Muinín Catalyst STEAM Education for Sustainable Development and Futures Literacy

SGD9 Future of Space

Programme Phase 3: Implementation
Micro-Module 1: Space Design Challenge - Problem to Pitch

SUBJECT AREAS: Art and Design, Climate Action and Sustainable Development, Technology

8 DECENT WORK AND ECONOMIC GROWTH
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

SFI Discover Science Foundation Ireland
An Roinn Oideachais Department of Education

SDG 9 Future of Space

Micro Module 7: Problem to Pitch Space Design

MM7: Space Design Problem to Pitch

Phase 3 Implementation

Subject Areas: Art and Design, CPSE, Climate Action and Sustainable Development, Engineering, Technology, SPHE

Problem to Pitch is a core project-based learning module that can be adapted to any topic. It introduces students to the concept and process of Design Thinking; the cognitive, strategic and practical processes for creative problem solving.

Adapted for The Future of Space this module encourages students to engage and explore real-world space related problems and concerns in meaningful and tangible ways. The module encourages the development of 21st Century skills supporting students to keep up with the lightening pace of a constantly changing technologised world.

Design Thinking helps the students to understand that they can create their own future by enabling them to design their own experiences and participation. Using linked learning and systemic thinking with practical methods of learning, including inquiry and project-based methods, the activities support teachers and students to undertake projects that address contemporary issues on a local scale, in line with the Sustainable Development Goals, Space4SDGs and the 2030 agenda.

In this project-based learning module, the learner will...

- develop skills of organising, planning and scheduling
- develop awareness of the basics of Design-Thinking for problem-solving
- practice problem solving and critical thinking skills as individuals and part of a group
- be introduced to project management tools such as Lean Canvas, Logic models, 5Ws (who, what when, why where)
- Vision boards and a Pecha Kucha presentation

This module includes:

- Lesson plans
- Accompanying resources
- Project-specific worksheets related to specific goals and other project modules,
- Optional assessments Skill support resources

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As a project support module, building core skills in circular design thinking, it is recommended this is undertaken before focusing on specific modules. The module is designed to work in tandem with the Space4SDGs and the Space Design Challenge Briefs

Further, the lessons can also be supported by working key aspects of with MM4 and MM5

Lesson 1: What is Design Thinking?
Design Thinking is the cognitive, strategic and practical process for creative problem-solving. This lesson will introduce students to the 5 stages of Design Thinking to build a foundational understanding of the process.

Resources: Introduction to Design Thinking, Stakeholder Mapping, Flipped Classroom

Lesson 2: Empathy 1
Stanford Design School's five-chairs exercise encourages students to learn how to develop design principles for a user profile. Students consider the 5 users' needs and develop ideas on paper and create 3D prototypes of their designs. This activity encourages students to iterate on their designs and practice using different materials.

Resources: User profiles worksheet, Empathy Map, Step into the Problem worksheet.

Lesson 3: Defining the Problem
In this lesson students will begin to understand how to define a problem. Students are asked to begin to identify a real problem they have wanted to address on a local or global level, using the SDGs as a starting theme. Students also have an opportunity to develop an awareness of a local problem

Resources: Define the Problem support sheet, Problem Tree worksheet

Lesson 4: Ideate, Generating and Remixing - Ideas
This lesson enables students to develop an understanding of the process of generating ideas starting with their personal experience and then moving into project themes.

Resources: Ideate Remix worksheet and Remix SWOT worksheet

Lesson 5: Ideate 2 Generating and Remixing Ideas 2.0 Good Idea / Bad Idea
This lesson builds on lesson 4 and enables students to develop an understanding of the importance of developing ideas and looking for opportunities to iterate and improve on existing ideas. Students are also introduced to Open Source concepts e.g. iteration and collaboration.

Lesson 6: Prototype Your Idea
In this lesson students will begin to consider their ideas for
prototyping, develop a concept statement and look at ways to prototype their ideas depending on their users / audience.

Resources: Rapid Response prototyping worksheet and Ready, Set, Design worksheet

Lesson 7: Test Your Idea
Evaluating an idea is a key aspect of Design Thinking. In this lesson students will begin the process of testing their ideas with potential users. Students will learn that this is not the end of

the process and that they may learn something that means they might need to return to an earlier stage e.g. Define or Ideate.

Resources: 5 Ws of Business planning, 8Ws Business planning, Lean Canvas and Zone Map

Model Development and Expertise: Dr Anita McKeown
Adaptations: Rebecca White

Using the Resources:
If you wish to use these resources, we can offer an induction and online support throughout the module to help you plan integration into your projects and timetable. To register for this option, please contact us e:hello@futurefocus21c.com

For more information on the resources please visit www.muinincatalyst.com

Setting up an online learning environment for the lessons on this module:
Our lessons integrate the use of virtual learning environments. To ensure seamless use of our lessons, a module should be setup o n your school's virtual learning environment such as Teams, Google Classroom, etc. Learners are encouraged to upload documents to share with their peers. If your virtual learning environment does not support document sharing, we recommend OneDrive or Google Drive.

You can also use Google Sites or Microsoft Sway to encourage learners to present their work over the year - this can easily be set up to reflect the aims of TY and provide a showcase for their work as well as an assessment tool.

Setting up a Canva Education account.
As our lessons integrate design, our lessons also refer to Canva. Educators and schools can a free Canva for Education account by registering here: https://www.canva.com/education/

Canva for Education provides primary and secondary school teachers and students with premium features and templates. You can then also set up lessons and invite your learners to the class.

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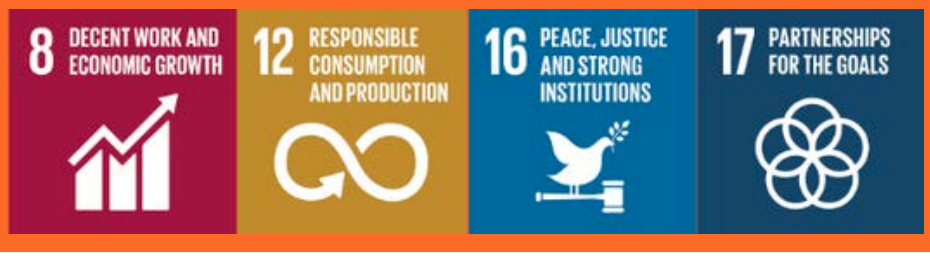

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