MM7: SDG5 SPACE4SDGS GENDER EQUALITY

SDG 5: Space for Gender Equality in STEM

- Design a global space education programme or campaign that encourages gender equality in science, technology, engineering, and mathematics (STEM) fields

Challenge

Imagine a world where everyone has an equal chance to pursue a career in space science and technology, regardless of gender. Despite significant progress, gender diverse people around the world still face barriers to entering and advancing in STEM fields. This project invites you to create a campaign or educational programme that promotes gender equality in space and STEM, making these fields more welcoming, inspiring, and accessible for everyone. Your programme should engage and encourage young people, to see themselves as future scientists, engineers, and space explorers.

Considerations

- User-Friendly and Inclusive Design: Your programme / campaign should feel accessible to everyone, regardless of technology experience, education level, or cultural background.
- Engagement and Inspiration: Think of ways to make your solution engaging and inspiring to young people. Could you include stories of Diversity and Inclusion in STEM, exciting space science challenges, or interactive activities?
- Diverse Representation: Represent a wide range of backgrounds, cultures, and experiences to help participants see role models who look like them.
- Accessibility and Reach: Consider how to make your programme or campaign accessible in areas with limited internet or school resources.
- Safety and Privacy: Think about how to keep participants' information private, especially if they're sharing their own stories or taking part in online discussions.

Background

Although women make up nearly half of the global workforce, they remain underrepresented in STEM fields, especially in space-related sciences and engineering. Yet there are many diverse gender identities and gender expressions are under represented in these fields, which can make it harder for individuals to envision a future in STEM. This gap in representation limits the entire field. Studies show that more diverse teams lead to stronger innovation and better scientific outcomes. Many barriers like cultural expectations, lack of role models, and limited educational resources, discourages gender diversity in these areas.

Space science, engineering, and technology are crucial fields that shape our understanding of the universe, and gender equality in STEM is essential for future discovery and progress. The

aim of SDG 5, Gender Equality, is to ensure that all genders have equal opportunities in every area of society, including STEM. This design brief challenges you to create a programme that encourages young people, especially those under-represented through limiting gender identities and gender expressions to explore space and STEM with confidence, curiosity, and a strong sense of possibility.

Your Mission

Create a global space education programme or campaign that will inspire, engage, and encourage young people and gender diversity through exploration of the STEM fields. Your programme could be an online campaign, an interactive workshop series, a social media movement, or a combination of activities. Think about how you can help break down the barriers that prevent individuals from pursuing their interests in STEM. Focus on making the experience fun, inclusive, and inspiring for all. You'll also need to consider how your programme can reach students from different backgrounds and with different levels of access to technology.

Questions to Consider

Understanding the Audience:

- Who are the young people this campaign or programme will target? What challenges or barriers might they face in pursuing STEM education?
- How can you reach young people who may not have access to regular internet or advanced educational resources?

Designing for Engagement:

- What kinds of activities or stories will make this programme exciting and relatable? Could you include videos, stories, or challenges that show how fun and rewarding STEM can be?
- How will you keep participants interested and motivated throughout the campaign?

Including Role Models and Real Stories:

- What kinds of role models could be included to inspire young people?
- How can you present their stories in an authentic and empowering way?
- Could you create virtual interviews, video stories, or written profiles to introduce these STEM role models?

Building an Inclusive Platform:

- How will you ensure the programme feels welcoming to participants of all genders, abilities, and backgrounds?
- What elements could you include to make the platform accessible to those with limited internet, lower literacy, or other challenges?

Promoting Safe and Respectful Engagement:

- How can you create a safe environment where participants feel comfortable sharing their ideas and experiences?
- What privacy settings and online safety measures would you put in place for young people participating in online discussions or workshops?

Supporting Web links:

- https://training.spaceskills.org/
- https://www.esa.int/About_Us/Diversity_and_Inclusiveness
- https://www.nasa.gov/learning-resources/stem-engagement/stem-impacts/
- https://www.nasa.gov/news-release/nasa-grants-to-strengthen-diversity-in-engineering-stem-fields/.

Design Process General Overview

Step 1: Introduction: What is available and Who are your users?

- Explore examples of satellite and app solutions for supporting education
- Think about how space technology can gather different data

Step 2: Empathy

- Create user profiles for the people you want to help. 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, is it access to education, markets, weather information for farming, or something else?

Step 4: Ideate

- Brainstorm different ideas for how your system could work. How would people use it? What kind of information would it provide?

Step 5: Ideate 2 – Good Idea / Bad Idea

- Refine your ideas. Focus on the most promising ones and think about how they could be even better or more accessible.

Step 6: Prototype

- Create a model or sketch of your satellite system or app. 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

Deliverables

- User Profile: Develop a profile of a youth participant, interested in STEM, there background, and her unique needs or challenges.
- Campaign or Programme Overview: A one-page summary describing your program's goals, key activities, and how it will promote gender equality in STEM.
- Sample Content or Activity: Design a sample activity, lesson, or campaign element (like a social media post, video concept, or interactive quiz) to show how your programme will inspire participants.
- Presentation: Prepare a brief presentation outlining your campaign or programme's impact on promoting gender equality in STEM. Include visual examples to illustrate how it will look and work in action.

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

VISIT

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. https://www.unoosa.org/oosa/en/ourwork/space4sdgs/sdg1.html

Step 1: Introduction: What is the available and Who are your users?

- Use the Internet to explore examples of satellite and app solutions that support education. Look at existing platforms like Khan Academy, Oxford Scholastica
- Think about how you might use social media if creating an awareness campaign
- Look at social media campaigns that promote gender equality / multiple gender identities and gender expressions in STEM

Step 2: Empathy: Create user profiles for the people you want to support.

- What are their challenges, and what would help improve access to STEM?

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 are to help learners understand and empathise with potential users for a global space education programme designed to encourage gender equality in STEM fields. Asking these questions will help you create user profiles and help you design their challenge solution

Audience's Needs and Challenges

- Who are the young people who would benefit most from this programme? Think about those in communities or with gender identities and gender expressions that may face barriers to exploring STEM fields.
- What kinds of challenges might discourage them from pursuing STEM? Consider social expectations, lack of access to resources, or limited exposure to role models in science or technology.

Understanding Daily Life and Access to STEM

- Imagine a day in the life of a teenager interested in STEM but living in a community with limited access to STEM programmes or resources. How might they learn about science or space?
- What challenges might they face in learning about STEM on their own? Think about obstacles like limited internet, few STEM classes, or cultural expectations that could affect their educational goals.

Different Users, Different Perspectives

- Think about how different groups of young people might engage with the programme. How could a student in a rural area, a young person from an under served community, or an individual from a culture where STEM is less encouraged have different needs?
- How might students with varying levels of internet access or technology experience feel about joining an online STEM programme? What could help make the programme easier and more inclusive for all?

Exploring STEM Role Models and Inspiration

- Imagine a user discovering the story of an astronaut or engineer that represents them for the first time. How might this influence their interest in STEM?
- What kinds of role models or stories could inspire young people to pursue careers in space and STEM? Consider astronauts, scientists, and engineers from diverse backgrounds who have overcome challenges to succeed.

Creating Interactive and Engaging Content

- Think about activities that would make STEM exciting and relatable. What kind of hands-on challenges, quizzes, or storytelling could make the learning experience more engaging?

- How could you design interactive content that feels like an adventure in space or science? For example, consider virtual workshops, space missions, or engineering challenges that spark curiosity.

Language, Literacy, and Cultural Accessibility

- Consider users who may speak different languages or who may be new to STEM vocabulary.
- What features could help all users understand and enjoy the programme, like videos, icons, or translations?

Building a Supportive and Inclusive Environment

- What could help young people feel comfortable participating in this programme, especially if they're new to STEM or feel unsure about their skills?
- What ways could you build a sense of community among participants? Think about discussion groups, mentors, or peer support to help them stay engaged and feel connected.

Overcoming Barriers to STEM Participation

- What kinds of messages or stories might help young people see that STEM is a field for everyone?
- How could your programme address specific concerns that girls or other underrepresented groups might have about STEM, such as overcoming stereotypes or seeing themselves as future scientists?

Safety, Privacy, and Respectful Interaction

- How could you create a safe online space where young people feel comfortable sharing their thoughts and questions? Think about privacy settings, moderated discussions, and respectful interactions.
- What guidelines or support features might help participants feel confident sharing their progress, trying new activities, and asking questions in the programme?

Feedback and Continuous Improvement

- What questions could you ask users to find out if the programme is meeting their needs and inspiring them?
- How might you gather feedback to improve the program's content, engagement, and accessibility over time?

Creating User Profiles

After working through the prompts, ask learners to create a user profile for a learner or educator who might use the system. This can include:

- Name, age, and location of the user
- A description of their daily challenges and pain points
- Technology they have access to and comfort level with digital tools
- Their specific learning or teaching needs
- An example of how they would use the system to access education

Step 3: Defining the Problem: Define the main problem that your project will solve. For example, is it connecting with role models, showing the roles available or existing programmes

Support: Use the resources in MM7: Problem to Pitch Space Design Challenge, Lesson 3, Define e.g. on the problem tree what are the root causes (historical exclusion, lack of role models and mentors, access to information and support,) and the "branches" (poor uptake of

STEM, limited perspectives and insights) to show interconnected issues.

Step 4: Ideate: Brainstorm different ideas for mentorship programmes, scholarships, STEM workshops, and space-themed outreach

Step 5: Refine your ideas. Focus on the most promising ones and think about how user feedback could improve them or develop collaborative solutions

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

Step 6: Prototype: Create a prototype for a global STEM mentorship platform, a space-themed learning programme for schools or awareness campaign for STEM roles, role models and supports

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. 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 Dimensions project, and set it to 1080x1920 pixels (this mimics a 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 “Virtual Classroom” or “Assignments.”
- Add Buttons or Icons for Key Functions:
  - Create buttons or icons for each function, such as Quizzes, Videos or practice activities. Place each button within the phone 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 access to “Recorded Classes, Books” 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
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

Create Prototypes for any platform

https://www.canva.com/prototypes/templates/
https://www.canva.com/prototypes/

Step 7: Test: Test the platform with potential users and adjust based on their experiences and suggestionsShare your prototype with others to get feedback. Use their suggestions to make improvements and ensure it’s easy to understand and helpful for your users.

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

- Equality Diversity & Inclusion in 2021 - WHAT'S IT ALL ABOUT? https://www.youtube.com/watch?v=maw6hmlNh44
- AMAZE org (2024) Range of Gender Identities, https://www.youtube.com/watch?v=i83VQIaDlQw,
- She Knows (2019) What Gender Identity Means to Today's Teens, https://www.youtube.com/watch?v=TShvPSFExro
- The Conversation, (2021) Transgender and gender diverse teens: How to talk to and support them https://theconversation.com/transgender-and-gender-diverse-teens-how-to-talk-to-and-support-them-170992