

SDG12 Future of Innovation and Enterprise

MM5: Introduction to Engineering for Good



Micro-Module 5: Introduction to Engineering for Good

Exploration and Experimentation

Lesson 2: Engineering a Better World 2

Subjects: Applied
Technology, Climate
Action and Sustainable
Development, Digital
Literacy, Technology

Lesson Title and Summary: Engineering a Better world 2

Engineering a Better World 2 examines the concept of engineering and the SDGs in more detail by developing problem-solving skills through a design challenge.

Vocabulary: Engineering, Design Process, Prototype

In this lesson, the learner will...

- further develop their understanding of how engineering can be used to help solve the SDG's
- learn the concepts behind and utilise the idea of the engineering design process
- work collaboratively with peers on an engineering-related problem
- plan, design, sketch and improve a design prototype

Materials:

- Design challenge slide deck: Engineering a Better World
- SDG Image - see media box
- Notebooks, Pen/Pencil
- A4 blank paper



MM5: Introduction to Engineering for Good

L2: Engineering a Better World 2



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION



Activity Instructions

Activity 1: Desert Island Survival (35min)

1. Divide learners into groups of 4. Explain they are going to work in their groups to find a solution to the following challenge:

Design a hut no bigger than the sheet of A4 paper provided that is at least 10cm high with a working door. It must withstand a windstorm, which will be generated by a hair dryer on full power for 10 seconds.

2. Use the Design challenge slide deck: Engineering a Better World to prepare learners as a whole class.
3. Ask each group to select two SDGs of their choice. They will need to show/explain how their design meets those two specific SDGs.
4. Give the groups time to plan and design their hut on paper.

Activity 2: Improving designs (15min)

1. Ask each group to nominate a spokesperson to present paper designs to the class and a scribe to record feedback.
2. Allow 2 minutes between each presentation for the other groups to offer feedback and suggestions that the scribe records on paper. This feedback will be used in the next lesson.

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 opinion they have about the tasks

Use Post-its or a mentimeter survey - www.mentimeter.com - to gather reflections

MM4 Introduction to Engineering for Good

L2: Engineering a Better World 2



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Extension / Reduction Activities

Reduction: For a shorter class, complete Activity 1 only and move Activity 2 to the start of the next lesson.

Extension: For a longer class, give more time to learners to design their huts and extend the presentation and feedback time.

Media (materials, online video links, extra resources, case studies etc)

SDG Image: <https://www.un.org/development/desa/en/news/sustainable/sustainable-development-goals.html>

What is Prototyping <https://www.youtube.com/watch?v=4XenqN5Ib9o>

Rapid Prototyping <https://www.youtube.com/watch?v=JMjozqJS44M>

Ready Steady Design https://www.youtube.com/watch?v=jlXSuZg2awA&feature=emb_logo

Design Thinking Prototype <https://youtu.be/Q4MzT2MEDHA>

Innovation for All TEDx: https://www.ted.com/talks/colin_keogh_innovation_for_all

Local Tips / Expertise / Additional Work and Assessments

Invite local engineers to speak to the class about projects they work on, and their connection to the SDGs.

Organise a virtual talk with an engineer working on particular SDG-related problems.

Encourage learners to explore volunteer and fundraising projects that Engineers are involved with with such Engineers Without Borders <https://ewb-ireland.org/past-projects/> or

Habitat For Humanity Ireland who are partnering with Engineers without Borders Ireland and their Hope Building Project <https://www.habitatireland.org/joinus/schoolsyouth/hopebuilder>



Use the three images to create a 3-slide presentation to share the challenge with the learners

Desert Island Survival



Design a hut no bigger than the sheet of A4 paper provided that is at least 10cm high with a working door. It must withstand a windstorm, which will be generated by a hair dryer on full power for 10 seconds.



Desert Island Survival



Define

- What is the problem/challenge you are trying to solve?
- What do you need to consider?

Develop Solutions

- What possible solutions are there? How many of them might work?





Select two SDGs.

Your group needs to show and explain how your design meets those two specific SDGs.

