

***The Atmosphere: An Introduction to Meteorology, 12e (Lutgens/Tarbuck/Tasa)***  
**Chapter 1 Introduction to the Atmosphere**

1) The term *meteorology*:

- A) can be used interchangeably with *climate* because they have the same meaning.
- B) is the study of the atmosphere and its related weather systems.
- C) is the study of the long-term average weather conditions at a given location.
- D) is the study of meteors and their effects on the atmosphere.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

2) This country has the greatest variety of weather in the world.

- A) China
- B) United States
- C) South Africa
- D) Australia
- E) Russia

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 4: Physical and Human Characteristics of Places

3) Which of the following statements is an expression of *climate*?

- A) Big Rapids, MI, recorded six inches of snowfall today.
- B) Tornado warnings are in effect for Oklahoma City, OK.
- C) February is the wettest month in Los Angeles, CA, with an average rainfall of 3.92 inches.
- D) Tomorrow's high is forecasted to be 67°F.

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

4) A primary difference between the concepts of weather and climate is the:

- A) measuring technique used.
- B) type of weather elements measured.
- C) temperature scale used.
- D) time period involved.

Answer: D

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

5) The BEST definition of the term *climate* is:

- A) a comprehensive statistical analysis of aggregate weather conditions in a specific place or region.
- B) average weather over a long period of time.
- C) identical to the definition of *meteorology*.
- D) the weather occurring in the atmosphere at a specific place and time.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

6) The basic elements of weather and climate include all of the following, except:

- A) the humidity of the air.
- B) the temperature of the air.
- C) the pressure of the air.
- D) the chemical composition of the air.
- E) the type and amount of cloudiness.

Answer: D

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

7) In the process of scientific inquiry, a *theory* is best defined as:

- A) the initial formulation of an idea based on a few observed facts.
- B) a "best guess" that may explain how something works, but is as yet untested and unproven.
- C) a hypothesis that has been extensively tested and is generally accepted by the scientific community.
- D) a final solution to a scientific problem that is proven correct and will never be disproven.

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

8) The primary function of the *Tropical Rainfall Measuring Mission* is to:

- A) provide satellite data about precipitation in the low latitudes, over both land and water.
- B) aid in the reconstruction of past climates in the tropics.
- C) forecast the tracks of hurricanes in the Northern Hemisphere.
- D) utilize remote sensing to measure precipitation amounts in uninhabited rain forests.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

- 9) In meteorological terminology, the acronym *TRMM* refers to:
- A) the Tropical Rainfall Measuring Mission satellite.
  - B) Tropospheric Radiation and Meteorological Measurement.
  - C) the international scientific panel on Technology, Research, and Methods in Meteorology.
  - D) the Typical Receipt of Mesospheric Meteors.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

- 10) Which of the following outlines the steps of the scientific method in the correct order?

- A) collect data; develop hypothesis; test hypothesis; accept/modify/reject hypothesis
- B) develop hypothesis; test hypothesis; accept/modify/reject hypothesis; collect data
- C) test hypothesis; develop hypothesis; collect data; accept/modify/reject hypothesis
- D) collect data; test hypothesis; develop hypothesis; accept/modify/reject hypothesis

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

- 11) Which one of the following is not a term used to designate one of the "spheres" of the earth's environment?

- A) atmosphere
- B) geosphere
- C) biosphere
- D) aquasphere

Answer: D

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

- 12) The common boundary where different parts of a system interact is called:

- A) a systemic boundary.
- B) the plane of interaction.
- C) a cycle.
- D) an interface.

Answer: D

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

13) Which of the following is an example of an *interface*?

- A) The circulation of water through the hydrologic cycle.
- B) Solar energy traveling through space.
- C) The formation of an igneous rock as lava cools following a volcanic eruption.
- D) The formation of the Grand Canyon as running water erodes, transports, and deposits rock.

Answer: D

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Bloom's Taxonomy: Apply

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

14) The least dense portion of the solid Earth is the:

- A) mantle.
- B) center.
- C) core.
- D) crust.

Answer: D

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

15) The majority of the water outside of the oceans is in the form of:

- A) groundwater.
- B) glacial ice.
- C) water vapor in the atmosphere.
- D) streams.
- E) lakes.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 16: Changes Related to Resources

16) Which of the following spheres is composed exclusively of water?

- A) biosphere
- B) lithosphere
- C) hydrosphere
- D) atmosphere

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

17) The earth system:

- A) is powered solely by the Sun.
- B) includes parts that affect one another.
- C) is the highest level of system possible.
- D) cannot be affected by anything from space.

Answer: B

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

18) An interacting group of parts that is fueled by energy and works to accomplish the movement of matter or energy is called:

- A) a system.
- B) a threshold.
- C) a collection.
- D) a sphere.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

19) *Air* may best be described as:

- A) an element.
- B) one of four basic substances that composes all things.
- C) a compound.
- D) a mixture.

Answer: D

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

20) Decay of plants, animals eating, and volcanic eruptions are all part of which major Earth system cycle?

- A) the carbon cycle
- B) the hydrologic cycle
- C) the nitrogen cycle
- D) the rock cycle

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

21) Which one of the following is the MOST abundant gas in the atmosphere?

- A) hydrogen
- B) oxygen
- C) nitrogen
- D) argon
- E) carbon dioxide

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

22) Which two gases make up a combined total of 99% of clean, dry air in the homosphere?

- A) nitrogen and oxygen
- B) oxygen and carbon dioxide
- C) nitrogen and argon
- D) carbon dioxide and water vapor

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

23) The formation of fossil fuels begins when:

- A) dormant volcanoes fail to erupt, trapping carbon dioxide under ground.
- B) biomass is deposited and buried with sediment instead of decaying.
- C) carbon-rich rocks are buried beneath volcanic lava flows.
- D) extensive fossil deposition occurs all at once, such as when the dinosaurs went extinct in a short period of time.

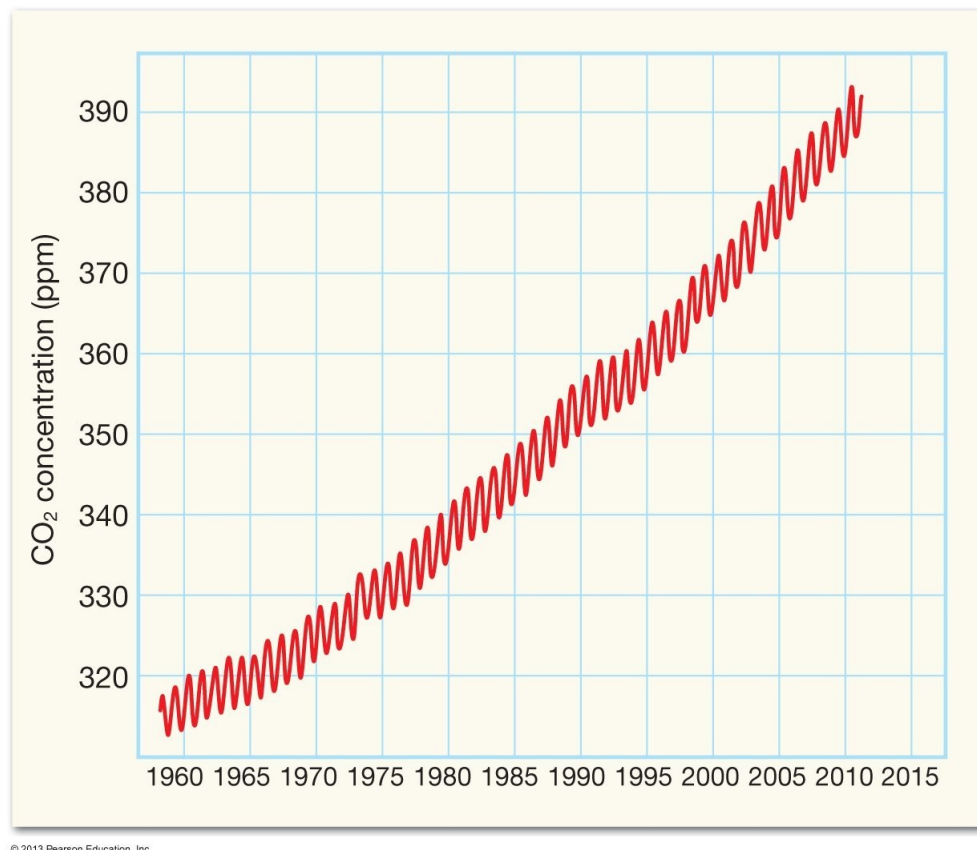
Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 16: Changes Related to Resources

Consider the following diagram, and then answer the question below.



24) According to current scientific consensus, what is the reason for the upward trend in overall CO<sub>2</sub> concentrations demonstrated in the graph above?

- A) large and increasingly frequent volcanic eruptions
- B) changes in Earth's atmosphere brought about by natural climate variation
- C) rapidly increasing fossil fuel combustion and the resulting emissions
- D) The causes are still unknown.

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment

25) What best explains the "bumps" seen in the seen in the CO<sub>2</sub> concentrations on the graph above?

- A) greater amounts of CO<sub>2</sub> released by the burning of fossil fuels for heat during the winter
- B) higher levels of traffic producing more CO<sub>2</sub> during the summer travel season
- C) changes in plant growth that result in less CO<sub>2</sub> being absorbed during the dormant season
- D) a cyclic pattern in the eruption of volcanoes, causing more CO<sub>2</sub> to be released each spring

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

26) Scientists believe that a growing amount of this gas in the atmosphere will probably bring about a warming of the lower atmosphere.

- A) nitrogen
- B) carbon dioxide
- C) oxygen
- D) argon
- E) hydrogen

Answer: B

Page Ref: 19

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment

27) Which of the following is NOT a variable component of the atmosphere?

- A) water vapor
- B) ozone
- C) aerosols
- D) argon

Answer: D

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

28) This variable atmospheric component can exist in all three states of matter (solid, liquid, and gas) at the temperatures and pressures that normally exist on Earth.

- A) nitrogen
- B) methane
- C) oxygen
- D) water
- E) ozone

Answer: D

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth



29) Which of the following is the MOST important atmospheric component with regard to the earth's climate and the formation of weather systems?

- A) water vapor
- B) ozone
- C) oxygen
- D) nitrogen
- E) argon

Answer: A

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

30) The most important source of the free oxygen in our atmosphere is:

- A) green plants that carry on photosynthesis.
- B) deforestation.
- C) volcanic degassing.
- D) the dissociation of water vapor in the upper atmosphere.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 8: Characteristics and Distribution of Ecosystems

31) Water vapor represents what fraction of the air near the earth's surface?

- A) 40 - 100 percent
- B) about 20 percent
- C) less than 4 percent
- D) 0 - 100 percent
- E) about 10 percent

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

32) Photosynthesis:

- A) was prevalent during the first years of the earth's atmosphere.
- B) releases carbon dioxide into the atmosphere.
- C) is carried out primarily by bacteria.
- D) releases oxygen into the atmosphere.

Answer: D

Page Ref: 20

Bloom's Taxonomy: Understand

Nat. Geog. Stand: 8: Characteristics and Distribution of Ecosystems

33) Which of these was NOT involved with the formation and evolution of our present atmosphere?

- A) stratification
- B) cooling
- C) outgassing
- D) photosynthesis

Answer: A

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

34) Which one of the following gases has the greatest effect on weather?

- A) nitrogen
- B) oxygen
- C) argon
- D) ozone
- E) water vapor

Answer: E

Page Ref: 20

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

35) Which of these is NOT a significant factor in the role played by particles or dust in the atmosphere?

- A) cloud formation
- B) ozone production
- C) reflection of sunlight
- D) absorption of sunlight

Answer: B

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

36) The first function of water vapor in the earth's original atmosphere was to:

- A) fall as rain and thus cool the earth's surface.
- B) create oxygen.
- C) increase the amount of carbon dioxide in the atmosphere.
- D) provide needed nourishment for primitive plants.
- E) block the solar wind.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

37) The *ozone layer* is found in the:

- A) thermosphere.
- B) stratosphere.
- C) troposphere.
- D) mesosphere.
- E) ionosphere.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

38) Dust and aerosols in the atmosphere are associated with all of the following EXCEPT:

- A) altering the amount of oxygen in the atmosphere
- B) optical phenomena such as red sky at sunset
- C) reflection of solar energy
- D) condensation and cloud formation

Answer: A

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

39) This atmospheric component absorbs damaging ultraviolet radiation from the Sun.

- A) neon
- B) argon
- C) helium
- D) nitrogen
- E) ozone

Answer: E

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

40) Studies have shown that on average ozone depletion is greatest over this area.

- A) Antarctica
- B) Australia
- C) Europe
- D) the Middle East
- E) North America

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 16: Changes Related to Resources

41) When chlorofluorocarbons (CFCs) are subjected to sunlight, \_\_\_\_\_ is released, in turn leading to the destruction of ozone molecules.

- A) chlorine
- B) carbon
- C) nitrogen
- D) hydrogen
- E) carbon dioxide

Answer: A

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

42) Ozone:

- A) is considered beneficial at the surface of the Earth.
- B) protects life on Earth by filtering harmful UV radiation from sunlight.
- C) is rapidly depleting for reasons scientists do not yet fully understand.
- D) is concentrated in the mesosphere.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

43) The Montreal Protocol:

- A) is generally considered a diplomatic disaster by most environmentalists.
- B) called for a 10 percent reduction in CFC production by the end of the century.
- C) has already created a reduction in ozone-depleting gases in the atmosphere.
- D) was not adhered to by the United States.
- E) was designed primarily to address the problem of global warming.

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment

44) Ninety percent of our atmosphere lies below an altitude of about:

- A) 65 km.
- B) 16 km.
- C) 100 km.
- D) 6 km.
- E) 31 km.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

45) With an *increase* in altitude, air pressure:

- A) increases at a constant rate.
- B) increases at a decreasing rate.
- C) decreases at a decreasing rate.
- D) decreases at an increasing rate.
- E) decreases at a constant rate.

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

46) Atmospheric pressure is caused by:

- A) Earth's magnetic field.
- B) the weight of the air above.
- C) the rotation of Earth.
- D) solar radiation.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

47) The four *thermal* layers of the atmosphere in order beginning from the surface are:

- A) troposphere, stratosphere, mesosphere, thermosphere
- B) thermosphere, stratosphere, mesosphere, troposphere
- C) mesosphere, stratosphere, thermosphere, troposphere
- D) stratosphere, troposphere, mesosphere, thermosphere

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

48) Which of the following associations is CORRECT?

- A) thermosphere — high heat
- B) mesosphere — begins at a height of 50 km
- C) troposphere — positive lapse rate
- D) stratosphere — coldest temperatures in the atmosphere

Answer: B

Page Ref: 27

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

49) On the average, for every 1 km increase in altitude in the *troposphere* the air temperature:

- A) drops about 6.5 degrees Celsius.
- B) rises by day and drops by night.
- C) rises about 6.5 degrees Celsius.
- D) remains unchanged for the first 500 m and then drops.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

50) The vertical temperature structure of the *troposphere* is described by:

- A) air temperature.
- B) the barometric pressure.
- C) the lapse rate.
- D) its density.
- E) the wind speed.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

51) Assuming the average value of the *environmental lapse rate*, what would be the temperature in the tropopause at a height of 3 km if the temperature at the surface is 20°C?

- A) 32.9°C
- B) 9.2°C
- C) 0.5°C
- D) The answer cannot be calculated with the information given.

Answer: A

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Bloom's Taxonomy: Apply

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

52) The summit of Mt. Everest (8.85 km) is found in the:

- A) stratosphere.
- B) troposphere.
- C) mesosphere.
- D) thermosphere.

Answer: B

Page Ref: 27

Bloom's Taxonomy: Apply

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

- 53) The *troposphere* is most likely to be thickest:
- A) over the North Pole.
  - B) over the Arctic Circle.
  - C) over the equator.
  - D) at about 45 degrees north and 45 degrees south.
  - E) over the South Pole.

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

- 54) The term *troposphere* literally means:
- A) "layer of life."
  - B) "region of weather."
  - C) region where air "turns over."
  - D) "warm air."

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

- 55) The "weather sphere" is in the:
- A) troposphere.
  - B) stratosphere.
  - C) thermosphere.
  - D) mesosphere.

Answer: A

Page Ref: 27

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

- 56) While ascending through the atmosphere, you record temperature *with a standard thermometer* and find that the temperature has risen from -48°C (-54°F) to -18°C (-0.4°F) over the last 10 km (6.2 miles). Which of the following regions of the atmosphere are you most likely in?

- A) troposphere
- B) stratosphere
- C) mesosphere
- D) thermosphere

Answer: B

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Bloom's Taxonomy: Apply

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

57) The *normal lapse rate* applies to the

- A) thermosphere.
- B) stratosphere.
- C) troposphere.
- D) mesosphere.

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

58) Ozone is concentrated in the

- A) mesosphere.
- B) troposphere.
- C) thermosphere.
- D) stratosphere.

Answer: D

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth





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59) The name of the instrument being launched with a weather balloon in the photograph above is:

- A) a radiosonde.
- B) a TRMM sensor.
- C) a satellite.
- D) a Doppler radar.

Answer: A

Page Ref: 28

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

60) The level of the atmosphere with the highest temperatures is the:

- A) thermosphere.
- B) mesosphere.
- C) stratosphere.
- D) troposphere.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

61) If you were to put your hand out into the thermosphere, it would:

- A) instantly burn up because of very high temperatures.
- B) gradually warm up above body temperature.
- C) not feel any heat, because very few air molecules would collide with your skin.
- D) freeze quickly because of the very cold temperatures.

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

62) Which of the following is NOT true of radiosondes?

- A) They are carried aloft by weather balloons.
- B) They are only used in a few dozen places around the world.
- C) They are critical sources of data for weather forecasters.
- D) They send meteorological data to the ground via radio transmitters.

Answer: B

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

63) You are gathering information for a severe weather forecast and you need to know the temperature and relative humidity of the air throughout the tropopause above your head. The instrument you need to employ is:

- A) a satellite.
- B) a weather radar.
- C) a weather balloon with radiosonde.
- D) an aircraft.

Answer: C

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

64) The lowest temperatures in the atmosphere exist in the:

- A) stratosphere.
- B) thermosphere.
- C) mesosphere.
- D) troposphere.

Answer: C

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

65) The heterosphere and ionosphere are *both* found in the:

- A) stratosphere.
- B) thermosphere.
- C) mesosphere.
- D) troposphere.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

66) The *aurora* that is visible in the southern hemisphere is the:

- A) aurora borealis.
- B) aurora australis.
- C) ionic aurora.
- D) antarctic aurora.

Answer: B

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

67) The approximate altitude of auroral displays is:

- A) above 1000 km.
- B) 80-400 km.
- C) above 500 km.
- D) about 50 km.
- E) below 30 km.

Answer: B

Page Ref: 30

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

68) The *ionosphere* is an atmospheric region defined on the basis of:

- A) temperature structure.
- B) composition.
- C) electrical charges.
- D) pressure.

Answer: C

Page Ref: 30

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

69) The aurora borealis will most likely be stronger:

- A) when there is a lot of solar flare activity.
- B) above the South Pole.
- C) nearest the equator.
- D) when there are few ions in the ionosphere.

Answer: A

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

70) Weather influences people, but people don't influence weather.

Answer: FALSE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment

71) Weather and climate are synonymous terms.

Answer: FALSE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

72) "Average weather" is an adequate definition of climate.

Answer: FALSE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

73) Climate knowledge can be used to accurately predict weather.

Answer: FALSE

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

74) Scientific hypotheses are rejected when they do not agree with observed data.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

75) A scientific hypothesis may be regarded as a tentative explanation of observed facts or events.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

76) The biosphere interacts with the lithosphere, the hydrosphere, and the atmosphere.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

77) Nearly all of planet Earth's mass is in the region known as the hydrosphere.

Answer: FALSE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

78) The oceans cover about 50 percent of the earth's surface.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 16: Changes Related to Resources

79) Although carbon dioxide is present only in small amounts, it is still more significant meteorologically than the other more abundant gases composing dry air.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

80) Carbon dioxide's importance in the atmosphere is solely due to its absorption and release of latent heat.

Answer: FALSE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

81) The rise of atmospheric carbon dioxide levels over the last century is due primarily to the burning of fossil fuels.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment

82) Ozone is actually a form of the element hydrogen.

Answer: FALSE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

83) Ozone is continually created in our atmosphere by solar radiation.

Answer: TRUE

Page Ref: 21

Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

84) At one time the earth's atmosphere contained no free oxygen.

Answer: TRUE

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85) Ozone is a significant atmospheric component in the greenhouse effect.

Answer: FALSE

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86) The depletion of stratospheric ozone is primarily a problem only in urban areas.

Answer: FALSE

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Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment

87) Depletion of the ozone layer leads to increased amounts of UV radiation striking the surface of the earth.

Answer: TRUE

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88) The largest hole in the ozone layer was observed in 1974.  
Answer: FALSE  
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89) Weather occurs in the thermosphere.  
Answer: FALSE  
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90) The stratosphere is an example of a temperature inversion.  
Answer: TRUE  
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91) The tropopause is found where the air temperature stops decreasing with height.  
Answer: TRUE  
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92) Vertical motion in the lower atmosphere is strongly related to the environmental lapse rate.  
Answer: TRUE  
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93) The environmental lapse rate is not constant.  
Answer: TRUE  
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94) The thermosphere has the lowest temperatures in the atmosphere.  
Answer: FALSE  
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95) The troposphere is part of the homosphere.  
Answer: TRUE  
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96) There is a sharp and definable boundary between the atmosphere and outer space.

Answer: FALSE

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97) The atmosphere ends abruptly at an altitude of 30 kilometers.

Answer: FALSE

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98) There is no well-defined thermopause.

Answer: TRUE

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99) Satellites do not orbit in the thermosphere because the intense heat would quickly incinerate them.

Answer: FALSE

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100) The ionosphere is a region within the stratosphere.

Answer: FALSE

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101) Auroral displays increase conspicuously at times when sunspots are most numerous.

Answer: TRUE

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Bloom's Taxonomy: Remember

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102) The ions in the ionosphere come primarily from oxygen and nitrogen.

Answer: TRUE

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

103) If a scientific theory is to be accepted and considered useful, it must be able to: \_\_\_\_\_.

Answer: correctly predict observed facts or events

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations



104) The state of the atmosphere at a given time and place defines the term \_\_\_\_\_.

Answer: weather

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

105) List four of the basic elements of weather and climate.

Answer: temperature-humidity-clouds-precipitation-air pressure-wind speed-wind direction

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

106) The primary usefulness of satellites in observing the weather is their ability to provide \_\_\_\_\_.

Answer: cloud images, rainfall data

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

107) The earth's physical environment is traditionally divided into three major parts, one solid, one liquid, and one gaseous. List these three parts.

Answer: lithosphere(solid)-hydrosphere(liquid)-atmosphere(gaseous)

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

108) What are the two energy sources for the earth system?

Answer: the Sun and the earth's interior

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Nat. Geog. Stand: 7: Physical Processes that Shape Earth

109) The *stratosphere* is home to a layer of gas known as \_\_\_\_\_.

Answer: ozone

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

110) What causes the region of warmer temperatures found in the stratosphere?

Answer: Absorption of solar ultraviolet by ozone.

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

111) A lightweight instrument package that is carried aloft by a balloon and transmits data on temperature, pressure, and humidity is called a(n) \_\_\_\_\_.

Answer: radiosonde

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

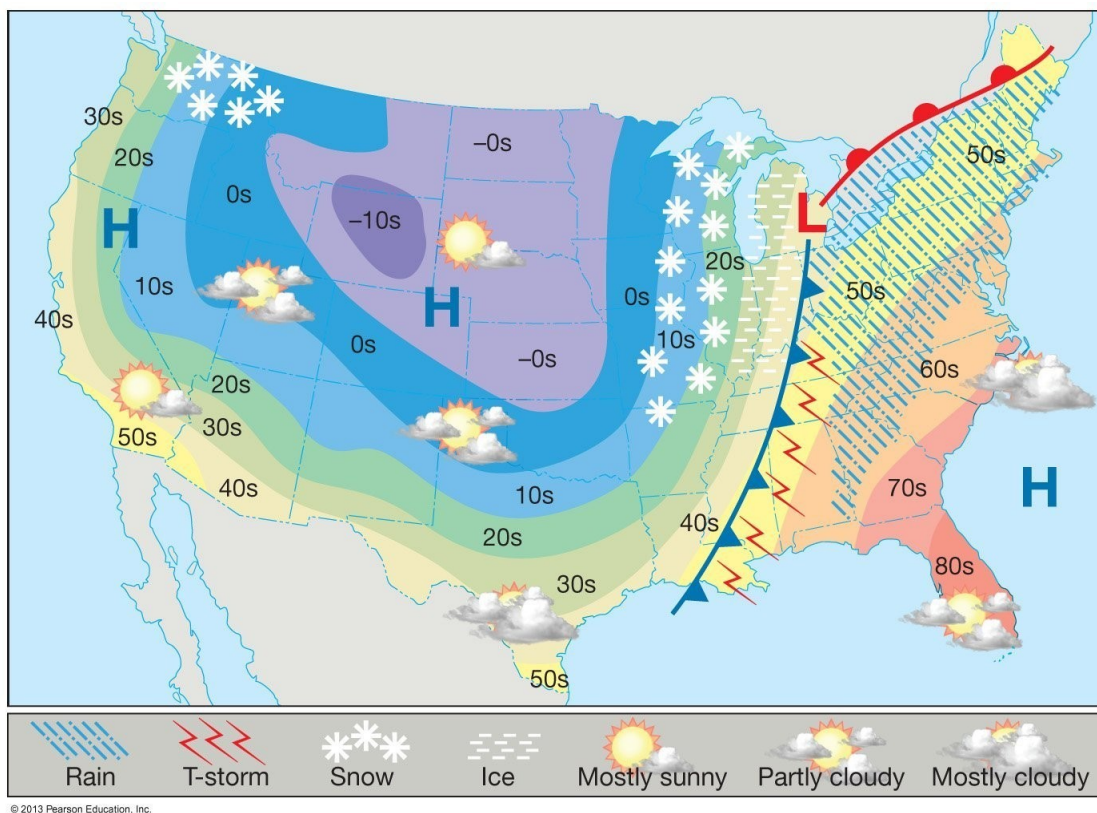
112) That portion of the atmosphere where the makeup of the air is uniform in terms of the proportions of its component gases is termed the \_\_\_\_\_.

Answer: homosphere

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Bloom's Taxonomy: Remember

Nat. Geog. Stand: 7: Physical Processes that Shape Earth



113) Use the weather map above to answer the following questions.

a) Based on this map, what kind of weather might you generally expect to be associated with a low pressure system (red L)?

b) Describe the temperature and precipitation currently occurring in Wisconsin.

Answer: a) Snow, rain, ice, fronts

b) Wisconsin is experiencing snow and temperatures in the 20s and 30s (Fahrenheit).

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Bloom's Taxonomy: Apply

Nat. Geog. Stand: 1: Maps and Other Geographic Representations

114) Define the two terms "weather" and "climate." Explain the difference between them.

Answer: Weather is the instantaneous state of the atmosphere at a given time and place. Climate is the statistical summary of the weather to be expected in a given place, and includes information such as long term averages and the range of extremes experienced. One of the key differences is time. Weather is focused on the present and immediate future; meteorologists are interested in current observations and short-term forecasting. Climate studies require a long period of observations to allow for generalizations to be made about typical weather in a certain place. Climatologists are often focused on long term trends and shifts in weather patterns rather than specific weather events currently in progress.

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 7: Physical Processes that Shape Earth

115) Discuss the role of ozone in the upper atmosphere. In your discussion, explain what ozone does, how it is threatened, and what legislation has been enacted in order to protect it.

Answer: Ozone is a molecule of three oxygen atoms that absorbs ultraviolet energy from incoming solar radiation. In so doing, the ozone molecule is split into individual oxygen atoms. In the process of absorbing UV and splitting apart, the ozone molecule prevents UV from reaching Earth's surface. Once divided, the individual oxygen atoms can rebound and create a new ozone molecule ready to absorb more incoming UV. Because of its role in shielding the Earth from UV radiation, the ozone layer (found only in the stratosphere) is critical to life on this planet. Unfortunately, scientists identified a hole in the ozone layer several decades ago. Eventually, the scientists Crutzen, Rowland, and Molina were able to identify that this hole was being caused by the presence of CFCs (chlorofluorocarbons) in the atmosphere. CFCs at the time were widely used in a variety of things, including refrigerants, styrofoam, and aerosol cans, because of their excellent thermal properties and long life span. However, the chlorine in CFCs is capable of bonding with ozone in the upper atmosphere and tearing it apart, thus reducing the number of ozone molecules in the ozone layer. The gradual buildup of CFCs in the upper atmosphere caused a hole to form in the ozone. When the world realized that CFCs were the primary cause of the rapidly growing hole in the ozone layer over Antarctica, the international community hastened to enact a treaty which limited and eventually eliminated CFC production and use. This treaty was known as the Montreal Protocol. As CFC production is stopped and existing CFCs work their way out of the system over the next century, it is expected that the ozone layer will recover and the hole will disappear.

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Bloom's Taxonomy: Understand

Nat. Geog. Stand: 14: Human Actions Modify the Physical Environment