

VERSION NUMBER 2

LAST UPDATED: 21st March 2024





Education Pack

Educators Guide

Welcome!

The Australian Space Discovery Centre

The Australian Space Discovery Centre is dedicated to inspiring the next generation of Australia's technology workforce. Located in Adelaide, South Australia, our centre serves as an opportunity for the public to learn about Australia's role in space and emerging space technologies. Utilising a variety of digital programs and immersive learning resources, we extend this experience to schools across the country.

We are excited to present our comprehensive **Education Pack**, designed to bring the wonders of space and technology directly to you. Our pack offers four distinct experiences: Virtual sessions, Downloadable Resources, Partnerships, and In-Person visits, each tailored to provide engaging and informative opportunities for students. With our Downloadable Resources readily available online, and our Virtual sessions easily booked through our website, accessing our educational materials has been made simple. These resources are open to all, fostering inclusivity and accessibility.

Our goal with this Education Guide is to illuminate the breadth of our offerings, ensuring that your students are equipped with enriching experiences that ignite curiosity and inspire future exploration.

Educators Guide

How to use this pack:

To make the most of this pack...

Read this document to understand our offerings.

Check the program overview and objectives to match them with your teaching goals.

Explore the different resources

- [Virtual](#)
- [Downloadable Resources](#)
- [Partnerships](#), and
- [In-Person](#).

COMING SOON:

Use our curriculum links for easy integration into your lessons and check out the careers resources to inspire students toward STEM and space-related careers.

Who this pack is intended for:

Educators, Science Centres, Public Libraries, Families

Programs Guide

We offer four types of experiences: Virtual, Downloadable Resources, Partnerships and In-Person.

Facilitated

- [Workshop - Standard School Session](#)
- [Workshop - Operation: Eyes on Earth](#)
- [Workshop - S.C.R.A.P Rocket Challenge](#)
- [Workshop - Solar System Explorers](#)
- [Workshop - So Many Satellites](#)
- [Workshop - Operation: Plants in Space](#)
- [Operation: Storytime](#)

Virtual

- [Digital Q&A with a Space Guest](#)
- [Workshop - Operation: Goldilocks](#)
- [Workshop - Operation: Trailblazer](#)

Downloadable Resources

- [Team Artemis Australia](#)
- [Tween Booklet](#)
- [Make your own Solar System with Jarli](#)
- [Why does Space Matter?](#)
- [Careers Quiz](#)
- [Australian Space Milestones](#)

Partnerships

- [Robogals](#)
- [Science Gallery Melbourne](#)

Facilitated Programs

In-Person at Discovery Centre

For Schools

We offer 2 types of sessions for school groups; **Standard Discovery Sessions** or more specialized **Workshops**. Teachers can book a session by emailing our team at book@discover.space.gov.au including the following details:

- School Name
- Year level
- Group size including adults and students
- Choice of session (standard, workshop or virtual)

Our school programs are free of charge. You will be emailed a Trybooking link to secure your session. *Please note school bookings must be made at least two weeks in advance.*

Standard Session:



Duration: 75 minutes

Capacity: 40 students

Year: 7 -12

Explore why space matters, what is happening in space in Australia, and some of the amazing career pathways space offers.



Students will receive a welcome and presentation from our Space Communicators before exploring our centre, including the Space Gallery, Careers Hub and other special displays.

Workshops

Get hands-on in one of our space workshop sessions. These workshops are designed to link the Australian curriculum to specialist topics in space. Our workshops integrate the space gallery for your students to expand on workshop content.

Operation: Eyes on Earth

Duration: 90 minutes

Capacity: 30 students

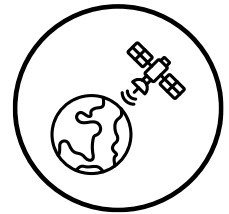
Ages: Yr 7 - 12

Recommended for: [Schools](#)

Key Learning Areas: Science, Mathematics, Design & Technology

Program elements:

- Presentation
- Worksheet
- Mission Elements



Program Overview and Learning Objectives:

This workshop explores design and engineering principles in the context of an Australian space mission. Facilitated by Space Communicators, students will:

- Learn about the importance of Earth Observation technology, and how its use impacts everyday life on Earth.
- Gather relevant information from the Space Gallery and other resources in-centre.
- Collaborate to Define, Ideate and Prototype an Earth Observation mission.
- Gain greater awareness of career pathways in the Australian space industry.

Resources:

All EOE Mission Elements can be located in our **Resources Folder**.

[EOE Resources all located in Resources Folder](#)

- | | | |
|------------------------------|---------------------------|--------------------------|
| • What is Earth Observation? | • Your Mission Pack Guide | • SatCat Booklet |
| • Assemble Catalogue | • Rocket Cards | • Launch Map |
| • Types of Orbits | • CubeSat Catalogue | • This is a Satellite A3 |

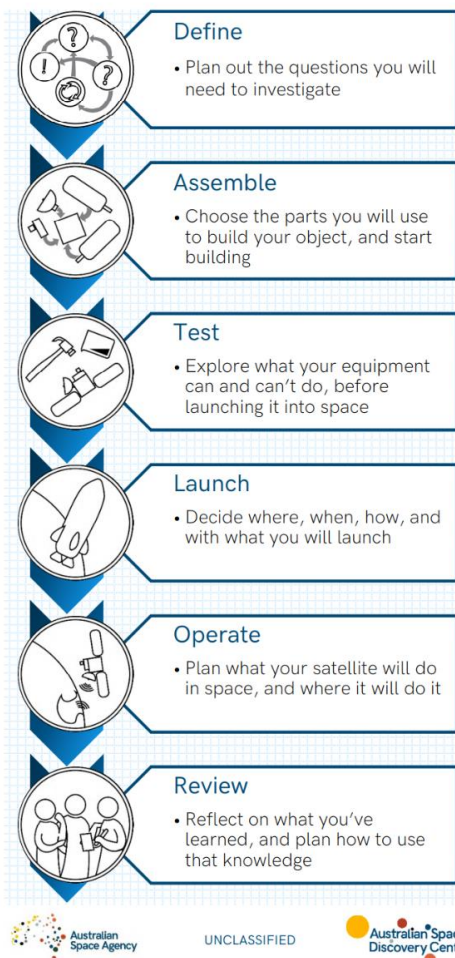
Operation: Eyes on Earth



Mission Assignment:

Measure and record surface temperatures across Australia.

Contributing to Australia's Earth Observation National Civil Space Priority Area.



Mission: Objective

For Internal Routing Only

Measure and record the surface temperatures of Australia.

Mission: Resources

1. [Gallery Map](#)
2. Earth Observation Graphic
3. [CubeSat Parts Diagram](#)
4. [EO Browser](#)
5. IR Camera and Tablet
6. Rocket Trade-Off Cards
7. Launch Location Graphic
8. [TAROT](#)
9. [Common Satellite Orbits](#)

Glossary

EO: Earth Observation
EPS: Electrical Power Supply
CubeSat: A small class of satellite
NVDI: Normalized Difference Vegetation Index
LEO: Low Earth Orbit
MEO: Medium Earth Orbit
GEO: Geostationary Orbit

Student Mission Planning Booklet

Provided to students and a perfect guide for this mission.



We also encourage students to use the following online resources:

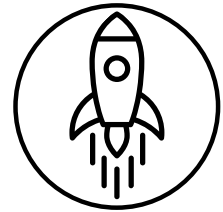
- [ASDC Gallery Map](#)
- [T.A.R.O.T](#) - Satellite Tracker
- [Sentinel EO Browser](#)

**EOE Resources
all located in
Resources
Folder**

Workshops:

S.C.R.A.P Challenge

(Student Cadet Rocket Adventure Program)



Duration: 90 minutes

Capacity: 30 students

Ages: Yrs 7 - 12

Recommended for: [Schools](#), [Science Centres](#)

Key Learning Areas: Science, Mathematics, Design & Technology

Program elements

- Presentation
- Craft Materials
- Mission Elements:
 - Guide and Templates

Program Overview and Learning Objectives:

The Student Cadet Rocket Adventure Program (SCRAP) Challenge is a practical, highly interactive workshop that uses design and engineering processes to explore propulsion and aerodynamic effects in the real world. Facilitated by Space Communicators, Students will:

- Learn about foundational concepts of aerodynamics, gravity and propulsion.
- Follow an iterative design process to create a paper rocket, making decisions about the design of the fuselage, nose cone and fins.
- Set their own criteria for launch success (fastest, highest-flying, etc.) and continue to evaluate and re-evaluate as design changes are made.

Note: This workshop requires "air-puff" launchers for the rockets. These can be purchased from education and toy shops, usually sold as a "stomp rocket", "stomp flyer" or "air stomp launcher." Otherwise, students can make their own benchtop versions using the S.C.R.A.P. Challenge: Micro-launch supplement included at the end of the S.C.R.A.P. Challenge resource.

The '[SCRAP Educator's Guide](#)' can be found in the [Resources Folder](#).

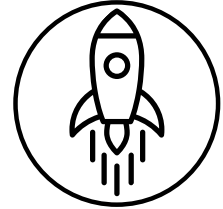
[SCRAP Resources all located in Resources Folder](#)

About the Resource:

The accompanying document uses a simplified four-part cyclical engineering design process, intended to be broadly accessible to most STEM learners. It is generic enough that other design cycle models can be readily substituted, if desired.

S.C.R.A.P Challenge

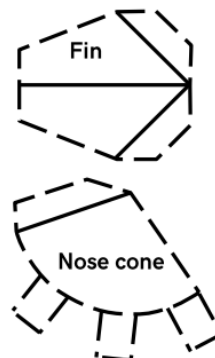
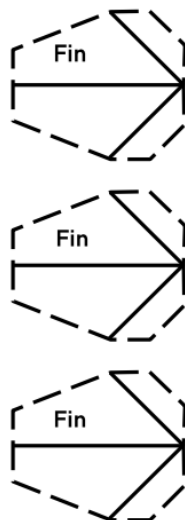
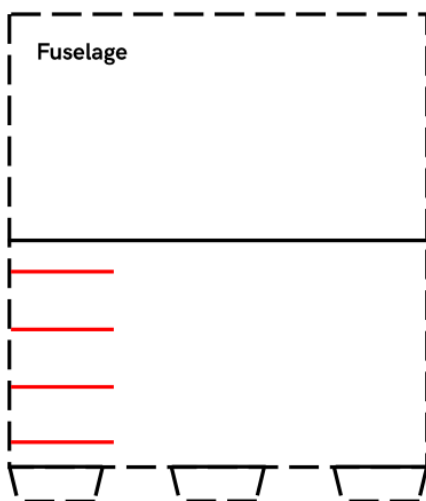
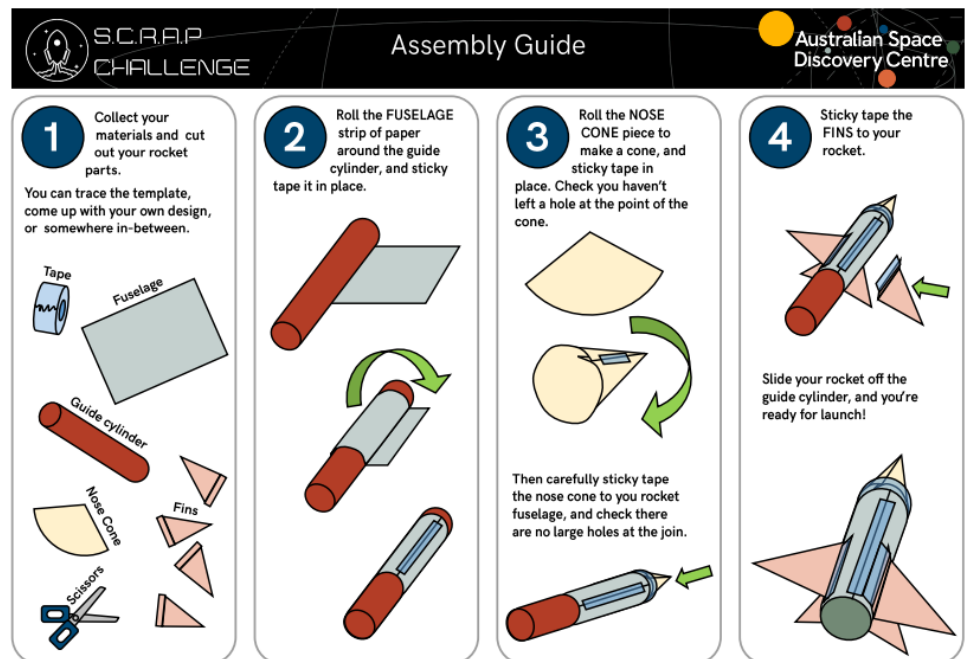
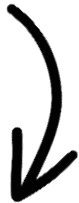
(Student Cadet Rocket Adventure Program)



SCRAP Rocket Tracing and Instructions



SCRAP Challenge Nose Cone Templates



You will need:
1 fuselage
(main body of the rocket)
4 fins
1 nose cone
Please refer to the assembly guide, also on this table.

[SCRAP Resources](#)
all located in
[Resources Folder](#)

Solar System Explorers

Duration: 90 minutes

Capacity: 30 students

Ages: Yrs 5 - 12

Recommended for: Schools, Science Centres

Key Learning Areas: Science, Mathematics, Design & Technology

Program elements

- Presentation
- Craft Materials
- Internet Access
- NASA Eyes
- Mission Elements:
 - Slides
 - Worksheets
 - Challenge Design Cycle

Program Overview and Learning Objectives:

Participants in this program will embark on a journey to explore our solar system while honing their understanding of planetary systems and technologies in exploration. Through this activity, they will delve into the unique characteristics and differences between planets. By using [NASA's Eyes](#), a powerful learning tool, participants have an opportunity to look at an array of celestial objects within our solar system.

The goals and objectives of this program are:

- Consider what humans and human-like life needs to be able to survive.
- Understand other planets are different from Earth and different from each other, and what causes those differences.
- Understand technology can be (and is) used to allow exploration.
- Encounter NASA's Eyes as a tool for learning more about the solar system.

Participants choose a destination, collect the corresponding printed "fact file", labelled "SSE_PlanetsPrintable" in the Resources folder. Students complete the worksheets, design and build a space habitat appropriate for their chosen destination.

Resources can all be found in the [Resources Folder](#)

NASA Eyes site: <https://eyes.nasa.gov/>

SSE Resources all
located in
Resources Folder



[NASA Eyes
Resource
can be
found here](#)

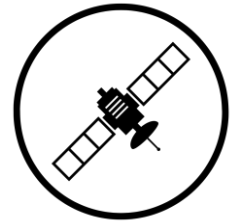
So Many Satellites

Duration: 90 minutes

Ages: Ages 5-12

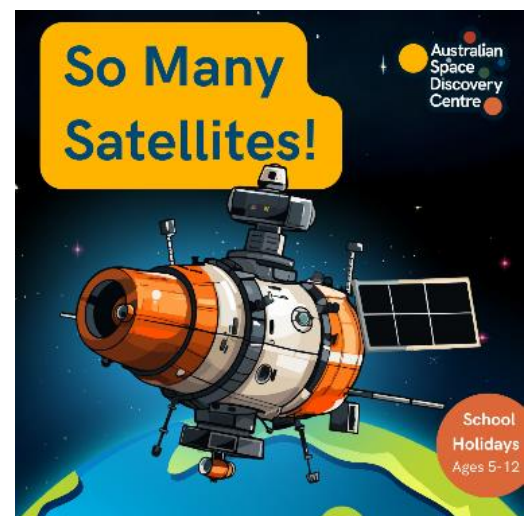
Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Mathematics, Design & Technology



Program overview and learning objectives:

- What is a satellite? What do they do? And why are there *so many* of them?
- So Many Satellites showcases how many different types of satellites orbiting our planet there are, and how they help to improve life here on Earth.



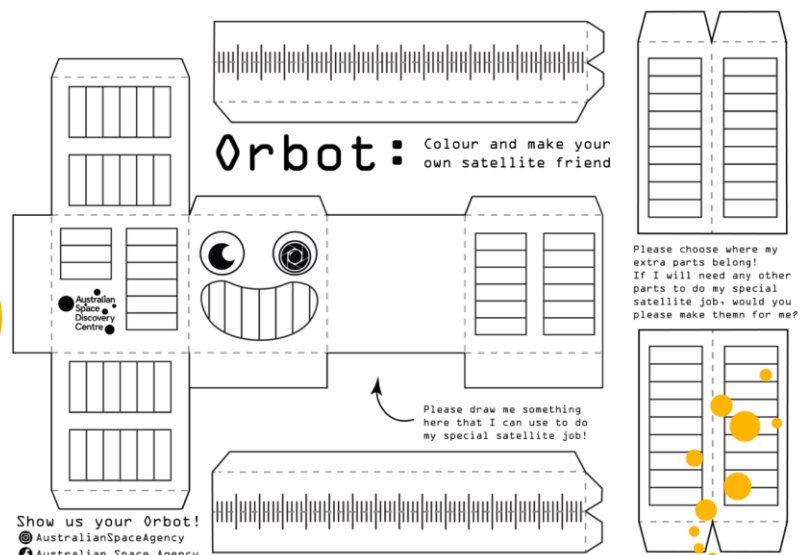
Participants will:

- Learn about how satellite technology helps people on Earth.
- Understand how different satellites have different purposes (e.g. Communication, GPS, Earth Observation, Human Exploration).
- Creatively explore different ways of building their own satellite out of craft materials.

Resources:

- Orbot Worksheet

"Orbot Worksheet" is located in Resources Folder



Operation: Plants in Space



Duration: 90 minutes

Ages: Ages 5-12

Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Design & Technology

Program overview and learning objectives:

Plants are an important part of any human space habitat. They give us food, and they make us feel good. But what do plants need to be able to thrive off-Earth? How can we grow enough food for astronauts living in space, on the Moon, or even on Mars? In Operation: Plants in Space, it's up to you to design the solution!

Participants will:

- Discover the importance of learning to grow food off-planet, and how plant research in space influences agriculture on Earth.
- Explore plant growth experiments on Earth and on the International Space Station.
- Follow design and engineering principles to define, ideate, and prototype their own space plant growth solution.



Operation: Plants in Space

Duration: 90 minutes

Ages: Ages 5-12

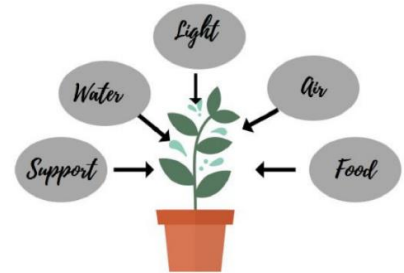
Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Design & Technology



Materials, recommended and not limited to:

- Cardboard
- Paper cups
- Paper plates
- Coloured card /paper
- Coloured washable markers
- Alfoil
- Plastic Wrap
- Glue sticks
- Scissors
- Sticky tape



Resources:

Operation: 'Plants in Space Worksheet' can be found in the **Resources Folder**.

About the Resource:

This PDF is a straightforward handout designed for students. It provides a space for students to sketch their habitat designs while also enabling them to refer to the original mission statement.



THINK

What are the things that plants need to grow successfully in space?



MAKE

Make a model of your plant habitat or module. Be creative!



TEST

Would your design be able to grow many types of plants that could feed the future astronauts? Or is anything missing?

IMPROVE

Change or add something to your design so it helps both plants and astronauts!



[Plants in Space Resources all located in Resources Folder](#)

Operation: Storytime



Duration: 30 minutes

Ages: Ages 3-8

Recommended for: Science Centres, Public Libraries, Families

Key Learning Areas: Literacy, STEM Concepts, Curiosity and Inquiry

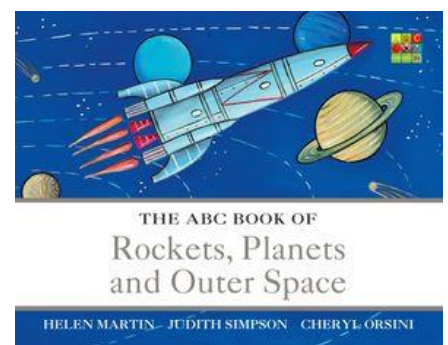
Materials:

- Picture book of choice
- Optional and dependent on space: A screen and laptop with picture book loaded.

Book recommendations:

In centre, Space Communicators have a range of books to read from. These include, but are not limited to:

- Alone – Scott Stuart
- Bluey: Sleepytime – Bluey
- Here We Are: Notes for living on planet Earth
- Meanwhile back on Earth – Oliver Jeffers
- The ABC Book of Rockets, Planets and Outer Space – Helen Martin, Judith Simpson
- The Astronaut's Cat – Tohby Riddle



Virtual Programs

Virtual Sessions

Tune in to the Discovery Centre from anywhere with our Virtual offerings.



Digital Q&A with a Space Guest

Program Overview and Learning Objectives:

Connect online with us monthly to hear about exciting pathways to a career in the space sector. From your classroom or your home, you can book into any of our digital sessions, each with a different Space Guest. Attendees will:

- Learn about the diverse range of careers in the Australian space industry.
- Gain valuable insights and expertise about space-related topics and current events.
- Explore the work and study pathways that lead into the space industry.

Note: The sessions last 45 minutes each. Our sessions are hosted on Microsoft Teams; however, you do not need a Microsoft Teams account to take part.

Accompanying Resource: Digital Q&A Activity Pack

**RESOURCES
COMING
SOON**


To book tickets for upcoming

Digital Q&A events:

- Visit our website: space.gov.au
- Click "Quick Links" in the top right of your screen.
- Select "Tickets - Australian Space Discovery Centre"

Current Events

Past Events



Online: Q&A with a Space Guest

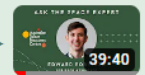
Friday 16 February 2024

Connect online with us to hear about exciting pathways to a career in the space sector. From your classroom or your home, you can book into any of our digital sessions, each with a different Spa...

BOOK NOW


Ask The Space Expert Digital Q&A

Australian Space Agency - 1/18



Digital Q&A - Edward Robinson (Robinson Aerospace Systems)

Australian Space Agency



Digital Q&A - Janna Fabris (Australian Space Agency)

Australian Space Agency

To catch up on past Digital Q&A sessions:

The Australian Space Agency YouTube Playlist with previous recorded Digital Q&As can be found [here](#).

Operation: Goldilocks

Duration: 60 minutes

Capacity: 30 students

Recommended for: Schools, Yrs 3-7

Key Learning Areas: Science, Design & Technology

RESOURCES
COMING
SOON



Program Overview and Learning Objectives:

Operation: Goldilocks is an interactive virtual workshop that guides students on a journey through our solar system using NASA's *Eyes on the Solar System* software. On this tour, students will:

- Explore how factors such as the distance from the sun and the physical make-up of the planets and affect conditions on their surface.
- Learn about the 'Goldilocks Zone' - and what it takes for a place to be not too hot, not too cold, but *just right* for human-like life to thrive.

Equipped with this understanding and a planetary factsheet of their choice, students are then invited to create and share a design for a vehicle to explore their chosen planet or celestial body.

At the end of the session, we will seek both teacher and student feedback via anonymous online forms, to inform the next iteration of the program.

Materials and session requirements:

- Personal computer or tablet able to run eyes.nasa.gov
- Classroom with facilities to join a Teams call, including access to a mic (required) and webcam (recommended).
- Basic recycled and/or recyclable crafting materials (recommended), for example:
 - Coloured card
 - Cardboard boxes and tubes
 - Paper cups and plates
 - Pipe cleaners
 - Paper straws
 - Glue, tape, and scissors
- OR paper and pencils for drawing vehicle designs (minimum required).

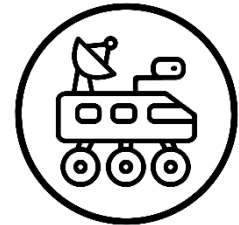
Operation: Trailblazer

Duration: 60 minutes

Ages: Ages 12-17

Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Design & Technology



Program elements

- Hands-On
- Worksheet

Program Overview and Learning Objectives:

The Trailblazer program is the flagship element for the Moon to Mars initiative. It helps to support NASA for the space exploration program and the plan to return to the Moon and further to Mars. [Trailblazer](#) is a grants program that offers funding for applicant to develop a rover that will be used in the Artemis program. This semi-autonomous rover will collect lunar soil and then take this to NASA equipment to attempt oxygen extraction.

Equipped with this understanding and worksheets, students are then invited to ***Design and construct Australia's Lunar/Martian Habitat.***

Students will...

- Discover the importance of learning how to sustain life off-planet.
- Explore the four basic needs that life needs to survive.
- Follow design and engineering principles to define, ideate, and prototype their own planetary habitat.

Materials and session requirements:

- Student Handouts
- Writing utensils
- Basic recycled and/or recyclable crafting materials (recommended), for example:
 - Coloured card
 - Cardboard boxes and tubes
 - Paper cups and plates
 - Pipe cleaners
 - Paper straws
 - Glue, tape, and scissors

[All Resources
in Resources
Folder](#)

Downloadable Resources

All of these downloadable resources are located on our [website](#).

To access directly, refer to our Learning resources and activities page [here](#).



Downloadable Resources

Make your own solar system with Jarli

Duration: 60 minutes

Ages: 5-12

Recommended for: Science Centres, Public Libraries, Families

Program Overview and Learning Objectives:

Interested in bringing the solar system to life at home or in your classroom?

Follow some simple instructions with the help of Jarli, an adventurous Australian Aboriginal girl with dreams of heading to space. Participants will:

- Learn about the order of the planets.
- Develop fine motor skills in cutting out shapes and tying knots to assemble.

Materials and session requirements:

- Scissors
- String
- Sharp pencil
- Coat hanger
- Glue stick

Note: This activity pairs well with watching accompanying short films [Jarli](#) and [Jarli goes to Space](#)

Activity Sheet can
be found here



Downloadable Resources

Careers in Space

Ages: 10 +

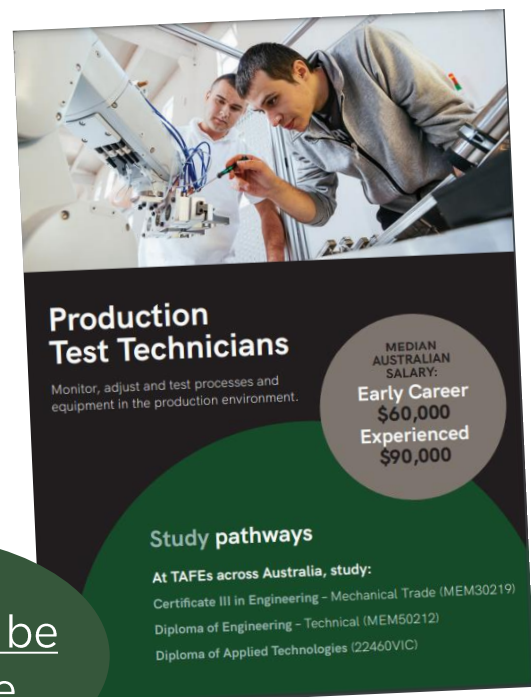
Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Career Exploration

Program Overview and Learning Objectives:

The intention of this booklet is to showcase and explore the many different types of careers that Australia's space industry has to offer. With this resource, students have an opportunity to discover the skills and study pathways that can link their passion for space with the subjects and topics they love at school.

Our space career booklet covers all the space careers featured on the [Agency Website](#) and can be downloaded by students, teachers or parents to read, share or use in the classroom.



Booklet can be found here

Tween Booklet

Ages: 10 – 18

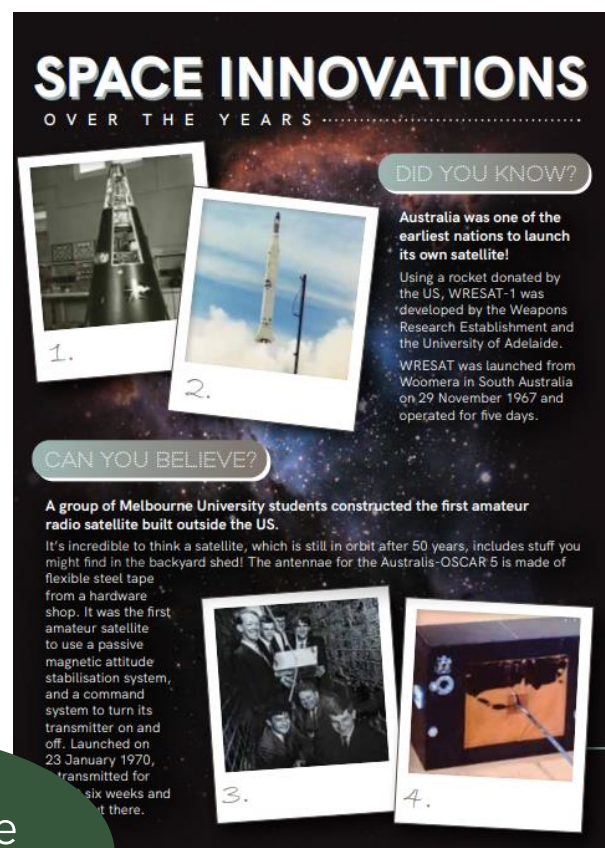
Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Geography, English

Program Overview and Learning Objectives:

This magazine-style booklet is aimed at pre-teen or tween students. The booklet can be used as general reading material, or more specialised as a text for lessons (Geography, English, or Science).

Learn about the Australian Space Agency, Meet Katherine: Aussie astronaut in training, Discover our plans to return to the Moon, Explore Aussie space innovations, companies, careers and more.



Booklet can be
found here

Team Artemis Australia

Ages: 10 – 18

Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Geography, English

Program overview and learning objectives:

Team Artemis Australia interactive is a resource that explains how Team Artemis Australia aligns Australian capabilities with NASA's Artemis Program and Moon to Mars strategy.

This resource showcases Australia's space capabilities, and their potential for supporting national and global space activities. Team Artemis highlights the collaboration between the Australian Space Agency and NASA throughout the Artemis Program and lays out NASA's plan for a sustained human presence on the Moon.

[This PDF can be found here](#)



Interactive Poster: Why does Space matter?

Ages: 10 – 18

Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Geography

Program Overview and Learning Objectives:

Space technologies are seamlessly integrated into the modern world, and we can find it all around us.

Satellites help collect and relay data to track wildlife to help manage and protect their habitats. Live broadcasts are available due to communication satellites, Communication satellites and GPS make it easy to shop anywhere, anytime – and so much more!

With this interactive PDF resource, learn how space matters in our everyday lives – from keeping us healthy to inspiring us to go beyond the boundaries of what we think is possible.



Interactive Poster: Australian Space Milestones

Ages: 10 +

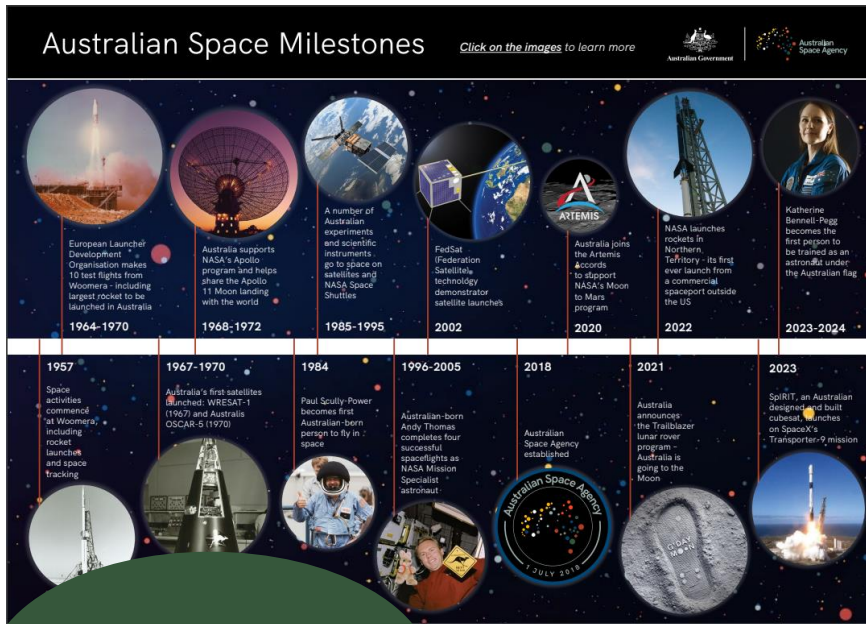
Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Science, Geography, History

Program Overview and Learning Objectives:

Learn about the key moments in Australia's rich space history that dates back to the 1950s.

This collection of Australian space milestones can be displayed as a set of posters, or as a more in-depth learning resource for classroom use.



Poster can be
found here



Purra's Activity Booklet

Ages: 3 +

Recommended for: Science Centres, Public Libraries, Families

Key Learning Areas: Science, Geography, History

Program Overview and Learning Objectives:

Join Purra in a range of fun and educational activities such as colouring in rockets and planets, a space-themed word search, and a spectacular dot to dot.

Purra is an Australian Space Agency 'kanganaut' named after an Indigenous astronomy story, which can be visualised in the stars across the nights skies in the Southern Hemisphere.

Booklet can be
found here



Space Careers Quiz

Ages: 10 +

Recommended for: Schools, Science Centres, Public Libraries, Families

Key Learning Areas: Career Exploration

Program Overview and Learning Objectives:

This highly engaging career quiz allows students to explore potential careers and envision a future for themselves in the space industry. The quiz will:

- Situate students on a moon base as they try to find their role in the new lunar settlement.
- Navigate scenarios that explore students' interests, strengths and values.
- Generate a space career suited to the student based on their answers.



[Start the Quiz here](#)

Collaborations

Collaborations

Science Gallery Melbourne Mission Control – School Workshop Bring Mars to your Classroom

In **Module 1**, students learn about civics and how to pass a space-related bill through the houses of their state parliament [VIC and SA only]. They decide and vote on which 10 Industries deserve to be taken on a mission to Mars.

In **Module 2**, students undertake a design challenge where students are tasked with a design-thinking challenge to model the infrastructure needed for a successful mission. Success relies on collaborating with other industries to build a thriving city on the Red Planet.



[All resources
can be found
on the Science
Gallery
Melbourne
website](#)



Robogals

[Robogals Robot Battle – School Holiday Workshop](#)

Participants learn about basic concepts of robotics and then code a robot to 'battle' with other participants' creations.

[Stay tuned for
more Partnership
events here](#)



Education Pack

Educators Guide

Have any questions? Reach out!

Thank you for exploring the Australian Space Discovery Centre's Education Pack!

We hope these [resources](#) ignite a passion for space exploration within your students and inspire. Should you have any questions or require further assistance, please don't hesitate to reach out to our team.

Stay updated on the latest news and events by [subscribing to our newsletter](#).

Ready to embark on your next educational adventure? Organise your school session with us today by visiting our [website](#) or emailing us at book@discover.space.gov.au

We value your partnership and commitment to inspiring future generations of space enthusiasts.

VERSION NUMBER 1

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