

Directed Reading

EVEN

Section: The Outer Planets (27.4)

In the space provided, write the letter of the description that best matches the term or phrase.

- | | |
|------------------------|---|
| _____ 1. outer planets | a. a planet with a deep, massive gaseous atmosphere |
| _____ 2. asteroid belt | b. the planets that are farthest from the sun; include Jupiter, Saturn, Uranus, and Neptune |
| _____ 3. gas giant | c. a celestial body that is usually found past the orbit of Neptune |
| _____ 4. Pluto | d. a ring of debris that separates the inner planets from the outer planets |

GAS GIANTS

- _____ 5. How do the gas giants compare with the terrestrial planets?
- The gas giants are larger and denser.
 - The gas giants are larger and less dense.
 - The gas giants are smaller and denser.
 - The gas giants are smaller and less dense.
- _____ 6. Compared with the terrestrial planets, the gas giants
- have more gravity, which helps them retain gases.
 - have less gravity, which helps them retain gases.
 - have the same amount of gravity, which helps them retain gases.
 - have no gravity, which helps them retain gases.
- _____ 7. The thick atmosphere of the gas giants is made up of
- oxygen and hydrogen.
 - helium and carbon dioxide.
 - hydrogen and helium.
 - carbon dioxide and oxygen.
- _____ 8. The gas giants have ring systems that are made mostly of
- orbiting moons.
 - dust and icy debris.
 - comets.
 - asteroids and gases.

Directed Reading *continued*

JUPITER

9. Jupiter is the _____ planet from the sun.

10. Jupiter's mass is more than _____ times the mass of Earth.

11. How long is Jupiter's orbital period?

12. How often does Jupiter rotate on its axis?

13. Jupiter has at least 63 _____, 4 of which are the size of small planets.

14. How much of Jupiter's atmosphere is composed of hydrogen and helium?

15. Jupiter's composition is much like the composition of the _____.

16. Why did Jupiter not become a star?

17. What do Jupiter's unique bands of orange, gray, blue, and white suggest?

18. How do the bands form?

Directed Reading *continued*

19. Describe Jupiter's Great Red Spot.

20. What do Jupiter's high wind speeds tell scientists about the planet's weather?

21. How does Jupiter's large mass affect its interior temperature and pressure?

SATURN

_____ 22. What is Saturn's position from the sun?

- a. Saturn is the fourth planet from the sun.
- b. Saturn is the sixth planet from the sun.
- c. Saturn is the closest planet to the sun.
- d. Saturn is the farthest planet from the sun.

_____ 23. How long is Saturn's orbital period?

- a. 100 years
- b. 2,950 years
- c. 3 years
- d. 29.5 years

_____ 24. How many moons does Saturn have?

- a. at least 30
- b. at least 60
- c. at least 75
- d. at least 125

_____ 25. How large is Titan, Saturn's largest moon?

- a. half the diameter of Earth
- b. twice the diameter of Earth
- c. half the diameter of the sun
- d. twice the diameter of Venus

Directed Reading *continued*

26. Saturn, like the planet _____, is made up almost entirely of hydrogen and helium, and has a rocky iron core.
27. Saturn is the least _____ planet in the solar system.
28. Saturn is known for its _____, which are two times the planet's diameter.
29. Like Jupiter, Saturn has _____ of colored clouds.
30. How often does Saturn rotate on its axis?

31. NASA's _____ spacecraft will orbit Saturn for many years to gather information about the planet and its moon Titan.

URANUS

32. Uranus is the _____ planet from the sun and the third largest planet in the solar system.
33. Why is Uranus a difficult planet to study?

34. Uranus has at least _____ moons and at least 12 thin rings.
35. The orbital period of Uranus is almost _____ years.
36. Although most planets rotate with their axis perpendicular to their orbital plane, Uranus's axis is almost _____ to its orbital plane.
37. How often does Uranus rotate?

38. Uranus's blue-green color indicates that its atmosphere may contain significant amounts of _____, in addition to hydrogen and helium.

Directed Reading *continued*

NEPTUNE

39. Neptune is the _____ planet from the sun and is similar to Uranus in size and mass.

40. Neptune's orbital period is nearly 164 years, and it rotates about every _____

41. Neptune's existence was _____ before it was actually discovered.

42. How was Neptune's existence predicted before the planet was actually discovered?

43. What gases make up Neptune's atmosphere?

44. What have images taken by *Voyager 2*, the *Hubble Space Telescope*, and telescopes on Earth told us about Neptune's weather?

OBJECTS BEYOND NEPTUNE

45. Pluto is now defined as a _____

46. Pluto's orbit is an unusually elongated and tilted _____

47. How does Pluto compare with other objects in the solar system in terms of its size and distance from the sun?

Directed Reading *continued*

48. Describe Pluto's composition.

49. Describe the Kuiper Belt.

50. Name two objects that have been found beyond Pluto.

EXOPLANETS

51. Define *exoplanet*.

52. Exoplanets cannot be directly observed through telescopes or satellites. How do scientists know they exist?

53. Where are large exoplanets located with respect to their stars?
