

Our Solar System

SECTION 28.1 Solar System Overview

In your textbook, read about early ideas.

Write the letter of the term from Column B next to its matching item in Column A.

Column A

Column B

- | | |
|---|----------------------|
| _____ 1. Motion of a planet moving in the opposite direction of the normal direction of planetary motion as observed from Earth | a) Planetesimal |
| _____ 2. Objects that collided and merged to form other various objects in the solar systems | b) Heliocentric |
| _____ 3. Nicolaus Copernicus's model of the solar system in which the planets orbit the Sun | c) Retrograde |
| _____ 4. Oval shape centered on two points instead of one point | d) Ellipse |
| _____ 5. Point in a planet's orbit when it is closest to the Sun | e) Geocentric |
| _____ 6. Defines a planet's elliptical orbit as the ratio of the distance between the foci and the length of the major axis | a) Asteroid |
| _____ 7. Unit of measure that is the average distance between the Sun and Earth (1.4960×10^8 km) | b) Perhelion |
| _____ 8. Large rock in space mainly between the planets Mars and Jupiter | c) Astronomical Unit |
| | d) Eccentricity |
| | e) comet |

In your textbook, read about gravity and orbits.

Use each of the terms below just once to complete the passage.

Questions 8-11 [select from the four choices below]

- a) moon b) Force c) Newton d) acceleration e) Galileo

English scientist (8) _____ developed an understanding of gravity by observing the motion of the (9) _____, the orbits of the planets, and the (10) _____ of falling objects on Earth. He learned that two bodies attract each other with a (11) _____ that depends on their (12) _____ and the (13) _____ between the bodies. This is called the law of (14) _____. He also determined that each planet orbits a point between itself and the Sun. That point is called the (15) _____.

SELECTION begins
below



Questions 12-15 [select from the four choices below]

- a) Center of Mass b) Universal Gravitation c) Distance d) Speed e) masses

SECTION 28.1 Solar System Overview, continued

In your textbook, read about collapsing interstellar clouds and Sun and planet formation.

Write the letter of the item in Column B next to its matching item in Column A.

Column A

- _____ 16. Gas and dust from which stars and planets form
- _____ 17. Force that pulls matter together
- _____ 18. Solid bodies hundreds of kilometers in diameter that merged to form the planets
-
- _____ 19. Believed to be the first large planet to develop
- _____ 20. Main element in early interstellar clouds
- _____ 21. Lacking in satellites because of proximity to the Sun

Column B

- a) Planetesimals
- b) Intersellar clouds
- c) Roche Limit
- d) Gravity
-
- a) Jupiter
- b) outer planets
- c) inner planets
- d) hydrogen

In your textbook, read about asteroids.

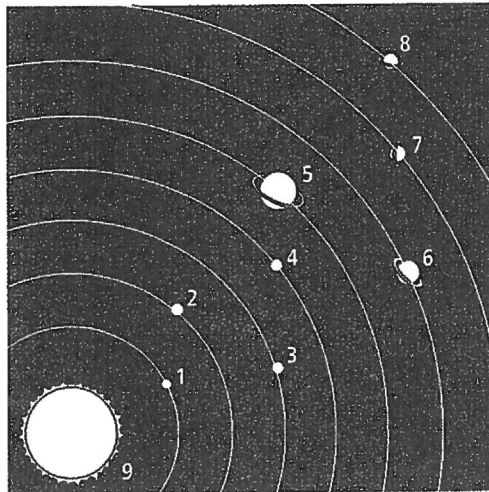
For each statement, write *true* or *false*. a= TRUE b= FALSE

- _____ 22. The Sun formed outside the rotating interstellar cloud.
- _____ 23. Most asteroids are located between the orbits of Mars and Jupiter in the asteroid belt.
- _____ 24. Asteroids are thought to be planetesimals that never formed planets.

Understanding Main Ideas (Part B)

Label the diagram of our solar system by writing the name of each body next to its number. Note that the diagram is not to scale.

1 and draw the symbol

The Solar System

25. Figure 1. _____
26. Figure 2. _____
27. Figure 3. _____
28. Figure 4. _____
29. Figure 5. _____
30. Figure 6. _____
31. Figure 7. _____
32. Figure 8. _____
33. Figure 9. _____

Answer the following questions.

34. . Which are the terrestrial planets?

- (A) Figures 1 to 4 (B) Figures 5 to 8 (C) all EVEN number Figures (D) all ODD number Figures

35. i. Which are the gas giant planets?

- (A) Figures 1 to 4 (B) Figures 5 to 8 (C) all EVEN number Figures (D) all ODD number Figures

36. . Which planet has a reddish color caused by a high iron content?

- (A) Figure 2 (B) Figure 4 (C) Figure 6 (D) Figure 8

37. Which planet has the largest mountain in our solar system? What is this mountain called?

- (A) Figure 2 (B) Figure 3 (C) Figure 4 (D) Figure 5

38. Which planet Figure would float because its density is less than water?

- (a) Figure 1 (b) Figure 5 (c) Figure 6 (d) Figure 7 (e) Figure 8

39. Which planet Figure DOESNOT have rings around the planet?

- (a) Figure 4 (b) Figure 5 (c) Figure 6 (d) Figure 7 (e) Figure 8

40. Which planet Figure has the Largest Moon orbiting it?

- (a) Figure 3 (b) Figure 9 (c) Figure 6 (d) Figure 5 (e) Figure 8

41. Which planet Figure has a natural satellite orbiting it?

- (a) all but Figures 1 & 8 (c) all but Figures 2 & 4
 (c) all but Figures 1 & 2 (d) all but Figures 3 & 2

Think Critically

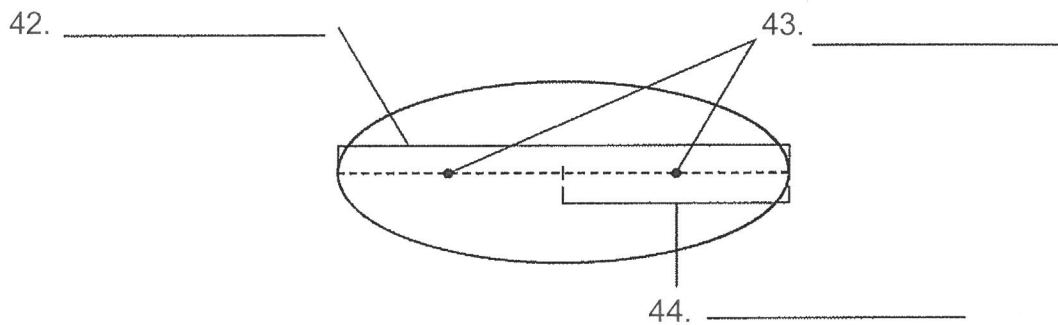
Planetary Motion

Kepler's laws of planetary motion demonstrate that each planet's orbit around the Sun sweeps out in a shape called an ellipse, rather than a circle. This means that a planet does not maintain a constant distance from the Sun. Kepler found that an imaginary line between the Sun and a planet sweeps out equal amounts of area in equal amounts of time. Kepler also discovered a mathematical relationship between the size of a planet's ellipse and its orbital period.

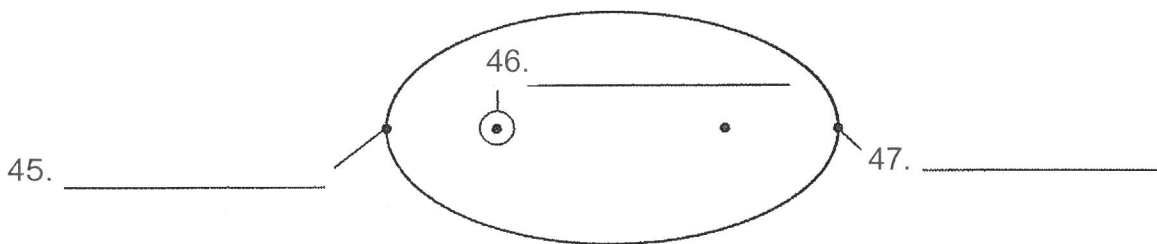
Use the terms below to Label the diagram by selecting the BEST answer for each question:

- (a) Foci (b) semimajor axis (c) Major axis (d) Aphelion

Elliptical Orbit of a Planet



Orbit of Pluto



Use the terms below to Label the above diagram by selecting the BEST answer for each question:

- (a) Perihelion (b) Sun (c) Major axis (d) Aphelion (e) Semimajor axis

SECTION 28.2 Inner Planets

In your textbook, read about Mercury and Venus.

Circle the letter of the choice that best completes the statement or answers the question.

1. The four inner planets of our solar system are
 - a. gas giant planets.
 - b. interplanetary asteroids.
 - c. terrestrial planets.
 - d. meteorites.
2. The closest planet to the Sun is
 - a. Venus.
 - b. Mercury.
 - c. Mars.
 - d. Earth.
3. How many times bigger than Mercury is Earth?
 - a. two times
 - b. three times
 - c. four times
 - d. five times
4. The surface of Mercury is similar to the surface of
 - a. Earth.
 - b. the Moon.
 - c. Venus.
 - d. Mars.
5. Observations of Mercury suggest that it was originally much larger, with a mantle and crust similar to that of
 - a. Earth.
 - b. the Moon.
 - c. Venus.
 - d. Mars.
6. The brightest planet in Earth's nighttime sky is
 - a. Mercury.
 - b. the Moon.
 - c. Venus.
 - d. Mars.
7. One day on Venus is equal to how many days on Earth?
 - a. 243 days
 - b. 43 days
 - c. 143 days
 - d. 4 days
8. In the 1960s, radar measurements showed that the surface of Venus is very hot and that it is
 - a. rotating quickly.
 - b. orbiting quickly.
 - c. rotating slowly.
 - d. orbiting slowly.
9. Venus's spin is an example of
 - a. retrograde motion.
 - b. backward rotation.
 - c. retrograde rotation.
 - d. backward motion.
10. The atmosphere of Venus is mostly
 - a. nitrogen and oxygen.
 - b. sodium.
 - c. oxygen.
 - d. carbon dioxide and nitrogen.

In your textbook, read about Earth and Mars.

For each statement below, write *true* or *false*.

- _____ 11. Earth's distance from the Sun and its nearly circular orbit allow water to exist on its surface as a solid, liquid, and gas.
- _____ 12. Earth's atmosphere is moderately dense and is composed of 78 percent oxygen and 21 percent nitrogen.
- _____ 13. Only Earth has a greenhouse effect.
- _____ 14. Mars is referred to as the red planet as a result of its high iron content and reddish appearance.
- _____ 15. Mars's atmosphere is similar to that of Venus, and it has a strong greenhouse effect.
- _____ 16. The southern hemisphere of Mars is dominated by sparsely cratered plains.

SECTION 28.3 *The Outer Planets, continued*

In your textbook, read about Uranus, Neptune, and Pluto.

For each statement, write true or false. Mark "A" for TRUE ; "B" for FALSE

- _____ 30. Uranus was discovered accidentally in 1781.
- _____ 31. Today, we are certain that Uranus has no moons and 15 rings.
- _____ 32. Most of Uranus's atmosphere is composed of helium and hydrogen, which causes its atmosphere to reflect blue light back into space.
- _____ 33. Uranus has a large, solid core that extends almost to the planet's surface.
- _____ 34. The rotational axis of Uranus is tipped over so far that the north pole almost lies in its orbital plane.
- _____ 35. Saturn is the only planet with rings.
- _____ 36. Uranus's tilt and its great distance from the Sun result in seasons on Uranus that last about 21 Earth years.
- _____ 37. Until 1994, Neptune had a persistent storm, the Great Dark Spot, with characteristics similar to Jupiter's Great Red Spot.
- _____ 38. Neptune's largest moon, Triton, has a retrograde orbit, which means it orbits like every other satellite in the solar system.
- _____ 39. Triton has nitrogen geysers and a thin atmosphere.
- _____ 40. Neptune's six rings are composed of microscopic dust particles.
- _____ 41. Neptune has a cloud-streaked atmosphere like Jupiter.

SECTION 28.4 Formation of Our Solar System

In your textbook, read about the other objects in the solar system. Mark "A" for TRUE ; "B" for FALSE

- _____ 42. A meteoroid is a broken fragment of an asteroid or other interplanetary material.
- _____ 43. A meteor is a meteoroid that bypasses Earth's atmosphere.
- _____ 44. A large meteorite will cause an impact crater when it collides with Earth.
- _____ 45. Pluto is not classified as a terrestrial planet because of its low density and small size.
- _____ 46. Pluto is larger than Earth and is made of ice.
- _____ 47. Like Earth's Moon, Pluto has no atmosphere.
- _____ 48. The orbit of Pluto is a perfect circle.
- _____ 49. Pluto and its moon Charon are in a synchronous rotation with each other.
- _____ 50. Pluto's properties more closely resemble those of the gas giants' large moons than of the other planets.

skip What happens when a comet comes within 3 AU of the Sun?

skip What is a periodic comet? Give an example.

skip What is a meteor shower?
