

1. Mark the parts that confuse you. Make a marginal note to explain how it confuses you. (Underlined words in bold must be annotated.)
2. Use what context clues you can to make a guess about what confuses you.
3. Comment on the text by connecting to personal experience or previous knowledge.
4. Watch the vocabulary video afterward (on Friday) – this will be part of your grade.

After a year in space, Scott Kelly returns 2 inches taller

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Comprehension

Comments

(USA Today) – NASA astronaut Scott Kelly returned to the U.S. on Thursday after spending nearly a year in space. Now that Kelly is home, his journey is just beginning. Scott Kelly’s year in space was part of a NASA twin study involving his brother, Mark Kelly. While Scott was in space, Mark remained **earthbound**, which will allow scientists to study the effects of space travel on the human body in preparation for a crewed mission to Mars.

Specifically, researchers are looking at the effects of space radiation, as well as the effect of visual **impairment** associated with long-duration space flight, according to Graham Scott, chief scientist at the National Space Biomedical Research Institute and deputy project scientist for the NASA and NSBRI Twin Study.

So, what can a year in space do to the human body?

Vision

One of the primary things researchers will be focusing on is the effect that being in space for almost a year had on Kelly’s vision, according to scientist Graham Scott. “We will be looking at the eyes to see how much visual **acuity** has been lost,” he said during a phone interview Thursday.

Mr. Scott said the majority of astronauts who return from time in space have mild vision loss, but researchers still aren’t completely sure why vision is affected while in space.

Bones and muscles

For almost a year, Scott Kelly did not have to use his legs to walk, but instead floated to different areas of the space station. In the past, astronauts would leave space with brittle bones and weak muscles because of the lack of use while in space, according to Scott.

But today, researchers have helped **mitigate** the impact on bones and muscles by using extensive workout routines that astronauts carry out while in space. Scott said onboard the International Space Station astronauts tie themselves down to a treadmill, strap into a bike and use a resistance device to work out for 2 to 2.5 hours a day.

“The workouts have positively impacted the astronauts’ bones and muscles, and they are coming back in really good shape,” he said. “But some are losing bone and muscle but not as much as we saw in the early

days.”

Long-term effects of radiation

Radiation is the biggest issue that astronauts will face as they eventually journey to Mars, Mr. Scott said.

On the International Space Station, astronauts get 20 times the amount of radiation people on Earth are exposed to, according to Scott. “If you go on a journey to Mars and get into deep space, there is several hundred times, maybe 300 times the radiation,” he said.

He said researchers are extremely interested in the effect radiation has on the heart, blood vessels, bones, central nervous system and the brain as well as the cancer risk. There is also worry that radiation can accelerate coronary heart disease.

The heart can shrink

While in space, the cardiovascular system does not have to work as hard as it does on Earth. “Just like the bones and muscles, the heart is designed to work in one gravity here on Earth, so when you put the heart in space it operates differently and changes shape,” Scott said.

He notes that one of the transitional effects of returning to Earth is that astronauts can feel faint. Scott said that’s one of the reasons that when astronauts return to Earth, they are placed on custom beds to **ensure** they don’t faint while they are up and walking around.

Body

One obvious and temporary change for Kelly was that he came back 2 inches taller than his brother because a lack of gravity causes spinal disks to expand.

When astronauts return to Earth, they must re-adjust to gravity and can have issues with balance and simple tasks like standing up, walking or operating a vehicle. Scott said astronauts go through a physical reconditioning program and are typically functioning normally within one-to-three weeks unless they’ve suffered significant bone or muscle loss, which could take months or years to recover from.

EFFECTS OF SPACE ON THE HUMAN BODY

