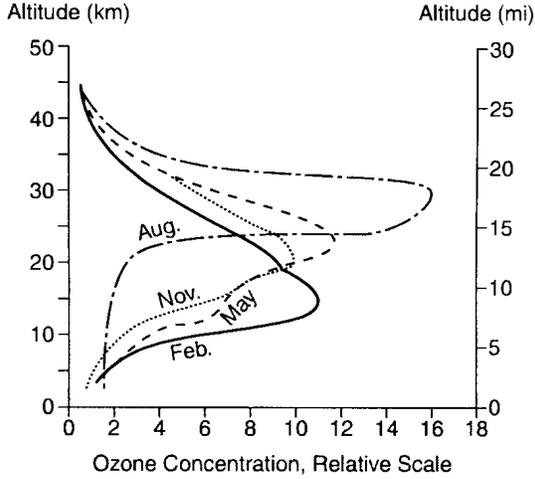


EARTH'S ATMOSPHERE

1. The graph below shows the average concentration of ozone in Earth's atmosphere over Arizona during 4 months of the year.



Which layer of Earth's atmosphere contains the greatest concentration of ozone?

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

2. In which atmospheric layer is most water vapor found?

- A troposphere** B stratosphere C thermosphere D mesosphere

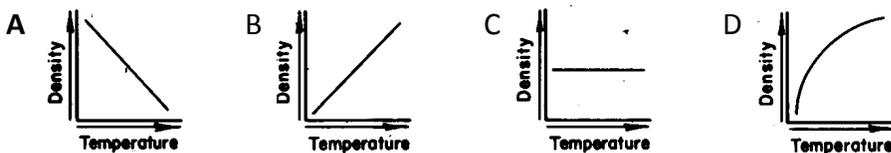
3. What is the approximate altitude of the mesopause in the atmosphere?

- A 50 km B 66 km **C 82 km** D 90 km

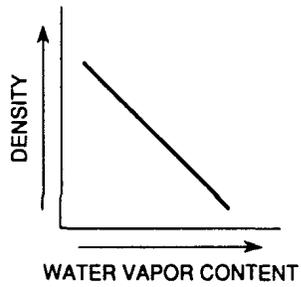
4. The greatest atmospheric pressure occurs in the

- A troposphere** B stratosphere C mesosphere D thermosphere

5. Which graph best represents the effect that heating has on air density in the troposphere?



6. According to the graph below, what happens to the density of a mass of air when its water vapor content increases?



A **Density decreases.**
C Density remains the same.

B Density increases.

7. The element oxygen is found in the Earth's

A troposphere, only
C troposphere and hydrosphere, only

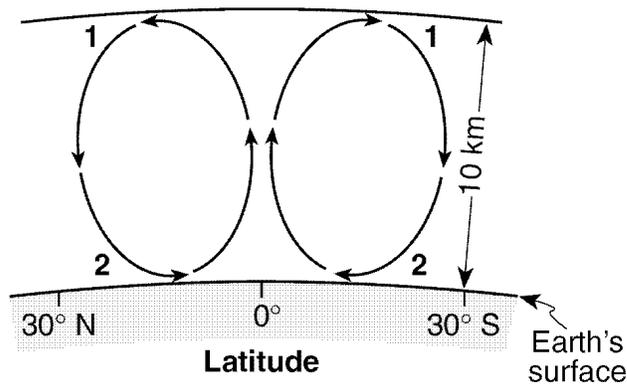
B hydrosphere, only
D **troposphere, hydrosphere, and crust**

8. As the altitude increases within Earth's stratosphere, air temperature generally

A decreases, only
C decreases, then increases

B **increases, only**
D increases, then decreases

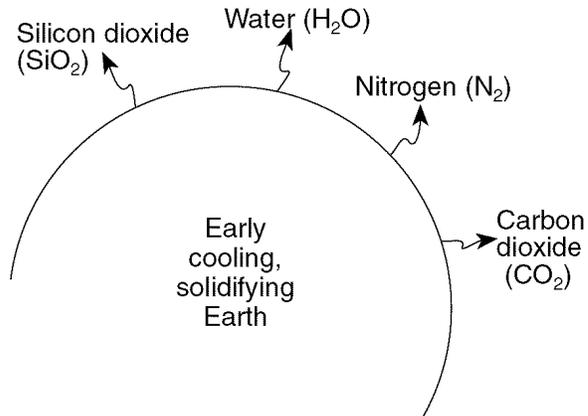
Base your answers to questions **9** and **10** on the cross section below and on your knowledge of Earth science. The cross section shows the general movement of air within a portion of Earth's atmosphere located between 30° N and 30° S latitude. Numbers 1 and 2 represent different locations in the atmosphere.



(Not drawn to scale)

- _____ 9. What is the approximate percentage by volume of oxygen present in Earth's atmosphere at location 2?
- A 10% **B 21%** C 33% D 46%
- _____ 10. Which temperature zone layer of Earth's atmosphere is shown in the cross section?
- A troposphere** B stratosphere C mesosphere D thermosphere
-

11. The diagram below shows four different chemical materials escaping from the interior of early Earth.



Which material contributed *least* to the early composition of the atmosphere?

- A SiO₂ B H₂O C N₂ D CO₂

12. In which two temperature zones of the atmosphere does the temperature increase with increasing altitude?

- A troposphere and stratosphere B troposphere and mesosphere
C **stratosphere and thermosphere** D mesosphere and thermosphere

13. Which statement best describes the stratosphere?

- A **It is warmer at the top than at the bottom.**
B It is located 75 kilometers above sea level.
C It has greater pressure at the top than at the bottom.
D It absorbs large amounts of water vapor from the troposphere.

14. In which two Earth regions is oxygen the second most abundant element by volume?

- A crust and hydrosphere B **hydrosphere and troposphere**
C troposphere and core D core and crust

15. Which element has the highest percentage by volume in the troposphere?

- A oxygen B **nitrogen**
C hydrogen D carbon dioxide
-

16. Which list shows atmospheric layers in the correct order upward from the Earth's surface?

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

17. As a stationary airmass is heated, its density will generally

- A decrease**
- B increase
- C remain the same

18. As altitude within the troposphere increases, the amount of water vapor generally

- A decreases, only**
- B increases, only
- C remains the same
- D decreases, then increases

19. What is the approximate elevation above sea level at which atmospheric pressure is 10^{-1} atmosphere?

- A 7.0 km
- B 17 km**
- C 27 km
- D 37 km

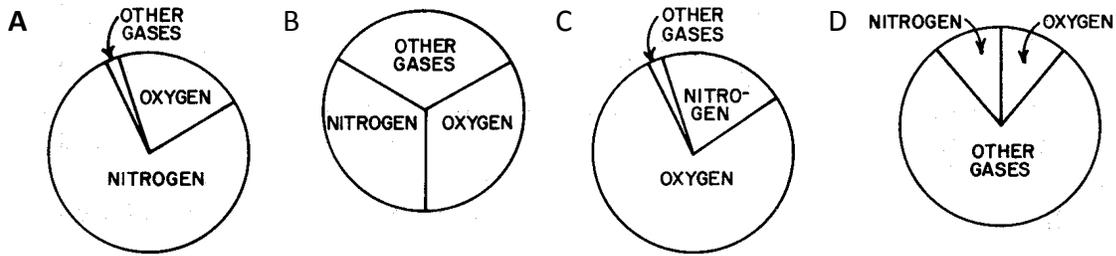
20. At an altitude of 95 miles above Earth's surface, nearly 100% of the incoming energy from the Sun can be detected. At 55 miles above Earth's surface, most incoming x-ray radiation and some incoming ultraviolet radiation can no longer be detected. This missing radiation was most likely

- A absorbed in the thermosphere**
- B absorbed in the mesosphere
- C reflected by the stratosphere
- D reflected by the troposphere

21. What do the tropopause, stratopause, and mesopause all have in common?

- A Each is a point of maximum temperature in its layer of the atmosphere.
 - B Each is an interface between two layers of the atmosphere.**
 - C Each is a region of increasing pressure within the atmosphere.
 - D Each is a zone of decreasing water vapor content within the atmosphere.
-

22. Which circle graph best represents the volume of gases in the troposphere?



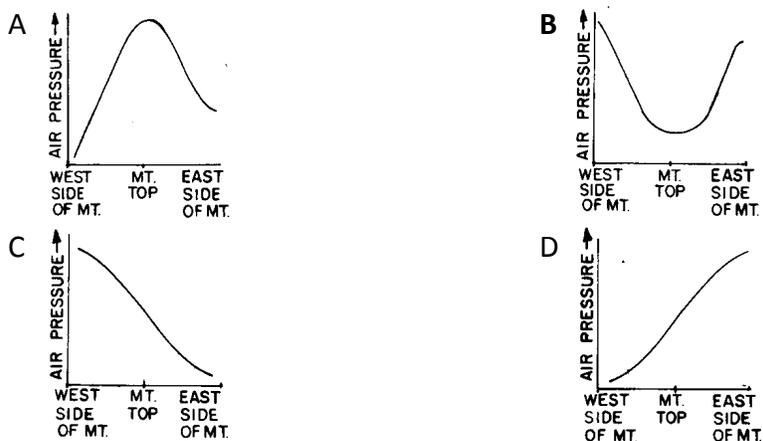
23. Why do most clouds form in the troposphere?

- A Air pressure rises with increasing altitude.
- B The dewpoint is too high in the other layers of the atmosphere.
- C The other layers of the atmosphere are too cold to contain water.
- D The lowest 11 km of the atmosphere contains almost all of the atmospheric water vapor.**

24. Earth's early atmosphere formed during the Early Archean Era. Which gas was generally absent from the atmosphere at that time?

- A water vapor
- B carbon dioxide
- C nitrogen
- D oxygen**

25. An observer recorded the barometric pressure while traveling up the west side of a mountain and down the other side. Which graph best represents the probable air pressure changes that were observed?



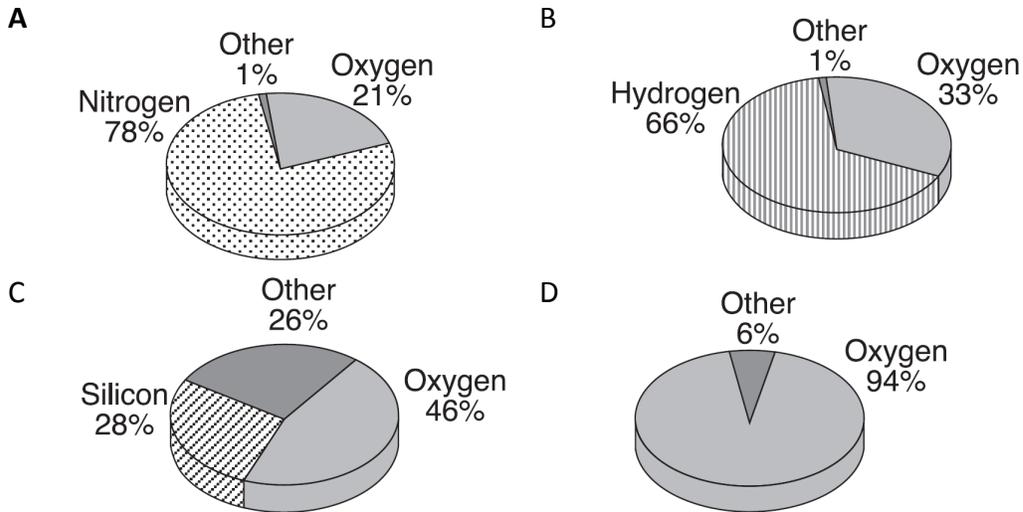
26. At what approximate altitude in the atmosphere can stratospheric ozone be found?

- A 10 km **B 30 km** C 70 km D 100 km

27. Most scientists believe Earth's Early Archean atmosphere was formed primarily by gases released from

- A stream erosion B chemical weathering
C volcanic eruptions D plant transpiration

28. Which pie graph correctly shows the percentage of elements by volume in Earth's troposphere?



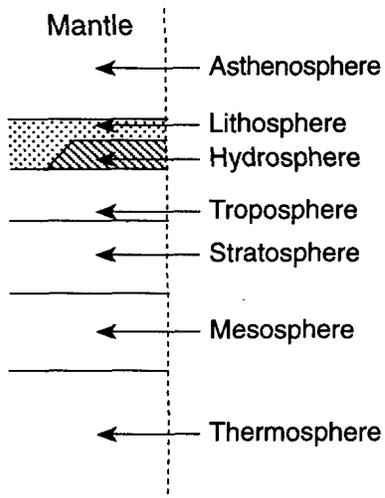
29. An air temperature of 95°C most often exists in which layer of the atmosphere?

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

30. As altitude increases from the tropopause to the mesopause, the atmospheric temperature will

- A decrease, only B increase, only
C decrease, then increase **D increase, then decrease**
-

31. The diagram below shows spheres associated with Earth.



(Not drawn to scale)

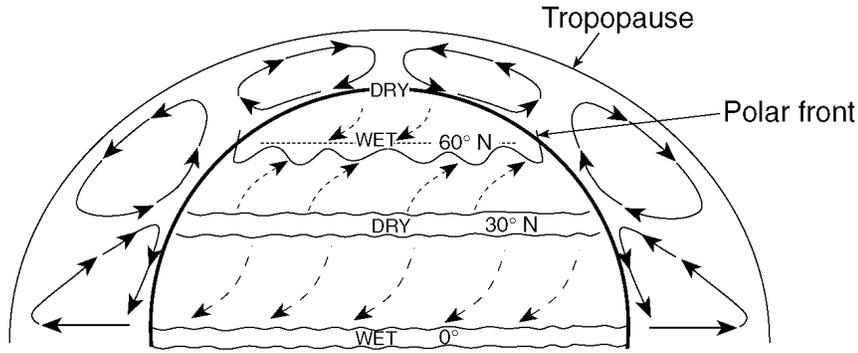
Which spheres are zones of Earth's atmosphere?

- A lithosphere, hydrosphere, and troposphere
- B stratosphere, mesosphere, and thermosphere**
- C asthenosphere, lithosphere, and hydrosphere
- D hydrosphere, troposphere, and stratosphere

32. The altitude of the ozone layer near the South Pole is 20 kilometers above sea level. Which temperature zone of the atmosphere contains this ozone layer?

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

33. Base your answer to the following question on the diagram below, which represents the planetary wind and moisture belts in Earth's Northern Hemisphere.



(Not drawn to scale)

The tropopause is approximately how far above sea level?

- A 12 mi **B 12 km** C 60 mi D 60 km

34. Earth's troposphere, hydrosphere, and lithosphere contain relatively large amounts of which element?

- A iron **B oxygen** C hydrogen D potassium

35. What is the approximate elevation of the stratopause?

- A 10 km B 30 km **C 50 km** D 80 km

36. Which temperature zone of Earth's atmosphere contains the most water vapor?

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

37. Ozone is concentrated in Earth's atmosphere at an altitude of 20 to 35 kilometers. Which atmospheric layer contains the greatest concentration of ozone?

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

38. Which statement most accurately describes the Earth's atmosphere?

- A **The atmosphere is layered, with each layer possessing distinct characteristics.**
- B The atmosphere is a shell of gases surrounding most of the Earth.
- C The atmosphere's altitude is less than the depth of the ocean.
- D The atmosphere is more dense than the hydrosphere but less dense than the lithosphere.

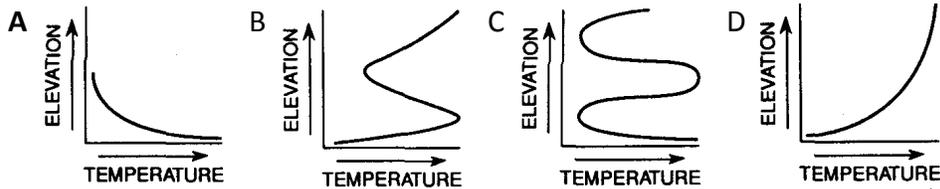
39. What is the approximate percent of oxygen by volume present in Earth's lower atmosphere?

- A **21%**
- B 33%
- C 46%
- D 94%

40. If atmospheric pressure measurements were taken at regular intervals from sea level to the stratopause, the measurements would most likely show that the pressure

- A **decreases, only**
- B increases, only
- C remains the same
- D decreases, then increases

41. Which graph best represents the relationship between air temperature and elevation in the troposphere?



45. If the base of a cloud is located at an altitude of 2 kilometers and the top of the cloud is located at an altitude of 8 kilometers, this cloud is located in the

A troposphere, only

B stratosphere, only

C troposphere and stratosphere

D stratosphere and mesosphere

Answer Key Earth's Atmosphere

1. B
 2. A
 3. C
 4. A
 5. A
 6. A
 7. D
 8. B
 9. B
 10. A
 11. A
 12. C
 13. A
 14. B
 15. B
 16. B
 17. A
 18. A
 19. B
 20. A
 21. B
 22. A
 23. D
 24. D
 25. B
 26. B
 27. C
 28. A
 29. D
 30. D
 31. B
 32. B
 33. B
 34. B
 35. C
 36. D
 37. D
 38. A
 39. A
 40. A
 41. A
 42. D
 43. A
 44. A
 45. A
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