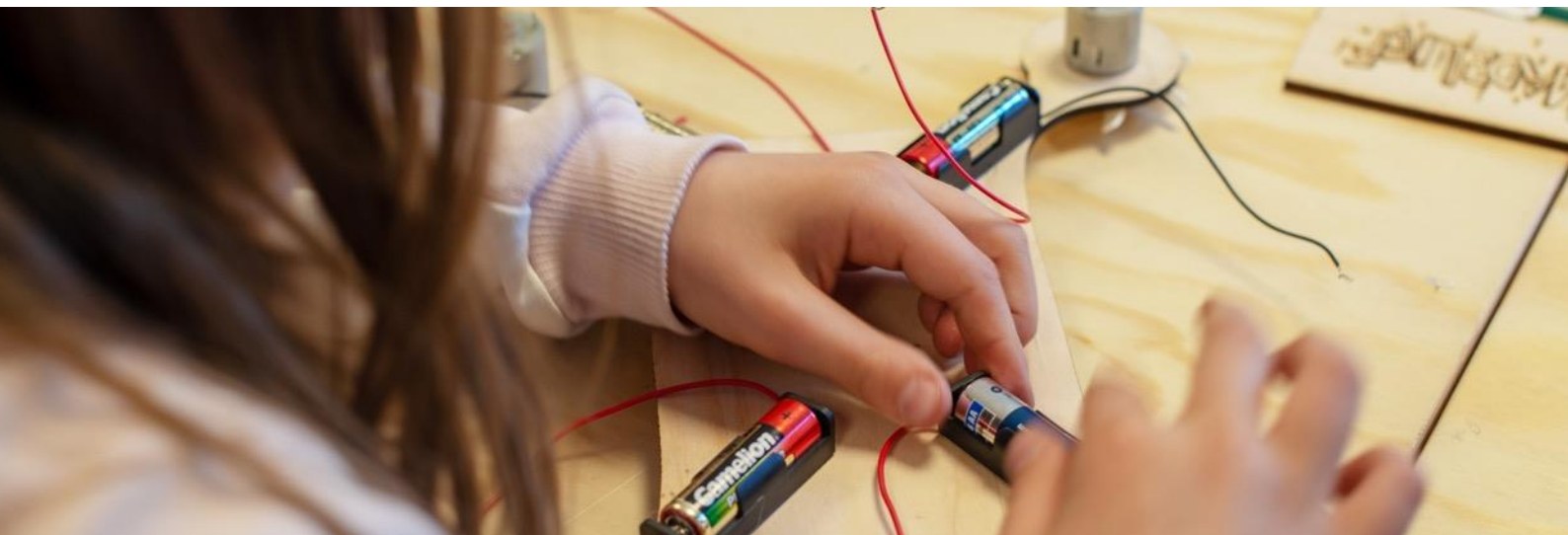




Entrepreneurial skills
for young social innovators
in an open digital world



Workshop Description

GIVE A HAND TO OUR PLANET

Af



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Give a Hand to our Planet

This is one variation of our Give a Hand workshop which was usually focused on people, individuals, or neighbourhoods. In this version, the focus is to help our planet Earth. The workshop was adapted to be inclusive for children with special needs. It uses this fact to sensitize participants about specific problems and needs in their neighbourhood.

In just two days (15 hours) the children identify a variety of possible problems, either in their own neighbourhood or in general, choose a problem, design a solution, and create a prototype of recycled materials. They used both traditional and digital skills and electronics to further develop the prototype.

First the children analyse the **system** of the production and use of a pair of jeans by mapping out the product chain. They take a holistic view and identify intervention points. After identifying these intervention points, they frame the issue in a **problem** definition. For these defined problems children develop **solutions**.

Finally, they craft a physical **prototype** of the robotic solution by combining and manipulating recycled materials like cardboard and plastics.

The facilitation of the process focuses on entrepreneurial competences. Children are stimulated to work with others, develop creative and purposeful ideas, cope with uncertainty, keep up motivation and perseverance, plan and manage project, and work on self-efficacy. The learning method of choice is scaffolding: the students first try themselves, but if they need some help, they get support to take the next step.



Workshop duration: 2 days (7 + 8 hours)

Setting: afterschool

Group size: 15 – 20 children in groups of 3 – 4

Age: 8 – 12 years old

Settings note:

When working in a school environment, try to use an unusual space (corridor, central space etc.) or, when using a classroom, reorganize the tables, decorate the space etc.

Materials:

- computers & electronics
 - laptops with Wi-Fi connection
 - Micro:Bit / Arduino boards
 - speaker, microphones,
 - sensors,
 - motors,
 - LED,
 - battery, ...
- generic crafting materials and tools
 - scissors
 - glue gun
 - cardboard and paper
 - foamboard
 - stickers
 - paint
 - markers, ...





Day 1

Introduce yourself (A) Motivation & (C) Co-creation Duration: 30 min

Short Description:

With this first exercise, the participants and the facilitators are introduced to each other. This exercise is also used to get to know each other better and to learn something more specific of each person beside their name (what are their hobbies, what is their favourite food, or find out something about the shoes he/she is wearing...). The idea here is to try to find out more about a person besides his/her name.

Aim:

- getting to know each other
- getting closer as a group
- breaking down potential shyness in children

Materials:

- (long) rope
- alternatively, you can use a ball or a balloon (you could even use this to write the name or other info on)
- or nothing

Settings Note: stand in a circle

Facilitator instructions:

- Decide on an interesting question to ask.
- Pass the rope (or the ball, balloon, ...) to the person you want to ask the question to. After answering, this person passes the rope (or the ball, balloon, ...) to the next person, and so on.
- If the rope is used, by the end of the exercise a net has been created. You can use this to reflect with the participants about individual strength vs. group (team, network, ...) strength.

Introduction to the DoIT workshop

Duration: 30 min

Short Description:

In this section, the topic of the workshop (how to help other people, your school, community, planet, ...) is introduced. A short and informative presentation prepared in advance is presented with the necessary additional explanations. It is important to emphasize that questions and comments are allowed, in fact both desirable - short discussion is encouraged during the presentation (by no means is this a classic lecture in which children are just passive listeners).

Aim:

- raising awareness of the topic / the problem and motivating children to start thinking and try to do something about it





Materials:

- presentation
- LCD projector
- speakers (if sound is needed during the presentation, or to have background music during the workshop)

Facilitator instructions:

- Briefly talk about the programme of the workshop:
 - o The participants will make waste bots using waste material, digital fabrication and electronics.
 - o They will learn through making. They will encounter many things they haven't done before, so they will explore how to use technology to make things.
 - o Explain the final objective (making a prototype for sustainable development) and how they are going to achieve this (design, digital fabrication)
 - o Step-by-step describe the next 2 days.
- When you are in a makerspace environment, explain what a makerspace is and what the difference with a school is.
- Depending on the environment (school vs makerspace), discuss the general rules (hang your coats and bags, no running, no food and drinks near machines and laptops, ...).

Reflect*Duration: 15 min*

Short Description:

In this section (but also after each section/part as well) it is important, good and desirable to get feedback from the children.

Aim:

- encouraging discussion (two-way communication / dialogue with children to get a better result in the end)

Facilitator instructions:

- Ask questions to reflect on the introduction. How do they feel about the topics? What was new? What are they most excited/curious/... about?

Break*5 min***Make a Nametag***(A) Motivation & (C) Co-creation**Duration: 15min*

Short Description:

The idea of this activity is to introduce participants to the making process by using already familiar traditional tools and skills, but also some digital fabrication. Therefore, lasercutted nametags are the basis for further work. Each participant will make a name tag for the person who threw them the rope during the "Introduce yourself" activity. This reinforces the idea of the workshop to do something for other people, not for yourself.





Aim:

- to introduce participants to the making process

Materials:

- various sources of materials, including recycled ones (cardboard, leftover wood, ...)
- decorations (rope, buttons, ...)
- whatever you have and whatever you can collect and secure

Facilitator instructions:

- Motivate the participants to not only write the name, but to do this in an unusual, creative way.
- Ask the participants to decorate the nametag using the available materials.

Reflect

Duration: 10 min

Short Description:

In this section children were given the opportunity to show what they have done and to listen to one another's comments.

Aim:

- It is always important to get feedback.

Facilitator instructions:

- At the end of the activity, let the children show each other what they made/designed for their partner.

Mapping a problem

(D) Iterate & (E) Reflect

Duration: 45 min

Short Description:

Take a holistic view of the problem of the textile industry on a systemic level and identify intervention points.

- Make groups of 3 to 4 children.
- Each team member takes some time to think and write down the problem(s) she/he would like to deal with.
- Each team member presents their chosen problem to the team.
- The team discusses all options and decides on one problem they want to work on.

Aim:

- It is important to identify (by a team!) the one problem the team will deal with.

Materials:

- DOIT Toolbox Building the Problem
- DOIT Action Canvas
- post-its
- paper for the team discussion





Facilitator instructions:

- If possible, let the kids decide how to organize the teams themselves. Of course, if that's not possible, help them group themselves.
- In case of an in-school workshop, ask the teachers (because they know children) for help to spread known friend groups over different teams.
- Keep an eye on the timer to ensure a good split between individual reflection and collaborative discussion.
- Add post-its for each team member
- When talking to the group, get feedback from each member to avoid the loudest in the team to dictate the course of action.
- Leadership is important, therefore talk to those team members who take the lead in motivating others.
- Provide the team with the DoIT Canvas after the problem is defined to avoid jumping to solutions before the problem is defined.

Reflect*Duration: 15 min*

Short Description:

Each team briefly presents to the whole group which problem they would like to work on, and why they believe it is important.

Aim:

- It is important to get feedback.

Facilitator instructions:

- Ask participants to present briefly and clearly what problem they have chosen to deal with and why are they thinking that it is important (ask them to answer on two questions – what? and why?)

Define cause*(A) Motivation & (C) Co-creation**Duration: 45 min*

Short Description:

The purpose of this activity is to define the cause of the problem. This activity can be separate from or a continuation of the "Mapping a problem"-activity. First each team member individually considers possible causes of the problem, after which the whole team brainstorms together and discusses the different points of view.

Aim:

- It is important to identify the cause. Without identifying the problem cause it is impossible to reach a coherent / meaningful solution.

Materials:

- DOIT Action Canvas





- Post-its
- Paper for the team discussion

Facilitator instructions:

- After defining the problem, determine the cause of the problem.
- This activity, as well as the previous one, are brain intensive and can be exhausting for the participants. Be mindful about the group dynamic - if necessary, allow for a short break or interrupt with a simple make exercise.
- Don't forget to ensure a good split between individual reflection and collaborative discussion.
- Add post-its for each team member
- When talking to the group, get feedback from each member to avoid the loudest in the team to dictate the course of action.
- Leadership is important, therefore talk to those team members who take the lead in motivating others.
- Instruct them the team to fill out the DoIT Canvas (they already have from previous section) after the problem cause is defined to avoid jumping to solutions before the problem cause is defined.

Reflect

Duration: 15 min

Short Description:

Each team briefly presents to the whole group which causes they have identified.

Aim:

- It is important to get feedback.

Facilitator instructions:

- Ask participants to present briefly and clearly what is the cause of the problem they are dealing with and to explain short their opinion.

Make a Bot

(A) Motivation & (C) Co-creation

Duration: 25 min

Short Description:

Participants will take their next step in makers learning with this activity. They will make a small bot using electrical parts (motor, switch, battery, ...). There are several possibilities (ArtBot, BrushBot, ...) that use the same principle.

Aim:

- Makers learning in a fun and easy way.

Materials:

- simple packaging
- battery holder and battery





- motors and wires
- tape
- glue gun
- pens or brush/toothbrush

Facilitator instructions:

- Prepare instructions (can be projected) and materials for each team.
- There are several great maker exercises, e.g. egg straws, build a parachute, build a LED Lamp, build simple motor, ...

Reflect

Duration: 5 min

Short Description:

Each team briefly presents and demonstrates their bot to the whole group.

Aim:

- It is always important to get feedback.

Facilitator instructions (note):

- Children are happy when they make something with their hands (do something themselves) and when they can show it.

Lunchbreak

45 min

What can be done?

(D) Iterate & (E) Reflect

Duration: 45 min

Short Description:

This activity is a little easier than the previous ones, because finally the teams are discussing what can be done to solve their chosen problem.

- First each team member takes some time to individually think about and write down which solutions they propose.
- Secondly each team member presents their solutions to the team.
- Finally, the team discusses all solutions presented and the group decides on one or two approaches.

Aim:

- To think, discuss and to figure out what can be done.

Materials:

- DOIT Action Canvas
- Post-its
- Papers for the team discussion

Facilitator instructions:

- Prepare instructions (can be projected) and materials for each team.





- Add post-its for each team member.
- Provide the team with the DoIT Canvas after the problem is defined to avoid jumping to solutions before the problem is defined.
- Provide the team with the DoIT Canvas after consolidating the previous steps to avoid jumping to solutions before solid arguments have been formulated.

Reflect

Duration: 15 min

Short Description:

Each team briefly presents to the whole group which problem they had decided on, and what they want to do about it.

Aim:

- It is always important to get feedback. (By listening to comments and feedbacks you might get an idea of how to improve something.)

Facilitator instructions:

- Ask participants to present briefly and clearly what is the problem and what they want to do about it. And of course, let them know that by listening to comments and feedback from other children, their team can improve, upgrade what they have done.

Competition

(A) Motivation & (C) Co-creation

Duration: 30 min

Short Description:

To take a break from the brain-intensive work on the project, a number of short make activities can be used. There are several possibilities, depending on the resources you have to work with, ranging from simple activities such as a LED lamp or a simple motor wheel, to more demanding challenges such as the Straw Egg or the Spaghetti-Marshmallow challenge.

- Working together on a maker challenge engages team members and strengthens the team.
- Organize a competition to see which group can make the highest construction from the materials given.

Aim:

- To maintain the level of interest (in children) but also not to lose momentum.
- To take a break from the brain-intensive.

Materials (for the Spaghetti-Marshmallow challenge):

- 18 sticks of spaghetti
- 1m string
- 1m tape
- 1 marshmallow

Facilitator instructions:

- Observe and encourage, do not work instead of children.





To improve:

- There are several variations on this challenge that focus more on the construction aspect, distance (e.g. build a bridge), strength (e.g. egg protection), ...

Dream solution

(A) Motivation & (C) Co-creation

Duration: 60 min

Short Description:

The last activity of the first day is the final step of the ideation phase. The teams dream about their solution: how does it help to solve the problem, how does it work, what has to be done, what are the options, how can it be done, The participants can rethink their solution and dream about various approaches.

Aim:

- To rethink solutions and consider different approaches

Materials:

- paper
- pens
- team discussion

Facilitator instructions:

- Just as in the previous design thinking activities, take care to get feedback from all team members.
- Observe and encourage, do not offer solutions, encourage instead children to think (provoke them positively).

Reflect

Duration: 15 min

Short Description:

Each team can briefly present to the whole group what they propose as their preferred solution.

Aim:

- It is always important to get feedback.

Facilitator instructions:

- Ask and encourage teams to clearly describe and explain (to say all the important information) what they intend to do.
- Remind teams (all) that by listening to comments and feedbacks of other teams their own team might get an idea of how to improve something they currently have.

End of day 1 and reflection of the day

Duration: 15 min





Aim of this day: Map the system, define the problem, and prototype a first solution.

Facilitation focus: This workshop is quite packed, keep up the pace and enthusiasm!

- clean up together





Day 2

Welcome

Duration: 15 min

Aim of this day: Prototype and present solution/project.

Facilitation focus: This workshop is quite packed, keep up the pace and enthusiasm!

- Welcome the children.
- Reflect on day 1: what did they enjoy, any comments from home, ...
- Discuss the plan for day 2.

Sketch solution

(D) Iterate & (E) Reflect

Duration: 60 min

Short Description:

Each team should make a sketch of the solution they came up with for their chosen problem and start the prototype of the solution. It is important and necessary to sketch solution before prototyping phase because sketches help to convey ideas, demonstrate functionality, visualize user flow, and illustrate anything that requires human interaction. Sketching helps discover potential issues and solutions early, prior to starting the further phase, prototyping, design and development stages. It is important to realize that sketches are an important part of the whole process.

Aim:

- To help explore and explain design concepts. (That's exactly what sketching is for.)
- The idea is to keep your sketches fast, rough and dirty. This helps you worry less on design aesthetics and focus more on rapid formulation of ideas.

Materials:

- paper
- pens
- DoIT Action Canvas

Facilitator Instructions:

- The facilitators' guide to prototyping with digital fabrication and electronics for 8 – 12 year olds.
- First each team member takes some time to individually think about and write down which solutions they propose.
- Secondly each team member presents their solutions to the team.
- Finally the team discusses all solutions presented and the group decides on one or two approaches.

To improve:

- Add post-its for each team member.





- Provide the team with the DoIT Canvas after the problem is defined to avoid jumping to solutions before the problem is defined.

Reflect

Duration: 15 min

Short Description:

Each team briefly presents the sketch of their proposed solution.

Aim:

- It is always important to get feedback.

Facilitator instructions:

- Ask and encourage teams to clearly describe and explain the sketch (what is it? and how does it work?).
- Remind again teams (all) that by listening to comments and feedbacks of other teams their own team might get an idea of how to improve something they currently have.

Prototype solution

(D) Iterate & (E) Reflect

Duration: 60 min

Short Description:

A very common aspect of various making exercises is the prototyping phase. All exercises should offer small segments of some basic makers skills, and this is applied here during the prototyping activity.

- Each team works together on the same prototype.
- Depending on the individual skills of each group member and the specific prototype they are making, they can opt to split up and work individually on separate tasks for same solution/project.

Aim:

- DIY & work together.
- Having fun by making.

Materials:

- recycled materials collected by the attendees before the start of the activity
- hot glue gun
- cutter knife
- basic electronics (battery & battery holder, LED light, motor, switch & wires, additional sensors, ...)

Facilitator Instructions:

- Ask about the intentions of each group on what to do.
- In case something is too difficult to do, try to motivate the children before offering help - they can be very resourceful.
- This activity can result in teams falling apart due to different visions, ambitions, and skills. Motivate each group to continue to work together.





To improve:

- add solar cells and generator suggested by kids
- add basic sensors (light, proximity, sound)
- add electronics and processing (Sketch)

Reflect

Duration: 15 min

Facilitation focus:

- Keep a close eye on how it is going, and what the most difficult moments are for the children.

Lunchbreak

45 min

Continue prototype

(D) Iterate & (E) Reflect

Duration: 60 min

Usually children can't wait to continue with prototyping and finish their projects.

Prepare project presentations

Duration: 45 min

Facilitator Instructions:

- Lay out the tables so the children can show their prototypes. Make sure there is also space for the sketches and early versions of prototypes so they can show the entirety of the process.

Instructions for children:

- Show your final result
- Show each step of the process
- Tell your story

Break

15 min

Welcome the jury, parents and other visitors that arrive.

Present project

(D) Iterate & (E) Reflect

Duration: 60min

Short Description:

Each team presents their project to the other groups and to the public (parents, other teachers, guest critics, ...). Each team tells their story: what was the problem they wanted to tackle, what caused the problem, what is their solution, how does it work, ...

Aim:

- To provide an opportunity for children (teams) to show what they have done. (This is very important!)





Note:

- Public speaking helps to progress children in the following: improved communication skills, increased self-esteem, planning experience, the power of persuasion. (As public speaking is critical to have as an adult, developing the ability as a child is one of the best ways to conquer it.)

Materials:

- Present with the help of the prototype and the DoIT Action Canvas

Facilitator Instructions:

- You will be the host of the presentation. Invite all children to present their prototypes. Let them tell their own story. If you think they skipped something interesting or valuable that you remember from the workshop, ask them about it so they can tell the complete story. Be careful to motivate each group member to contribute to presentation in their own way.

Instructions for children:

- One by one the children will be invited to present their prototypes. Afterwards there will be time to chat to the people you have invited.

Goodbye and certificates

Duration 30 min

After the presentations, there will be time for the visitors to walk around and ask further questions. Be aware that it is important to present to each child some kind of Certificate or Diploma.

