Muinín Catalyst STEAM Education for Sustainable Development and Futures Literacy

SDG14 The Future Of The Ocean



Programme Phase 3: Implementation

Micro-Module 6: Problem to Pitch Marine Plastic Waste

Subject Areas: Climate Action and Sustainable Development, Engineering, Design and Communication Graphics, Design and Technology, Maths, Science







Micro-Module 6: Problem to Pitch Marine Plastic Waste

Implementation

Subjects: Climate Action and Sustainable Development, English, Design and Communication Graphics, Design and Technology, Maths, Science

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



RESPONSIBLE CONSUMPTION AND PRODUCTION



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATI



Module Overview

In the SDG 14, Problem to Pitch unit, introduces learners to the concept and process of Design Thinking: the cognitive, strategic and practical processes for creative problem solving.

Learners are encouraged to engage with their local context to enable them to explore real-world- problems, e.g. marine plastic waste or ocean health, in meaningful, manageable, and tangible ways. The module encourages the development of 21st Century skills supporting learners 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 and the 2030 agenda.

In this 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
- develop an awareness of marine plastic waste and the issues within that problem
- 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
- develop a minimum viable product, project, solution, system-change or service for Marine Plastic Waste using circular economic principles



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Subjects: Climate Action and Sustainable Development, English, Design and Communication Graphics, Design and Technology, Maths, Science

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 11 SUSTAINABLE CITIES AND COMMUNITIES 12 RESPONSIBLE CONSUMPTION AND PRODUCTION AND PRODUCTION COOL 13 CLIMATE ACTION

This module includes:

- lesson plans
- · accompanying resources
- project-specific worksheets related to specific goals and other project modules
- optional assessments skill support resources





Problem to Pitch Marine Plastic Waste

This module can be used as a standalone module or as a follow up to the SDG 14 MM1: Ocean Literacy Module. If used together, the two modules form a full Transition Year Unit SDG14 Ocean Health of 40hrs broken down as follows:

- SDG 14 Ocean Literacy x10 1hr lesson Plans with extension and reduction options depending on class time 40 mins / 1 hr.
- SDG 14 P2P Marine Plastic Waste x15 1hr lesson plans with 15 hrs additional self-directed work in completing the tasks including prototyping, vision boards, and Pecha Kucha presentation.

The resources use blended learning and project-based learning to support learners to acquire knowledge and skills and apply them within the context of the real-world issue of Marine Plastic Waste.

Lesson Summary

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

Lesson 3: Empathy 2 Mapping the User

This lesson facilitates learners to develop further insight

into specific users and develop an understanding of their needs and interests. Building on Lesson 2, learners develop their understanding of empathic design and the steps required for empathic / user design.

Resources include: Stakeholder Mapping worksheet, User Journey Map, Understanding the User worksheet.









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Lesson 4: 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 include: Define the Problem support sheet, Problem Tree worksheet, Problem Tree Teachers Guide, Flipped Classroom Task: Problem search.

Lesson 5: Defining the Problem 2.0

Learners will begin to research aspects of Marine Plastic Waste, in particular the Fishing Industry, and key aspects of Marine Plastic Waste ecosystem.

Learners will research net manufacturers, net transport, net waste, fishers, activism, and community impact and collate their findings.

Resources Include: Define 2 - Fishing System / Ecology.

Lesson 6: Ideate 1.0 Worst Idea Ever - Good Idea / Bad Idea

This lesson enables learners to develop an understanding of the importance of developing ideas and looking for opportunities to iterate and improve on existing ideas. Learners are also introduced to Open Source concepts, e.g. iteration and collaboration.

Resources include: Support sheet - Worst idea ever background, examples and ways to use facilitate the lesson.

Lesson 7: Ideate 2 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 Include: Ideate Remix worksheet and Remix SWOT worksheet.

Lesson 8: Ideate 3 Exploring Biomimicry for Design

In this lesson, learners are introduced to the concept of Biomimicry and through a practical activity develop potential ideas and assess them for their potential.

Resources include: Biomimicry worksheet.

Lesson 9: Prototyping 1 - Circular Design and the Life Cycle Analysis

In this lesson, learners are asked to consider a product case study for its sustainability and learn how to break down the 'system' in which the design / product is part of. Learners will then apply this skill to thinking about their own possible ideas by undertaking a life cycle analysis by considering the input processes and inputs involved.

Resources include: Life Cycle Analysis Case study including Spider map, Life Cycle Analysis tools Zone Mapping and Support Sheet: ROLE Life Cycle Analysis.









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Lesson 10: Prototyping 2

In this lesson, students will learn some key skills for prototyping and 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 Include: Concept statement worksheet, Rapid Response prototyping worksheet, and Ready, Set, Design worksheet.

Lesson 11: Prototyping 3

Learners continue to develop their prototype. Learners can also be introduced to the worksheets in Lesson 15 to enable them to begin to expand their concepts for their vision boards and Pecha Kucha.

Lesson 12: Test Your Idea 1.0

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 Include: 5 Ws of Business planning, Create your idea / vision board worksheet

Lesson 13: Peer Assessment and Developing Pitch Criteria.

In this lesson, learners will define their peer assessment criteria. Peer assessment enables those directly involved in the task or project to appraise their own learning. Learners are encouraged to consider what is most important, valuable, and successful from what has been learned and the process of learning it.

Lesson 14: Pecha Kucha

In this lesson, learners will be introduced to the Pecha Kucha ('chit chat' in Japanese) format and begin to analyse what makes a good presentation so they can prepare to create their own Pecha Kucha presentation.

Worksheets include: Pecha Kucha Analysis

Lesson 15: Test your Idea 2.0 - The Pecha Kucha Pitch

The Pecha Kucha format enables learners to develop confidence and competence in sharing their ideas and presenting their work. In this lesson, learners begin to understand messaging / storytelling, the relationship between image, text, and oral presentations, and transferable skills that they will use in many contexts.

Resources include: Pecha Kucha Planning Guide, Pecha Kucha Outline, Pecha Kucha Checklist Pecha Kucha Lean Canvas and Zone Map, Lean Canvas





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Lesson 16: Test your Idea 2.0 continued

Learners, complete their presentation cross-referencing with the Lean Canvas and 5 Ws of Business Planning worksheet that they have gathered and present all the information for their pitch.

Resources include: The 5 W's of Business Planning, Lesson 15 worksheets on Pecha Kucha Planning

External expertise: Marine Plastic Waste Sprint concept and module design: Dr. Anita McKeown, originally developed through CoDesRes and iterated through the Sea Synergy MARplas project

Sprint development and expertise: Dr. Tara Baoth-Mooney and Dr. Colin Keogh.

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 <u>www.muinincatalyst.com</u>

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 on your school's virtual learning environment such as Teams, Google Classroom, etc. Learners are encouraged to upload documents to share with their peers.

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.

Setting up a Canva Education account:

As our lessons integrate design, our lessons also refer to Canva. Educators and schools are able to open a free Canva for Education account by registering here: <u>Setting up a Canva Education</u> account:

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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