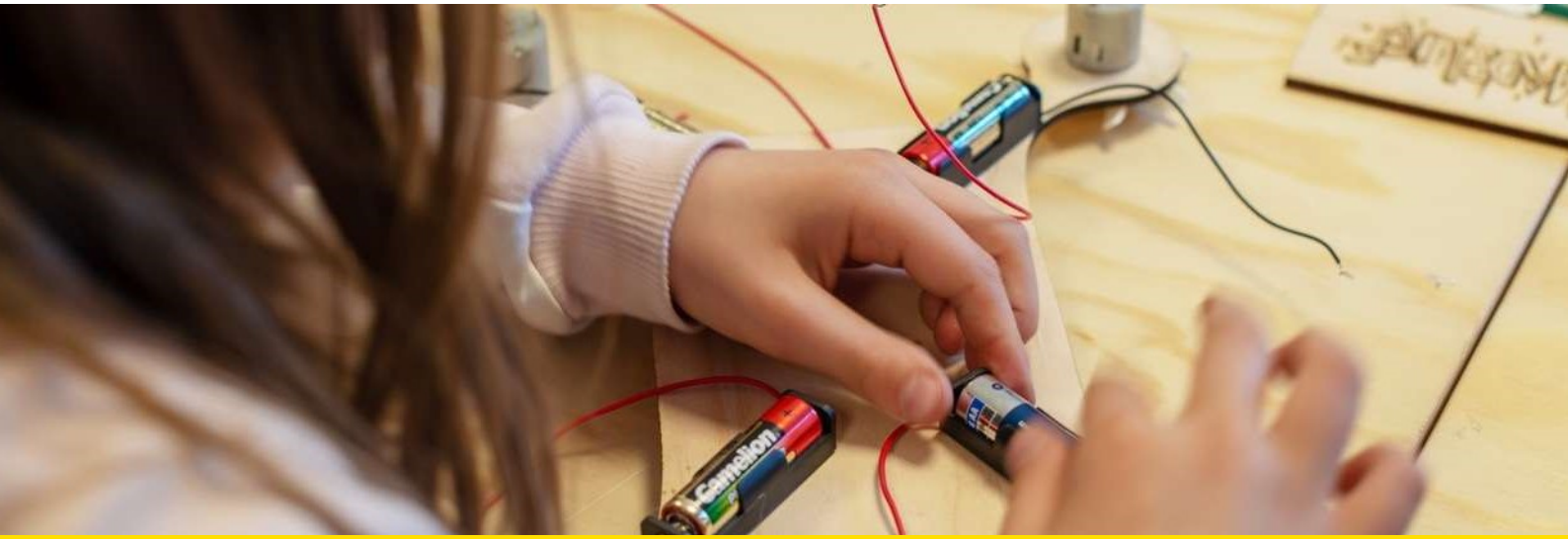
Entrepreneurial skills
for young social innovators
in an open digital world



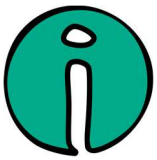
Workshop Description

# Waste in my school

This project has received funding from
the European Union's Horizon 2020 research and innovation
programme under grant agreement No 770063

# Waste in my school (UC Syd)

Over a period of four days, the children researched, analysed and identified a waste challenges in their school connected to the theme Nature and environment. They when worked with developing ideas to solve the issues they found. They worked with prototyping their solution in recycled materials and combining it with LEGO WeDo robots.



Duration: 4 sessions of 3-4 hrs.
Setting: In classrooms
Group size: 36 children
Age: 7-9 year

## Day 1

Aim of day 1 is to spark curiosity, creativity and finding a common goal

### Welcome and introduction – 15 min.

Introduction of the facilitators and children. Find your seats.

### Introduction - 15 min

Introduce the topic of the workshop series

Facilitator Instructions:

- Briefly tell what the programme of the workshop series is going to be
- Explain what the rules for the coming days are (agree on a sign for silence and listening, how to work together as teams, when there are breaks ect.)
- Explain what the final objective is (making a prototype for sustainable development)
- Explain how we are going to do this (design, digital fabrication)
- Tell what we will do today

### Play exercise – 35 min

Play a small icebreaker game with the children for everybody to get comfortable and build relations for the coming days.

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## Video and Discussion about waste and environment – 40 min.

Show video (can be found on Youtube) of the different things plastic waste comes from and have a discussion with the children about this.

Aim:

- Spark curiosity
- Get an idea of what waste is and where it comes from
- Start the idea process

Facilitator instructions:

- Watch the video
- Ask the children what they thought?
- Ask if anyone can come up with an idea on how to use plastic waste for new things

Student prompt:

- In groups of 3 discuss what they found most interesting/surprising in the video
- Come up with 2 uses of plastic waste

## Break – 10 min.

Outdoors break

## Lego Building exercise – 20 min

Aim:

- Cooperation
- Self efficacy
- Resource management

Facilitator Instructions:

- Divide the children into 2-3 pers. Groups
- Make sure there is enough room for all the children to engage with the materials
- Show examples of your own constructions
- Let the children follow some fun and easy building prompts and slowly turn up the difficulty (make sure it relates to to video you chose)
- They can draw their ideas before building it

Materials:

- Lego
- White paper
- Pencils

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## Presentation – 60 min.

Aim:

- Build motivation
- Presentation skills
- Feeling of accomplishment

Facilitator instruction:

- Have the children choose which 1-2 constructs they wish to present
- Have a timer ready and make sure all groups have the same time

Instructions for the children:

- Choose the constructs you like best
- Make a mini-poster for your constructs
- Prepare a presentation for each answering following questions:
    1. Why is this the most awesome construct in the whole world?
    2. What makes it so different from other things like it?
    3. Why did you chose to build this?
- Present for the rest of the class (max 2 min. pr. Construct)

Materials:

- White paper
- Pencils
- Drawing materials

## Wrap-up and clean up – 10 min.

Everyone helps to clean up before we end todays session

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# Day 2

Aim of the day : research the issue at hand, define the problem and make the first blueprint

## Good morning and welcome - 10 min

Set the scene for the day and let the students know what to expect

## Recap from last session - 15 min

Discuss thoughts and pointers from the video and constructs from last time

## Idea generation and research w. mindmaps– 60 min.

The students should be devided into groups of 4-5.

Using the mind-map method the students should explore ideas ad notions about nature and envoirment at their school. They should work on identifying different waste issues that they find interesting, and would like to work on. Check out the Mindmap tool from DOIT *HERE*

Aim:

- Circular thinking
- Corporation
- Co-creation

Instructions:

- Think of a problem you are trying to solve. You'll use these ideas as the basis of your mind map.
- By hand, draw a circle in the middle of a piece of paper.
- Draw about 6 lines extending from the circle. The lines touch the main circle
- In the center of the circle, write the main problem, goal, etc. If you thinking visually and want images or symbols along with the words—include them.
- On each of the 6 extended lines write or draw images of various aspects or issues of the problem or goal you are working on
- You can also have lines that branch out from each line—with words or images about each issue
- Make your map colorful—use at least 3 colors
- Use keywords and write in all upper- or lower-case letters
- Develop your own particular style of mind-mapping. Make it represent YOU!
- Use the mindmap to pin down what problem you as a group want to work on

## Break – 10 min.

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## Brainstorm – 20 min.

Aim: For the group to come up with suggestions on how to solve their chosen problem

Instructions:

- Talk about your chosen problem from your mindmap and how you can build a robot to solve it
    - Is there something solving part of the problem already?
    - What do you need to solve the problem?
    - Can you break the problem into smaller pieces?

## Prototype blueprint – 45 min.

Aim: Sketching out ideas on a solution to their chosen problem

Instructions:

- Each group member (or in pairs) draws an idea for a robot that can solve the problem
- Show the ideas to the rest of the group
    - Is there something you have in common?
    - Is there some really good ideas you should take rigtht away
    - Is there something you could combine?
- The whole group now works on a common blueprint for the prototype they want to work on

## Break – 10 min.

## Present blueprint – 45 min.

Every group presents their blueprint

Aim:

- Practice presentation and communication
- Get feedback from peers

Instructions

- Every group gets 2 minutes to present their blueprint
- 2 minutes feedback from their classmates.
- Note down any suggestions

## Wrap-up and clean up – 10 min.

Everyone helps to clean up before we end todays session

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# Day 3

aim of this week: Learn about the LEGO WeDo system and start building the prototype

## Welcome - 10 minutes

Set the scene for the day and let the students know what to expect

## Warm-up: instructed build – 60 minutes

Aim:

- Getting a feel for the robotics
- Learning basic functions

Facilitator Instructions:

- Introduce the material and show how to open the WeDo app on the Ipads
- Depending on the childrens prior knowledge and age choose an appropriate instruction from *LEGO Education* – we used *MILO*
- Be available to help, but let the children work with the WeDos and instructions themselves

Instructions for children:

- Each group should build a construct from the instructions

## Break – 10 minutes

## Building 1st prototype – 60 minutes

Aim: The groups should end up with a first prototype for their solution

Instructions:

- Based on your blueprint from last time, start building a working prototype using the materials and WeDos available.
- Test your prototype accordingly and discuss in the group if there are changes needed.

## Break – 10 minutes

## Building 1st prototype – 45 minutes

Continue building the prototype

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## Test and feedback – 30 min

Aim: Get feedback from their peers and iterate 1st build

Instructions:

- Each group makes a short introduction of their robots, and why they choose to build it this way
- Get feedback from classmates
- Write down the feed back for next time

## Wrap-up and clean up – 10 min.

Everyone helps to clean up before we end todays session

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# Day 4

Aim of this day: Finish the first prototype and present it to the teachers and principal

## Welcome – 5 minutes

Set the scene for the day and let the students know what to expect

## Iteration of 1st build – 70 minutes

Aim: finish the prototype

Instructions:

- Continue to build on your prototype
- Use the feedback you got from your peers the last time
- Make sure to include and discuss everybodys ideas

## Break 10 minutes

## Continue Prototyping – 30 minutes

The groups keep working on their builds

## Video infomercial – 60 minutes

Aim: develop a small video infomercial that can present the robot to an audience (eg. Parents)

Instructions:

- Using Imovie you should make a small ( 2-3 min.) informercial to tell all about your robot and why it will help your school.
- Write down what things you want to say about your robot
    - Find a cool name for your robot
    - What is the problem
    - Why is this a problem at your school
    - How can your robot help solve it
    - Show how it works
- Draw a storyboard (like a cartoon) so you know what scenes to shoot, and what to say in them
- Shoot the video and make sure to include everybody from the group

## Break 10 minutes

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## Continue with video infomercial – 30 minutes

Finishing touches on the infomercial

## Screening of infomercials – 30 minutes

We watch all the infomercials together with the teachers and the principal

## Goodbye – 5 minutes

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