Down To Earth: Mission Stellar Health

Train Like An Astronaut Quiz

Astronauts on the International Space Station (ISS) must exercise regularly to stay healthy in microgravity. Without Earth's gravity, muscles can weaken and bones can lose density, so astronauts use specialized equipment like treadmills and resistance devices. On Earth, we can use similar exercises to build strength and keep our hearts healthy.

1. What is a key reason for astronauts to exercise regularly in space?
    a. To learn new skills
    b. To maintain physical and mental health
    c. To enjoy floating around
    d. To generate energy for the station

2. What is a common effect of microgravity on the body?
    a. Increased muscle strength
    b. Bone density loss
    c. Respiratory inflammation
    d. Improved vision

3. How does microgravity affect the cardiovascular system?
    a. Increases blood pressure
    b. Decreases heart rate
    c. Causes fluid shift towards the head
    d. Improves circulation

4. How often do astronauts exercise on the International Space Station?
    a. Every other day
    b. Once a week
    c. Six days a week
    d. Only on weekends

5. What is the purpose of the ARED on the ISS?
    a. To simulate free weights for exercise
    b. To improve lung capacity
    c. To clean the space station
    d. To help astronauts stretch

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6. What does the CEVIS stationary bike help improve?
    a. Balance
    b. Cardiovascular health
    c. Bone density
    d. Flexibility

7. What is the T2 COLBERT on the ISS?
    a. A treadmill
    b. A trampoline
    c. An elliptical machine
    d. A rowing machine

8. How does the ARED machine work?
    a. It uses vacuum cylinders to create resistance
    b. It uses water weights
    c. It uses magnets to simulate gravity
    d. It uses steel dumbells

9. What is the main purpose of the harness used by astronauts on the treadmill in space?
    a. To keep them warm
    b. To hold them in place
    c. To improve their running speed
    d. To measure their heart rate

10. What is one way space research DOES NOT help people on Earth?
    a. Creating better treatments for osteoporosis
    b. Making microgravity available at local gyms
    c. Understanding muscle loss from aging and injury
    d. Developing better prosthetics

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Answer Keys

1. c) To maintain physical and mental health

Astronauts exercise regularly in space primarily to maintain physical and mental health. In microgravity, muscles and bones can weaken, so exercise helps counteract these effects, ensuring overall well-being.

2. a) Bone density loss

In microgravity, the body experiences bone density loss due to reduced mechanical loading on bones. This is a well-documented effect of long-term space travel, making 'bone density loss' the correct answer.

3. a) Causes fluid shift towards the head

In microgravity, fluids shift towards the head due to the lack of gravitational pull, leading to increased intracranial pressure and facial puffiness. This is a key effect on the cardiovascular system.

4. d) Six days a week

Astronauts on the ISS exercise for two to two-and-a-half hours a day, six days a week to counteract the effects of microgravity on their muscles and bones, ensuring they maintain physical health during their missions.

5. a) To simulate free weights for exercise

The ARED (Advanced Resistive Exercise Device) on the ISS is designed to simulate free weights for exercise, helping astronauts maintain muscle strength and bone density in a microgravity environment.

6. d) Cardiovascular health

The CEVIS stationary bike primarily helps improve cardiovascular health by providing an effective aerobic workout, which strengthens the heart and lungs, enhancing overall fitness and endurance.

7. b) A treadmill

The T2 COLBERT is a treadmill used on the International Space Station (ISS) to help astronauts maintain their physical fitness in microgravity. It allows them to run and exercise, which is crucial for their health during long missions.

8. d) It uses vacuum cylinders to create resistance

The ARED has two 8-inch diameter vacuum cylinders that contain pistons. The pistons move within the vacuum, generating resistance. The resistive load can range from 0 to 600+ pounds for bar-related exercises and up to 150 pounds for cable-related exercises.

9. d) To hold them in place

The main purpose of the harness used by astronauts on the treadmill in space is to hold them in place. In microgravity, without the harness, they would float away, making it difficult to exercise effectively.

10. b) Making microgravity available at local gyms

Making microgravity available at local gyms does not help people on Earth, as it is impractical and unrelated to the direct benefits of space research, unlike the other options which focus on health advancements.