

Directed Reading

28.4 (EVEN)

Section: Asteroids, Comets, and Meteoroids

1. In addition to the sun, planets, and their moons, what other bodies exist in the solar system? What sizes are they?

ASTEROIDS

- _____ 2. What are asteroids?
- small stars outside the solar system
 - rocky bodies that orbit the planets
 - fragments of rock that orbit the sun
 - small bodies of rock and ice with tails
- _____ 3. Most asteroids are found in the asteroid belt located
- between the orbits of Mars and Jupiter.
 - beyond the orbit of Neptune.
 - in orbit around Earth.
 - between the orbits of Mercury and Venus.
- _____ 4. Concentrated in groups just ahead of and just behind Jupiter as it orbits the sun are the
- Martian asteroids.
 - Roman asteroids.
 - Turkish asteroids.
 - Trojan asteroids.
- _____ 5. The composition of asteroids is similar to that of the
- inner planets.
 - gas giants.
 - comets.
 - outer planets.
- _____ 6. For what reason do many astronomers think that asteroids in the asteroid belt were not able to form a planet?
- because of the strong gravitational force of Mars
 - because of the strong gravitational force of Jupiter
 - because of the tidal forces of the outer planets
 - because of the inertia of the inner planets

Directed Reading *continued*

7. The total mass of all asteroids, including that of the largest, is estimated to be less than the mass of
- a. both of Mars's moons.
 - b. Earth's moon.
 - c. the head of a comet.
 - d. the *Voyager* spacecraft.

Use the terms from the list below to complete the sentences that follow. Each term may be used only once. Some terms may not be used.

- | | | |
|-----------|----------|-------------|
| Mars | ellipses | carbon |
| iron | planets | asteroids |
| silicates | Ceres | composition |

8. The largest of the minor bodies in the solar system are _____.
9. The orbits of asteroids, like those of the planets, are _____.
10. The largest known asteroid, _____, has a diameter of about 1,000 km.
11. The closest asteroids to the sun are inside the orbit of _____.
12. Asteroids are classified according to their _____.
13. Asteroids composed of nickel and _____ have a shiny and metallic appearance.
14. Another group of asteroids is made mostly of _____, which gives them a dark color.
15. What are near-Earth asteroids?
- _____
- _____
- _____
16. Why has interest in near-Earth asteroids increased in recent years?
- _____
- _____
- _____

Directed Reading *continued*

17. What do scientists hope to accomplish by identifying and monitoring near-Earth asteroids?

COMETS

- _____ 18. What is a comet?
a. a natural body that revolves around a planet
b. a ring of pieces of rock and ice around a planet
c. the largest of the smaller bodies in the solar system
d. a small body of ice, rock, and cosmic dust that orbits the sun
- _____ 19. What kind of orbit do comets follow?
a. fast
b. slow
c. circular
d. elliptical
- _____ 20. Halley's comet passes by Earth in its orbit every
a. month.
b. year.
c. 76 years.
d. 67 years.
- _____ 21. A comet's spectacular tails form when
a. sunlight changes the comet's ice to gas.
b. sunlight is reflected from the coma.
c. moonlight is reflected from the comet.
d. gravity pulls gas from the comet.

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

- | | |
|---------------------|---|
| _____ 22. nucleus | a. streams from the comet's head and always points away from the sun |
| _____ 23. coma | b. is composed of rock, metals, and ice metals |
| _____ 24. head | c. is made up of the nucleus and coma |
| _____ 25. ion tail | d. curves backward along the comet's orbit |
| _____ 26. dust tail | e. surrounds the nucleus in a spherical cloud of gas dust and reflects sunlight |

Directed Reading *continued*

27. What is the name of the ring of icy bodies that lies beyond Neptune's orbit?

28. Name two bodies located in the Kuiper Belt.

29. Describe the Oort cloud.

30. Where is the Oort cloud located?

31. The gravity of a star that passes near the solar system may cause a comet to fall into a more elliptical _____ around the sun.

32. What is the difference between long-period and short-period comets?

33. What has forced some comets that originated in the Kuiper Belt outward into the Oort cloud?

34. Give an example of a short-period comet.

Directed Reading *continued*

METEORIDS

35. What are meteoroids?

36. How do scientists think that most meteoroids originate?

37. What happens when a meteoroid enters Earth's atmosphere?

38. Why do meteor showers occur at about the same time each year?

Directed Reading *continued*

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

- | | |
|--------------------------------|---|
| _____ 39. meteor | a. a meteoroid that vaporizes very quickly in a brilliant flash of light |
| _____ 40. shooting star | b. a bright streak of light that results when a meteoroid burns up in Earth's atmosphere |
| _____ 41. fireball | c. a meteorite similar in composition to rocks on Earth that may contain carbon compounds |
| _____ 42. meteor shower | d. the rarest type of meteorite; contains iron and stone |
| _____ 43. meteorite | e. a meteoroid or any part of a meteoroid that is left when it hits Earth |
| _____ 44. stony meteorite | f. a meteorite with a distinctive metallic appearance |
| _____ 45. iron meteorite | g. a common name for a meteor |
| _____ 46. stony-iron meteorite | h. a large number of small meteoroids entering Earth's atmosphere in a short period of time |

47. Where do astronomers think that most meteorites come from?

48. Why are the oldest meteorites important?

49. Where do some rare meteorites originate?

50. According to computer simulations, how do these rare meteorites reach Earth?

