Space Explorer Challenge

Use this key to check answers and read the explanations.

1. Which planet is nicknamed the Red Planet?
   A. Mars
   B. Venus
   C. Mercury
   D. Neptune
   Correct answer: A. Mars
   Iron minerals in Martian dust oxidize, giving Mars its reddish appearance.

2. What object supplies most of the light and heat reaching Earth?
   A. Jupiter
   B. The Moon
   C. The Sun
   D. Polaris
   Correct answer: C. The Sun
   The Sun is the star at the center of our solar system.

3. Which mission first landed humans on the Moon?
   A. Apollo 8
   B. Apollo 11
   C. Gemini 4
   D. Voyager 1
   Correct answer: B. Apollo 11
   Apollo 11 landed Neil Armstrong and Buzz Aldrin on the Moon in July 1969.

4. Which planet has the greatest diameter in our solar system?
   A. Earth
   B. Saturn
   C. Neptune
   D. Jupiter
   Correct answer: D. Jupiter
   Jupiter is the largest planet, with a diameter roughly eleven times Earth's.

5. Which essential life-support function does a spacesuit provide outside a spacecraft?
   A. Preventing all effects of gravity
   B. Maintaining pressure and supplying oxygen
   C. Making the astronaut's bones weightless
   D. Replacing oxygen with nitrogen
   Correct answer: B. Maintaining pressure and supplying oxygen
   A spacesuit provides a pressurized, breathable environment and thermal protection.

6. The main asteroid belt lies mostly between which two planets?
   A. Mars and Jupiter
   B. Earth and Mars
   C. Venus and Earth
   D. Saturn and Uranus
   Correct answer: A. Mars and Jupiter
   Most main-belt asteroids orbit between Mars and Jupiter.

7. Which planet do the moons Phobos and Deimos orbit?
   A. Neptune
   B. Jupiter
   C. Saturn
   D. Mars
   Correct answer: D. Mars
   Mars has two small moons named Phobos and Deimos.

8. Which spacecraft pair was launched in 1977 to explore the outer planets?
   A. Spirit and Opportunity
   B. Viking 1 and 2
   C. Voyager 1 and 2
   D. Pioneer 3 and 4
   Correct answer: C. Voyager 1 and 2
   The Voyager probes used a favorable planetary alignment to explore the outer solar system.

9. Why is Venus hotter at its surface than Mercury, despite being farther from the Sun?
   A. A powerful greenhouse effect
   B. A faster rotation
   C. Heat reflected by a large moon
   D. More intense solar radiation at its orbit
   Correct answer: A. A powerful greenhouse effect
   Venus's thick carbon-dioxide atmosphere traps heat extremely effectively.

10. What causes the Moon's ordinary monthly phases?

A. Clouds forming on the Moon
B. Earth's shadow covering it every night
C. The Moon producing more light each week
D. Our changing view of its sunlit half

Correct answer: D. Our changing view of its sunlit half
As the Moon orbits Earth, we see different portions of the half illuminated by the Sun.

11. Which moon of Saturn has lakes and seas of liquid methane and ethane?

A. Triton
B. Europa
C. Titan
D. Ganymede

Correct answer: C. Titan
Titan's cold surface supports a cycle of liquid hydrocarbons rather than Earth's water cycle.

12. New Horizons made its historic 2015 flyby of which dwarf planet?

A. Ceres
B. Pluto
C. Eris
D. Haumea

Correct answer: B. Pluto
New Horizons returned the first close-up images of Pluto and its moons.

13. Astronauts in orbit appear weightless mainly because they and their spacecraft are doing what?

A. Experiencing gravity only on the spacecraft's exterior
B. Traveling beyond the reach of Earth's gravity
C. Moving fast enough to eliminate their mass
D. Continuously falling around Earth

Correct answer: D. Continuously falling around Earth
Orbit is continuous free fall; Earth's gravity still acts strongly at space-station altitude.

14. Which moon is the most volcanically active world in our solar system?

A. Io
B. Callisto
C. Titan
D. Earth's Moon

Correct answer: A. Io
Jupiter's tidal forces heat Io's interior, powering intense volcanism.

15. A comet follows an elliptical orbit around the Sun. Where does it move fastest?

A. At every point equally
B. Farthest from the Sun
C. Nearest the Sun
D. Only while crossing Earth's orbit

Correct answer: C. Nearest the Sun

Kepler's second law implies greater orbital speed near perihelion, the closest approach to the Sun.