

A large gas giant planet, likely Jupiter, dominates the right side of the frame. A space probe with two large solar panels is in orbit, pointing towards the planet. The background is a dark space filled with stars.

Space Exploration: Community of Inquiry

YEAR 5 AND 7
EARTH AND SPACE SCIENCES



QGC

FUTUREMAKERS



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Future Makers

Future Makers is an innovative partnership between Queensland Museum Network and Shell's QGC business aiming to increase awareness and understanding of the value of science, technology, engineering and maths (STEM) education and skills in Queensland.

This partnership aims to engage and inspire people with the wonder of science, and increase the participation and performance of students in STEM-related subjects and careers — creating a highly capable workforce for the future.

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EXPLORE

Space Exploration: Community of Inquiry

Teacher Resource

In the following activity, students will participate in a community of inquiry to consider the implications of human space travel. This process gives students the opportunity to come to a full, shared understanding of the concepts and issues around human space travel.

The community of inquiry is a process of discussion where participants pose open-ended questions, listen to the viewpoints of others, and share their own ideas. Disputed or contestable issues and concepts are considered collaboratively within a supportive and respectful classroom environment. It is important that all participants reflect on their own thinking.

The following ways of working are used during the community of inquiry process. These should be put up on a wall for all students to refer to throughout the process.

- Listen attentively to others
- Build upon and connect ideas
- Have respect for others, yourself and place
- Disagree with respect and reason
- Many responses and opinions may be considered to be correct

Detailed instructions for this activity are below.

1. Commence with the following stimulus and prompt a class discussion of current developments in space travel:

In 2018, Australia established a space agency. In 2019 China landed a spacecraft on the far side of the Moon, and a Japanese rover has collected samples from under the surface of the asteroid Ryugu, which will be brought back to Earth in 2020. The International Space Station (ISS) partners are committed to establishing a permanent human presence on the Moon in the next few years, and putting humans on Mars by the 2030s.

2. Students should discuss in small groups the overall question: Is space-related research important?

Students can consider the following prompts and should give reasons for their answers:

- The advantages/disadvantages of space travel
- Our own impact on our planet
- Any risks to individuals, society, our own or other planets
- Other ethical and economic considerations

3. Now invite students to share their responses, while you note their answers on the whiteboard or butchers paper (a PMI chart is useful for this activity).

If it isn't clear where a response fits, ask the students if they see it as an advantage or a disadvantage. If it is uncertain, record in the Interesting column.

4. Ask the students if there are questions they are still wondering about, and record in the Interesting Column.

You can also ask if they think the advantages of space travel outweigh the disadvantages.

Keep the PMI as a resource for use during the rest of the unit. You may want to ask these questions again at the end of the unit, as students may change their minds based on new information or understandings.

A number of other questions you could use as prompts are:

- Why do you think people have always been fascinated by space?
- Why do you think people want to understand and explore space?
- Do you think we should be spending a lot of money on space research?
- Do you think space research is important?
- Should humans be focused on travelling to Mars?
- Why do you think returning to the moon and travelling to Mars is a goal of international space agencies?
- How might artificial intelligence assist us to travel to Mars?
- Would it be useful to discover life on planets other than Earth? Why do you think that?
- If space travel can risk human safety, why do you think many people have expressed interest in becoming part of a colony/settlement on Mars?
- How might the colonisation of Mars benefit our own planet?
- Are there risks in putting a human colony on Mars? Could these be avoided?
- Could sending humans into space impact on our connections to nature here on Earth?
- What are the key ethical considerations around sending humans into space?
- Would you be interested in travelling into space or colonising Mars? Why/why not?

Curriculum Links

Science

YEAR 5

Science Understanding

The Earth is part of a system of planets orbiting around a star (the sun) (ACSSU078)

Science as a Human Endeavour

Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions (ACSHE081)

Scientific knowledge is used to solve problems and inform personal and community decisions (ACSHE083)

YEAR 7

Science Understanding

Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon (ACSSU115)

Science as a Human Endeavour

Scientific knowledge has changed peoples' understanding of the world and is refined as new evidence becomes available (ACSHE119)

Solutions to contemporary issues that are found using science and technology, may impact on other areas of society and may involve ethical considerations (ACSHE120)

People use science understanding and skills in their occupations and these have influenced the development of practices in areas of human activity (ACSHE121)

General Capabilities

Critical and Creative Thinking

Inquiring: Identifying, exploring and organising information and ideas

Reflecting on thinking and processes

Personal and Social Capability

Social awareness

Ethical Understanding

Understanding ethical concepts and issues

Reasoning in decision making and actions

Intercultural Understanding

Interacting and empathising with others

Cross-Curriculum Priorities

Sustainability

Designing action for sustainability requires an evaluation of past practices, the assessment of scientific and technological developments, and balanced judgements based on projected future economic, social and environmental impacts (OI.8)

Space Exploration – PMI Chart

Student Activity

What are the advantages (Plus) and disadvantages (Minus) of space research? In the Interesting column you may record anything that you find interesting or wonder about space research.

Plus	Minus	Interesting