

Space Effects

FOCUS QUESTIONS

1. What was the main point of the *Space Effects* story?
2. How long was Scott Kelly in space?
3. Where did he live while he was in space?
4. What interesting things did Scott take into space?
5. What did he like about being back on Earth?
6. Describe the NASA research project that he was part of.
7. How much taller was Scott when he returned from space? Why was he taller?
8. Why do astronauts lose bone and muscle mass in space?
9. What do they do to strengthen bones and muscles while they are in space?
10. Would you like to spend a year in space? Why or why not?

ACTIVITY

Discuss the BtN *Space Effects* story as a class. What questions were raised in the discussion (what are the gaps in their knowledge)? The following KWLH organiser provides students with a framework to explore their knowledge on this topic and consider what they would like to know and learn.

- Would you want to spend a year in space? Why or why not?
- What do you think the challenges would be?
- What is it like living in microgravity?
- What impact does microgravity have on the human body?
- How would it feel coming back to Earth after being in space for a year?

KWLH organiser

What do I <u>k</u> now?	What do I <u>w</u> ant to know?	What have I <u>l</u> earnt?	<u>H</u> ow will I find out?

KEY LEARNING

Students will investigate the effects of microgravity on the human body in space.

AUSTRALIAN CURRICULUM

Science – Year 5

Scientific knowledge is used to solve problems and inform personal and community decisions ([ACSH083](#))

Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions ([ACSH081](#))

Science – Year 7

People use science understanding and skills in their occupations and these have influenced the development of practices in areas of human activity ([ACSH121](#))



ACTIVITY

How the body reacts to life in space

The BtN story explained some of the effects space had on Scott Kelly's body after spending 340 days aboard the International Space Station. Students will investigate in more detail, the effect space has on the human body, why it happens and what can be done to reduce the effects. Ask students to share their research with the class in an interesting way.

What is affected	What happens	Why it happens	What can be done to reduce the effects
<i>Bones</i>			
<i>Muscle</i>			
<i>Cardiovascular system</i>			
<i>The spine</i>			
<i>Inner ear and balance system</i>			
<i>Sleep</i>			
<i>Sense of taste</i>			



ACTIVITY

Experiment: Are people taller in the morning?

Students will test whether humans are taller when they wake up in the morning than later during the day and night. Conduct the experiment over the period of a week.

Procedure: Students measure and record their height:

- as soon as they get out of bed
- at midday
- before they go to bed

Students also record the number of hours of sleep (including bed rest) they got.

What **conclusion** did the students come to about whether we are taller in the morning? What happens to the spine when we sleep? How does it relate to what happens to astronauts in space?



ACTIVITY

Scott Kelly's Mission in Space

Students will investigate in more detail Scott Kelly's year-long mission in space and how he feels about being back on Earth.

- Who is Scott Kelly? Find out some interesting facts about him.
- What did he do on his year-long mission aboard the International Space Station?
- What special research projects was he involved in?
- How did Scott's body feel after returning from space?
- [Watch the interview](#) with Scott Kelly. Why does he talk about having 'mixed emotions' about returning to Earth?
- How do you think it would feel coming back to Earth after being in space for a year?
- What would you like to ask Scott Kelly? Think of three questions.



ACTIVITY

Train like an Astronaut

Do you have what it takes to become an astronaut? In this activity, students will investigate what some of the physical demands are for astronauts.

Using a range of physical activities students will use the same body parts/systems as astronauts do in training and on missions in space. Choose from a range of these [NASA activities](#), or use the activities we've picked out below.



Mission 1: Taste in Space

Mission question: Can I compare taste sensations on Earth and in space? In this activity, students will investigate and discover variables that affect their own sense of taste. Check out the [NASA video](#) and download the [Taste in Space handout](#).

Mission 2: Agility Astro-course

Mission question: How can you perform a physical activity that will improve your agility, coordination and speed? In this activity, students will complete an agility course as quickly and as accurately as possible to improve agility, coordination and speed. Check out the [NASA video](#) and download the [Agility Astro-course handout](#).

Mission 3: Jump for the Moon

Mission question: How could you perform a physical activity that would increase bone strength, as well as heart and other muscle endurance? In this activity, students will perform jump training with a rope, both while stationary and moving, to increase bone strength and to improve heart and muscle endurance. Check out the [NASA video](#) and download the [Jump for the Moon handout](#).



USEFUL WEBSITES

NASA – One Year Mission

<http://www.nasa.gov/content/one-year-crew>

CBBC Newsround – What are the effects of space travel on the human body?

<http://www.bbc.co.uk/newsround/22527246>

NASA – How astronauts are affected by space exploration

http://www.nasa.gov/externalflash/HRP_Feature/

National Space and Biomedical Research Institute – The Body in Space

<http://nsbri.org/impact/>

Behind the News – Space Suits

<http://www.abc.net.au/btn/story/s2857386.htm>

Behind the News – Astronaut Ad

<http://www.abc.net.au/btn/story/s4349704.htm>



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