

## MM7: SDG10 SPACE4SDGS INCLUSIVE EXPLORATION



### SDG9: Inclusive Space Exploration

- Design an inclusive space program ensuring equal opportunities for participation.

#### Challenge

Space exploration is often limited to a select few, but the future of space belongs to everyone. In this challenge, you will design a space program that makes participation accessible and inclusive. This could mean creating opportunities for diverse individuals to train as astronauts, ensuring that educational resources are available in multiple languages, or designing space habitats and technologies that are adaptable for people with disabilities. Your task is to ensure that everyone, regardless of background or ability, can have an equal chance to be involved in space exploration.

#### Considerations

- **Accessibility:** Consider how to make space training, missions, and learning materials accessible to people with disabilities, people from diverse cultures, and those with limited resources or educational opportunities. What might be the challenges they face?
- **Diversity of Roles:** Think beyond astronauts—space exploration requires scientists, engineers, communicators, technicians, and more. Design opportunities for various roles so people can participate in ways that match their skills and interests.
- **Cultural Sensitivity:** Ensure that your program respects and incorporates the cultural values, languages, and perspectives of different communities, making space exploration a global and inclusive endeavour.
- **Gender Equality:** Make sure that your program promotes equal opportunities for people of all genders to participate in space-related fields and careers.
- **Equitable Access to Resources:** Consider ways to make educational resources, training programs, and technology accessible to underserved and underrepresented communities, both online and offline.

#### Background

Space exploration has often been limited to a narrow range of people—those with specific training, backgrounds, or physical abilities. However, as our vision for space expands, so does the need for a diverse group of participants who bring unique perspectives, skills, and experiences. Inclusive space exploration is about creating equal opportunities for people of all genders, backgrounds, and abilities to learn about, train for, and participate in the future of space. This involves designing accessible education, adapting space technology for diverse users, and providing equitable access to resources.

In addition to fairness, inclusivity brings important benefits. Diverse teams improve innovation,

solve complex problems more effectively, and represent the interests and needs of a global society. From accessible training programs to spacesuit adaptations, inclusive design ensures that the future of space exploration can be shared by everyone. Through this project, you have the chance to create a program that embodies equality, creativity, and opportunity, making space exploration truly open to all.



## Your Mission

Your mission is to design an inclusive space exploration program that provides opportunities for people from diverse backgrounds, abilities, and cultures to participate and contribute to space-related fields. Focus on making educational and training programs accessible, diverse, and culturally inclusive. Consider how to highlight a variety of roles within space exploration to ensure that everyone can find a place in this field. Whether it's designing accessible space tech, creating multilingual resources, or developing adaptable training methods, your work will help make space exploration more inclusive and equitable for all.

## Project Objectives

Develop an Inclusive Framework for Space Exploration:

- Create a framework that allows people from all backgrounds, abilities, and locations to participate in space-related programs, from training to job roles.
- Include resources and initiatives for those who face barriers due to geographic, economic, or educational limitations.

Promote Accessible Education and Training:

- Design educational materials and training programs adaptable for different learning needs, including resources in multiple languages and formats for people with disabilities.
- Focus on making space science, technology, and exploration understandable and engaging for people of all backgrounds.

Encourage Diversity in Space-Related Roles:

- Emphasise the variety of careers involved in space exploration, showing that there are paths for everyone, from science and engineering to communications and design.
- Ensure the program highlights role models from diverse backgrounds and promotes equal opportunities for people of all genders, abilities, and cultures.

Support Community Engagement and Global Collaboration:

- Create opportunities for international and community-based partnerships to strengthen the global space workforce and engage local communities in space initiatives.
- Ensure that the program fosters global awareness, curiosity and involvement, inviting people from different places to participate and contribute.

## Deliverables

- **User Profile:** Create a profile for an individual who could benefit from an inclusive space program, such as a student from an underserved community, a person with a disability interested in STEM, or a young woman exploring careers in space.
- **Inclusive Space Program Overview:** A one-page summary describing the key aspects of your program, including how it promotes accessibility, diversity, and equal opportunity.
- **Prototype or Concept Sketch:** Design a visual model or sketch showing the main features of your program, such as adaptable training modules, a global learning platform, or role-based mentorship options.

- **Presentation:** Prepare a presentation to showcase how your program promotes inclusivity in space exploration, highlighting its benefits, accessibility, and impact on communities worldwide. Use visuals to illustrate how it provides equal opportunities and a variety of career paths.

## Questions to Consider

### Understanding Barriers to Participation:

- What are the main challenges people from diverse backgrounds might face in trying to enter space-related fields? Consider factors like economic limitations, lack of local resources, or accessibility issues.
- How could removing these barriers benefit the space industry and society as a whole?

### Designing Accessible Education and Training:

- What types of educational resources could help people from all learning backgrounds access space science and technology? Consider tools like videos, interactive activities, or hands-on kits.
- How can training programs be adapted for individuals with different abilities, skill levels, and learning styles?

### Encouraging Diversity in Space Roles:

- How can you showcase a variety of careers in space exploration beyond being an astronaut? Think about roles in communication, data science, engineering, and beyond.
- How could your program provide diverse role models and mentors to inspire and guide participants from underrepresented backgrounds?

### Promoting Global and Community Collaboration:

- What role could communities and international partnerships play in promoting inclusive space exploration? Consider ways for people from around the world to engage and contribute.
- How might you create community-based programs or partnerships with educational institutions to support diversity in the space workforce?

## Design Process Overview

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

- Explore issues of inequality in access to space exploration and any programmes that have been devised to address Equality, Diversity and Inclusion (EDI).

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

- Create user profiles for under-represented groups (e.g., diverse gender identities, people from developing nations or differently-abled).

### Step 3: Defining the Problem

- Define barriers to entry in space exploration for various groups.

### Step 4: Ideate

- Brainstorm initiatives to make space exploration more inclusive, such as scholarships, outreach programs, or international partnerships.
- How will people be recruited for the programme, what might be the entry process? How might you provide accessible information, classes and what information is needed?

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

- Remix and refine ideas to ensure broad accessibility and diversity in space initiatives.

## Step 6: Prototype

- Develop a prototype of an outreach or education program, scholarship, or policy.



## Step 7: Test

- Test the inclusivity program through surveys or role-playing, and adjust to increase its effectiveness.
- 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: Understand the experiences and challenges of diverse groups who may want to participate in space exploration but face barriers.**

This could include students from underserved areas, individuals with disabilities, or communities with limited access to STEM resources. By empathising with their perspectives, you can design solutions that address their unique needs and aspirations. Use the Internet to explore Equality, Diversity and Inclusion initiatives within Space programmes and agencies e.g. NASA, ESA - European Space Agencies. Visit <https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg10.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: Explore the perspectives of those who may face barriers in accessing space exploration opportunities.**

Think about individuals from underserved communities, people with disabilities, or those from diverse cultural backgrounds and their challenges in participating in space programs. Consider limited access to education, technology, resources, or representation within the space industry to ensure equal opportunities to participate and contribute, to create a space programme that fully embodies inclusivity and diversity.

**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 Diverse Users**

- Who are the people who could benefit from an inclusive space exploration program? Think about students from underserved communities, individuals with disabilities, or people from diverse cultural backgrounds.

- What specific challenges do they face in accessing space-related education or careers? Consider barriers like lack of resources, mentorship, or accessible technology.



### **Daily Life and Access to Space Opportunities**

- Imagine a day in the life of a person interested in space exploration but limited by available resources. How would an inclusive space program help them access learning materials or find mentors?
- How could an individual's interest in space impact their community or personal development if they had equal access to resources and support?

### **Tools and Technology for Accessibility**

- What educational tools, resources, or technologies could make space learning more accessible for different user needs? Think about audio guides, tactile models, or adapted physical environments.
- How might mentors, role models, or adaptive training programs help break down barriers for individuals from diverse backgrounds?

### **Creating Equal Opportunities for Diverse Careers**

- How could your program support access to different roles in space exploration, such as engineering, communications, or data science? Consider what tools or resources could help people explore these options.
- What kind of mentorship or guidance would help underrepresented individuals feel more confident and supported as they pursue a career in space?

### **Community and Global Impact of Inclusivity**

- How could inclusivity in space exploration benefit communities worldwide? Think about how diverse perspectives might shape space technology or contribute to global understanding.
- How could this program inspire other industries to adopt inclusive practices, showing that everyone has a place in innovation and exploration?

### **Creating User Profiles**

After exploring the prompts above, create a user profile for an individual who would benefit from an inclusive space exploration program. This could be a young person from an underserved community interested in space science, a person with a disability who dreams of becoming an astronaut or an educator working to bring space education to diverse learners. This can include

- Name, age, and location of the user
- A description of their daily challenges and pain points, such as limited access to educational resources, lack of inclusive opportunities, or social barriers that impact their ability to pursue interests in space exploration
- Technology they have access to and comfort level with learning tools, noting whether they have access to the internet, adaptive technologies, or educational platforms for STEM learning
- Their specific needs or goals related to inclusive space exploration, such as access to mentorship, adaptive learning resources, or training that accommodates diverse abilities and backgrounds
- An example of how they would use the inclusive space program to pursue their goals, such as how mentorship would help them plan for a career in space, or how accessible resources would support their learning journey and build confidence in exploring space-related careers

**Step 3: Define the core issue your project addresses. For example, limited access to space-related education or training for under-represented groups**



Use a problem tree to identify root causes like limited resources, social biases, or lack of accessible training. The “branches” or effects might include limited career opportunities, underrepresentation in space industries, or a lack of diversity in perspectives. This helps you see the interconnected issues and focus on creating inclusive solutions.

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 2 and 3,

#### **Step 4: Ideate Brainstorm various solutions to make space exploration inclusive.**

- Consider multilingual educational platforms, adaptive training programs, or scholarships for underserved communities. Think about how to create pathways for diverse career interests and address accessibility needs, making space exploration welcoming and inclusive for all.

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

- Focus on designing resources that are culturally sensitive, accessible, and adaptable for different user needs. Consider partnerships with global organisations, and ensure your design includes opportunities for users to connect, share, and learn from diverse role models.

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

#### **Step 6: Prototype Create a model or sketch of your inclusive space programme, showcasing key features like accessible learning materials, diverse career pathways, and mentorship opportunities.**

- Include examples of how different user groups could benefit from each element of your programme
- Explore diverse learning needs such as neurodivergence and different ways of giving information - blended learning (online, visual, audio) and awareness of political aspects e.g. cultural sensitivities, different perspectives

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 or explore Canva’s Mock-up app to show a range of prototypes for different aspects of your programme

#### **Steps in Canva:**

- Open a New Project:
  - Create a Custom Size project, 1080x1920 pixels - mobile screen format.



- Ensure it's optimised for mobile accessibility and readability.
- 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.
  - Choose a background colour that is easy on the eyes, such as soft blue or light gray, ensuring good contrast for text and icons to improve readability
- Design the App's Home Screen:
  - Inside the mobile frame, add a rectangle at the bottom for the main navigation bar. Include menu items like “Learn,” “Connect,” and “Careers” to provide easy access to program resources, mentorship, and career opportunities.
  - Near the top, add a circle or square for the main icon or app name to establish a welcoming, inclusive feel for the app.
  - Use text to title this screen as “Explore” or “My Space Path” to create a sense of belonging and engagement for the user.
- Add Buttons or Icons for Key Functions:
  - Create large, clear buttons or icons for each main function. Examples might include “Resources” for educational content, “Role Models” to showcase diverse individuals in space careers, and “Opportunities” for career pathways.
  - Place each button or icon within the screen in a logical, easy-to-navigate format
  - Label each button clearly with text, such as “Learn,” “Mentor,” or “Jobs”.
  - Include alt-text or audio labels for users with visual impairments to navigate the app smoothly.
  - Ensure icons are placed logically within the screen, with spacing between buttons to make tapping easier and reduce accidental clicks.
- Add a Sample Data Preview:
  - Use a rectangle in the middle of the screen to serve as a sample “data preview” section. This might display information like “Featured Role Model,” “Upcoming Training Sessions,” or “New Space Articles” to keep users engaged with updated content.
  - Use smaller text for this data preview to give a realistic feel to the interface, and consider offering options to enlarge the text or enable voice narration for added accessibility.
- Enhance with Colours and Borders:
  - Add borders around each button/icon for a polished, organised look. Choose colours that align with an inclusive theme, such as a friendly blue and white colour scheme that gives a “tech” feel while ensuring all elements are visually accessible.
  - Use high-contrast colours to ensure that icons, text, and buttons are easy to see, and consider adding visually-friendly options or themes for additional accessibility.
- Review, Download, and Save:
  - Review the mock-up to ensure neat alignment, easy readability, and that all labels and icons are accessible.
  - Check that all elements are positioned intuitively to guide users naturally.
  - Once the design is polished, download and save the mock-up as a finalized version.

You can also use cardboard - Cardboard Prototyping | Techniques,  
Cal Maritime Makerspace 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>

## Step 7: Present your design to classmates, teachers, or potential users and gather feedback.



- Share your program design with classmates, teachers, or potential users and gather feedback. Ask questions to find out if the program feels accessible, engaging, and inclusive. Use this feedback to improve your design's effectiveness, accessibility, and impact on promoting equality in space exploration.

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 and what you may need to consider in developing your Space Education Programme

- Kern, A. (2020) Edutopia Creating an Inclusive Virtual Classroom  
<https://www.edutopia.org/article/creating-inclusive-virtual-classroom/>
- LabXchange (2023) What Is an Inclusive Classroom? [7:34 mins]  
<https://www.youtube.com/watch?v=K-AWPB8adE4>
- Learning for Justice (2010) Introduction to Culturally Relevant Pedagogy [4:39 mins]  
<https://www.youtube.com/watch?v=nGTVjJuRaZ8>
- Teaching in Education (2019) Culturally Responsive Teaching [2:25mins]  
<https://www.youtube.com/watch?v=aXHITeJyMOU>
- United Nations (2024) SDG10 Targets and Indicator  
[https://sdgs.un.org/goals/goal10#targets\\_and\\_indicators](https://sdgs.un.org/goals/goal10#targets_and_indicators)
- UNOOSA (2024) Decent Work and Economic Growth  
<https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg10.html>