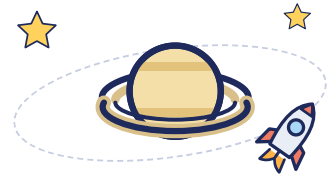


Space Quiz



Mission Specialists

Grades 9–12 (high school) · ages 14–18

SCORE

____ / 25

Name _____ Class _____ Date _____

25 questions · 25 points · about 35 minutes



Multiple choice

Fill in the circle next to the best answer. One point each.

12 POINTS

- ① In a main-sequence star's core, the outward pressure from fusion balances which force?
 - Ⓐ Gravity
 - Ⓑ Magnetism
 - Ⓒ Friction
 - Ⓓ The strong force
- ② Where does the Sun lie on a Hertzsprung-Russell (H-R) diagram?
 - Ⓐ Among the red giants
 - Ⓑ Among the white dwarfs
 - Ⓒ On the main sequence
 - Ⓓ Among the supergiants
- ③ What does the core of a Sun-like star become after the star sheds its outer layers?
 - Ⓐ A black hole
 - Ⓑ A white dwarf
 - Ⓒ A neutron star
 - Ⓓ A supernova remnant
- ④ The cosmic microwave background (CMB) is best described as which of these?
 - Ⓐ Radio noise from quasars
 - Ⓑ Heat from Milky Way stars
 - Ⓒ Light from the first galaxies
 - Ⓓ The oldest light we can observe
- ⑤ Light from distant galaxies is redshifted. What does this show?
 - Ⓐ The galaxies are unusually hot
 - Ⓑ Space is expanding
 - Ⓒ The galaxies are mostly hydrogen
 - Ⓓ Red dust is absorbing blue light
- ⑥ A planet orbits at an average distance of 4 AU. By Kepler's third law, its year lasts about
 - Ⓐ 8 Earth years
 - Ⓑ 4 Earth years
 - Ⓒ 16 Earth years
 - Ⓓ 2 Earth years
- ⑦ If the distance between two masses doubles, the gravitational force between them becomes
 - Ⓐ Half as strong
 - Ⓑ Twice as strong
 - Ⓒ Four times as strong
 - Ⓓ One quarter as strong
- ⑧ One parsec is equal to about
 - Ⓐ 3.26 astronomical units
 - Ⓑ 3.26 million kilometers
 - Ⓒ 3.26 light-years
 - Ⓓ 326 light-years

- 9 Absorption lines in a star's spectrum are used to identify its
- (A) Distance from Earth
 - (B) Rotation period
 - (C) Chemical elements
 - (D) Number of planets
- 10 The transit method finds exoplanets by detecting
- (A) A Doppler shift in the star's light
 - (B) Radio signals from the planet
 - (C) Direct photos of the planet
 - (D) A periodic dip in the star's brightness
- 11 A neutron star forms when
- (A) The core of a massive star collapses
 - (B) A white dwarf slowly cools
 - (C) Two planets collide
 - (D) A Sun-like star runs out of fuel
- 12 Why are X-ray telescopes placed in space?
- (A) X-rays are too faint to detect on Earth
 - (B) Earth's atmosphere blocks X-rays
 - (C) X-ray telescopes need zero gravity
 - (D) The Moon reflects X-ray light



True or false

Circle TRUE or FALSE. One point each.

4 POINTS

- 13 Stars much more massive than the Sun live longer than the Sun. True False
- 14 The radial velocity method detects planets by measuring Doppler shifts in a star's light as the star wobbles. True False
- 15 Radio waves have shorter wavelengths than visible light. True False
- 16 Nothing, not even light, can escape from inside a black hole's event horizon. True False



Matching key terms

Draw a line from each term to its meaning. One point each.

5 POINTS

- | | | |
|----------------------------------|---|--|
| 17 Astronomical unit (AU) | • | • (A) Stage when a star fuses hydrogen in its core |
| 18 Light-year | • | • (B) About the average Earth–Sun distance |
| 19 Absorption line | • | • (C) Boundary of no return around a black hole |
| 20 Main sequence | • | • (D) Dark line showing an element in a star |
| 21 Event horizon | • | • (E) Distance light travels in one year |



Short answer

Answer in complete sentences. One point each.

4 POINTS

- 22) Name the nuclear reaction that powers the Sun and say what it produces.

- 23) Give two pieces of evidence that support the Big Bang theory.

- 24) Explain how the transit method and the radial velocity method each detect an exoplanet.

- 25) How does a planet's speed change as it moves closer to the Sun, and what law describes this?
