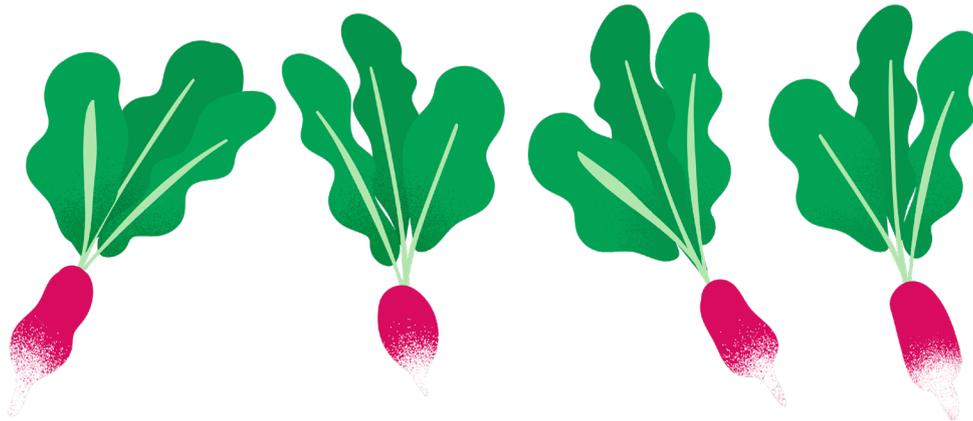


Space Food

Year 5 – Science, English

Year 6 – Science, English



(Science; Yr 5, ACSSU043)

Living things have structural features and adaptations that help them to survive in their environment

(Science; Yr 5, ACSHE081)

Science involves testing predictions by gathering data and using evidence to develop explanations for events and phenomena, and reflects historical and cultural contributions

(Science; Yr 5, ACSHE083)

Scientific knowledge is used to solve problems and inform personal and community decisions

(Science; Yr 6, ACSSU094)

The growth and survival of living things is affected by the physical conditions of their environment

(Science; Yr 6, ACSHE098)

Science involves testing predictions by gathering data and using evidence to develop explanations for events and phenomena and reflects historical, and cultural contributions

(Science; Yr 6, ACSHE100)

Scientific knowledge is used to solve problems and inform personal and community decisions

(English; Yr 5, ACELY1704)

Plan, draft and publish imaginative, informative and persuasive print and multimodal texts, choosing text structures, language features, images and sound appropriate to purpose and audience

(English; Yr 6, ACELY1714)

Plan, draft and publish imaginative, informative and persuasive texts, choosing and experimenting with text structures, language features, images and digital resources appropriate to purpose and audience

Cross-curriculum priority

Sustainability

Space Food

What to eat – and how to grow food – when you're an astronaut

Students are fascinated with Mars, and it's interesting that many of them think living on Mars won't be that difficult within their lifetime. Perhaps they're right! Or perhaps it's harder than the movies make it seem. This lesson explores some of the significant hurdles facing life on Mars, including the serious question: 'what's for dinner?'

Location:

The classroom

Notes:

Getting started

👁 Watch **The One with the Space Potato**

🎧 Bonus Track **Nomcast Episode 8**



- ? **Discuss** – can you really grow food in space?
And will it mutate and take you on a ride, like Billy and Maddy's first meeting with Tuberman?

“I was born on the Space Shuttle Columbia in 1996. My kind began life as a crop of space potatoes. A simple experiment. But, when we began to mutate, our astronaut fathers and mothers shot us into the cold vacuum of space.”
– Tuberman



Lexicon

dehydrate

To remove the water, or dry out something.

mutate

To change, possibly from one generation to the next through genetic variation.

Space gardens

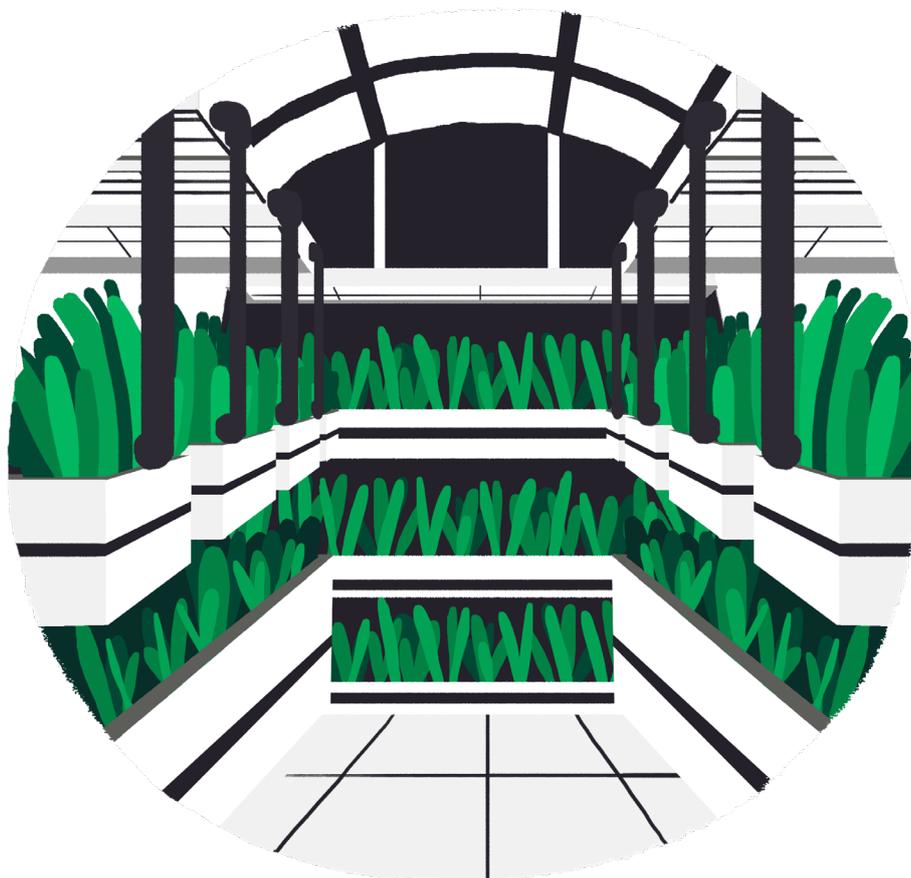
? Discuss:

- Do students think that plants need gravity to tell their roots which way is 'down'? Water will always sink to the lowest point, and roots need to find water. Take a vote.
- Students research the topic (some resources are provided for you on the next page).
- Scientists used to think that yes, plant roots did need gravity to find their way down to water below the soil – but recently this theory has been proven wrong with findings from several plant growing experiments on the International Space Station. Russian astronauts worked with NASA to supply and help monitor their vegetable-growing units on the International Space Station.

Space Exploration Mission 1:

- Students choose one of the following topics to research further:
 - ◇ The effect of gravity on plants.
 - ◇ Why space missions are trying to grow plants.
 - ◇ What types of experiments astronauts are performing on the plants in space.
 - ◇ A diagram, with labels and explanations, of how the plant growing equipment works.

Here's a great resource to get them started (and there are plenty more on the next page): https://www.nasa.gov/mission_pages/station/research/10-074.html



Space food

- The first space missions required astronauts to take all of their food in dry form (because you can't have water floating about in the air inside a space station). But recent investigations and inventions have found ways to improve the variety, texture and palatability (taste) of food in space.
- Maintaining a sense of normalcy in space is always a consideration, which is why the astronauts' petition to have a table installed in the eating area was granted. This presents a great opportunity to role-model positive dining behaviours for students, whilst honing their persuasive writing skills.

Space Exploration Mission

- Students choose one of the following topics to research further:
 - ◇ Are there fridges and freezers in space? Why or why not?
 - ◇ What might the effect of micro-gravity on eating, washing up and waste disposal? (For example, if you were in micro-gravity, would you rather eat with a spoon or use a pair of chopsticks? Why?)
 - ◇ Why is water so precious on a space station? What are some of the difficulties that occur as a result?
 - ◇ Why was the table so important to the astronauts? What is your table like at home?

Mission to Mars – yes or no?

Write an opinion or persuasive piece about whether or not humanity can or should establish an ongoing colony on Mars. Ideally, this writing activity comes after each student has chosen and written a report on one or more of the topics above, so that they have a degree of knowledge about some of the unique difficulties presented by space missions.

- In addition, students should research (perhaps in working groups providing presentations to the class), these topics:
 - ◇ the atmosphere on Mars
 - ◇ the climate of Mars
 - ◇ the soil and its capacity for growing plants
 - ◇ the gravity on Mars
 - ◇ the day/night cycles on Mars.

Resources

Space gardens:

- ◇ NASA International Space Station – Growing Plants and Vegetables in a Space Garden: https://www.nasa.gov/mission_pages/station/research/10-074.html
- ◇ National Geographic – Plants grow fine without gravity: <https://news.nationalgeographic.com/news/2012/12/1207-plants-grow-space-station-science/>

Space Food:

- ◇ European Space Agency – ESA Kids – Eating in Space: https://www.esa.int/esaKIDSen/SEMBQO6TLPG_LifeinSpace_0.html
- ◇ EOS – Tests indicate which edible plants could thrive on Mars: <https://eos.org/articles/tests-indicate-which-edible-plants-could-thrive-on-mars>
- ◇ NASA – Eating in Space: https://www.nasa.gov/audience/foreducators/stem-on-station/ditl_eating
- ◇ NASA Education, Grades 5-8 – No Pizza in Space? https://www.nasa.gov/audience/forstudents/5-8/features/F_No_Pizza_in_Space_5-8.html
- ◇ NASA – Space Food & Nutrition https://www.nasa.gov/pdf/143163main_Space.Food.and.Nutrition.pdf

Mission to Mars?

- ◇ Australian Popular Science – How You'll Die on Mars: <http://www.popsci.com.au/space/space-travel/how-youll-die-on-mars,404486>
- ◇ Mars One: <https://www.mars-one.com>
- ◇ NASA Education – Astronaut Requirements: https://www.nasa.gov/audience/forstudents/postsecondary/features/F_Astronaut_Requirements.html
- ◇ NASA Education – Mars Facts: <https://mars.nasa.gov/allaboutmars/facts/#?c=inspace&s=distance>
- ◇ Sydney Morning Herald – Meet the Australians preparing for the mission of a lifetime: <http://www.smh.com.au/technology/sci-tech/life-on-mars-meet-the-australians-preparing-for-the-mission-of-a-lifetime-20140705-zsxch.html>
- ◇ The Verge – Mars One just delayed its (highly unlikely) Mars mission – again: <https://www.theverge.com/2016/12/7/13869856/mars-one-revised-mission-timeline-again-launch-plan-2031>

Space Food



**In space, no one can
hear you chew...**

In order to feel more at home, astronauts petitioned for a table to be installed in the space station. This means that now food must be velcroed to a secured tray. “The original Space Station took out the table because nothing stays on it anyway,” offers Mary Roach, author of *Packing for Mars: The Curious Science of Life in the Void*. “But at a certain point, the astronauts said, ‘Bring back the table. Put some straps on it. We want to sit around a table at the end of the day and eat like humans.’”

Feels like Home

Imagine you're one of the astronauts campaigning to make the space station feel more like home. How might you persuade your superiors on Earth to make this happen?

What does your table at home mean to you?

Write a letter or record a video message convincing them to bring back a "family table" to the space station.

How to Become an Astronaut

You will need:

- A bachelor's degree in engineering, biological science, physical science, computer science or mathematics.
- At least three years of related professional experience obtained after degree completion OR at least 1,000 hours pilot-in-command time on jet aircraft.
- The ability to pass the NASA long-duration astronaut physical. Distant and near visual acuity must be correctable to 20/20 for each eye. The use of glasses is acceptable.

Astronaut candidates must also have skills in leadership, teamwork and communications.

NASA Education – Astronaut Requirements:

https://www.nasa.gov/audience/forstudents/postsecondary/features/F_Astronaut_Requirements.html

"Salt and pepper are available but only in a liquid form. This is because astronauts can't sprinkle salt and pepper on their food in space. The salt and pepper would simply float away. There is a danger they could clog air vents, contaminate equipment or get stuck in an astronaut's eyes, mouth or nose." – 'Eating in Space', on the NASA Education website.

