

Earth, Moon, and Sun • Chapter Test

Earth, Moon, and Sun**Multiple Choice**

Write the letter of the correct answer on the line at the left.

- _____ 1. Earth's spinning on its axis is called its
a. revolution.
b. orbit.
c. rotation.
d. cycle.
- _____ 2. Which of the following events occurs once every 24 hours?
a. Earth revolves around the sun.
b. The moon rotates on its axis.
c. The moon revolves around Earth.
d. Earth rotates on its axis.
- _____ 3. When the south end of Earth's axis is tilted toward the sun,
a. it is summer in the Northern Hemisphere.
b. it is winter in the Northern Hemisphere.
c. the sun is low in the sky in the Southern Hemisphere.
d. the sun is farthest north of the equator.
- _____ 4. The force that propels a rocket forward is called
a. velocity.
b. escape velocity.
c. an action force.
d. thrust.
- _____ 5. Spring tides occur
a. when the sun and moon are at right angles to Earth.
b. when day and night are equal.
c. when the sun, moon, and Earth line up.
d. only when the sun and moon are the same distance from Earth.
- _____ 6. The tendency of an object to resist a change in motion is
a. inertia.
b. orbital motion.
c. gravity.
d. universal gravitation.
- _____ 7. The pull of gravity on the surface of the moon is
a. six times that of Earth.
b. one quarter that of Earth.
c. one eightieth that of Earth.
d. one sixth that of Earth.

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- _____ 8. Maria are
 - a. seas on the moon.
 - b. regions with many craters.
 - c. regions formed from huge lava flows.
 - d. lunar highlands.

- _____ 9. The goal of the Apollo program was to
 - a. land astronauts on the moon.
 - b. establish a permanent colony on the moon.
 - c. put the first American in space.
 - d. prove that the moon is solid.

- _____ 10. The main advantage of a multistage rocket is that
 - a. it requires less fuel to overcome gravity at the time of launch.
 - b. it can carry humans into space.
 - c. the total weight of the rocket is reduced as the rocket rises.
 - d. it can be reused after returning to Earth.

Completion

Fill in the line to complete each statement.

- 11. The two days on which the sun is overhead at either 23.5 degrees north or south are called _____.
- 12. A tide with the smallest difference between low and high tides is called a _____.
- 13. The force of gravity on an object is its _____.
- 14. Some space probes have small robots called _____ that collect and analyze samples.
- 15. Each of the two days of the year when neither hemisphere is tilted toward the sun is known as a(n) _____.

True or False

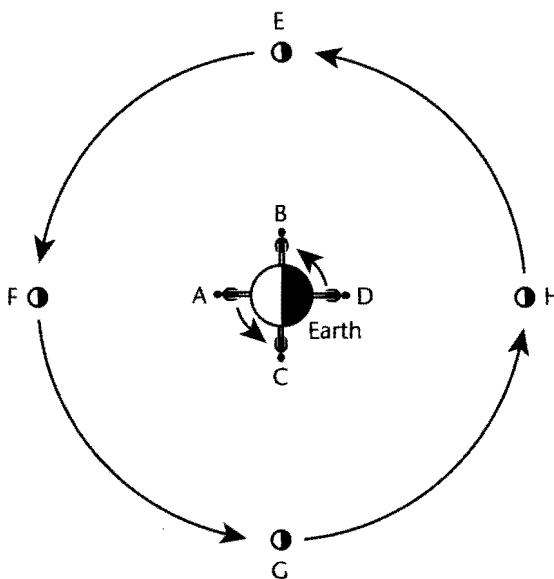
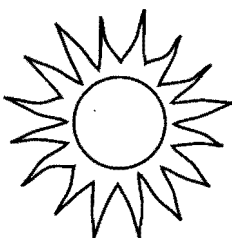
Determine whether each statement is true or false. If it is true, write true. If it is false, change the underlined word or words to make the statement true.

- _____ 16. In one year, Earth completes 365 revolutions.
- _____ 17. The day in March on which the sun is overhead at noon at the equator is called the autumnal solstice.
- _____ 18. A solar eclipse occurs during a full moon when Earth is directly between the moon and the sun.
- _____ 19. Orbital velocity is the velocity a rocket must reach to fly off into space.
- _____ 20. The distance between two objects and the masses of the objects determine the strength of the force of gravity between those objects.

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Using Science Skills

Use the diagram below to answer questions 21 and 22. Answer each question on the lines provided.



21. **Inferring** Where in the sky would the sun appear to an observer at each of the four positions on Earth shown in the diagram? (Examples: overhead, on the horizon, not visible.)

- A. _____
- B. _____
- C. _____
- D. _____

22. **Drawing Conclusions** What is the phase of the moon when it is in each of the positions shown?

- E. _____
- F. _____
- G. _____
- H. _____

Essay

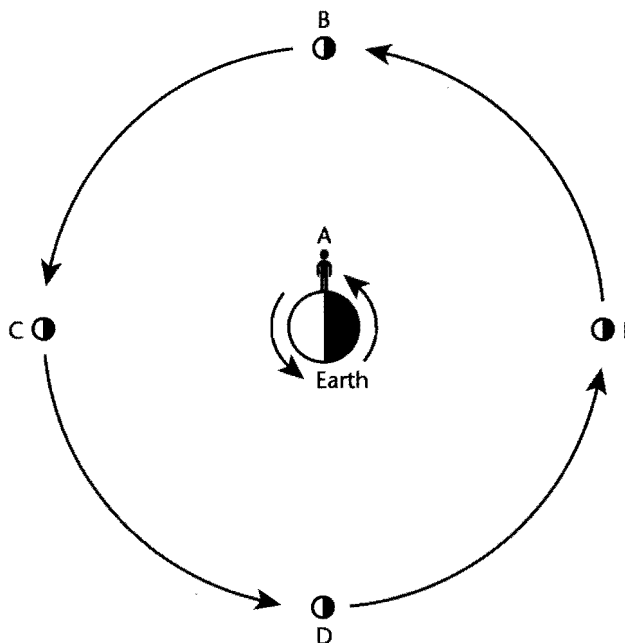
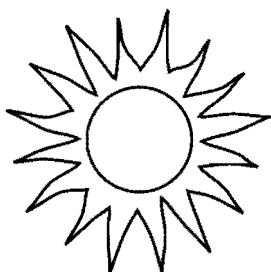
Write an answer for each of the following questions on a separate sheet of paper.

- 23. Describe how the tides change at a point on the seashore over the course of a day.
- 24. Explain why Earth experiences seasons.
- 25. Describe the events that most likely created the moon.

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Using Science Skills

Use the diagram below to answer the following questions. Answer each in a brief paragraph on a separate sheet of paper.



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- 26. Interpreting Diagrams** In which two positions of the moon would Earth experience neap tides? In which would it experience spring tides? Explain.
- 27. Applying Concepts** Which phases of the moon would be visible during the highest spring tides? At that time, would the person at point A be witnessing high or low tide?

Essay

Write an answer for each of the following questions on a separate sheet of paper.

- 28.** Describe the steps in the process by which a multistage rocket launches a satellite into orbit around Earth.
- 29.** Explain why we observe solar and lunar eclipses. Which is more common to observe? Why?
- 30.** Explain how Earth remains in orbit around the sun.

Performance Assessment

1. Students should show two positions of Earth, the sun, and the moon in a line, with the sun farthest from Earth and the moon. In one position, Earth is between the sun and the moon. In the other position, the moon is between Earth and the sun. In both positions, a high tide is on the side of Earth facing the moon, and on the side facing away from the moon.
2. When the moon is on the opposite side of Earth from the sun, it is full. When the moon is on the side toward the sun, it is new.
3. If connected by a line, the positions of Earth, the sun, and the moon should form a right triangle, with the sun at the vertex of the two longest sides. The moon will be at either side of Earth in the two positions. In both positions, a high tide is on the side of Earth facing the moon, and on the side facing away from the moon.
4. In both positions, the moon will be half illuminated by the sun. The two positions are called first quarter and third quarter.

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1. c
2. d
3. b
4. d
5. c
6. a
7. d
8. c
9. a
10. c
11. solstices
12. neap tide
13. weight
14. rovers
15. equinox
16. rotations
17. vernal equinox
18. lunar eclipse
19. Escape velocity
20. true
21. A. overhead
B. on the horizon
C. on the horizon
D. not visible
22. E. last quarter
F. new moon
G. first quarter
H. full moon
23. At most points by the seashore there are two high tides separated by two low tides during 25 hours. The length of time between a high and low tide is a little more than 6 hours.
24. The seasons are caused by the tilt of Earth's axis in relation to the plane of the orbit and the revolution of Earth around the sun. When the Northern Hemisphere is pointed toward the sun, it is warm because the sun hits the Northern Hemisphere most directly. We call that summer. Six months later, sunlight hits the Northern Hemisphere less directly, and so is more spread out and provides less heat. This is winter. During spring and fall, sunlight hits at an angle between the maximum and minimum.
25. About 4.5 billion years ago, a planet-sized object collided with Earth. Material from Earth's outer layers was ejected into orbit around Earth, where it formed a ring. Gravity caused this material to combine to form the moon.
26. Neap tides—positions B and D because the gravity of the moon and sun are pulling at right angles. Spring tides—positions C and E, because the gravity of the sun and moon are pulling along the same line.
27. During spring tides, the moon would be either new or full. A person standing at position A would observe a low tide.
28. The back side of the moon is not visible from Earth because it always faces away. Space probes could observe the back side of the moon, or astronauts could go there.
29. Each month, as the moon revolves around Earth, it crosses between Earth and the sun. Occasionally, it crosses directly between Earth and the sun. Then the moon's shadow hits Earth's surface. Anyone in this shadow sees a solar eclipse. Occasionally, the moon passes directly behind Earth, so that the moon enters Earth's shadow. People on Earth then observe a lunar eclipse.
30. The first stage of the multistage rocket provides the thrust needed to launch the rocket off the ground. When its fuel has been used up, the first stage separates from the rocket and falls back to Earth. The second and third stages perform in the same way, each boosting the rocket higher and then falling away. This leaves the satellite in orbit at orbital velocity.