

Astrophysics and the Human Body

Astrophysics · Answer Key · 20 Questions

1. Which organ in the human body is primarily responsible for balancing, which becomes disoriented in the microgravity of space?

- A) The heart
- B) The inner ear**
- C) The lungs
- D) The liver

2. What happens to the height of an astronaut while living in space due to the lack of gravity compressing their spine?

- A) They shrink
- B) They stay the same
- C) They grow taller**
- D) They lose limbs

3. Which form of radiation, common in space, can cause damage to human DNA if not properly shielded?

- A) Visible light
- B) Cosmic rays**
- C) Radio waves
- D) Infrared heat

4. What happens to an astronaut's bone density during long-duration space flight in microgravity?

- A) It increases
- B) It remains stable
- C) It decreases**
- D) It turns into muscle

5. What is the primary gas, also found in the Earth's atmosphere, that astronauts must monitor in the space station to prevent hypercapnia?

- A) Carbon dioxide**
- B) Helium
- C) Neon
- D) Argon

6. Which fluid in the human body shifts toward the head in microgravity, often causing a puffy face appearance?

- A) Bile
- B) Synovial fluid
- C) Blood and extracellular fluid**
- D) Gastric acid

7. What is the main source of vitamin D that humans get on Earth, which must be supplemented in space?

- A) Sunlight**
- B) Moonlight
- C) Starlight
- D) Nebula light

8. Space travel can affect the human circadian rhythm because astronauts experience how many sunrises per day in low Earth orbit?

- A) One
- B) Sixteen**
- C) Zero
- D) One hundred

9. Which part of the eye can be affected by the pressure changes associated with fluid shifts in space?

- A) The pupil
- B) The retina**
- C) The iris
- D) The sclera

10. What is the term for the rapid loss of muscle mass that occurs when astronauts do not perform resistance exercise in space?

- A) Hypertrophy
- B) Atrophy**
- C) Metabolism
- D) Ossification

11. Which celestial body's gravitational pull is responsible for the tides, which indirectly influence marine life cycles that humans consume?

- A) The Moon**
- B) Mars
- C) Jupiter
- D) Saturn

12. Astronauts undergo physical training to counteract the effects of microgravity on which bodily system?

A) The cardiovascular system

B) The digestive system

C) The endocrine system

D) The nervous system

13. What is the primary fuel source for the human body that astronauts must consume in specific amounts to maintain energy in space?

A) Nuclear energy

B) Calories

C) Solar radiation

D) Kinetic energy

14. Exposure to what type of space-based environment can lead to a decrease in the production of red blood cells, known as 'space anemia'?

A) High oxygen

B) Microgravity

C) Extreme heat

D) Darkness

15. What protective gear must humans wear to prevent the vacuum of space from causing ebullism (gas bubbles forming in blood)?

A) A pressurized space suit

B) Sunglasses

C) A raincoat

D) A thermal blanket

16. Which major organ is responsible for filtering waste, a process that can be stressed by the increased calcium levels in astronaut blood?

A) The brain

B) The kidneys

C) The pancreas

D) The spleen

17. The Earth's magnetic field protects humans from solar particles; what is this shield called?

A) The atmosphere

B) The magnetosphere

C) The crust

D) The mantle

18. What effect does the lack of gravity have on the human sense of taste, often making food seem blander?

- A) It increases sensitivity
- B) It causes congestion that dulls taste**
- C) It creates a spicy sensation
- D) It has no effect

19. What is the main danger to human health from solar flares, which are intense bursts of radiation from the Sun?

- A) Radiation sickness**
- B) Excessive sweating
- C) Increased hair growth
- D) Better sleep

20. In the context of space health, what does 'deconditioning' refer to?

- A) Learning new skills
- B) The body adapting to microgravity**
- C) The cooling of space craft
- D) Eating too much food