

Student: _____

1. Concern about the greenhouse effect stems from
 - A. Increases in volcanic ash in the air.
 - B. Increases in atmospheric carbon-dioxide levels.
 - C. Worldwide cooling observed since the 1920s.
 - D. Falling sea level.
2. The greenhouse gas is classified as any gas that
 - A. Traps visible rays and thereby promotes global warming.
 - B. Traps gamma rays and thereby reduces global warming.
 - C. Traps infrared rays and thereby promotes global warming.
 - D. Traps infrared rays and thereby reduces global warming.
3. Uncertainty in projecting probable greenhouse-effect heating arises from uncertainty about
 - A. The effects of gases other than CO₂.
 - B. Projected global cloud cover as temperatures change.
 - C. The relationship between CO₂ produced and resultant atmospheric CO₂ levels.
 - D. All of the choices are correct.
4. The melting of sea ice
 - A. Will cause a rise in sea level.
 - B. Will cause a lowering of sea level.
 - C. Will not affect sea level; melting of land ice will cause a rise in sea level.
 - D. Will not affect sea level; melting of land ice will cause a lowering of sea level.
5. The albedo of the earth
 - A. Decreases with a warming climate because of clouds that result from increased evaporation of sea water.
 - B. Is part of a positive feedback cycle, where the increased albedo due to clouds causes a reduction in solar energy that reaches the earth, thus resulting in cooling.
 - C. Is part of a negative feedback cycle, where the increased albedo due to increased snow and ice coverage increases the effectiveness of solar energy in warming land areas.
 - D. None of the choices are correct.
6. All of the following could cause global cooling except
 - A. Increased cloud cover.
 - B. Increased sulfate aerosols in the atmosphere.
 - C. Increased volcanic ash in the atmosphere.
 - D. Increased carbon dioxide in the atmosphere.
7. When water evaporates from the oceans,
 - A. The water vapor is isotopically "heavier" (has a higher ¹⁸O/¹⁶O ratio) than the residual water.
 - B. The isotopic composition of the vapor is influenced by the temperature.
 - C. The oceans are warmed by the evaporation process.
 - D. All of the choices are correct.
8. Possible sources of methane from human activities include all of the following except
 - A. Rice paddies.
 - B. Raising livestock.
 - C. Cornfields.
 - D. Extracting fossil fuels.

9. Indicators of past global air or water temperatures include all of the following except
- Calcium carbonate content of sediments.
 - Volcanic ash deposits in glacial ice.
 - Isotopic composition of glacial ice.
 - Oxygen-isotope composition of marine microorganisms' shells.
10. A combination of winds that push the ocean currents and differences in oceans' water density that is driven by oceanic circulation, which is related to
- Temperature and pressure.
 - Temperature and oxygen content.
 - Temperature and salinity.
 - None of the choices are correct.
11. Seattle, Washington is located at 47.5°N latitude and Boston, Massachusetts is located at 42.22°N latitude, so Seattle is farther north than Boston. Both cities border oceans, the Pacific Ocean in the case of Seattle and the Atlantic Ocean in the case of Boston. Both cities are in close proximity to a segment of the global thermohaline circulation system, the Japanese Current for Seattle and the Gulf Stream for Boston. Seattle, though, rarely experiences winter snowfall, whereas Boston often does. Why?
- Winter storms approach Seattle from the west driven by the warm thermohaline Japanese Current.
 - Winter storms approach Boston from the east driven by the warm thermohaline Gulf Stream.
 - Winter storms approach Boston from the west that draw cold air southward from the Arctic.
 - A and C combined provide the answer.
12. When glaciers retreat,
- Water storage in pore spaces in the ice decreases.
 - All glaciers worldwide retreat.
 - The glaciers flow slowly back toward their sources.
 - All of the choices are correct.
13. An El Nino event is likely to be associated with
- Increased upwelling.
 - Cooler surface waters in the Pacific.
 - Changes in paths and intensities of Pacific storms.
 - All of the choices are correct.
14. An animal that may need protection under the Endangered Species Act because of global warming
- The penguin.
 - The seal.
 - The polar bear.
 - The arctic fox.
15. This gas is a more efficient greenhouse gas in comparison to carbon dioxide, but it has a far lesser presence in earth's atmosphere
- Water vapor.
 - Methane.
 - Carbon monoxide.
 - Ozone.
16. Many Pacific Island nations consist of a collection of atolls. Some of these nations have appealed to the United Nations claiming that rising sea level is causing coastal flooding. Another explanation for coastal flooding on these islands other than rising sea level is
- Atolls are ringed by coral reefs and these reefs are dying.
 - Atolls are susceptible to more beach erosion than other types of islands.
 - Atolls are former volcanoes that are slowly sinking (subsiding).
 - Atolls are composed of limestone that is slowly dissolving.

17. Rising sea level due to global warming will
 - A. Cause a decrease in coastline erosion.
 - B. Increase the acreage of coastal wetlands by increasing moisture content.
 - C. Decrease the acreage of coastal wetlands due to saltwater intrusion.
 - D. Cause beaches worldwide to grow seaward.
18. Of the following, one that actually reduces carbon dioxide emissions
 - A. An electric car that requires battery recharging using 110V or 220V electricity that is generated by a fossil fuel plant.
 - B. Replacing a 40W incandescent light bulb with a 15W fluorescent bulb in a socket that receives 110V . electricity generated by a fossil fuel plant.
 - C. An electric lawn mower that runs on 110V electricity generated by a fossil fuel plant.
 - D. Replacing a 40W incandescent light bulb with a 15W fluorescent bulb in a socket that receives 110V . electricity generated by solar photovoltaic cells.
19. The Arctic ice cap is more vulnerable to melting due to warming than is the Antarctic ice cap because
 - A. Liquid seawater is beneath the Arctic ice cap, so warmer water can cause melting from below the ice in . addition to melting on the surface due to atmospheric warming.
 - B. The Arctic ice cap is substantially smaller than the Antarctic ice cap.
 - C. Ocean currents do not influence the southern hemisphere.
 - D. All of these answers are factors.
20. During the so-called Mini Ice Age, 1650 to 1700, the number of sun spots recorded for any year within this 5-decade period
 - A. Was much lower than average.
 - B. Was significantly greater than average.
 - C. Was about average.
 - D. Is unknown because sun spots were recorded for the first time ever in 1750.
21. The term "greenhouse effect" refers to an increase in atmospheric temperatures resulting from an increasing blanket of clouds around the earth.
True False
22. The principal source of rising levels of carbon dioxide in the atmosphere is the burning of fossil fuels.
True False
23. Slowing the destruction of tropical rain forests may also slow the rise in atmospheric CO₂, because plants use carbon dioxide during photosynthesis.
True False
24. The changes in permafrost has very little effect on traditional lifestyles of local population, animal migrations, and ecosystems.
True False
25. Global warming is not uniform throughout the earth as some places it is more severe than others.
True False
26. If all the polar ice sheets were to melt, world sea levels would rise only 1 to 2 meters.
True False
27. The gas bubbles trapped in alpine glaciers preserve an excellent record of past atmospheric composition, which can be correlated with temperature.
True False
28. Studies of cores from polar ice sheets indicate a correlation between greenhouse-gas concentrations and temperatures but do not indicate cause-and-effect.
True False

29. Concerns about greenhouse-effect heating relate not only to possible changes in temperature, but also to possible changes in precipitation patterns.
True False
30. Studies of past correlations between climate and atmospheric composition allow us now to project atmospheric warming very precisely as a function of CO₂ concentration.
True False
31. The limited resolution of global climate models makes it difficult to project small-scale, local climatic variations.
True False
32. It is difficult to determine the effect of CO₂ on climate because the atmospheric concentration of methane, another "greenhouse gas" is so much greater.
True False
33. El NinoSouthern Oscillation phenomena seem to be cyclic, recurring every four to seven years.
True False
34. United Nations studies suggest that the impacts of global climate change are likely to be most severe in the highly industrialized countries.
True False
35. Signs of global warming are more evident in the northern hemisphere than in the southern hemisphere.
True False
36. Increased levels of carbon dioxide in earth's atmosphere will definitely result in increased crop yields.
True False
37. Water vapor is the most significant greenhouse gas in terms of average atmospheric concentration (2 to 3%), but its amount varies quickly over a matter of days, whereas the average level of carbon dioxide changes much more slowly.
True False
38. The plants and animals that will be most negatively impacted by global warming are those having ecosystems on or very near the equator.
True False
39. Climate changes can influence the spread of number of diseases such as mosquito borne dengue and malaria, as well as the ones spread by waterborne bacteria and parasites.
True False
40. Global warming may increase the number of heat related deaths during summer.
True False
41. Melting permafrost poses no construction engineering problems.
True False

10 Key

1. Concern about the greenhouse effect stems from
- A. Increases in volcanic ash in the air.
 - B.** Increases in atmospheric carbon-dioxide levels.
 - C. Worldwide cooling observed since the 1920s.
 - D. Falling sea level.

Montgomery - Chapter 10 #1

2. The greenhouse gas is classified as any gas that
- A. Traps visible rays and thereby promotes global warming.
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Montgomery - Chapter 10 #2

3. Uncertainty in projecting probable greenhouse-effect heating arises from uncertainty about
- A. The effects of gases other than CO₂.
 - B. Projected global cloud cover as temperatures change.
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Montgomery - Chapter 10 #3

4. The melting of sea ice
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Montgomery - Chapter 10 #4

5. The albedo of the earth
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Montgomery - Chapter 10 #5

6. All of the following could cause global cooling except
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 - C. Increased volcanic ash in the atmosphere.
 - D.** Increased carbon dioxide in the atmosphere.

Montgomery - Chapter 10 #6

7. When water evaporates from the oceans,
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 - B.** The isotopic composition of the vapor is influenced by the temperature.
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Montgomery - Chapter 10 #7

8. Possible sources of methane from human activities include all of the following except
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 - C.** Cornfields.
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Montgomery - Chapter 10 #8

9. Indicators of past global air or water temperatures include all of the following except
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Montgomery - Chapter 10 #9

10. A combination of winds that push the ocean currents and differences in oceans' water density that is driven by oceanic circulation, which is related to
- A. Temperature and pressure.
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 - C.** Temperature and salinity.
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Montgomery - Chapter 10 #10

11. Seattle, Washington is located at 47.5°N latitude and Boston, Massachusetts is located at 42.22°N latitude, so Seattle is farther north than Boston. Both cities border oceans, the Pacific Ocean in the case of Seattle and the Atlantic Ocean in the case of Boston. Both cities are in close proximity to a segment of the global thermohaline circulation system, the Japanese Current for Seattle and the Gulf Stream for Boston. Seattle, though, rarely experiences winter snowfall, whereas Boston often does. Why?
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Montgomery - Chapter 10 #11

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Montgomery - Chapter 10 #12

13. An El Nino event is likely to be associated with
- A. Increased upwelling.
 - B. Cooler surface waters in the Pacific.
 - C.** Changes in paths and intensities of Pacific storms.
 - D. All of the choices are correct.

Montgomery - Chapter 10 #13

14. An animal that may need protection under the Endangered Species Act because of global warming
- A. The penguin.
 - B. The seal.
 - C.** The polar bear.
 - D. The arctic fox.

Montgomery - Chapter 10 #14

15. This gas is a more efficient greenhouse gas in comparison to carbon dioxide, but it has a far lesser presence in earth's atmosphere
- A. Water vapor.
 - B. Methane.**
 - C. Carbon monoxide.
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Montgomery - Chapter 10 #15

16. Many Pacific Island nations consist of a collection of atolls. Some of these nations have appealed to the United Nations claiming that rising sea level is causing coastal flooding. Another explanation for coastal flooding on these islands other than rising sea level is
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Montgomery - Chapter 10 #16

17. Rising sea level due to global warming will
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Montgomery - Chapter 10 #17

18. Of the following, one that actually reduces carbon dioxide emissions
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Montgomery - Chapter 10 #18

19. The Arctic ice cap is more vulnerable to melting due to warming than is the Antarctic ice cap because
- A. Liquid seawater is beneath the Arctic ice cap, so warmer water can cause melting from below the ice in addition to melting on the surface due to atmospheric warming.**
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 - C. Ocean currents do not influence the southern hemisphere.
 - D. All of these answers are factors.

Montgomery - Chapter 10 #19

20. During the so-called Mini Ice Age, 1650 to 1700, the number of sun spots recorded for any year within this 5-decade period
- A. Was much lower than average.**
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 - D. Is unknown because sun spots were recorded for the first time ever in 1750.

Montgomery - Chapter 10 #20

21. The term "greenhouse effect" refers to an increase in atmospheric temperatures resulting from an increasing blanket of clouds around the earth.
- FALSE**

Montgomery - Chapter 10 #21

22. The principal source of rising levels of carbon dioxide in the atmosphere is the burning of fossil fuels.
- TRUE**

Montgomery - Chapter 10 #22

23. Slowing the destruction of tropical rain forests may also slow the rise in atmospheric CO₂, because plants use carbon dioxide during photosynthesis.
TRUE
24. The changes in permafrost has very little effect on traditional lifestyles of local population, animal migrations, and ecosystems.
FALSE
25. Global warming is not uniform throughout the earth as some places it is more severe than others.
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26. If all the polar ice sheets were to melt, world sea levels would rise only 1 to 2 meters.
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FALSE
33. El NinoSouthern Oscillation phenomena seem to be cyclic, recurring every four to seven years.
TRUE
34. United Nations studies suggest that the impacts of global climate change are likely to be most severe in the highly industrialized countries.
FALSE
35. Signs of global warming are more evident in the northern hemisphere than in the southern hemisphere.
TRUE

Montgomery - Chapter 10 #23

Montgomery - Chapter 10 #24

Montgomery - Chapter 10 #25

Montgomery - Chapter 10 #26

Montgomery - Chapter 10 #27

Montgomery - Chapter 10 #28

Montgomery - Chapter 10 #29

Montgomery - Chapter 10 #30

Montgomery - Chapter 10 #31

Montgomery - Chapter 10 #32

Montgomery - Chapter 10 #33

Montgomery - Chapter 10 #34

Montgomery - Chapter 10 #35

36. Increased levels of carbon dioxide in earth's atmosphere will definitely result in increased crop yields.
FALSE
37. Water vapor is the most significant greenhouse gas in terms of average atmospheric concentration (2 to 3%), but its amount varies quickly over a matter of days, whereas the average level of carbon dioxide changes much more slowly.
TRUE
38. The plants and animals that will be most negatively impacted by global warming are those having ecosystems on or very near the equator.
FALSE
39. Climate changes can influence the spread of number of diseases such as mosquito borne dengue and malaria, as well as the ones spread by waterborne bacteria and parasites.
TRUE
40. Global warming may increase the number of heat related deaths during summer.
TRUE
41. Melting permafrost poses no construction engineering problems.
FALSE

Montgomery - Chapter 10 #36

Montgomery - Chapter 10 #37

Montgomery - Chapter 10 #38

Montgomery - Chapter 10 #39

Montgomery - Chapter 10 #40

Montgomery - Chapter 10 #41

10 Summary

<u>Category</u>	<u># of Questions</u>
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