OPERATION: NEGOTIATION

PARTICIPANT HANDOUT

LIST OF COUNTRIES

There are 8 countries with varying primary and secondary science and technology objectives. Teams should attempt through negotiation to satisfy at least one of the two objectives. It is not necessary that all objectives are 100% satisfied, as no organization has the budget required to fund everything they want to do.

Note to activity facilitator: Provide each team with the information about their country only. If only assigning 4 countries it is recommended to use Andromeda, Betelgeuse, Epimetheus and Fornax.

1. Andromeda

Andromeda is a large country with a long history in space, and has contributed to significant development in technology for human space travel. The current focus of the Andromedean administration is human exploration in space.

Primary objective: Determine how humans can survive long term in deep space, and explore the potential for human habitation off Earth.

Secondary objective: Improve understanding of the long-term effects of space on the human body and develop technologies to mitigate negative impacts of living in space.

Space budget: 55 SpaceBucks

2. Betelgeuse

Betelgeuse is a small island nation with a great interest in the formation of the universe and life on Earth. Betelgeuse University is home to world experts on planetary science and geology.

Primary objective: Understand the origin of life on Earth and continue the search for extraterrestrial life.

Secondary objective: Develop knowledge of the formation of extraterrestrial planetary bodies and how this can influence what we know about Earth.

Space budget: 45 SpaceBucks

3. Calypso

Calypso is an international leader in artificial intelligence and technology. While their space program is fairly new, the technical acumen of Calypsians is an asset to the international space industry.

Primary objective: Demonstrate the country's significant AI capabilities through testing a novel algorithm for machine learning (e.g. geographical feature categorization, biological models, autonomous driving, navigation).

Secondary objective: Develop and test robotic systems for space to aid in performing tasks autonomously or with human operators.

Space budget: 35 SpaceBucks

4. Deimos

Deimos is a northern country with thousands of kilometres of shorelines and frequently harsh climates. Deimotians look to space exploration as a way to better understand and protect their own country and coastlines, and have significant experience in remote sensing projects.

Primary objective: Monitor polar ice cap melting to gain an understanding of the possible effects of climate change on Deimos's borders and population.

Secondary objective: Develop new techniques for providing food to northern communities with limited growing seasons and harsh weather.

Space budget: 30 SpaceBucks

5. Epimetheus

The rocky and cratered terrain of southern Epimetheus parallels geological features seen on other bodies in our solar system. Learning more about the creation of these formations and the formation of the universe remains a key objective for Epimetheans, as seen by their investment in state-of-the-art geological analysis techniques.

Primary objective: Improve knowledge of the formation of the universe and its initial expansion.

Secondary objective: Collect specimens from ancient bodies that can inform us about planetary and celestial development.

Space budget: 40 SpaceBucks

6. Fornax

Fornax has an impressive history of being on the cutting edge of space technology and wants to continue to expand their development of in-situ technology. Their current tech includes advanced prototypes for fuel generation.

Primary objective: Develop in-situ techniques for extracting water and other required resources for long-term human habitation on other planets/moons.

Secondary objective: Develop and test in-situ techniques for rocket fuel generation off Earth to expand humanity's reach into the cosmos.

Space budget: 50 SpaceBucks

7. Ganymede

Ganymede is located in a desert, and Ganymedeans are constantly working to develop new techniques to improve crop yields and quality of life. They believe that conquering challenges related to food production in space can help with terrestrial crop development, and Ganymede is already among the most advanced countries in limited resource food production.

Primary objective: Demonstrate food production in space, i.e. on board an orbiting science platform or other celestial body.

Secondary objective: Monitor crop yield in low precipitation/harsh environment regions on Earth to enable the development of improved long-term crop planning.

Space budget: 30 SpaceBucks

8. Halley

Hallean material science is on the cutting edge of space technology. Halley's recent focus has been on understanding radiation shielding and how conquering this challenge can bolster international space exploration.

Primary objective: Showcase a new material that can significantly decrease the effects of radiation on biological or electrical systems.

Secondary objective: Further understand the effects of radiation in deep space and characterize its levels throughout the galaxy.

Space budget: 30 SpaceBucks

LIST OF MISSIONS

There are several missions that will help countries reach their objectives. Below is a list of some examples to help teams think about what kind of space missions could meet their priorities. Teams do not have to pick from this list. They are encouraged to conduct additional research on different possible space missions that relate to their country's priorities. If they develop new missions, the cost should align with the examples below.

Note to activity facilitator: Provide this information to all teams.

GENERAL GUIDELINES

- A mission needs to be supported by a minimum of 2 countries.
- Emphasis is placed on working collectively towards a solution that meets at least one primary or secondary objective for every country.
- Depending on the required funding, the solution to meet a country's objectives could be multiple missions.

1. Short-Term Crewed Mission

In a short-term crewed mission, a small team would be sent to a celestial body in our solar system. The maximum mission duration (on the surface) would be one month.

Potential objectives

- Human exploration
- Technology demonstrations
- Short-term space medicine
- Sample collection and return
- Solar system exploration
- Search for extraterrestrial life

Cost: 100 SpaceBucks

2. Long-Term Crewed Mission

In a long-term crewed mission, a small team would be sent to a celestial body in our solar system. The mission could be a long-term return mission (6+ months) or the beginning of an indefinite colony.

Potential objectives

- Human exploration
- Technology demonstrations
- Long-term space medicine
- Sample collection and return (if returning)
- In-situ resource processing
- Food production
- Solar system exploration
- Gateway to deep-space exploration
- Search for extraterrestrial life

Cost: 140 SpaceBucks

3. Earth Observation Satellite

A specially made satellite will be sent up to observe Earth using a variety of techniques and will send meaningful data back to the people on the ground.

Potential objectives

- Technology demonstrations
- Earth observation

Cost: 40 SpaceBucks

4. Deep-Space Telescope

A specially made satellite will be sent up to observe the universe using high-powered lenses. This can be used to observe other planetary systems, galaxies or significant cosmological events.

Potential objectives

- Deep-space exploration
- Technology demonstration
- Determining origins of the universe

Cost: 55 SpaceBucks

5. Orbiting Science Station Visit (around any celestial body: planet, moon)

A group of astronauts will be sent up to an existing orbiting space station where they can perform a variety of science experiments and research related to human longevity in space and test new technologies.

Potential objectives

- Human exploration
- Technology demonstrations
- Short-term space medicine
- Food development

Cost: 40 SpaceBucks

6. Sample Return Mission (from any celestial body: planet, moon, asteroid)

A probe will be sent to a celestial body with the goal of collecting and bringing back material from its surface.

Potential objectives

- Sample collection/return
- Solar system exploration
- In-situ fuel generation (for return trip)
- Technology demonstration
- Search for extraterrestrial life
- Determining origins of the universe

Cost: 60 SpaceBucks

7. Deep-Space Probe

A probe will be sent into deep space to observe our solar system and galaxy. This data will be sent back to Earth, where it will be analyzed by scientists and engineers.

Potential objectives

- Solar system exploration
- Deep-space exploration
- Technology demonstration
- Search for extraterrestrial life
- Determining origins of the universe

Cost: 60 SpaceBucks

8. Robotic Mission (rover, etc.)

A robotic device will be sent out to a celestial body where it will roam around and perform numerous experiments and sample analyses to further our understanding of that celestial body.

Potential objectives

- Sample collection/in-situ analysis
- Solar system exploration
- Technology demonstration

Cost: 50 SpaceBucks