

The Sun-Earth-Moon System

SECTION 27.1 *Tools of Astronomy*

In your textbook, read about electromagnetic radiation and telescopes.
Use each of the terms below just once to complete the passage.

larger electromagnetic radiation visible light wavelength
reflecting telescope frequency telescopes refracting telescope
interferometry electromagnetic spectrum

(1) _____ consists of electric and magnetic disturbances, or waves, that travel through space. Human eyes see one form of this energy, called (2) _____. All forms of electromagnetic radiation, including X rays and radio waves, make up the (3) _____. Each type of radiation can be classified in two ways. (4) _____ measures the distance between the peaks on a wave and (5) _____ is the number of waves that occurs each second. Scientists study radiation with (6) _____, which collect and focus light. The (7) _____ the opening that gathers light in a telescope, the more light that can be collected. A(n) (8) _____ uses lenses to bring light to a focus, and a(n) (9) _____ uses mirrors to do the same thing. The process of linking several telescopes together so that they can act as one is called (10) _____.

In your textbook, read about satellites, probes, and space-based astronomy.
For each item in Column A, write the letter of the matching item in Column B.

Column A	Column B
_____ 11. The first multi-country space habitat for long-term human occupation	a. <i>Hubble Space Telescope</i>
_____ 12. Probe to Pluto and beyond	b. <i>New Horizons</i>
_____ 13. Telescope launched in 1990 to carry out observations in visible light, infrared, and ultraviolet wavelengths	c. <i>Chandra X-Ray Observatory</i>
_____ 14. Craft in which astronauts study weightlessness, growth of crystals, and other phenomena	d. <i>Space Shuttle</i>
_____ 15. Telescope used to observe X rays blocked by Earth's atmosphere	e. <i>International Space Station</i>

SECTION 27.2 The Moon

In your textbook, read about the characteristics and history of the Moon.

Circle the letter of the choice that best completes the statement.

- Temperatures on the Moon's surface are
 - always very hot.
 - either very hot or very cold.
 - always very cold.
 - moderate.
- The light-colored, mountainous regions of the Moon are called
 - maria.
 - impact craters.
 - rilles.
 - highlands.
- The dark, smooth plains on the Moon are called
 - maria.
 - impact craters.
 - rilles.
 - highlands.
- The features on the Moon formed by objects crashing into its surface are
 - rilles.
 - mountain ranges.
 - impact craters.
 - regolith.
- The material that falls back to the Moon's surface after an impact blast is
 - regolith.
 - feldspar.
 - ejecta.
 - lava.
- Long trails of ejecta on the Moon's surface are called
 - rilles.
 - rays.
 - plains.
 - highlands.
- Meandering valleylike features on the Moon's surface are called
 - rays.
 - ejecta.
 - rilles.
 - craters.
- There is no erosion, other than surface creep and erosion due to impacts, on the Moon because there is no
 - lava or flowing water.
 - atmosphere or flowing water.
 - ejecta or lava.
 - ejecta or atmosphere.
- After a long period of impacts, the Moon's impact basins filled with
 - water.
 - lava.
 - feldspar.
 - breccia.
- Scientists hypothesize that the Moon's crust is twice as thick
 - in the highlands.
 - in the maria.
 - on the side seen from Earth.
 - on the far side.
- The layers of the Moon, from the surface inward, are the
 - upper mantle, lower mantle, crust, and core.
 - crust, core, upper mantle, and lower mantle.
 - core, crust, upper mantle, and lower mantle.
 - crust, upper mantle, lower mantle, and core.
- According to the most commonly accepted theory of the Moon's formation, the Moon is made from
 - materials from asteroids and comets.
 - materials from Earth only.
 - materials from Mars.
 - materials from Earth and the body that hit it.
- The most commonly accepted theory about the origin of the Moon explains why the
 - the Moon and Earth have similar compositions.
 - the Moon is so far away from Earth.
 - the same side of the Moon is always seen from Earth.
 - the Moon has very little regolith.

SECTION 27.2 *The Moon, continued*

In your textbook, read about explorations of the Moon.

Number the following events in chronological order from 1 to 5.

- _____ 14. Project *Gemini* launches two-person crews into space.
- _____ 15. *Sputnik 1* is launched into space by the Soviet Union.
- _____ 16. *Apollo 11* lands on the Moon.
- _____ 17. Cosmonaut Yuri A. Gagarin becomes the first human in space.
- _____ 18. American Alan B. Shepard, Jr., is launched into space.

In your textbook, read about the Moons.

Answer the following questions.

19. Describe the features on the Moon known as highlands and maria.

20. Describe the layers of the Moon's interior.

21. Explain the most commonly accepted theory of the origin of the Moon.
Then describe why this theory is currently the accepted theory.

SECTION 27.3 *The Sun-Earth-Moon System*

In your textbook, read about the motions of Earth, the Sun, and the Moon.

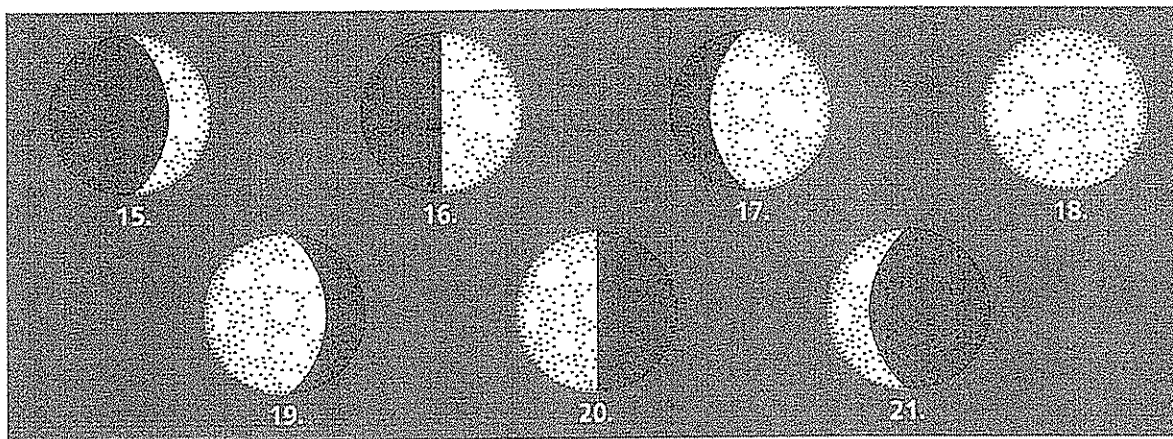
In the space at the left, write *true* if the statement is true; if the statement is false, change the italicized word or phrase to make it true.

- _____ 1. All societies base their calendars and timekeeping systems on the *apparent motion of the Sun and Moon*.
- _____ 2. The Sun, Moon, and stars appear to rise in the east and set in the west because of the rotation of *the Moon*.
- _____ 3. You can demonstrate that Earth rotates through the use of a *Foucault pendulum*.
- _____ 4. The period from one sunrise or sunset to the next is called the *solar day*.
- _____ 5. The length of time it takes for the Moon to go through a complete cycle of phases is called the *lunar month*.
- _____ 6. Annual variations in the length of the day and in temperatures are dependent on the *longitude* where you live.
- _____ 7. The plane of Earth's orbit about the Sun is called the *solstice*.
- _____ 8. The seasons are caused by Earth's orbit around the Sun in combination with the *tilt of Earth's axis*.
- _____ 9. The hemisphere that is tilted toward the Sun experiences *winter*.
- _____ 10. A *solar eclipse* occurs when the Moon passes through Earth's shadow.
- _____ 11. On the *summer solstice*, the number of daylight hours for the northern hemisphere is at a maximum.
- _____ 12. During the northern hemisphere's summer, the sun appears *lower* in the sky than it does in winter.
- _____ 13. On the winter solstice, the number of daylight hours is at its *minimum*.
- _____ 14. The lengths of day and night are equal for *both the northern and southern hemispheres* on the vernal equinox.

SECTION 27.3 *The Sun-Earth-Moon System, continued*

In your textbook, read about the phases of the Moon.

Label each phase of the Moon below. Choose from the following phases: *waning gibbous, waxing crescent, third quarter, first quarter, waxing gibbous, waning crescent, full moon.*



15. _____

16. _____

17. _____

18. _____

19. _____

20. _____

21. _____

Answer the question.

22. Why is the Moon invisible from Earth during a new moon?
