



### MM4: Space Innovation and Enterprise

#### Experimentation and Exploration

#### Lesson 5 Exploring Inclusion in the Space Industry 2

Subject Areas: CSPE/ SPHE, Design, English and Communication, Science, Sustainability, Technology

**8** DECENT WORK AND ECONOMIC GROWTH



**10** REDUCED INEQUALITIES



**12** RESPONSIBLE CONSUMPTION AND PRODUCTION



**17** PARTNERSHIPS FOR THE GOALS



#### Lesson Title and Summary: Exploring Inclusion in the Space Industry 2

In these three, linked lessons, learners will consider the importance of diversity and inclusion in space entrepreneurship, with a focus on the participation of women, indigenous communities, people of colour, and differently-abled individuals.

By recognising and celebrating diverse perspectives and contributions, a more equitable and innovative future for space exploration and beyond, can be created. By understanding the value of representation and equity, learners will be equipped to advocate for a more inclusive space economy.

Lesson 5, focuses on showcasing Indigenous Professionals and People of Colour highlighting challenges and opportunities of promoting inclusive practices in space-related industries, identifying the barriers that marginalised groups face and considering ways to overcome them.

#### Vocabulary: Differently-abled, Diversity, Equity, Inclusion, Indigenous, Representation

#### In this lesson, the learner will:

- understand the role of indigenous and people of colour professionals in the space industry
- Identify opportunities and challenges in promoting inclusion in the space industry
- consider the social and ethical implications of lack of diversity in the space industry
- critically consider the need to promote inclusion and diversity in future space industries

#### Materials

- Worksheet: Indigenous and People of Colour Space Professionals
- Worksheet: Planning Your Poster
- Teacher's Guide: Indigenous and People of Colour Space Professionals
- Paper / pens
- AV equipment
- Computers with internet access

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### Activity Instructions

#### Activity 1: Indigenous and People of Colour Space Professionals - a showcase (25 mins)

1. Working in groups of four, assign learners one of the Space Professionals from the Teacher's Guide: Indigenous and People of Colour Space Professionals to research as the focus of their showcase.
2. Ask learners to gather the following information for their assigned professional
  - Background:
  - Space Sector / Profession:
  - Contributions to the Space Industry:
  - Anecdotes / Facts:
3. Remind learners to divide the task equally, with each member responsible for one of the research points and the worksheet is completed on time.

#### Activity 2: Create a Showcase Poster (25 mins)

1. Continuing to work in their groups, learners will organise their information on their assigned professional to create a showcase poster.
2. Using the Worksheet: Planning Your Poster, learners will plan their poster's layout and design to enable them to create a clear, engaging showcase poster that effectively communicates the space explorer's achievements and story
3. Once their planning is complete ask learners to log into Canva or access a lesson you have set up previously in Canva [www.canva.com/education](http://www.canva.com/education) - see module overview for set up details.
4. Ask learners to select a template that reflects their planning and assign each member of the group to take one of the bullets below
  - A brief biography of the space professional, highlighting key milestones and achievements.
  - Images/photographs depicting the space explorer in action or participating in space missions.
  - Quotes or inspirational messages from the space explorer.
  - Optional: Fun facts or trivia about the space explorer's life and career
5. Circulate encouraging groups to develop their template using the worksheet guidelines

#### REFLECTIVE EXERCISE: 3-2-1 (10 mins)

- Three things they feel they have learnt from the tasks
- Two things they found most interesting and would like to explore more
- One – their opinion they have about the tasks

Use Post-its or a mentimeter survey - [www.mentimeter.com](http://www.mentimeter.com) to gather reflections

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### EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, complete the planning for the showcase poster and complete poster in a follow-up class.

Extension: For a longer lesson, summarise the key takeaways from the discussion and ask learners to share their thoughts and ideas for fostering a more inclusive space industry. See the Teacher's Guide for a list of questions and links used to extend the discussion

Option B: In the follow-up class, use any remaining time to explore challenges faced by Indigenous and people of colour in the space industry, such as gender bias, lack of representation, and barriers to advancement

### MEDIA BOX: (materials, online video links, extra resources, case studies etc)

Challenges and Opportunities For Integrating Indigenous Knowledge into Space Legal Frameworks  
[https://www.unoosa.org/documents/pdf/copuos/lsc/2022/Technical\\_presentations/09\\_CANEUS\\_COP\\_UOS\\_LSC\\_Presentation\\_April\\_6\\_2022.pdf](https://www.unoosa.org/documents/pdf/copuos/lsc/2022/Technical_presentations/09_CANEUS_COP_UOS_LSC_Presentation_April_6_2022.pdf)

What Can Indigenous Worldviews Bring to Space Exploration? As It Turns Out, a Lot.  
<https://www.motherjones.com/politics/2022/04/what-can-indigenous-worldviews-bring-to-space-exploration-as-it-turns-out-a-lot/>

Why indigenous tribes in the U.S. must have a voice in matters of space  
<https://aerospaceamerica.aiaa.org/departments/why-indigenous-tribes-in-the-u-s-must-have-a-voice-in-matters-of-space/>

Inspiring Black Youth through Outreach - Accessing Space [3:27mins] <https://www.youtube.com/watch?v=P1PHJOOdmf8>

Youtube playlist - Inclusion in Space seven videos from different perspectives on inclusion in space  
<https://www.youtube.com/playlist?list=PLjvl2quYK9xz3s9MDPmAHyHtdMmQV2ild>

### Local Trip / Expertise / Additional Work and Assessments

Inclusive Space Explorer Showcase: Learners can create a presentation / exhibition in school or online showcasing the significant contributions to space exploration, that diverse individuals have made. Each group can undertake presenting their showcases to others in the class or in the school, or create short introductory videos, for an on line showcase. Learners could facilitate a discussion on the importance of representation and cultural diversity in shaping the future of space exploration and breaking barriers or innovation and how it contributes to innovation inspiring future generations of space professionals - see media box additional support.



### List Indigenous and People of Color Space Professionals- a showcase

These individuals have made significant contributions to space exploration and have broken barriers, inspiring others from diverse backgrounds to pursue careers and opportunities in the space industry.

1. Mae Jemison: First African American woman in space, flying aboard the Space Shuttle Endeavour in 1992. She is also a physician, engineer, and entrepreneur, founding the Jemison Group, a technology consulting firm.
2. Anousheh Ansari: Iranian-American engineer and entrepreneur who became the first self-funded woman to fly to space as a space tourist aboard the Soyuz TMA-9 spacecraft in 2006.
3. Ellen Ochoa: First Hispanic woman in space, flying aboard the Space Shuttle Discovery in 1993. She later served as the Director of the Johnson Space Center, becoming the first Hispanic director of a NASA centre.
4. Guion S. Bluford Jr.: First African American astronaut to fly in space, participating in four Space Shuttle missions between 1983 and 1992.
5. Joan Higginbotham: African American engineer and NASA astronaut who flew aboard the Space Shuttle Discovery in 2006, becoming the third African American woman to travel to space.
6. Jeanette Epps: NASA astronaut selected as part of the 2009 astronaut class, becoming the first African American woman to be assigned to the International Space Station (ISS) as a flight engineer for a future mission.
7. Charles F. Bolden Jr.: Former NASA astronaut and administrator, Bolden served as the first African American Administrator of NASA from 2009 to 2017.
8. Jose Hernandez: Mexican-American engineer and former NASA astronaut who flew aboard the Space Shuttle Discovery in 2009, becoming the first person to tweet in Spanish from space.
9. Franklin Chang-Díaz: Costa Rican-American former NASA astronaut and physicist who flew on seven Space Shuttle missions, tying the record for most spaceflights by an individual.
10. Jessica Watkins: NASA astronaut selected in 2017, Watkins will become the first African American woman to live and work on the Moon as part of NASA's Artemis program.





### Points to consider when planning your showcase poster and choosing a template:

#### 1. Choosing a Layout/Template:

- Balance between text and visuals: Select a template that offers space for both written content (biography, quotes) and visuals (images, photographs). Ensure it's easy to read and visually appealing.
- Sections: Choose a design that allows you to organise content into clear sections (e.g., "Biography," "Key Milestones," "Quotes," "Fun Facts") so the viewer can navigate the poster easily.
- Image placement: Choose a template with designated spaces for images, ideally near or alongside the text they relate to (e.g., images of space missions next to key milestones).

#### 2. Biography Section:

- Brief, impactful biography: Ensure the biography section is concise with key life milestones (e.g., education, career beginnings, major space missions). Highlight significant achievements such as space missions, leadership roles, or contributions to space science.
- Text formatting: Use bullet points or short paragraphs to keep it clear and readable. Avoid long blocks of text.

#### 3. Images or Photographs:

- Choose high-quality images: Use clear, high-res. images of the space explorer, showing them in action (e.g., during space missions, training, or key moments in their career).
- Captions: Add short captions to the images to explain what's happening or the significance of the moment.

#### 4. Quotes or Inspirational Messages:

- Highlight with design: Use a distinct font or colour for quotes to make them stand out. Place them in visually prominent spots on the poster, like near the top or in the middle, where they'll catch attention.
- Relevance: Select quotes that reflect the space explorer's philosophy, motivation, or views on space exploration and science.

#### 5. Fun Facts or Trivia (Optional):

- Placement: Set aside a small section for "Fun Facts" that's separate from the main biography. This could be at the bottom or in the side margins for easy visibility.
- Engage your audience: Include interesting, lesser-known facts (e.g., personal hobbies, unique experiences in space, or unexpected career paths) to make the space explorer more relatable.

#### 6. Design and Visual Appeal:

- Color scheme: Consider Choosing colours that align with the space theme (e.g., dark blues, blacks, and silvers) and that also make the text and images stand out.
- Typography: Ensure the font size is large enough for easy reading, with headings and key information in bold or larger fonts.

#### 7. Conclusion / Call to Action (Optional):

- Closing thought: Include a final section summarising the impact and contributions or encouraging others to explore careers in space.