6. The youngest parts of Earth's crust are
   the midocean rifts.

11. Earth possesses few visible craters and the moon possesses many. This is because
    the moon doesn't have an atmosphere that could burn up many of the meteorites before impacting.
    erosion and plate tectonics have slowly removed evidence of past cratering on Earth.

12. The Himalayan Mountains are rugged, jagged peaks and the Appalachians are smooth and rolling. Why is there a difference?
    The Appalachians are much older and have been smoothed by erosion.

13. The ozone layer is
    opaque to ultraviolet radiation.

22. Compared to the Earth, the moon is no longer geologically active because
    it is much smaller in mass.

23. The presence of breccias among the lunar rock samples shows that
    the lunar surface was fragmented by meteorite impacts.

27. The theory that Mercury shrank slightly when it was young has been proposed to explain
    lobate scarps.

30. ____ are believed to have formed on Mercury when the planet's interior cooled and shrank.
    Lobate scarps

32. Which of the following are not found on Venus?
    lobate scarps

33. The geology of Venus appears to be dominated by
    volcanism.

34. The surface of Venus has been studied
    using radar maps made from Earth.
    using radar maps made from satellites orbiting Venus.
    using spacecraft that have landed on the surface of Venus.

35. The greenhouse effect keeps Venus hot because
    the atmosphere is predominently carbon dioxide.

36. Measurements of the magnetic field of Venus reveal that the
    planet has no detectable magnetic field.

37. The flow patterns found on the surface of Mars and the number of craters on top of them suggest that
    the climate on Mars was different billions of years ago.

38. Which of the following supports the idea that the Martian crust is not divided into moving plates like those on Earth?

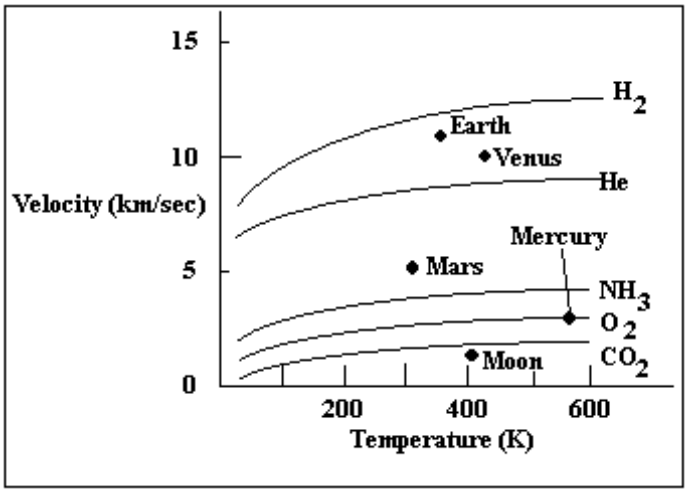
I. the size of Olympus Mons
II. the lack of folded mountain chains
III. the lack of rift valleys outlining entire plates
IV. the presence of dry river beds and sea floors

a. I & II
b. II & III
c. II, III & IV
d. I, II, & III
e. I, II, III, & IV

ANS: D PTS: 1

39. Coronae on Venus are believed to be
caused by rising convection currents in the interior of Venus.

41. The graph below plots the escape velocity of each planet along the vertical axis and its surface temperature along the horizontal. The lines plotted in the figure are the speeds of the fastest gas particles as a function of temperature for various gases. Which of the gases plotted in the diagram could be retained in the atmosphere of Mars?



a. only CO_2
b. only NH_3
c. CO_2, NH_3, and O_2
d. only H_2
e. H_2 and He

ANS: C PTS: 1

42. How rapidly a planet loses its atmosphere depends on the planet's

I. escape velocity (determined by mass and radius)
II. atmospheric composition
III. Temperature

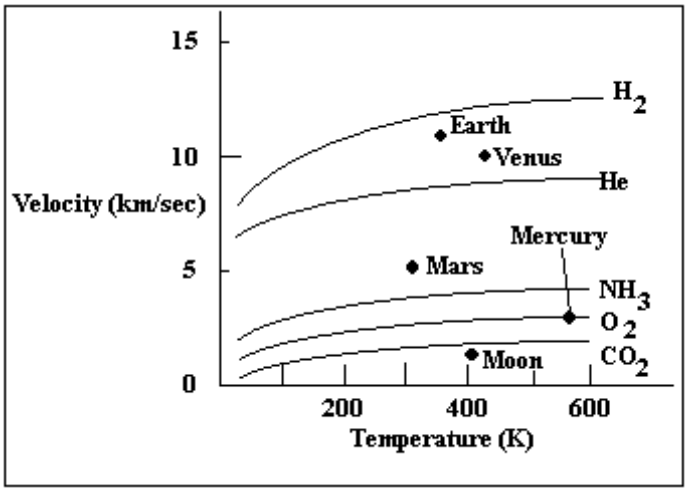
43. The crust of Mars is believed to ____ than Earth's.
    be much stronger

44. The moons of Mars are believed to be
    captured asteroids.

45. Mars has a sufficient mass and a low enough temperature that water molecules could exist in its atmosphere as vapor. One reason Mars' atmosphere does not contain a significant amount of water vapor is that
    Ultraviolet radiation breaks the water molecule into less massive particles that can escape.

46. ____ is a very long and deep canyon on Mars.
    Valles Marineris

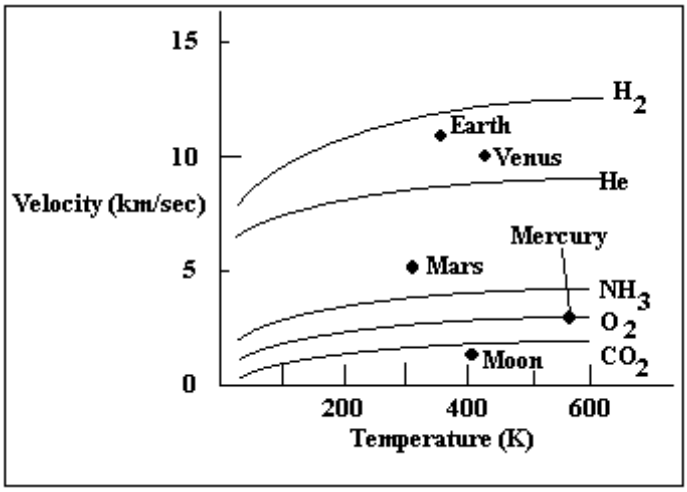
47. The graph below plots the escape velocity of each planet along the vertical axis and its surface temperature along the horizontal. The lines plotted in the figure are the average speeds of gas particles as a function of temperature for various gases. Which of the planets plotted in this diagram has the greatest escape velocity?



a. Mars
b. Moon
c. Mercury
d. Venus
e. Earth

ANS: E PTS: 1

48. The graph below plots the escape velocity of each planet along the vertical axis and its surface temperature along the horizontal. The lines plotted in the figure are the average speeds of gas particles as a function of temperature for various gases. Which of the planets or satellite plotted in this diagram is least able to hold an atmosphere?



a. Mars
b. Moon
c. Mercury
d. Venus
e. Earth

ANS: B PTS: 1

49. The extreme size of volcanoes on Mars indicates that
Mars has a much thicker crust than Earth.
large moving plates have not formed on Mars.

50. Besides Earth, which of the terrestrial planets and/or satellites of terrestrial planets show(s) evidence for the possible existence of liquid water flowing on its surface in the past?
Mars

51. Most terrestrial planets have portions of their surface that appear to be significantly older than other portions of their surface. What evidence suggests that the surface of Venus is all of the same age?

The craters on Venus are randomly distributed in size and number across the surface.

52. One hypothesis suggested to explain the uniform age of the surface of Venus is that

Venus periodically goes through a catastrophic melting of the entire surface.

53. The moon's distance from Earth is measured very accurately by bouncing a laser beam off of a small mirror left on the surface of the moon. If a laser is fired at the moon and the signal returns in 2.6 seconds, what is the distance to the moon?
a. 390,000 km
b. 390,000 m
c. 780,000 km
d. 780,000 m

ANS: A PTS: 1

56. Why does Mars have seasons similar to the Earth?
Mars' rotational axis is tilted relative to its orbit like the Earth's.

59. What do astronomers generally believe about the origin of Mars' moons?
    a. They formed with the planet out of the protoplanetary material.
    b. They formed elsewhere and were captured at a later time.
    c. They were ejected from Mars during its formation.
    d. They were once a single moon and a later catastrophic event broke them in two.

    ANS: B PTS: 1

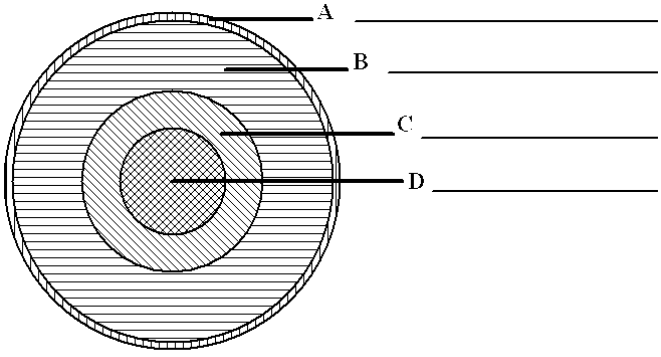
COMPLETION

1. _____ is responsible for absorbing ultraviolet radiation in Earth's upper atmosphere.

   ANS: Ozone

   PTS: 1

2. In the diagram below label each of the major divisions of Earth's interior.



Earth's Interior

   ANS: A: Crust, B: Mantle, C: Liquid Core, D: Solid Core

   PTS: 1

3. _____ waves are seismic waves that do not travel through Earth's liquid core.

   ANS:
   S
   Stress

   PTS: 1

4. The separation between Africa and Arabia is a(n) _____ valley.

   ANS: rift

   PTS: 1

5. The _____ hypothesis for the formation of the moon suggests that the moon and Earth formed from the same cloud of material and coalesced as two separate objects.

ANS: Condensation

PTS: 1

6. _____ are great lava flows covering 17% of the lunar surface.

ANS: Maria

PTS: 1

7. _____ formed as Mercury cooled and shrank.

ANS: Lobate scarps

PTS: 1

8. _____ is the molecule most responsible for the greenhouse effect on Venus and Earth.

ANS:
Carbon dioxide
(CO_2)

PTS: 1

9. The largest volcano found on one of the terrestrial planets is _____.

ANS: Olympus Mons

PTS: 1

10. The size of the volcanoes on Mars indicate that Mars has a(n) _____ crust than Earth.

ANS:
thicker
stronger

PTS: 1

11. The atmosphere of _____ contains acid compounds including sulfuric and hydrochloric acid.

ANS: Venus

PTS: 1

12. The largest satellite orbiting a terrestrial planet is _____.

ANS: Earth's moon

PTS: 1

13. The terrestrial planet with the oldest surface is _____.

ANS: Mercury

PTS: 1

14. The terrestrial planet with the most moons is _____.

ANS: Mars

PTS: 1

15. The terrestrial planet with the most effective greenhouse effect is _____.

ANS: Venus

PTS: 1

TRUE/FALSE

1. The Earth never passed through the cratering stage in planetary development.

ANS: F PTS: 1

2. The central part of Earth's core is solid.

ANS: T PTS: 1

3. The oldest parts of Earth's crust are located along the midocean rifts.

ANS: F PTS: 1

4. Earth's magnetic field is generated in the iron rich mantle.

ANS: F PTS: 1

5. Volcanism can occur in a midocean rift, above a hot spot in the mantle, or where one tectonic plate slides below another.

ANS: T PTS: 1

6. Earth's magnetic field has reversed itself.

ANS: T PTS: 1

7. Oxygen in Earth's atmosphere is outgassed in volcanic eruptions.

ANS: F PTS: 1

8. The greenhouse effect occurs because carbon dioxide is opaque to infrared radiation.

ANS: T PTS: 1

9. On the moon, the maria are younger than the highlands.

ANS: T PTS: 1

10. On the moon, the maria have fewer craters than the highlands.

ANS: T PTS: 1

11. The first Apollo missions to the moon found the maria to be plains of solid lava.

ANS: T PTS: 1

12. Fragmenting during meteorite impacts caused the vesicular basalts found among the lunar samples.

ANS: F PTS: 1

13. Fragmenting during meteorite impacts caused the breccias found among the lunar samples.

ANS: T PTS: 1

14. The moon stopped evolving because it is too small to have kept its internal heat.

ANS: T PTS: 1

15. Earth and the moon could not have condensed from the same materials because they have different densities and compositions.

ANS: T PTS: 1

16. We know Mercury must have a large metal core because it has a high density.

ANS: T PTS: 1

17. Mercury's smooth plains are probably the oldest parts of the crust.

ANS: F PTS: 1

18. Lobate scarps are believed to have formed on the moon when its interior cooled and shrank.

ANS: F PTS: 1

19. Flow channels on Venus suggest it was once rich in water.

ANS: F PTS: 1

20. Venus is very hot because its atmosphere is rich in carbon dioxide.

ANS: T PTS: 1

21. Outgassing produces gas rich in carbon dioxide, nitrogen, and water vapor.

ANS: T PTS: 1

22. Radar maps of Venus show impact craters.

ANS: T PTS: 1

23. Valles Marineris is a long valley on Mars believed to resemble the rift valleys of eastern Africa.

ANS: T PTS: 1

24. The canals of Mars were eventually found to be crustal faults.

ANS: F PTS: 1

25. The size of Olympus Mons suggests that the crust of Mars is very thick.

ANS: T PTS: 1

26. The absence of folded mountain ranges on Mars suggests that it has been subjected to plate tectonics.

ANS: F PTS: 1

27. Earth is the terrestrial planet with the largest moon.

ANS: T PTS: 1

ESSAY

1. Describe the four stages in the development of a terrestrial planet.

ANS:
Answer not provided.

PTS: 1

2. What evidence do we have that Earth has a molten core?

ANS:
Answer not provided.

PTS: 1

3. Why is volcanism associated with regions where one plate descends below another plate?

ANS:
Answer not provided.

PTS: 1

4. What is the difference between volcanism on Venus and that around the ring of fire on Earth?

ANS:
Answer not provided.

PTS: 1

5. Why is carbon dioxide important in maintaining a greenhouse effect?

ANS:
Answer not provided.

PTS: 1

6. Why is the ozone layer in Earth's atmosphere important to life on its surface?

ANS:
Answer not provided.

PTS: 1

7. Explain how we can determine the relative ages of lunar features.

ANS:
Answer not provided.

PTS: 1

8. What do the lunar rocks tell us about the origin of the lunar crust?

ANS:
Answer not provided.

PTS: 1

9. How do we know that the maria formed more recently than the highlands on the moon?

ANS:
Answer not provided.

PTS: 1

10. What does the presence of vesicular basalts and breccias among the lunar rock samples tell us about the history of the moon?

ANS:
Answer not provided.

PTS: 1

11. Describe the large impact theory of the Moon’s origin..

ANS:
Answer not provided.

PTS: 1

12. How do we know that the interior of the moon does not contain a large, molten core?

ANS:
Answer not provided.

PTS: 1

13. What evidence do we have that the crust of Mercury has been impacted in the past?

ANS:
Answer not provided.

PTS: 1

14. How is the greenhouse effect on Venus similar to the same effect on Earth?

ANS:
Answer not provided.

PTS: 1

15. Why did the atmosphere of Venus develop differently from that of Earth?

ANS:
Answer not provided.

PTS: 1

16. Discuss the evidence we have that the surface of Venus is marked by volcanism.

ANS:
Answer not provided.

PTS: 1

17. How did the four-stage history of Venus differ from that of Earth?

ANS:
Answer not provided.

PTS: 1

18. What evidence do we have that Mars once had a thicker atmosphere?

ANS:
Answer not provided.

PTS: 1

19. What evidence do we have that the surface of Mars has never divided into moving plates?

ANS:
Answer not provided.

PTS: 1

20. What factors determine the rate of loss of gases from a planet's atmosphere?

ANS:

Answer not provided.

PTS: 1

21. Explain how the surfaces of the terrestrial planets are similar. In what ways are they different?

ANS:
Answer not provided.

PTS: 1

22. Evaluate the evidence that Mars had a liquid water past.

ANS:
Answer not provided.

PTS: 1