

SDG9 Future of Space

MM4:Space Innovation and Enterprise



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Experimentation and Exploration

Lesson 9 Engineering Space Tourism 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: Engineering Space Tourism 2

In this lesson, learners will build upon their previous knowledge to develop a space venture focused on civilian space travel. They will collaborate to define the aims and objectives of their space tourism event, considering factors such as target audience, mission profile, and ethical considerations.

The core activity is designed for a full 1 hour lesson without the reflective exercise. The two activities presented could be extended, with Learners creating a logo that encapsulates the vision and values of their space venture in a following lesson.

Vocabulary: Civilian Space Flight, Commercialisation, Launch Systems,

In this lesson, the learner will:

- apply knowledge of space tourism concepts and principles to develop a civilian space travel event
- collaborate with peers to define the aims and objectives of the space venture, considering factors such as target audience, mission profile, and ethical considerations
- explore the interdisciplinary nature of space tourism, integrating concepts from science, technology, engineering, arts, and mathematics (STEAM) fields to develop a comprehensive space venture plan
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Materials

- Worksheet: Creating a Space Tourism Event
- Worksheet: Peer Review:Space Tourism Event
- Teachers Guide: Enterprise Planning, Lesson 10
- Paper / pens
- AV equipment
- Computers with internet access

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Activity Instructions

Activity 1: Creating your Own Space Tourism Event (35 mins)

1. Introduce the activity and explain the goal, designing a Space Tourism Event
2. Working in pairs, (or small groups of 3-4) learners will use the worksheet: Create your own Space Tourism Event to prompt them to create their own event.
3. Circulate the room, encouraging them to go think think more deeply about their event design using questions e.g.
 - How will you ensure the event is environmentally sustainable?
 - "Who can access this event, and how will you ensure fairness?".
4. Emphasise that they need to consider environmental impact, ethics, equitable access, as these will be considered in the peer review

Activity 2: Peer review and Idea Improvement (25 mins)

1. Ask learners to swap their event designs with another pair or group if working in 3s or 4s.
2. Ask each group to review the other's event, providing written feedback, suggestions, and questions using the feedback section of the worksheet.
3. Encourage the learners to challenge each other's ideas using the prompt questions on the worksheet Peer Review: Space Tourism event
4. After 10 minutes, ask learners to hand back the feedback sheet to the original creators of the event.
5. Allow learners 10 minutes to review the feedback and refine their event based on the comments and questions from their peers.
6. Depending on time ask if any groups would like to share how the feedback they received improved or changed their event idea. This can also be used to highlight the importance of collaboration and iterative improvement in planning as well as focus the reflective 321 exercise.

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 to gather reflections

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EXTENSION / REDUCTION ACTIVITIES

Reduction: For a shorter lesson, complete Activity 1 only and continue with activity 2 in a follow-on lesson

Extension: For a longer lesson, watch the video, How to design a great Logo and undertake activity 1 from lesson 10 Creating a logo for your Space Tourism business. Learners can develop a logo using online generators for the business that accompanies their space tourism event - see media box

Option B: Discuss some of the additional activities learners would have to consider if they were to seek investment for their imagined space venture. Use the teachers guide from Lesson 10 - Enterprise Planning for your Space Venture

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

How to design a great logo [3:09 mins] <https://www.youtube.com/watch?v=DiVygGdXuHE>

Business name generator:

- Shopify <https://www.shopify.com/tools/business-name-generator?index>
- Namelix <https://namelix.com/>

Logo Generators

- <https://www.design.com/logo-maker>
- www.Looka.com
- <https://www.vistaprint.ie/logomaker>
- <https://www.adobe.com/express/create/logo>
- www.canva.com
- www.wix.com

Local Trip / Expertise / Additional Work and Assessments

Learners can extend their space venture project by developing a business case overview. Using the Teacher's Guide and links in the Media Box learners and MM7: Problem to Pitch Space Challenge lesson 6 and 7 to develop a 'Pitch' Presentation and consider their market and business venture.

Explore ESA's Enterprise Ireland's Irish Space Directory and research any of the organisations who are using open source principles, software or working as collaborative communities.

MM4: 9WS CREATE A SPACE TOURISM EVENT



Activity 1: Planning your space tourism event

Use the table to help you develop your space tourism event by answering the questions using the prompts to help you plan your space tourism event. You can use the second page or a notebook to record your final answers for review by another group.

EVENT ASPECT	THINGS TO THINK ABOUT	NOTES
AIM: What is the aim of your space venture?	<ul style="list-style-type: none">• To provide suborbital joyrides for thrills / pleasure to wealthy customers?• Or longer-duration orbital missions for scientific research or leisure purposes?• Or space public transport or any other ideas e.g. parties or celestial bodies viewing?	
Market: Who is your customer?	<ul style="list-style-type: none">• Identify your customer based on what you decided was your aim. You will need to think about• Who they are, what they are interested in and their ability and willingness to pay	
Destination: Where are they going?	<ul style="list-style-type: none">• Sub-orbital civilian flights to the edge of space?• Orbital mission to the International Space station?• Or a yet to be explored planet?	
Experience: What will be the overall experience?	<ul style="list-style-type: none">• Functional, luxury or themed?• What facilities will there be?• Will it be like a cruise ship or more like an aeroplane?• If it is not research or educational design a memorable and immersive customer experience that aligns with the objectives of the space tourism venture.• Consider aspects such as pre-flight training, launch preparations, in-flight activities, accommodations, and post-flight celebrations or souvenirs	

MM4: 9WS CREATE A SPACE TOURISM EVENT

9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



Activity 1: Planning your space tourism event

You can use this page or a notebook to record your final answers for review by another group.

EVENT ASPECT	THINGS TO THINK ABOUT
AIM: What is the aim of your space venture?	
Market: Who is your customer?	
Destination: Where are they going?	
Experience: What will be the overall experience?	



Activity 2: Peer Review your space tourism event

After reviewing another pair's / group's Space Tourism Event, use the following questions to help you provide thoughtful feedback. Consider the environmental, ethical, and practical aspects of your peer's design.

EVENT ASPECT	Feedback Considerations	FEEDBACK
Environmental Impact	<p>Sustainability</p> <ul style="list-style-type: none"> • Does the event design address environmental sustainability? If so, how? • What additional steps could be taken to reduce the environmental impact (e.g., waste reduction, energy use)? <p>Carbon Footprint:</p> <ul style="list-style-type: none"> • Has the group considered the carbon footprint of the event, especially regarding space travel? • How could they make the event more eco-friendly? 	
Ethical Considerations	<p>Cultural Sensitivity:</p> <ul style="list-style-type: none"> • Does the event respect local cultures and traditions, particularly if it involves different locations on Earth or space habitats? • Are there any cultural or ethical aspects that could be improved? <p>Long-Term Impact:</p> <ul style="list-style-type: none"> • Does the event contribute positively to the space tourism industry or to local communities? • What measures could they include to ensure ethical integrity over time? 	

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EVENT ASPECT	Feedback Considerations	FEEDBACK
Equitable Access	<p>Inclusivity:</p> <ul style="list-style-type: none"> Who is the target audience for this event? Is the event accessible to people of different economic or social backgrounds? How could the event be made more inclusive? <p>Cost:</p> <ul style="list-style-type: none"> Does the event seem affordable for a wide range of participants, or is it only accessible to the wealthy? Suggest ways to make it more financially accessible to a broader audience. 	
Event Feasibility and Creativity	<p>Feasibility:</p> <ul style="list-style-type: none"> Does the event seem realistic and achievable with current technology and resources? What challenges might they face in making the event a reality? <p>Creativity:</p> <ul style="list-style-type: none"> How creative is the event concept? Does it bring new or innovative ideas to space tourism? What elements of the event could be developed further to enhance its uniqueness? 	

MM4: 9WSB PEER REVIEW: SPACE TOURISM EVENT



Activity 1: Peer Review your space tourism event

After reviewing another pair's / group's Space Tourism Event, use the following questions to help you provide thoughtful feedback. Consider the environmental, ethical, and practical aspects of their design.

EVENT ASPECT	Feedback Considerations	FEEDBACK
Suggestions and Improvements	<p>Overall Impressions:</p> <ul style="list-style-type: none">◦ What did you like most about their event idea?◦ What could be improved to make the event more compelling or sustainable? <p>Open Feedback:</p> <ul style="list-style-type: none">• Any additional thoughts, questions, or feedback not covered in the prompts above?	