Name _____ Class _____ Date _____

CHAPTER 29 STUDY GUIDE FOR CONTENT MASTERY

Our Solar System

SECTION 29.1 *Overview of Our Solar System*

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.** aphelion
_____	**2.** Point in a planet's orbit when it is farthest from the Sun	**b.** astronomical unit
_____	**3.** Nicolaus Copernicus's model of the solar system in which the planets orbit the Sun	**c.** eccentricity
_____	**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.** heliocentric
_____	**6.** Defines a planet's elliptical orbit as the ratio of the distance between the foci and the length of the major axis	**f.** perihelion
_____	**7.** Unit of measure that is the average distance between the Sun and Earth (1.4960×10^8 km)	**g.** retrograde

In your textbook, read about gravity and orbits.
Use each of the terms below just once to complete the passage.

acceleration	**center of mass**	**distance**	**force**
Isaac Newton	**masses**	**Moon**	**universal gravitation**

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)** _____.

SECTION 29.2 *The Terrestrial 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. **c.** terrestrial planets.
   b. interplanetary asteroids. **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. **c.** oxygen.
    b. sodium. **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.** The wobble in Earth's rotational axis is called precession.

_____ **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 29.3 *The Gas Giant Planets*

In your textbook, read about Jupiter and Saturn.
Circle the letter of the choice that best completes the statement or answers the question.

1. What percentage of all planetary matter in the solar system is in Jupiter's mass?
   a. 40% **b.** 60% **c.** 50% **d.** 70%
2. Galileo discovered Jupiter's
   a. rings. **c.** four major satellites.
   b. 12 smaller satellites. **d.** Great Red Spot
3. Elements in the Jovian atmosphere remain in
   a. only liquid form. **c.** only gas form.
   b. both gas and liquid forms. **d.** gas, liquid, and solid forms.
4. The form of hydrogen that has properties of both a liquid and a metal is
   a. liquid metallic hydrogen. **c.** liquid hydrogen.
   b. magnetic hydrogen. **d.** electric hydrogen.
5. Jupiter spins once on its axis in a little less than
   a. 5 hours. **b.** 12 hours. **c.** 10 hours. **d.** 2 hours.
6. Low, warm, dark-colored, sinking clouds in Jupiter's atmosphere are known as
   a. belts. **c.** zones.
   b. the Great Red Spot. **d.** rings.
7. Jupiter's four moons are composed of
   a. clouds. **b.** ice and rock. **c.** hydrogen and oxygen. **d.** ice.
8. What is Jupiter's Great Red Spot?
   a. a surface ocean **c.** an atmospheric storm
   b. a large moon **d.** an ice cap
9. Which of Jupiter's moons is almost completely molten inside?
   a. Io **b.** Europa **c.** Ganymede **d.** Callisto
10. Saturn's average density is lower than that of
    a. helium. **b.** hydrogen. **c.** water. **d.** methane.
11. The ringlets and open gaps in Saturn's rings are caused by the gravitational effects of
    a. Saturn. **c.** Saturn's moons.
    b. Jupiter. **d.** the Sun.
12. Many astronomers hypothesize that Saturn's rings were formed from
    a. debris left over from the formation of Saturn and its moons.
    b. debris left over when a moon was destroyed by a collision.
    c. debris that escaped from Jupiter's gravitational pull.
    d. asteroids attracted by Saturn's gravitational pull.
13. Saturn's largest moon is named
    a. Io. **b.** Titan. **c.** Europa. **d.** Ganymede.

SECTION 29.3 *The Gas Giant Planets, continued*

In your textbook, read about Uranus, Neptune, and Pluto.
For each statement, write *true* or *false*.

_____ **14.** Uranus was discovered accidentally in 1781.

_____ **15.** Today, we are certain that Uranus has no moons and 15 rings.

_____ **16.** Most of Uranus's atmosphere is composed of helium and hydrogen, which causes its atmosphere to reflect blue light back into space.

_____ **17.** Uranus has a large, solid core that extends almost to the planet's surface.

_____ **18.** The rotational axis of Uranus is tipped over so far that the north pole almost lies in its orbital plane.

_____ **19.** The existence of Neptune was predicted before it was discovered based on small deviations in the motion of Saturn.

_____ **20.** Uranus's tilt and its great distance from the Sun result in seasons on Uranus that last about 21 Earth years.

_____ **21.** Until 1994, Neptune had a persistent storm, the Great Dark Spot, with characteristics similar to Jupiter's Great Red Spot.

_____ **22.** Neptune's largest moon, Triton, has a retrograde orbit, which means it orbits like every other satellite in the solar system.

_____ **23.** Triton has nitrogen geysers and a thin atmosphere.

_____ **24.** Neptune's six rings are composed of microscopic dust particles, and parts of its outermost rings appear much brighter than other parts.

_____ **25.** Scientists hypothesize that the clumps in Neptune's rings do not spread evenly because of Neptune's gravitational effect.

_____ **26.** Pluto is not classified as a terrestrial planet because of its low density and small size.

_____ **27.** Pluto is larger than Earth and is made of ice.

_____ **28.** Like Earth's Moon, Pluto has no atmosphere.

_____ **29.** The orbit of Pluto is a perfect circle.

_____ **30.** Pluto and its moon Charon are in a synchronous rotation with each other.

_____ **31.** Pluto's properties more closely resemble those of the gas giants' large moons than of the other planets.

SECTION 29.4 *Formation of Our Solar System*

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		Column B
_____	**1.** Gas and dust from which stars and planets form	**a.** inner planets
_____	**2.** Rotating disk of dust and gas that formed the Sun and planets	**b.** tungsten
_____	**3.** Solid bodies hundreds of kilometers in diameter that merged to form the planets	**c.** planetesimals
_____	**4.** Believed to be the first large planet to develop	**d.** solar nebula
_____	**5.** One of the first elements to condense in the early solar system	**e.** interstellar cloud
_____	**6.** Lacking in satellites because of proximity to the Sun	**f.** Jupiter

In your textbook, read about asteroids.
For each statement, write *true* or *false*.

_____ **7.** Asteroids orbit the Sun and range from a few kilometers to about 100 kilometers in diameter.

_____ **8.** Most asteroids are located between the orbits of Mars and Jupiter in the asteroid belt.

_____ **9.** Asteroids are thought to be planetesimals that never formed planets.

_____ **10.** A meteoroid is a broken fragment of an asteroid or other interplanetary material.

_____ **11.** A meteor is a meteoroid that bypasses Earth's atmosphere.

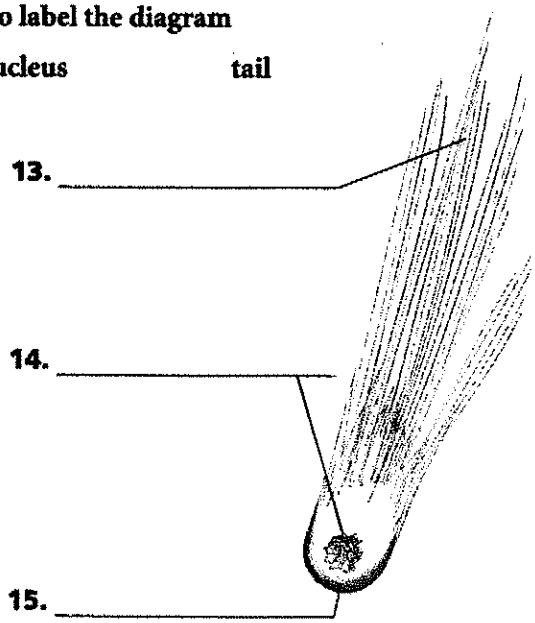
_____ **12.** A large meteorite will cause an impact crater when it collides with Earth.

SECTION 29.4 *Formation of Our Solar System, continued*

In your textbook, read about comets.

Use the words below to label the diagram

coma **nucleus** **tail**



Answer the following questions.

16. What type of orbit does a comet have? Describe a typical comet's perihelion and aphelion.

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

18. What is a periodic comet? Give an example.

19. What is a meteor shower?