

Name _____

Class _____

Date _____

Skills Worksheet

Directed Reading

Section: Formation of the Solar System

1. The sun and all of the planets and other bodies that revolve around it make up the _____.
2. Celestial bodies that orbit the sun, such as Earth and Jupiter, are called _____.
3. In 1796, the French mathematician Pierre-Simon, marquis de Laplace, advanced the _____ to explain the origins of the solar system.

THE NEBULAR HYPOTHESIS

4. Laplace's hypothesis states that the sun and the planets condensed at _____ about the same time out of a rotating cloud of dust and gas called a _____.
 - a. planet.
 - b. nebula.
 - c. supernova.
 - d. solar system.
5. The rotating cloud of dust and gas from which our solar system is thought to have formed is called the _____.
 - a. solar nebula.
 - b. gas giant.
 - c. sun.
 - d. nova.
6. Energy from collisions and pressure from gravity caused the center of the solar nebula to become _____.
 - a. hotter and less dense.
 - b. cooler and denser.
 - c. cooler and less dense.
 - d. hotter and denser.
7. Which of the following formed when the temperature at the center of the nebula reached about 10,000,000°C and hydrogen fusion began? _____
 - a. Mars
 - b. Earth
 - c. the sun
 - d. the moon

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8. How much of the matter that was contained in the solar nebula makes up the sun?
- a. 5%
 - b. about 99%
 - c. 25%
 - d. about 75%

FORMATION OF THE PLANETS

9. Small bodies from which a planet originated in the early development of the solar system are called
- a. atmospheres.
 - b. planetesimals.
 - c. suns.
 - d. moons.
10. Some planetesimals joined together through collision and through the force of gravity to form larger bodies called
- a. protoplanets.
 - b. sunspots.
 - c. protons.
 - d. nebulas.
11. The smaller bodies that orbit the planets are called
- a. solar nebulas.
 - b. moons.
 - c. planetesimals.
 - d. suns.

12. Why are Mercury, Venus, Earth, and Mars called the *inner* planets?

13. Why did the inner planets, which contained large percentages of heavy elements such as iron and nickel, lose their less dense gases?

14. How do the surfaces of the inner planets compare with that of Earth today?

15. How do the inner planets differ from the outer planets?

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16. Jupiter, Saturn, Uranus, and Neptune are referred to as

_____ planets.

17. How did distance from the sun affect the formation of the outer planets?

18. Name the three reasons why the outer planets are referred to as *gas giants*.

19. Which gas giant is farthest from the sun?

20. In what way does Saturn differ from the other outer planets?

21. In what way is Pluto similar to other Kuiper Belt objects?

22. How is Pluto more like Quaoar and Sedna than it is like Neptune?

FORMATION OF SOLID EARTH

23. When Earth formed, its high temperature was NOT due to
- a. heat produced when planetesimals collided with one another.
 - b. heat generated when the increasing weight of its outer layers compressed its inner layers.
 - c. the conversion of moving radioactive particles into heat energy.
 - d. an irregular orbit that brought it closer to the sun.

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- _____ 24. Dense materials such as molten iron sank to Earth's center and less dense materials were forced to the outer layers in a process called
- distinction.
 - differentiation.
 - distribution.
 - delineation.
- _____ 25. Which of the following did NOT form as one of Earth's layers when differentiation occurred?
- core
 - mantle
 - atmosphere
 - crust
- _____ 26. Which of the following elements is NOT present in large amounts in Earth's three layers?
- gold
 - iron
 - silica
 - magnesium
- _____ 27. Earth's surface continued to change as a result of
- increasing radiation.
 - colliding planetesimals.
 - the heat in Earth's interior.
 - hydrogen fusion.

FORMATION OF EARTH'S ATMOSPHERE

- _____ 28. The original atmosphere of Earth consisted of
- oxygen and nitrogen.
 - hydrogen and helium.
 - nitrogen and helium.
 - hydrogen and oxygen.
- _____ 29. Today, hydrogen and helium occur mainly in the
- oceans.
 - middle atmosphere.
 - lower atmosphere.
 - upper atmosphere.
- _____ 30. Earth's early atmosphere formed when volcanic eruptions released gases in a process called
- outgassing.
 - atmospheric composition.
 - air generation.
 - layering.

Directed Reading continued

31. What is the molecule that contains three oxygen atoms and collects in Earth's upper atmosphere called?
a. oxygen
b. argon
c. ozone
d. carbon dioxide
32. Some of Earth's early organisms, such as cyanobacteria and early green plants, used _____ during photosynthesis.
33. Which byproduct of photosynthesis was released into the atmosphere?

34. When did the chemical composition of Earth's atmosphere reach that of today?

35. What is the present chemical composition of Earth's atmosphere?

36. How did Earth's first oceans form?

37. Comet collisions may have contributed a significant amount of _____ to Earth's surface.
38. The first ocean was probably made of _____ water.
39. The concentration of certain _____ in the oceans increased as rainwater dissolved rocks on land and carried these dissolved solids into the oceans.
40. When ocean water evaporated, chemicals in the ocean combined to form _____.
41. Earth's atmosphere and surface cooled because ocean water also dissolved much of the _____ in the atmosphere.