth to cool.

PTS: 1                      KEY: ice age                      MSC: NEW





132. ANS:  
Lightning is an electric discharge that forms between clouds or between a cloud and the ground. The air around the lightning bolt expands rapidly to produce sound waves that we call thunder.

PTS: 1                      KEY: lightning | thunder                      MSC: NEW

133. ANS:  
A hurricane gets its energy from enormous volumes of warm, moist air, which are not present over landmasses.

PTS: 1                      KEY: hurricane                      MSC: NEW

## ESSAY

134. ANS:  
Answers may vary. Sample answer: Hurricanes are fed by warm, moist air over the ocean. The North Atlantic Ocean is warmest in summer; by September, a large amount of heat has built up. So this is when the air over the oceans is warmest.

PTS: 1                      KEY: hurricane                      MSC: CTC.0.17

135. ANS:  
Answers may vary. Sample answer: During an ice age, ice forms in high latitudes and moves toward lower latitudes. There are periods of cold (glacial periods) and periods of warmth (interglacial periods). During a glacial period, large sheets of ice advance, get bigger, and cover a larger area. The sea level then drops.

PTS: 1                      KEY: ice age                      MSC: CTC.0.18

136. ANS:  
Answers may vary. Sample answer: Milankovitch theory: explains that changes in Earth's orbit and in the tilt of Earth's axis cause ice ages. Plate tectonics and continental drift: A continent's location relative to the equator and poles determines how much solar radiation it receives. A continent's location relative to oceans and other continents is also important. A continent deflects ocean currents. Also, when continents move, the flow of air and moisture around the globe changes. Sun's cycle: The sun produces different levels of high-energy radiation. These variations affect the amount of energy in Earth's systems, which cause slight changes in climate. Asteroid impact: Debris from asteroid impacts can block some sunlight from reaching Earth's surface, which would lower average temperatures. Volcanic eruptions: Ash, dust, and smoke from volcanic eruptions can block some of the sun's rays, resulting in the cooling of Earth's surface and atmosphere. Human activity: Increases in carbon dioxide caused by burning fossil fuels cause a slight rise in global temperatures.

PTS: 1                      KEY: climate change                      MSC: CTC.0.19

## OTHER

137. ANS:  
a. air masses, b. front, c. hurricane, d. tornado, e. cyclone

PTS: 1                      KEY: front | air pressure                      MSC: CTC.0.20