MM1: Problem to Pitch - The Ice Cream Olympics

Programme Phase 1: Research and Development

Lesson 6: Design Thinking Prototype

Subjects: Climate Action and Sustainable Development, Design, Technology, Science

Lesson Title and Summary: Prototype Your Idea

In this lesson, learners will begin to consider their ideas for prototyping, develop a concept statement and look at ways to prototype their ideas depending on users / audience. They will also develop their designs on paper using their concept statement and prototyping support sheets. This lesson can be delivered over a number of sessions depending on learners timetable and lesson options selected.

Learners can use the Ready Set Design Challenge as a vehicle to develop the skills of Prototyping some of their ideas that came from Lesson 3 or 4. These skills will be applied within the Ice Cream Olympics' in other micro-modules Ice Cream Remix, Churning Games.

Vocabulary

Concept Statement; Enterprise; Innovation; Prototype

In this lesson, the learner will:

- explore how to evolve and iterate their ideas
- develop a concept statement
- explore prototyping methods
- develop prototyping skills

Materials

- Video: 'Design Thinking - Prototype'
- Worksheet: Rapid Response Prototyping
- Worksheet: Concept Statement
- Worksheet: Ready Set Design Challenge
- Materials: Ready Set Design (RSD) bags
  - A fastener, e.g. pipe cleaner, pin, paper clip
  - A surface, e.g. material, tin foil, card
  - A structure, e.g. sticks, straws, box,
- Craft / recycled materials (paper, card, glue, etc.)

Activity Instructions

Activity 1 Prototyping – Rapid Response (15 mins)

1. Watch the video What is a prototype.
2. Discuss the benefits of prototyping.
3. Go through the Support: Sheet Rapid Response Prototyping skills to give learners tools they can use for making models / prototypes.

Activity 2 Creating a Concept Map (20 mins)

1. Review Worksheet: Concept Statement to ensure task understanding.
2. Ask learners to complete a concept statement for their project.
   - Learners focus on their project and its selected problem area e.g. climate adaptation. Using their empathy maps and the project's driving questions learners will create a concept statement. It is important that learners document this process as they will use images in their vision board and if doing the Pecha Kucha lessons.
   - Learners could use this opportunity to design an ice cream flavour based on a user's needs or a concern identified in the local landscape or the SDGs.

Activity 3 Developing your Prototype – Rapid Response (20 mins)

1. Using their Concept Map - Learners can begin to prototype an aspect of their concept.

- *The Ice Cream Olympics: Learners can focus on the selected SDG problem / issue or concern they explored in relation to the Ice Cream Olympics in Lesson 3 and continue to work on those activities as a team. Teams can be grouped by selected SDG.*

Option B: Learners undertake a Ready Set Design design challenge using the Worksheet: Ready Set Design, selecting an open ended problem aligned to the SDGs and a global challenge or a challenge set by the teacher. Each team will use the 3 items in the bag for this.

REFLECTIVE EXERCISE: 3-2-1 (5 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 class undertake activity 1 and 2 only.

Option B: Ask learners to watch the Video: 'What is Prototyping' and complete the concept statement at home and come into class with the 3 benefits of prototyping for a class feedback session and undertake activity 3.

Extension: For a longer class, Watch the Video: Design Thinking - Prototyping before activity 3.

Option B: Ask learners' teams to present their concept statement and a prototype or design ideas for an Ice Cream Flavour.

Option C: Leaners can undertake a Ready Steady Design - see Media Box and P5 Rapid Response Prototyping worksheet - in preparation for activity 3.

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

'Design Thinking: Prototyping' (4:54min) https://www.youtube.com/watch?v=Q4MzT2MEDHA

'What is a Prototype?' (4:11min) https://www.youtube.com/watch?v=4XenqN5Ib9o

'Paper Prototyping' (2:36min) https://www.youtube.com/watch?v=85muhAaySps

'Rapid Prototyping' (7:31min) https://www.youtube.com/watch?v=JMjozqJS44M

'Ready Steady Design' (3:26min)
https://www.youtube.com/watch?v=jIXSuZg2awA&feature=emb_logo

Local Trip / Expertise / Additional Work and Assessments

Enterprise and Innovation Centres in Munster

- Kerryscitech https://kerryscitech.com/
- The Tom Crean Business Centre https://www.creancentre.com/
- RDI Hub Killorglin (home to the NDRC in the South West https://rdihub.com/
- HQ Kerry https://hqkerry.com/locations/hq-tralee/
- Cork Bic https://www.corkbic.com/

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INTRODUCTION

Watch the following video: 'What is Design Thinking?'
https://www.youtube.com/watch?v=a7sEoEvT8l8

Answer the questions below. You can re-watch the video as many times as you need to.

a) What or who does design thinking help you focus on?

_____

b) How do design thinkers learn?   _____

c) What do simple prototypes do?   _____

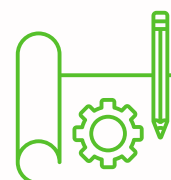d) What do rapid prototypes do?   _____

e) If you ideate, prototype and test too early - what are three mistakes
    that can be made?

_____

f) Write down the two reasons for using design thinking.

_____

g) What are the five stages of design thinking?

_____   _____   _____

_____   _____

Watch the video: 'How to make a cardboard prototype'
https://www.youtube.com/watch?v=k_9Q-KDSb9o Write down as many tips as you can.

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## READY, STEADY, BUILD: KNOWLEDGE GATHERING

Today we are going to experiment with rapid prototyping with
materials that we have to hand. You will explore three basic elements - useful for rapid
prototyping:

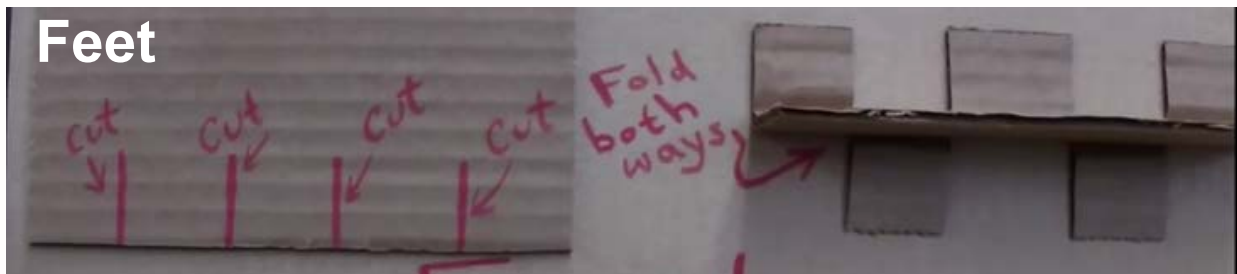- Structure
- Fastening / Joining
- Surface

1. Structure - this will provide support and form to your prototype. The structure provides
   strength by load-bearing if re-enforced or solid, e.g. columns or supports for covering, or
   other materials, e.g. tent poles. Here's some simple tips for creating structure.

Flange
make cuts & fold out
Glue flange

Tabs
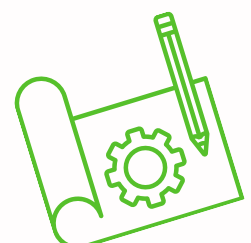Bend & Glue

Feet
cut   cut   cut   cut
Fold both ways
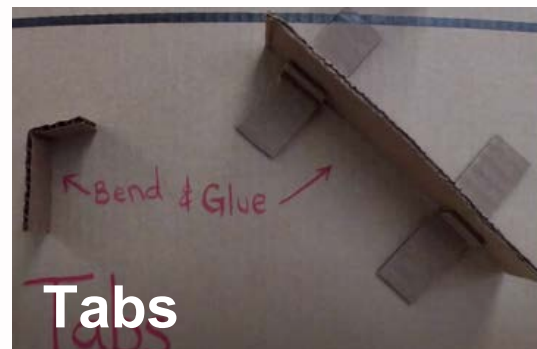
Watch the short video on
structural techniques - all
these processes can be
scaled up to make bigger
models and forms.

**Write down the key ideas in
the video. Use bullet points.**

Creating 3D sculptures https://www.youtube.com/watch?v=pi6Y7yCz7Y8
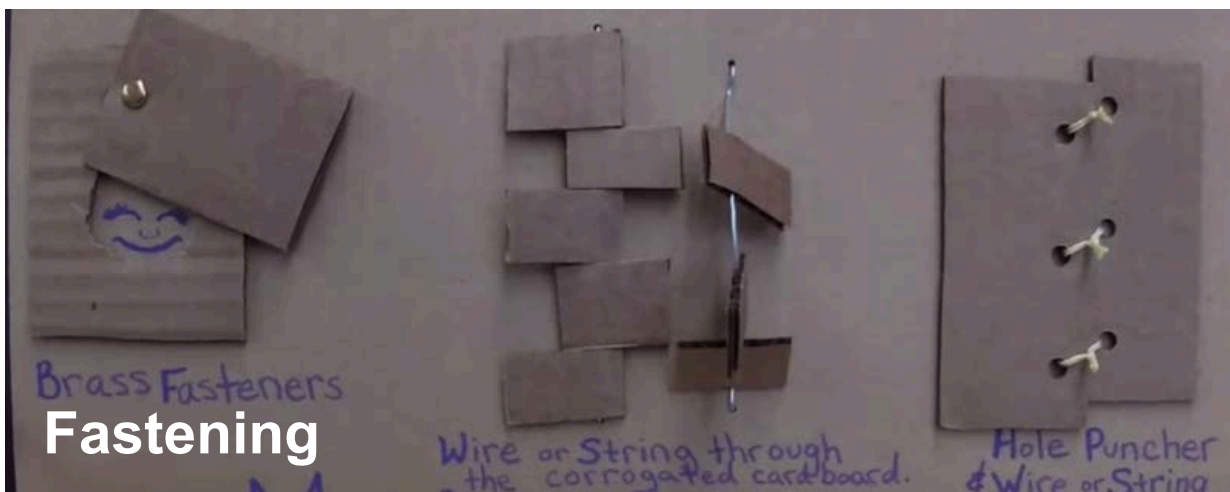
13 CLIMATE ACTION

2. <u>Fastening / joining and attaching</u> - this can be done
using structural approaches, such at slots and tabs, or using
other materials like pins, paperclips, string tape or glue.

Tabs and Slots

Fastening

Some techniques can be both structural and used to join things together like the slots / tabs here on the left.

What other ways do you know of joining things together? Discuss this in your group and make a list.

Knots are another useful joining technique- here's a useful website for learning to tie knots https://www.animatedknots.com/complete-knot-list

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3. A surface - a surface has a number of functions, such as protection, decorative, textural, adhesive, and are made from numerous materials, e.g. plastic, wood, fabric, paper, both natural and synthetic.

Sometimes they can be structural as well as serving other functions. This surface material could provide support and be used as an attachment or joining function as well as offering a decorative purpose.

Natural materials often have other properties such as insulation, waterproofing, protection as well as being structural, making them good for outdoor construction.

Waterproof, or those that are water repellent materials (hydrophobic), are often inspired by nature, whether a rough surface that minimises water contact and absorption or the nanopatterns of insects who fly in the rain undisturbed. You can also treat materials with sprays to make them waterproof.
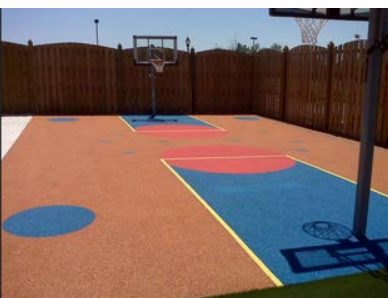
Safety surfaces can be both decorative and functional. They often use bright colours and recycled materials from other processes. They can be highly durable and so reduce maintenance.

Interior design surfaces, e.g. upholstery, curtains, wallpaper, bedding, worktops, are increasingly synthetic and made from recycled materials, e.g. SeaQual or Econyl from recycled fishing nets. They can be durable, easily cleaned and pleasurable to look at.

MM1: L6WS CREATING A CONCEPT STATEMENT

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What is a Concept Statement?

A concept statement summarises a project's meaning, purpose, direction and depth. Concept statements are used at the beginning of the project planning stage. Within innovation and product development, the concept statement helps to focus ideas and keep the team on task.

Use the prompt boxes below to help your team create a concept statement for The Ice Cream Olympics event, game or Ice Cream flavour.

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1. Define the need in two sentences

You are developing The Ice Cream Olympics event, game or Ice Cream flavour for... Who? (tell us about your attendee / player / consumer). To do what? (This is the purpose of the event, include your specific theme / SDG focus).

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2. The problem / issue - explain how your concept will address the problem

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3. Your people / person's needs - tell us about your user and their needs from your solution

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4. Details- explain how your solution's concepts meets this need

READY, STEADY, BUILD: THE CHALLENGE

The Challenge:

1. Indoor activity- set by the teacher
2. Outdoor activity- selected from the list below in Challenge 2

The rules of the challenge:

1. 5 minutes to plan + 15 mins to build a prototype
2. You must include at least one material / object from each element

   ○ Structure
   ○ Fastener / Joiner
   ○ Surface

Challenge 1 (Indoor): Set by the teacher.

Challenge 2 (Outdoor):

Select one of the following challenges to complete in your team.

1. Create something to shelter from the weather - wind, sun, rain.
2. Create something to encourage more biodiversity or wildlife to the area.
3. Create a raised bed that stops animals eating what's growing but looks good and is interesting.
4. Create a table / seating that allows buggies, and wheelchairs to fit comfortably

Post-Challenge Discussion

Let's discuss each teams' design. Use these questions to help focus the discussion:

   ○ How would you help them?
   ○ What might be the next stage of the project?
   ○ If this was to be developed, what are the issues that should be considered e.g. users' needs, surveys, market research?
   ○ Is there anyone local that they could talk to if this was a real project?