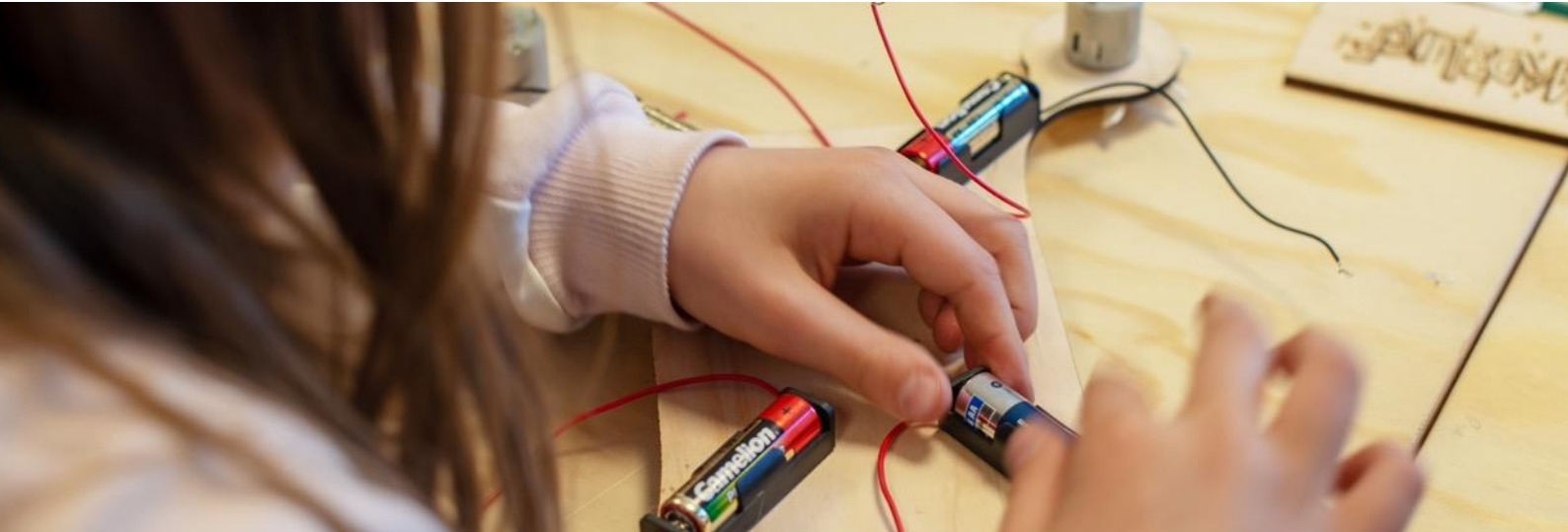Entrepreneurial skills
for young social innovators
in an open digital world

Workshop Description
PLAYGROUND IT!

POLYHEDRA
DESIGNED TO CREATE

Develop Innovative Playground Equipment (Polyhedra)

The participants were asked to think about the reasons why there is no children in the local playgrounds. Once the problem was brought to conciseness, they started brainstorming and creating an environment and solutions to bring the children back to the playgrounds.

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3-day workshop on digital fabrication and design thinking focusing on basic electronics and 3d printing skills and use of it for prototyping socially innovative ideas.

Workshops: 8x3 hrs
Setting: Primary school, 2nd and 3rd grade
Group size: 4-5 children per group
Age: 9 – 10 years old

Objectives

- ✓ Use simple electronics (littleBits)
- ✓ Plan design, prototype and build phases of a project
- ✓ Build prototypes with others in a group
- ✓ Foster creativity, teamwork, and ability to plan

Preparation

Use the Introduction to (littelbits) Electronics (docx) from the DOIT toolbox to prepare. Also, download 3D printing for beginners (pptx) to get acquainted with 3D printing and assure you have projector/TV available to show presentation.

The following tools and materials are recommended:
- Paper and Pencils (for sketches)
- A3 white paper (thick) as a placemat
- Arts and Crafts Supplies (Zip ties, Styrofoam, Rubber Bands, Pipe Cleaners, etc.)
- Hot glue gun, Scissors, Scalpel
- littleBits Workshop Set
- Legos
- 3D printer with PLA filament (optional)

Tips and Tricks

Bring pictures of existing (empty or ruined) playgrounds from the neighborhood to support discussions on social changes in digital world (e.g. virtual, online games vs. direct human interaction. Most children age 10-16 feel bored, so trigger their imagination on creating innovative solution that bring playgrounds back to life.

Unit 1: Build a Living Playground (210 minutes)

Main learning goal of this unit is to teach basic electronics using littlebits modules. Since playground equipment is based on movements, building known playground equipment allows for a use of wide range of input, logic, and output electronics modules.

Logistics Information (15 minutes)

Welcome and basic logistics information (time schedule including breaks, bathrooms, special requests, safety, etc.).

Playground It! Introduction (15 minutes)

Ask participants to name common playground equipment and explain the motions which are related to it (e.g. swing, see-saw, marry-go-round, slide, monkey bars, etc.).

Electronics (30 minutes)

Focus on inherited movements to introduce servo and dc-motor little bits, for others introduce sensors and lights.

- Marry-go-round - use DC-motor bit and use Button bit to start and stop the movement (alternatively use Dimmer bit to control the speed)
- Swing - use Servo-motor bit and use Dimmer bit to control the position of swing (alternative use Dimmer bit to define speed of the swing)
- See-saw - use Servo-motor bit and use Dimmer bit to control the speed of the see-saw (alternatively use Dimmer bit to define position of the see-saw)
- Slide - use Pressure button at the end of slide to turn on green light that allows the next person to go on slide
- Monkey-bars - use Timer-bit to measure time to pass the monkey-bars, use Button to start the timer
- Bench with Street light - use LED bit to build a light pole and Light sensor bit to turn it off and on

Break (15 minutes)

Build the Playground (60 minutes)

Define the size (e.g. 1:12) so that all equipment is in scale with each other. Divide participants into teams and assign a single playground equipment above so they can build it themselves. Be careful as they will use sharp objects and hot-glue gun, so help them if needed.

Presentation Preparation (15 minutes)

Use this time to explain basic presentation rules - each participant should take a part of presentation, total 5 minutes max, introduce team members, explain what electronics components are used and how, share problems and a-ha moments.

Break (15 minutes)

Presentations (30 minutes)

Make sure everyone not presenting is quiet and, in their seat, while presenters are in front of everybody. Take pictures. At the end put all equipment together to create a park and make a group photo.

Social Challenge (15 minutes)

What will bring the children back to the playgrounds? Can you imagine an innovative playground that kids will want to come to? Would there be any new, different equipment in the ideal playground? Individual assignment: Use large paper (preferable A2, at least A3 paper size) to draw your creation and prepare to show it in front of all others in 2 minutes or less. Refer to _online_0_C005: Marketing Poster (Printable worksheet)_ for help.

Unit 2: Design-thinking Innovative Playground (210 minutes)

Main learning goal of this unit is to teach design-thinking and break the barriers between innovation and availability.

Unit 1 Reflection (15 minutes)

Show some pictures from Unit 1 and ask for suggestions/feedback.

Individual Idea Presentations (60 minutes)

2 min presentations. Those that did not bring their homework also need to come up in front of everyone and make something up on the fly and create a poster for them. Keep track of time, do not allow for too many interruptions or questions.

Break (15 minutes)

Voting (15 minutes)

Give 6 Lego bricks to each participant. Ask participants to prepare 3 Legos high, 2 Legos high and single Lego high pieces to reflect first, second and third choice (3 Legos - first choice, top vote) After distributing all posters around the room, ask participants to walk around and place their votes (Legos) on top of the existing Lego pieces (previous votes). Select as many top scorers as there are groups as each group will be assigned to build one of these innovations (winners are leaders of the teams).

Design Thinking (45 minutes)

Groups are assigned colors for tracking and work on (re)design of the winning idea by suggesting changes and working together to define the details. End result should be:
- Name and Logo of the group
- Overall look with description of its functionality
- Detailed breakdown of the parts needed
- Assembly instructions

Break (15 minutes)

3D Printing (45 minutes)

Presentation and discussion. Use downloaded 3D printing for beginners (pptx). If 3D printer is available, print something while presentation is running. If any of the facilitators can do 3D modeling, design logo badges from the Design Thinking process and print them in the Group color.

Unit 3: Build the Innovative Playground (210 minutes)

Main learning goal of this unit is to prototype innovative product in the group.

Unit 2 Reflection (15 minutes)

Show some pictures from UNIT 2 and ask for suggestion/feedback. Make sure each team has a suggestion on how to do it better before giving them 3D printed badges for each team member which were prepared and printed between the units.

Prototyping (45 minutes)

Build, build, build

Break (15 minutes)

Prototyping (45 minutes)

Build, build, build

Presentation Preparation (15 minutes)

Use this time to explain basic presentation rules - each participant should take a part of presentation, total 5 minutes max, introduce team members, explain what electronics components are used and how, share problems and a-ha moments.

Break (15 minutes)

Presentations (45 minutes)

Leave room and encourage Q&A. At the end put all equipment together to create a park and make a group photo.

Wrap-up (15 minutes)

Lessons learned, pictures, cleaning up.