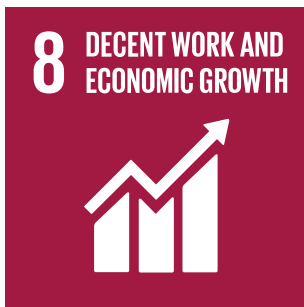


## MM7: SDG8 SPACE4SDGS DECENT WORK AND GROWTH



### SDG 8: Space Economy and Jobs of the Future

- Develop a space economy framework that supports job creation and economic growth.

#### Challenge

As space exploration and technology advance, opportunities for new careers and industries continue to grow. Your challenge is to design a framework that leverages space technology to support job creation and boost economies. Think about how industries related to space, such as satellite communication, space tourism, and asteroid mining, could open up new types of jobs and lead to economic benefits both in space and on Earth. This framework will support a future where the space economy can provide meaningful work and contribute to sustainable economic growth.

#### Considerations

- **Industry Potential and Skills:** Research which space-related fields are likely to grow and what skills might be needed in areas like space tech, data analysis, engineering, or resource management.
- **Accessibility and Inclusivity:** Consider how your framework can make space careers accessible to a diverse workforce, offering opportunities to people from various backgrounds and skill levels.
- **Sustainability:** Ensure that the jobs and industries promoted in your framework support sustainable practices, both for space environments and on Earth.
- **Safety and Regulations:** Design a framework that respects safety and aligns with international space regulations to ensure ethical and safe practices in space.
- **Education and Training:** Think about how the framework can include training programs, internships, or educational resources to prepare young people for careers in the space economy.

#### Background

The space industry is expanding rapidly, and as it does, it opens up new possibilities for economic growth and job creation. The space economy, which includes sectors like satellite communications, space tourism, and asteroid mining, has the potential to transform industries on Earth. Satellites, for example, are crucial for GPS navigation, weather forecasting, and global communications. With space tourism, private companies can offer flights into orbit, which creates opportunities in tourism, engineering, and hospitality. Even mining resources from asteroids could one day provide rare materials that support technology production on Earth.

For a thriving space economy, skilled workers are essential. A variety of careers will be needed, including engineers, data scientists, project managers, environmental experts, and many others. Developing a space economy framework that encourages job creation means creating opportunities for young people, building diverse and inclusive job pathways, and ensuring that new industries support economic growth while protecting both space and Earth's environments. With careful planning, the space economy can provide high-quality jobs, drive technological innovation, and benefit communities around the world.

### Your Mission

Your mission is to design a framework for a space economy that can support the creation of new jobs and stimulate economic growth. Focus on identifying the industries within the space sector with the most potential for expansion, the types of careers these industries could create, and how to make these jobs accessible to people from all backgrounds. Consider ways to ensure that the space economy remains sustainable and that it follows safe practices. By creating a well-rounded framework, you can help envision a future where the space economy provides meaningful work and global economic benefits.

### Project Objectives

- Identify Key Areas of Growth in the Space Economy:
  - Research potential space-related industries, like satellite technology, space tourism, asteroid mining, and how they can create jobs and drive economic growth.
  - Focus on industries that can have long-term impacts on Earth's economy and job market.
- Promote Accessibility and Skill Development:
  - Develop ideas for training programs and internships that make space industry careers accessible to people from diverse backgrounds.
  - Include a variety of job roles, from technical and engineering jobs to roles in communication, management, and research.
- Prioritise Sustainability and Safety:
  - Outline how jobs in the space economy can follow sustainable practices, protecting space and Earth environments.
  - Emphasise the importance of safety regulations to ensure that space activities are ethical and beneficial for everyone.
- Encourage Community and Global Collaboration:
  - Highlight ways for governments, private companies, and educational institutions to work together to build a strong, diverse workforce for space industries.
  - Consider how international collaboration can benefit the space economy, creating opportunities for people around the world.

### Deliverables

- User Profile: Create a profile of a typical individual or community that might benefit from jobs in the space economy. This could be a young person interested in a STEM career, a technician in a satellite technology company, or a researcher focused on sustainable space practices.
- Space Economy Framework Overview: A one-page summary explaining your framework's goals, key industries, and how it will support job creation and economic growth.

- **Prototype or Concept Sketch:** Design a visual representation of the framework, such as an infographic or flowchart, showing the space economy's key industries, training paths, and career opportunities.
- **Presentation:** Prepare a presentation to showcase, how your framework can stimulate economic growth and job creation, emphasising its benefits for diverse communities and sustainable practices.

## Questions to Consider

### Understanding the Potential of the Space Economy:

- What are the main areas of growth in the space industry, and which sectors have the greatest potential for creating jobs? Think about industries like satellite communications, space tourism, or resource mining.
- How might these industries benefit Earth's economy, communities, or technological progress?

### Focusing on Career Opportunities and Skills:

- What kinds of careers will be in demand within these industries, and what skills will people need to work in the space economy?
- How can your framework support training and education to prepare young people for these careers?

### Promoting Accessibility and Diversity:

- How can you make space-related jobs accessible to people from various backgrounds, regardless of geography, gender, or income?
- What programs or support structures would help ensure a diverse and inclusive workforce in the space economy?

### Ensuring Sustainability and Safety:

- How can you make sure that the space economy supports sustainable practices that protect Earth's and space's environments?
- What safety regulations and guidelines should be in place to protect both space workers and the environment?

### Global and Community Collaboration:

- How could governments, companies, and educational institutions collaborate to create a thriving space economy?
- What role could international cooperation play in creating job opportunities and expanding the space industry worldwide?

## Design Process Overview

### Step 1: Introduction: What is available?

- Introduce the emerging space economy and industries such as satellite services, space tourism, and asteroid mining.

### Step 2: Empathy - Who are your users?

- Create user profiles for space industry workers, entrepreneurs, and governments. What are their challenges, and what would help improve their lives?

### Step 3: Defining the Problem

- Define the main problem that your project will solve. For example, economic challenges like job creation, accessibility to space opportunities, and sustainability

#### Step 4: Ideate

- Brainstorm ideas for new industries and job roles in the space economy.
- How will people be recruited what skills will they use? What kind of information would it provide?



#### Step 5: Ideate 2 – Good Idea / Bad Idea

- Remix ideas, considering how the space economy can be inclusive and accessible. Focus on the most promising ones and think about how they could be even better or more accessible.

#### Step 6: Prototype

- Develop a prototype business plan or model for a space-based company or industry. This could include the type of information it provides, how people interact with it, and what it looks like.

#### Step 7: Test

- Share your prototype with others to get feedback. Use their suggestions to make improvements and ensure it's easy to understand for your users

Each step will take one or more lessons, your teacher will guide you with lessons and resources from 'Space Design Challenge Problem to Pitch' Module and the Future of Space



The United Nations Office for Outer Space Affairs (UNOOSA) works to promote international cooperation in the peaceful use and exploration of space, and in the utilisation of space science and technology for sustainable economic and social development.

**VISIT** <https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg1.html>

#### **Step 1: Introduction: Introduce the emerging space economy and industries such as satellite services, space tourism, and asteroid mining.**

Use the Internet to explore how the commercialisation of space, emerging technology and opportunities are evolving economic possibilities and industry and consider the implications for social, environmental and economic justice. Visit

<https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg8.html>.

Support: Use the resources in MM2,4 and 5 and the Problem to Pitch Space Design Challenge, Lesson 1, Empathy - see supporting links also on the last page

#### **Step 2: Empathy: Understand the needs of communities, citizens and space exploration and how this will inform jobs of the future. What are the challenges, and how to ensure justice.**

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 2, Empathy - see supporting links also on the last page

These prompts and deliverables will help guide learners in thinking about the development of economies and space industries and their impacts that serve earth and all its inhabitants .

Asking these questions will help you create user profiles and help you design your challenge solution.



- Identifying Needs and Challenges of Different Users
  - Who are the people who could benefit from jobs in the space economy?
  - Think about students interested in STEM careers, job seekers in rural areas, or communities near space industry centers.
  - What challenges might they face when trying to enter a space-related career? Consider limited access to resources, training, or role models in the space industry.
- Daily Life and Potential Impact
  - Imagine a day in the life of someone who could work in the space industry. For a young person, what training or education might they need to get started? For a technician, what would a typical workday look like?
  - How would having a space-related job impact their community, economic stability, or personal growth?
- Skills and Training Needs
  - What specific skills and knowledge are needed for different roles in the space economy? Consider technical skills, like engineering or programming, as well as soft skills, like communication and problem-solving.
  - What kind of training programs or internships would help people develop these skills?
- Creating Accessible Opportunities
  - How could your framework make it easier for people from diverse backgrounds to enter the space economy? Think about scholarships, mentorship programs, or partnerships with schools.
  - What support could help people who are new to STEM fields feel more confident about pursuing a space-related career?
- Community and Global Benefits
  - How could job creation in the space economy positively impact communities, especially those facing economic challenges? Consider how local businesses or schools might benefit.
  - Think about the broader impact. How could a thriving space economy contribute to technological advances, sustainability efforts, and economic growth worldwide?

### Creating User Profiles

After exploring the prompts, ask learners to create a user profile for an individual who could benefit from new job opportunities in the space economy. This could be a young person interested in STEM, an adult learner seeking new skills, or a technician working in the space industry. This can include

- Name, age, and location of the user
- A description of their daily challenges and pain points, such as limited access to STEM education, career opportunities, or training resources in their community
- Technology they have access to and comfort level with digital tools, noting whether they have internet access, access to online courses, or use digital learning platforms
- Their specific career or educational needs in the space economy, such as training programs, internship opportunities, or mentorship to develop skills for space-related roles
- An example of how they would use the framework to access job opportunities, training, or support within the space industry, and how it would help them achieve their career goals



### **Step 3: Defining the Problem: Define the main problem that your project will solve.**

- Define the core issue your framework aims to address. For example, is it expanding access to training for space-related jobs, creating sustainable industry practices, or making space careers accessible to underrepresented groups?
- Create a problem tree to identify root causes, such as lack of training resources or limited diversity in STEM fields. The “branches” might include limited economic opportunities, under representation in STEM, or missed technological progress. This will help clarify how your framework can address interconnected issues.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 4 and 5, Ideate

### **Step 4: Ideate Brainstorm different ideas for how to create a supportive and accessible space economy framework.**

- Think about career pathways, training programs, or partnerships with schools and industries. Consider innovative ways to promote sustainable practices in space industries and encourage diverse career opportunities.

### **Step 5: Refine your ideas, focusing on the most impactful concepts.**

- Think about how to make the framework adaptable for different communities and education levels. Could your framework include online courses, internships, or international partnerships? Ensure it promotes inclusivity, sustainability, and aligns with global industry standards.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 4 and 5, Ideate

### **Step 6: Prototype Create a sketch, model or wireframe of your space economy framework**

- showing key elements like job sectors, training pathways, and support programs. Use visuals to represent how the framework connects people to space-related job opportunities and supports economic growth.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 6 Prototype

Prototypes can be 3D or 2D if using wireframes for software / apps. You can read this article to help you <https://www.figma.com/resource-library/what-is-wireframing/>

Mock-ups can help you imagine how a user might interact with your satellite data-based app or system. The following links in Canva to create prototypes for any platform

- <https://www.canva.com/prototypes/templates/>
- <https://www.canva.com/prototypes/>

Follow the steps in Canva to create a user interface (UI) Mock-up for a mobile interface

## Steps in Canva:

- Open a New Project:
  - Create a Custom Size project, 1080x1920 pixels - mobile screen format.
- Set Up a Mobile Background:
  - In Elements, search for “mobile screen” to find a blank phone outline. Place it in the centre of the canvas.
- Design the App’s Home Screen:
  - Inside the mobile frame, add a rectangle for a menu bar at the bottom and a circle or square near the top for the main icon or app name.
  - Use text to title this screen as “Sector” or “Explore”, ‘Store’
- Add Buttons or Icons for Key Functions:
  - Create buttons or icons for each function as a means to navigate the \
  - programme
  - Place each button within the phone / tablet screen as a tapable icon.
  - Label each icon clearly with small text beneath or beside it.
- Add a Sample Data Preview:
  - Use a rectangle as a sample “data preview” section in the middle, where
  - satellite data like “Recruitment, Opportunities” would appear.
  - Use smaller text for this data to simulate a realistic UI (user interface) feel.
- Enhance with Colours and Borders:
  - Add borders to each button/icon for a polished look, and apply a consistent colour theme (e.g., blue and white for a “tech” feel).
- Review, Download, and Save:
  - Make sure everything is aligned neatly and easy to read.
  - Download the mock-up once it’s polished!



You can also use cardboard - Cardboard Prototyping | Techniques, [Cal Maritime Makerspace](https://www.youtube.com/watch?v=qxXj2RhKjZY) see <https://www.youtube.com/watch?v=qxXj2RhKjZY>

Or Paper Mobile Application Design: Paper Prototype Video, [Cor-mac](https://www.youtube.com/watch?v=y20E3qBmHpg) <https://www.youtube.com/watch?v=y20E3qBmHpg>

**Step 7: Test: Share your framework with others to get feedback. Use their suggestions to make improvements and ensure it’s easy to understand and helpful for your users.**

- Share with classmates, and teachers and role-played stakeholders (e.g., investors, workers) exploring if it meets their needs and is easy to understand and refine and improve the framework’s accessibility, impact, and effectiveness.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 7 Test

## Supporting links to help you define your users and testing

- Southern Universities (2021) What is a framework? Part 1: The Basics [https://www.youtube.com/watch?v=SoF\\_zYDfCRQ](https://www.youtube.com/watch?v=SoF_zYDfCRQ)
- United Nations (2024) SDG8 Targets and Indicator [https://sdgs.un.org/goals/goal8#targets\\_and\\_indicators](https://sdgs.un.org/goals/goal8#targets_and_indicators)
- UNOOSA (2024) Decent Work and Economic Growth <https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg8.html>