



STEM Project 1 - Background Research

International Space Farm

The Challenge

To address food security issues by designing an International Space Farm

One of many global issues that planet Earth is facing is food security. For a person to be considered food secure there must be food available to them, it must be affordable and the food must be good enough to provide them the nutrition needed to be healthy.

Growing crops for food on planet Earth is becoming increasingly difficult due to issues such as:

- an increasing population,
- natural disasters destroying food crops and land areas used for farming,
- climate change,
- pests and diseases affecting crops and livestock, and
- the lack of available land suitable for farming.

One possible solution to solve some of these issues is to consider developing an International Space Farm (ISF). The idea of a farm that is not based on Earth is a great way to pique students' interest in the project. This could be a farm based on a station orbiting the Earth or a farm on another planet, even a moon! There are many aspects to be considered in designing and operating an International Space Farm.



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Find Out More and Get Thinking

In this section of the project, you need to find out some background information about the issue of food security and how it affects Australians (as well as people across the world). We will ask you some stimulus questions that you will need to do some research to answer. Included on the next page is a worksheet that may help you to organise your research findings.

Some tips for researching on the internet:

- *Make sure you fully understand what it is you are trying to find out before you start your research.*
 - *You need to understand what all of the words in a question or statement mean so look them up if you don't.*
 - *If you're still stuck ask an adult.*
- *Try to use websites that are written by trusted sources.*
 - *Those ending in .gov, .org or .edu are usually reliable.*
- *Always find your information on more than one reliable website or source. If it only appears on one website, how do you know that the information can be trusted?*
 - *Wikipedia can be edited by anyone (even you!) so it may be a good starting point but cross check any information you get from there!*



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Background Information

Use the suggested websites to answer the following questions. If you use another website, record it next to the question numbers at the end of this section. Copy and paste the full URL and the date you used it.

1. Does *food security* affect people in WA?

Suggested site: <https://www.abc.net.au/news/2017-10-16/foodbank-wa-hunger-report-demand-increasing/9052956>

2. Are there better places we could be *growing food* in Australia?

Suggested sites:

- <http://www.abc.net.au/btn/classroom/northern-food-bowl/10529926>
- <http://www.abc.net.au/btn/classroom/food-bowl/10537258>
- <http://www.abc.net.au/btn/resources/teacher/episode/20100223-foodbowl.pdf>

3. What *effect* does a *growing population* have on *where* our *food* comes from?

Suggested site: <https://www.abc.net.au/news/rural/2019-03-27/melbournes-food-bowl-at-risk-to-urban-sprawl/10943564>



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4. Why do **droughts, floods, cyclones** and other weather events **impact food supply** so much?

Suggested sites:

- <https://www.abc.net.au/news/rural/2019-03-14/expensive-veggies-and-small-fruit-result-from-drought/10895426>
- <https://www.abc.net.au/news/2015-03-18/cyclone-pam-fears-of-food-shortages-vanuatu-huge-damage-revealed/6327658>
- <https://www.abc.net.au/news/rural/rural-news/2015-08-26/gascoyne-growers-cyclone-olwyn-snapshot/6721352>
- <https://www.abc.net.au/news/rural/2019-04-08/food-price-crunch-warning/10980234>

5. Why do places in Australia get cut off and **run out of supplies**, particularly fresh food, during cyclones and floods?

Suggested site: <https://www.abc.net.au/news/2018-02-20/broome-smashes-annual-rainfall-record-after-less-than-two-months/9462962>

6. How can **pests** (e.g. locusts or mice) **affect crops**?

Suggested site: <http://www.abc.net.au/btn/classroom/locust-plague/10535740>



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7. Does **food security** affect **people** around the **world** in **different** ways? For example, how do people in South Sudan cope with a lack of food compared to people in Australia? Who do they go to for help?

Suggested sites:

- <https://www.worldvision.com.au/get-involved/school-resources/detail/get-connected-food-security>
- <http://www.abc.net.au/btn/classroom/yemen-famine/10611588>
- <http://www.abc.net.au/btn/classroom/south-sudan-famine/10523354>

8. Is it possible to grow **food** in **space**? What **challenges** might we face?

Suggested sites:

- <https://science.howstuffworks.com/space-farming.htm>
- https://en.wikipedia.org/wiki/Space_farming
- <https://en.wikipedia.org/wiki/Astrobotany>

9. What **research** is currently being conducted on **growing food** in **space**?

Suggested sites:

- <https://youtu.be/bIc51VuEPng>
- https://www.nasa.gov/mission_pages/station/research/news/plants_in_space.html
- https://www.nasa.gov/mission_pages/station/research/experiments/explorer/Investigation.html?id=1159
- <https://sites.google.com/site/growingbeyondearth/products-services>



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10. What **problems** could we encounter **growing plants on other planets like Mars?**

Suggested sites:

- <https://youtu.be/Lav4ydRaN7k>
- <https://www.space.com/9597-space-farmers-grow-crops-planets.html>

11. How are scientists currently growing plants on the **International Space Station (ISS)?**

Suggested sites:

- https://www.nasa.gov/mission_pages/station/research/experiments/explorer/Facility.html?#id=374
- <https://youtu.be/SgpU08WJm0c>

Other websites used

Question	Website URL & date
1	
2	
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