

Chapter 20 The Solar System

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SECTION 20-1

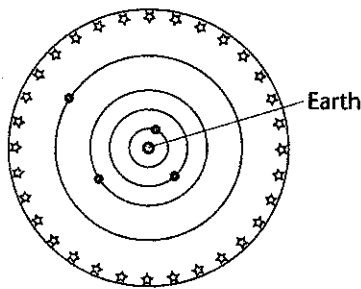
REVIEW AND REINFORCE

Observing the Solar System

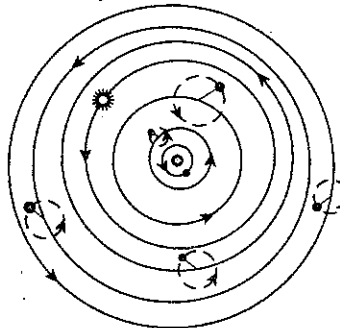
◆ Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

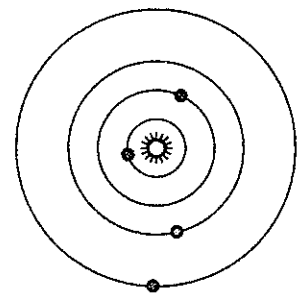
Ancient Greek Model



Ptolemy's Geocentric Model



Copernicus' Heliocentric Model



1. What is the main difference between the geocentric and heliocentric models of planetary motion?

2. What was Ptolemy trying to explain in his model by having the planets move on smaller circles that move on bigger circles?

3. How did Galileo's observations of Jupiter and Venus support Copernicus' model?

4. How do gravity and inertia keep the planets in orbit around the sun?

◆ Building Vocabulary

Fill in each blank to complete each statement.

5. The sun-centered system of planets developed by Copernicus is an example of a(n) _____ model.
6. Kepler discovered that the orbit of each planet is a(n) _____ rather than a circle.
7. An object's _____ tends to keep a moving object continuing in a straight line and a stationary object in place.
8. An Earth-centered system of planets is known as a(n) _____ model.

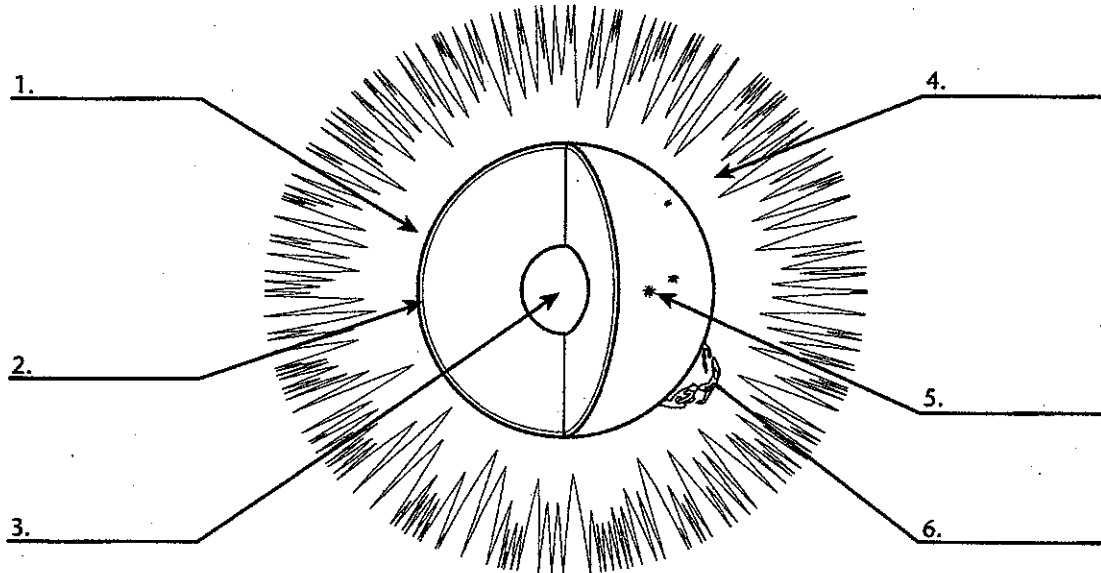
SECTION 20-2

REVIEW AND REINFORCE

The Sun

◆ Understanding Main Ideas

Label the diagram of the sun below.



◆ Building Vocabulary

Match each term with its description by writing the letter of the correct description on the line beside the term.

_____ 7. solar flare

_____ 8. core

_____ 9. chromosphere

_____ 10. sunspot

_____ 11. corona

_____ 12. nuclear fusion

_____ 13. photosphere

_____ 14. solar wind

_____ 15. prominence

a. the layer of the sun's atmosphere that makes light

b. the layer of the sun's atmosphere that has a reddish glow

c. the layer of the sun's atmosphere that looks like a halo during an eclipse

d. areas of gas on the sun that are cooler than the gases around them

e. reddish loops of gas that link parts of sunspot regions

f. explosions that occur when the loops in sunspot regions suddenly connect

g. a stream of particles produced by the corona

h. the center of the sun

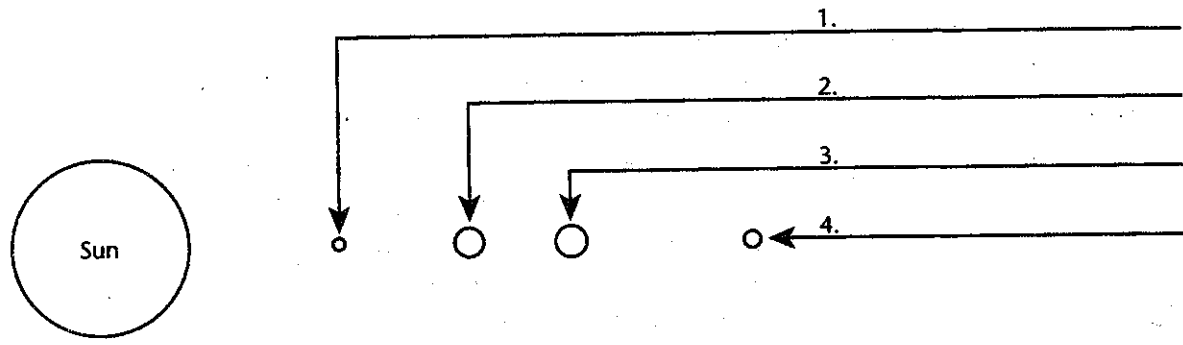
i. the joining of hydrogen atoms to form helium

SECTION 20-3 REVIEW AND REINFORCE

The Inner Planets

◆ Understanding Main Ideas

Label the diagram with the names of the inner planets.



Write the planet or planets the statement describes.

- _____ 5. has a rocky surface
- _____ 6. 70 percent is covered with water
- _____ 7. rotates in the opposite direction from most other planets and moons
- _____ 8. called the "red planet" because of the color of the dust
- _____ 9. has at least one moon
- _____ 10. similar to each other in size, density, and internal structure
- _____ 11. has almost no atmosphere
- _____ 12. atmosphere so heavy and thick that it would crush a human
- _____ 13. has a tilted axis so that the planet has seasons
- _____ 14. atmosphere has low air pressure and is mostly carbon dioxide

◆ Building Vocabulary

Write a definition for each of the following terms.

- 15. terrestrial planets

- 16. retrograde rotation

- 17. greenhouse effect

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SECTION 20-4

REVIEW AND REINFORCE

The Outer Planets

◆ Understanding Main Ideas

Answer the following questions in the spaces provided.

1. What are the five outer planets?

2. Which planets are the gas giants?

3. What are the two main differences between Pluto and the gas giants?

4. Why doesn't the gas on a gas giant escape into space, as it has on Mercury?

5. What object in the solar system has a composition similar to that of the gas giants?

6. What planet is by far the most massive of all the planets that revolve around the sun?

7. What are Saturn's rings made of?

8. Why did astronomers know where to look to discover Neptune?

9. Why do astronomers sometimes consider Pluto and its moon, Charon, to be a double planet?

◆ Building Vocabulary

Write a definition for the following term in the space provided.

10. gas giant

SECTION 20-5

REVIEW AND REINFORCE

Comets, Asteroids, and Meteors

◆ Understanding Main Ideas

Complete the following table.

Object	Description	Location/Movement
Asteroid		
Comet		
Meteoroid		

Answer the following questions on a separate sheet of paper.

1. Explain what happens to a meteoroid in order for it to become a meteorite.
2. Describe these parts of a comet: head, nucleus, coma, tail.
3. How can you tell a meteor from a comet?

◆ Building Vocabulary

From the list below, choose the term that best completes each sentence.

- asteroid asteroid belt comet
 meteor meteoroid meteorite

4. When a meteoroid enters Earth's atmosphere, friction causes it to burn up and produce a streak of light called a(n) _____.
5. A chunk of ice and dust whose orbit is usually a long narrow ellipse is a(n) _____.
6. If a meteoroid hits Earth's surface, it is called a(n) _____.
7. An object that revolves around the sun, but is too small to be considered a planet, is a(n) _____.
8. A chunk of rock or dust in space that usually comes from a comet or an asteroid is called a(n) _____.
9. The region of the solar system between the orbits of Mars and Jupiter is known as the _____.

SECTION 20-6 REVIEW AND REINFORCE

Is There Life Beyond Earth?

◆ Understanding Main Ideas

Answer the following questions in the spaces provided.

1. What are three characteristics that all living things on Earth have in common?

2. What does the phrase "Goldilocks conditions" refer to?

3. What are the three "Goldilocks conditions"?

4. Scientists have discovered unusual life forms on Earth such as animals that live in the ocean at very high pressure in the dark and others that get their energy from chemicals. Using this information, what do scientists infer about the conditions necessary for life on other planets?

5. Spacecraft sent to Mars have found regions on the surface of Mars that look like stream beds. Why do these regions lead scientists to hypothesize that there may have once been life on that planet?

6. Why do scientists think that Europa might have the conditions for life to develop?

◆ Building Vocabulary

Write a definition for the following term in the space provided.

7. extraterrestrial life

Name: _____

Class: _____

Choose the letter of the correct answer.

1. The model in which Earth is at the center of the system of planets is called the
[A] Copernican system. [B] heliocentric system.
[C] geocentric system. [D] solar system.
2. What solar feature can increase the solar wind, sometimes causing electrical power problems on Earth?
[A] sunspots [B] core emissions [C] prominences [D] solar flares
3. What do the first four outer planets have in common?
[A] They are much larger than Earth and are solid.
[B] They are about the same size as Earth and do not have solid surfaces.
[C] They are about the same size as Earth and are solid.
[D] They are much larger than Earth and do not have solid surfaces.
4. The heliocentric system gained support when Galileo observed that
[A] Venus goes through phases similar to those of Earth's moon.
[B] most of the smaller planets are closer to the sun.
[C] the orbit of each planet is an ellipse. [D] one side of the moon always faces Earth.
5. Europa is considered a good place to look for life because
[A] its equator has tropical temperatures. [B] there may be liquid water under its icy crust.
[C] it is the same size as Earth. [D] volcanic activity keeps it warm.
6. The asteroid belt is located
[A] between Saturn and Uranus. [B] between Earth and Mars.
[C] between Mars and Jupiter. [D] between Jupiter and Saturn.
7. When a meteoroid enters Earth's atmosphere, it produces a streak of light called a
[A] meteor. [B] comet. [C] meteorite. [D] asteroid.
8. Aside from Earth, which inner planet once had water on its surface?
[A] Mercury [B] Europa [C] Venus [D] Mars

Choose the letter of the correct answer.

9. There is enough fuel in the sun to last for about another
[A] 1 billion years. [B] 10 billion years. [C] 5 billion years. [D] 15 billion years.

Fill in the word or phrase that best completes the statement(s).

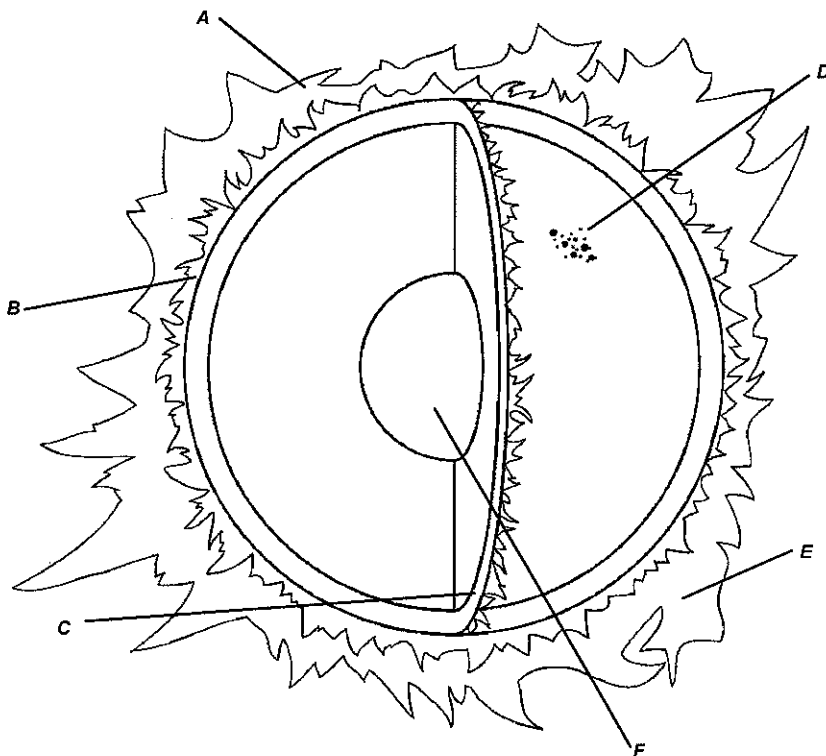
10. Kepler discovered that Mars' orbit is a(n) _____.
11. Of all the planets, only _____ is known to have liquid water.
12. A loop of gas that links different parts of sunspot regions is a _____.
13. Regions on the surface of Mars have patterns that appear to have been made by _____.
14. When a large _____ strikes Earth, it can create a crater.
15. If life were found on other worlds, it would be called _____.
16. Few comets pass near Earth because their _____ are so elliptical.
17. The force that pulls the moon toward Earth is called _____.

If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

18. Europa's surface is made of liquid water.
19. Four of the inner planets are gas giants.
20. A comet or asteroid can break up to form a chunk of rock called a meteoroid.
21. The part of the sun that can be seen in a photograph is the photosphere.
22. The inner planets are large and have rocky surfaces.
23. Sunspots are areas on the sun that are hotter than the gases surrounding them.
24. Chunks of ice and dust that usually have long elliptical orbits are called meteors.

Use the diagram to answer the question(s).

Layers of the Sun



Write an answer to the following question(s).

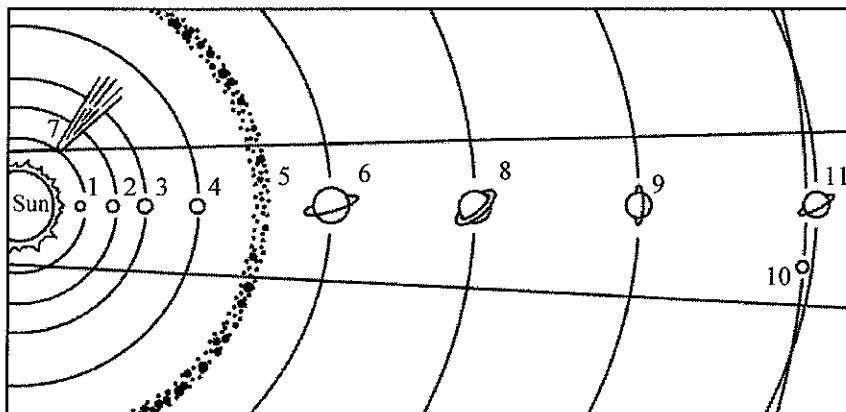
28. What are two reasons the sun is important?
29. Explain why the outer planets did not lose the gases in their atmospheres.
30. Describe the differences among a meteoroid, a meteor, and a meteorite.

25. Identify the objects in area D. Explain why they appear to be darker than the other parts of the sun.

Use the diagram to answer the question(s).

The Solar System

Not to scale



26. Explain how inertia and gravity combine to keep the planets in their orbits.
27. What objects are found at 5? Why are they not considered to be planets?

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