Australia Post

Full STEAM ahead!

Stamp Collecting Month

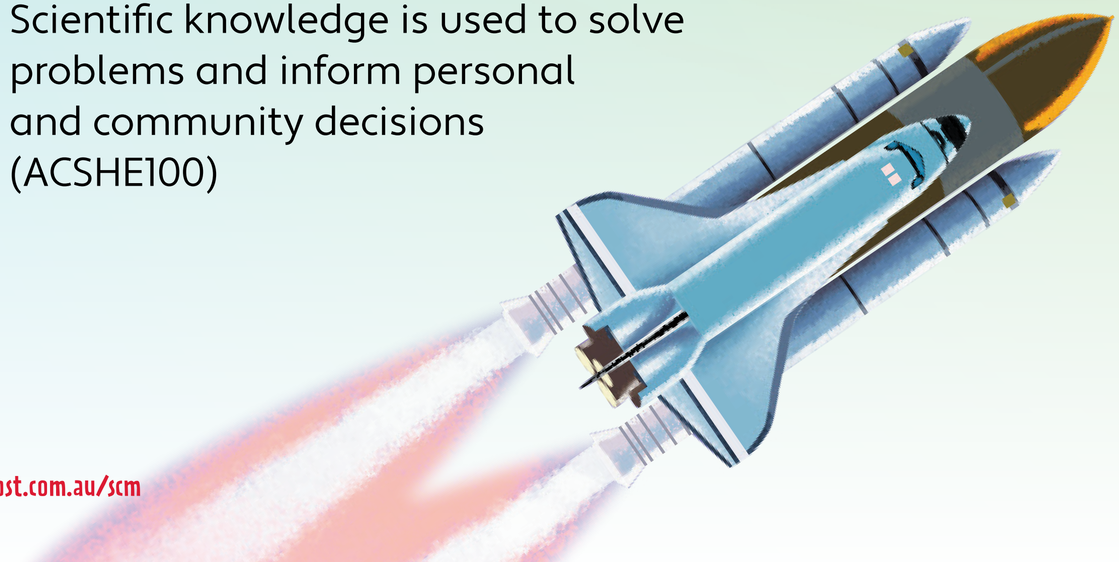
Aiming for the Stars

Classroom Activity Guide

Curriculum Links

Science

- Science involves making predictions and describing patterns and relationships (ACSHE061)
- Science knowledge helps people to understand the effect of their actions (ACSHE062)
- The Earth is part of a system of planets orbiting around a star (the sun) (ACSSU078)
- Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions (ACSHE098)
- Scientific knowledge is used to solve problems and inform personal and community decisions (ACSHE100)



Design and Technologies

- Examine how people in design and technologies occupations address competing considerations, including sustainability in the design of products, services, and environments for current and future use (ACTDEK019)
- Critique needs or opportunities for designing, and investigate materials, components, tools, equipment and processes to achieve intended designed solutions (ACTDEP024)
- Select appropriate materials, components, tools, equipment and techniques and apply safe procedures to make designed solutions (ACTDEP026)
- Negotiate criteria for success that include sustainability to evaluate design ideas, processes and solutions (ACTDEP027)

Curriculum Links

The Arts

- Use and experiment with different materials, techniques, technologies and processes to make artworks (ACAVAM107)
- Develop and apply techniques and processes when making their artworks (ACAVAM115)
- Plan the display of artworks to enhance their meaning for an audience (ACAVAM116)

Cross-Curriculum Priorities – Sustainability

- The biosphere is a dynamic system providing conditions that sustain life on Earth (OI.1)
- World views that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice, are essential for achieving sustainability. (OI.4)
- World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability. (OI.5)
- Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments. (OI.7)

General Capabilities

- Literacy & Numeracy
- ICT Capability
- Critical & Creative Thinking
- Personal & Social Capability
- Ethical Understanding
- Intercultural Understanding

How to use this guide:

This Aiming for the Stars Classroom Activity Guide is for Foundation to Year 6 teachers taking part in Australia Post Stamp Collecting Month 2021.

It is best to work through the read aloud interactive slideshow before your class commences the activities in this guide.

This guide contains activities of varying difficulty, including an extension task. Students can attempt one or all of the activities. Teachers should select activities that are appropriate for the capabilities and interests of their students. All content is linked to the Australian Curriculum.

The interactive slideshows contain introductory information about the Stamp Collecting Month topics and thought-provoking discussion questions intended to inspire deeper thought and conversation around technology and STEAM-learning.

Learning Intentions

Students will:

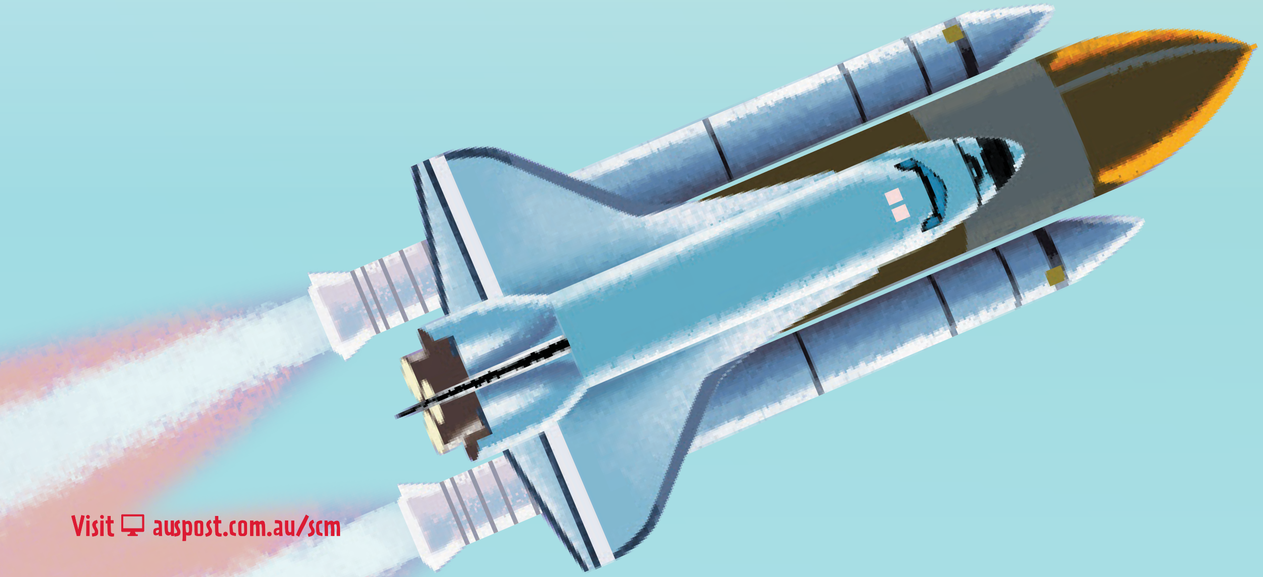
- Create models representing and developing their understanding of space travel and the solar system.
- Consider the conditions that make Earth habitable and the difficulty in replicating these conditions.
- Debate the technological and scientific benefits of space travel and the ethical considerations around its expense.

Activity 1
Straw Rockets!

Build a paper rocket powered by air from a straw. Test your rocket against your friends' creations.

Resources required:

- paper
- pencil
- scissors
- tape
- straws
- measuring tape



Follow the steps below to make your straw rocket:

1. Cut out a piece of paper measuring 12cm x 3cm. Curl the paper around a straw to form a tube. Tape the tube and remove the straw. This is the body of the rocket! Make four small triangular fins and tape them to the base of the tube.

2. Place a pencil inside the rocket. Twist the front end of the rocket around the tip of the pencil to make a pointy nose. Remove the pencil. Your rocket is ready!

3. Place a straw inside the base of the rocket and blow!

Measure and record how far your rocket travels. Experiment with the design of your rocket and its fins to see if you can make it travel further or straighter!

Reference: NASA | Make a Straw Rocket

Activity 2

Make a Model Showing the Relative Size of the Planets!

Gather and decorate everyday objects to show the relative size of the Sun and the eight planets in our solar system.

Research the size of each planet (see attached table). Earth, for example, is approximately 3 times larger than Mercury and Jupiter is about 11 times larger than Earth. What objects will you choose for each planet?

Make Earth the size of a small ball, such as a golf ball. Otherwise the objects representing the larger planets will get too big.

Remember, it will be impossible to get the sizes of the planets exactly right!

Reference: NASA | Planetary Fact Sheet (See: Row 2 “Diameter [km])

Activity 3

Class Debate: "We Shouldn't Spend Money Building Spaceships. We Should Spend it on Food for Hungry People Here on Earth."

Space programs cost a huge amount of money, but they arguably also lead to very valuable technological and scientific progress.

Should we be "aiming for the stars" when many people here on Earth lack adequate food, shelter, and basic health care?

Hold a class debate investigating the topic above.

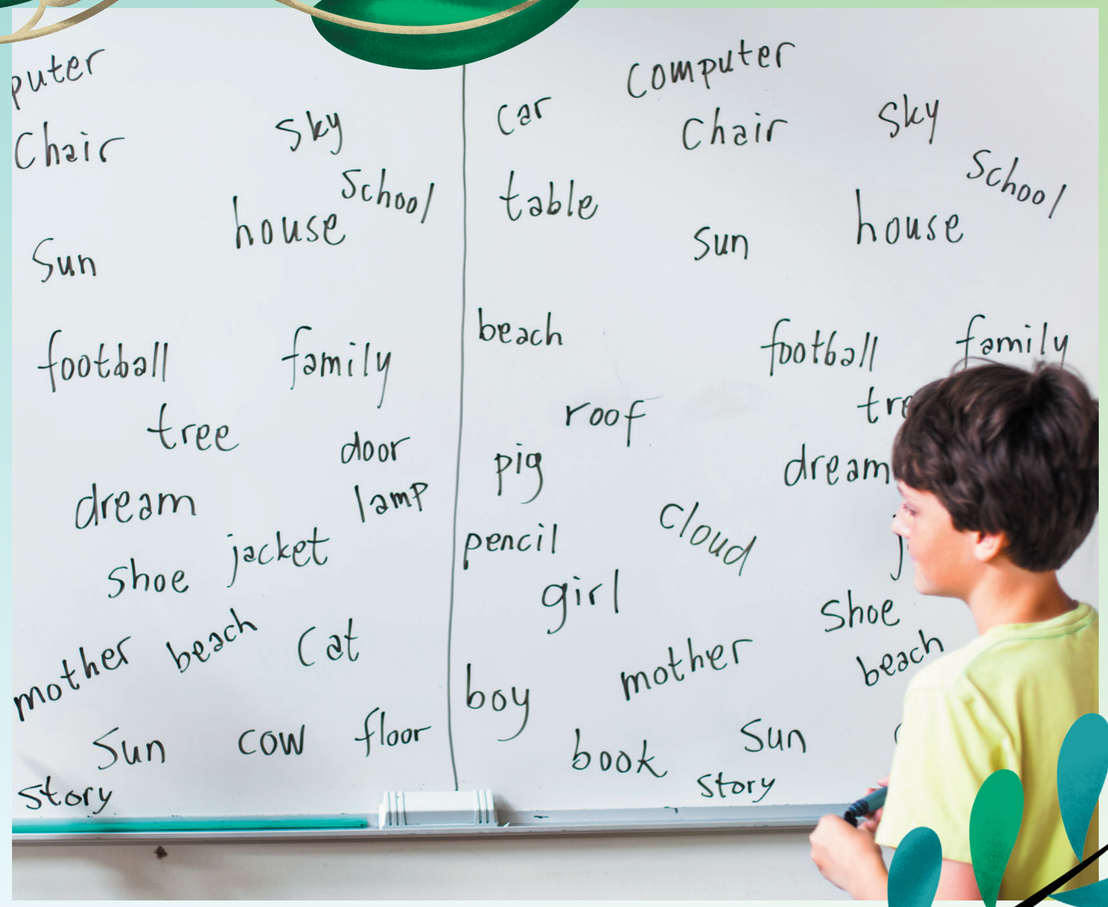
Teams will need time to brainstorm, organise their ideas, structure and write their speeches, and practise.

Find lots of other issues to debate in the interactive slideshows. Hold more debates to ensure every student gets an opportunity to express themselves!

Teacher Tip:

If you are unfamiliar with how to structure a debate, research this in advance.

- There should be two teams, the "affirmative" and the "negative".
- Each team should have 3 or 4 speakers.
- The teacher and the class can decide the winner!



Activity 4

Word Busters! Hold a Spelling Bee!

Look through the interactive slideshow for this unit to find new and hard-to-spell words. Depending on the age and capabilities of your students, some of the words your students may find difficult include:

Earth, solar system, space, NASA, computer, Jupiter, international, government, progress, society, astronomy, universe.

How many of your students understand all the challenging new words and phrases?

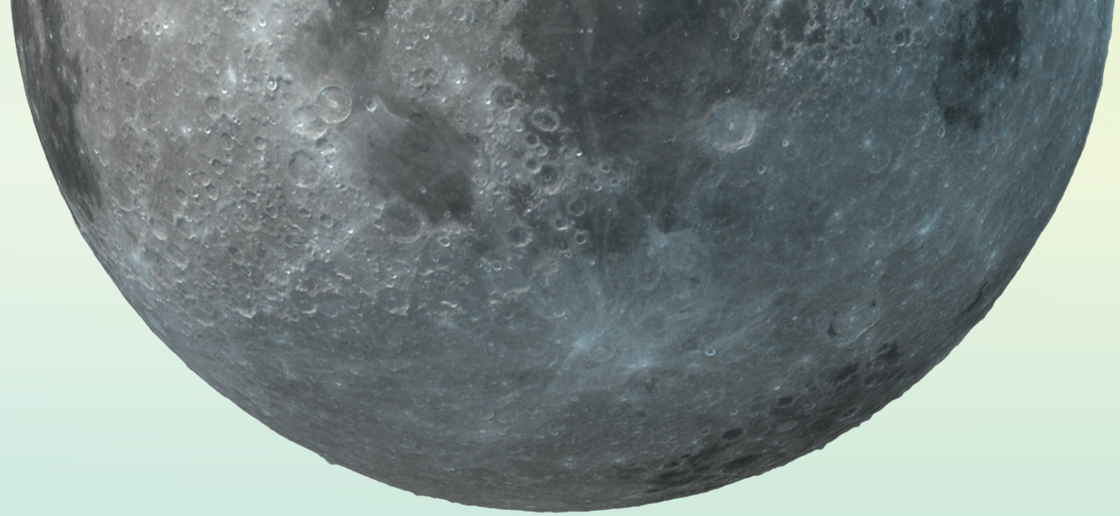
Activity 5
DIY Lunar Lander!

Design and build a model of a lunar lander. Compete in groups while learning about gravity, architecture and design.

The aim is for your lander to absorb the shock of landing without your marshmallow passengers being thrown from the attached cup.

Resources required:

- 2x squares of cardboard (20cm x 20cm)
- thinner cardboard, such as index cards
- tape
- plastic or paper cups
- decorations



Follow the steps below to make your lunar lander:

1. Use tape to attach the concertinas between the two pieces of cardboard. Fold two stacked pieces of thinner cardboard or paper into concertinas. They will act like springs, creating a shock-absorption system between the pieces of cardboard.
2. Firmly tape your cup to the top of one of the pieces of cardboard. Click on the "Reference" link below to see an image of the lunar lander design. Place your two marshmallow astronauts in the cup. Drop your lunar lander from 20 or 30cm. Did the marshmallows stay in the cup?
3. Experiment with your design so you can gradually increase the height from which you can safely land your astronauts.

Reference: Build a Lunar Lander

Extension Task
A New Home?

Extension students and fast finishers design a space station on which humans could live for an extended period of time.

Find out the basic living conditions humans require so you can try to replicate these. Consider oxygen, water, food, waste, and temperature.

Research the International Space Station to see how experts have solved some of the design challenges in building a space station.

Sketch and label your settlement. Outline the reasons for your design choices. Use an online design program such as Google SketchUp or build your invention using Lego.

What features and technologies have you included onboard to ensure a decent quality of life?

Congratulations

for completing the Aiming for the Stars! activities for Australia Post Stamp Collecting Month 2021.

Please place the giant collectable sticker underneath the Aiming for the Stars! heading on your A3 Classroom Poster!

We hope you and your students have enjoyed this year's program and look forward to you joining us for Stamp Collecting Month 2022!