



Workshop Description: Designing and Prototyping with Data



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



CC BY 4.0
(<https://creativecommons.org/licenses/by/4.0>)
DOIT <http://DOIT-Europe.net> | H2020-770063



Students learned how data might be used in designing new products and services. They first learned about the different types of data that can be collected and then, with the help of experts, they ideated solutions to sustainability challenges, which they developed further through rapid prototyping. The focus was on creating physical devices, such as wearables, rather than screen-based products. Students were encouraged to present their prototypes by acting out their use.

Topic: Environment and nature (UN SDG 11 & 13)

Setting: Secondary school

Group size: 20, teams of 2 to 3

Age group: 13 to 16

Timeframe: one half-day workshop

Special technologies and materials

- Data Bingo: A set of 'data' markers and individual bingo cards
- DataScape game: board game to learn how different types of data solve sustainability challenges
- Printed local maps and post-it notes
- Activity sheets
- Physical prototyping kit

Learning goals:

The participants learn that many different types of data are available for problem solving. They come to understand the different roles data can play in design, from providing evidence of problems to driving new 'smart' solutions. Participants should be comfortable in exploring and communicating new ideas using rapid physical prototyping techniques, which focus on 'making do' from available resources and imagination.

Source: This action was carried out by LUT (Finland)

Preparation

To prepare the action, you should assemble a **physical prototyping kit**, which should consist of general crafting materials, such as hot glue guns, craft glue, tape, scissors, straws, lollipop sticks, paper, cardboard, pens and makers and a range of day to day items, including clothing, accessories and other props participants might modify for their ideas (umbrellas, water bottles, dog toys, walking sticks).

You should identify a space where participants have ample **space to move around** and to get crafty. In the first part of the activity, it is important that participants get used to different types of data and how they are used in problem solving. One option is to download and use the **Data Bingo** and **DataScape** materials.

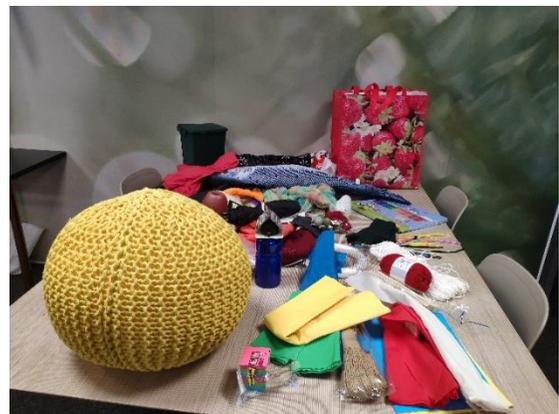


Photo: Prototyping kit



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



CC BY 4.0
(<https://creativecommons.org/licenses/by/4.0>)
DOIT <http://DOIT-Europe.net> | H2020-770063



Step 1: All About Data (40 minutes)

The aim of this activity is to familiarize participants with many different data types, whether it is survey data, social media, images, sensor data, satellite data or other.

In **Data Bingo**, participants (in groups of 2 or 3) were given tokens printed with data icons and a bingo card with 9 types of data printed on it. A caller picked their own token from the bag and called out the data type. If participants had that data, they would place their token on the square. Each data type was briefly discussed, in terms of how the data is collected and how it is typically used. The first group to place all tokens won a prize.

In the **DataScape** game, the participants used the same markers from the previous challenge, and additionally were handed a playing board and set of cards. Still in groups, participants play the game, which required them to read a problem from a playing card, identify up to three

different types of data they might use to help solve the problem and then show on the map the locations they would collect it from. Participants would then discuss their choices. The goal of DataScape is to make clearer links between data types and the physical places where it is taken from and to show up also what can be the limitations of data collections.



Photo: Data Bingo and DataScape

Step 2: Ideation and collaborative mapping (30 minutes)

The aim of this step is to move participants from thinking in abstract terms about data and the environment and to start to map it to the places that they know. Participants are provided with **maps of the local area** and asked how they would solve some of the sustainability problems they had already been thinking about, using data and

technology, or what new sustainability challenges they could now think of.

They can use **sticky notes** or the data markers to show what data they collect and where from. Students at the end of this stage are asked to select one sustainability challenge that they would design a solution for.



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



CC BY 4.0
(<https://creativecommons.org/licenses/by/4.0>)
DOIT <http://DOIT-Europe.net> | H2020-770063



Step 3: Prototyping (60 minutes)

In this step, students think through **possible solutions** to their sustainability challenge and use the prototyping materials as a way to help to test them. First, students fill in an activity sheet that helps them to think about who their users are, what problems they have and then what types of data they might be using as part of their solution. Participants are given some practical idea by the experts

on how to do physical prototyping when thinking about using sensors and other electronics that have to be designed into products in ways that are comfortable (if being worn or used by people or animals) and also functional. Participants are given the option to also produce a mobile phone app to complement their physical artefact.

Step 4: Pitching using Bodystorming (30 minutes)

Each group presents their ideas to the rest of the participants. Presentations are done by **bodystorming** and acting out scenarios of use. There are opportunities to ask further questions about each of the ideas.



Photo: Bodystorming and ready prototypes

*Bodystorming is a way of subjecting a researcher's own body to physically experience a situation in order to ideate.



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



CC BY 4.0
(<https://creativecommons.org/licenses/by/4.0>)
DOIT <http://DOIT-Europe.net> | H2020-770063