



Co-funded by the
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Project 2020-1-TR01- KA201-094533



The Key To Global Life,
Digital Change Of Nature



Total Duration: 3-4 hours



Student's Age: 12-18 Years



Application Area:

- Environment,
- Coding,
- Apps,
- Computer science,
- Recycling.



Keywords: Recycling, DIY, environment, water, MIT AppInventor.



W4 - Sustainability 2Go
(Mobile App for the
environment)



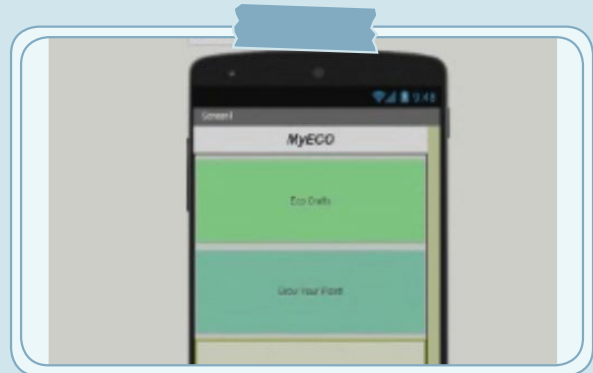
Module

- Environmental pollution
- Global Warming
- Water and healthy food

W4 - English Version

Materials:

- **Computer/Laptop with access to the Internet**
- **Gmail account**
- **Android Phone or tablet to test**
- **MIT AppInventor: appinventor.mit.edu**



Notes:

- Take safety precautions while using electrical devices
- During the activity there can be 2 students per PC
- Students should act in a DIY (Do It Yourself) approach



@digitalchangeon

Introduction

Students build an app that shows information about the environment that is important to them. For example, recycling centres close to their location, DIY crafts to promote recycling, healthy foods to eat to have less burden on the environment (Picture 1).

They research the topics that they are passionate about and collect links to include in the app. Then they build the user interface of the app to show the information they have collected.

For example, an app showing DIY products that can be made to promote recycling, recycling centres close to home and information about food for the environment. They code the app and then test it.

This activity aims to improve students' practices in terms of environmental pollution, recycling, environmental impact of water shortage and healthy food (Picture 2).



Picture 1. Water for foods

Currently, mobile applications are part of the daily routine of students, who often use apps, in class, in their free time and to socialize with their friends. The increased use of mobile applications explains the exponential growth of new apps in various areas and with different objectives, from teaching and culture to pure entertainment. The use of applications grew in line with the growth in the rate of use of mobile phones in most age groups, and in particular, in the student population.

An easy-to-use mobile app creator environment is MIT AppInventor. With this application, students are able to work with a block-based programming tool to build their own app to show information about the environment that surrounds them or to develop their topics of interest. For example, they can identify recycling centres near their location, or develop other topics such as: healthy food with less impact on the environment, DIY crafts to promote recycling, how to grow vegetables, among others.



Picture 2. Water for foods

Students are asked to identify questions of their interest (environmental pollution, recycling, water shortage, healthy food and its effect on environment, DIY to reuse). They should choose 3-4 different topics of interest. Following this, students are asked to research about their issues and collect related links to include in the app. They build the user interface of the app to show the collected information, code the app and then test it.

Considerations

- Take safety precautions while using electrical devices
- During the activity there can be 2 students per PC
- Students should act in a DIY approach

Aim of the Activity

- Create mobile apps to protect nature.
- Raise awareness on global warming, environmental pollution and water scarcity
- Students easily learn to code and to use algorithms
- Students discover critical learning approaches
- Students analyse some solutions such as recycling, healthy food, and water conservation mechanisms.

Activity Process

Before Activity

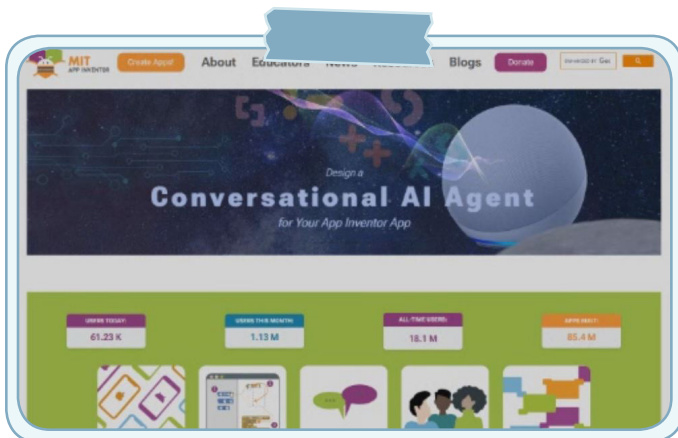
In this activity students are expected to create digital solutions to environmental problems by working in groups, using a DIY approach, and sharing their ideas. They are expected to improve their coding skills and their knowledge about the environment and its protection.

The mobile application to be used is MIT App Inventor (freeware, Picture 3).

MIT App Inventor is an intuitive, visual programming environment that allows everyone to build apps for phones using a block-based tool.

The themes to be discussed and worked on, are intended to improve the students' environmental awareness, talking about the protection of the environment in which we live, the need to use the environment with awareness and respect for other living beings, without forgetting that the environment is also essential for living beings.

In this activity we intend to start developing, from early ages, environmental awareness in young people and children, taking advantage of current technologies, much to their interest.

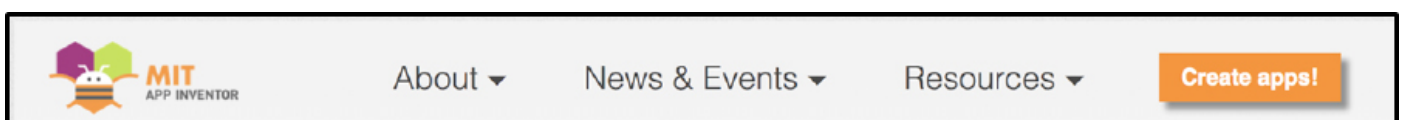


Picture 3. MIT App Inventor

Let's Start

1 Design Steps

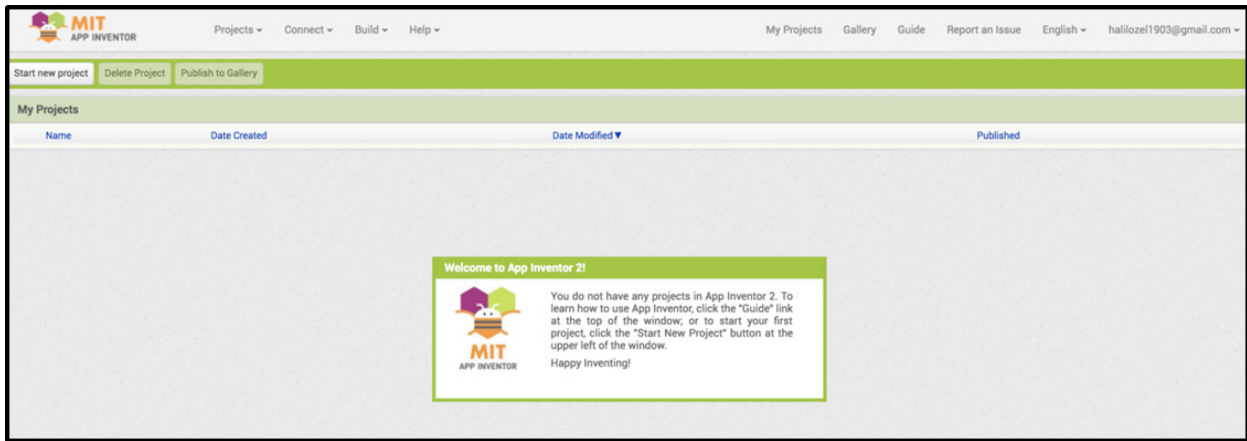
1. Open the MIT app Inventor appinventor.mit.edu and click on the *Create apps!* button. A new workspace is created by clicking on the button (Picture 4).



Picture 4. MIT App Inventor

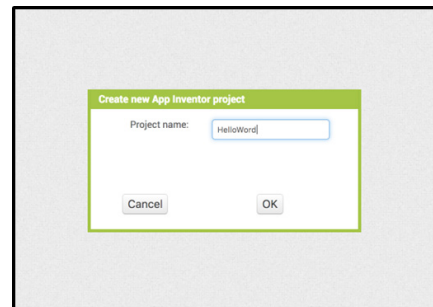
2. Login with a gmail account. Accept the Terms of Service! (scroll till the end, accept. You may skip some tutorials) ,

3. Click *Start New Project* from the screen (Picture 5).

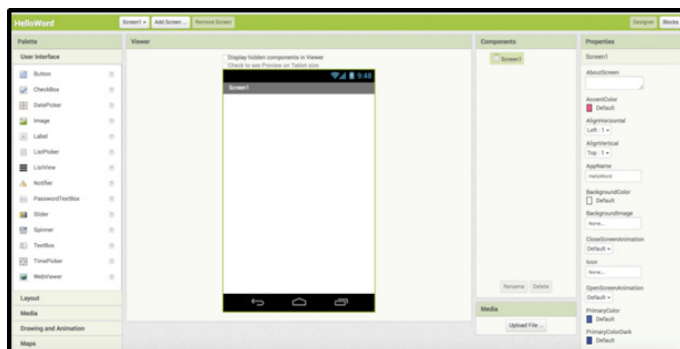


Picture 5. Start a new project

4. Give a name to your Project (Picture 6)



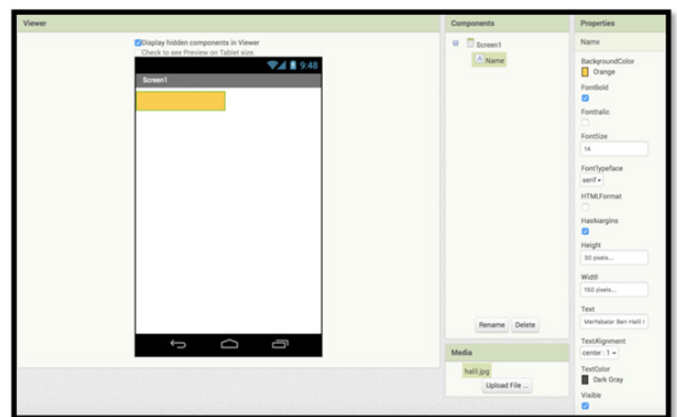
Picture 6. Give a name to your project



Picture 7. Working area

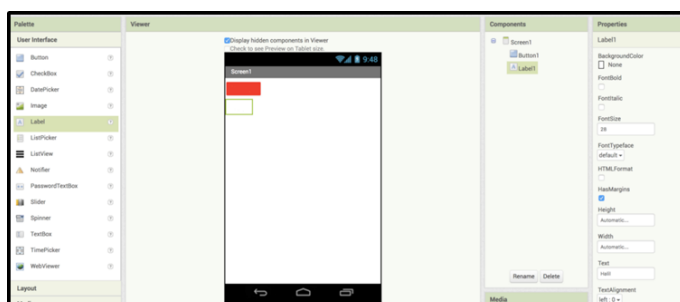
5. Go to the working area (Picture 7).

6. Components are located on the left-hand side of the *Designer Window* under the title *Palette*. Select components, like Buttons, to design your app. *Click Buttons* and drag to your screen. Buttons representing 4 Themes are created and named (Picture 8). You can format your Buttons and set their appearance via Background Color, FontSize, Height, Width, Text, ...



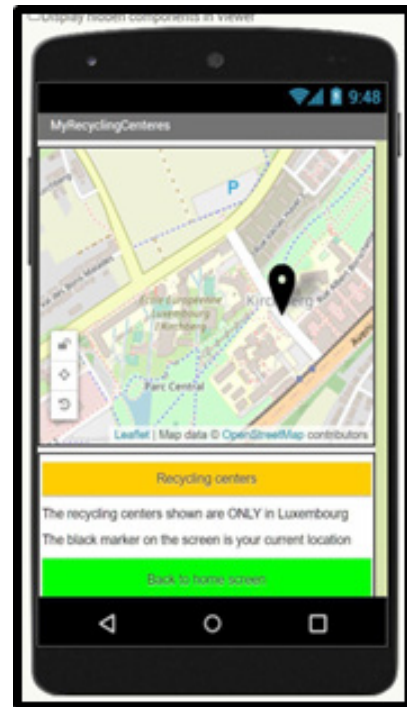
Picture 8. Add buttons

7. Subheadings of buttons (Names of Locations) can be added by using the Label option, which is a text block (Picture 9).



Picture 9. Subheadings of buttons

8. With the buttons and labels, make the app that shows the information you collected. For example the names of recycling centers and their address.
9. You can add a map to your application. For this, map information for locations must be encoded (Picture 10). Follow the instructions given in appinventor.mit.edu/explore/displaying-maps to learn how to add a map.



Picture 10. Map information en subheadings of buttons

10. Test your application on a smartphone, by installing the MIT AI2 Companion app on a smartphone, and opening your application on the phone. You can find this app in the google play store: play.google.com/store/apps/details?id=edu.mit.appinventor.aicompanion3
11. As you test the developed application you will probably find some errors are things that can be improved (Picture 11). Use an interactive design: improve your app based on the testing. Have some friends or family test the app also, and include their remarks in your app.



Picture 11. Try your App

Assesment

Evaluation

- Students develop and test their app. The developed application is displayed in the classroom. Evaluation is done by peers and the application is revised based on the feedback given. The teacher evaluates the students using Application Development Rubrics as follows:

Goals	Must be Improved (1)	Medium (2)	Good (3)	Very Good (4)
Expressing yourself	(.....)	(.....)	(.....)	(.....)
Participate in discussions	(.....)	(.....)	(.....)	(.....)
Create algorithm steps	(.....)	(.....)	(.....)	(.....)
The originality of developed application	(.....)	(.....)	(.....)	(.....)
Creativity of the app designed	(.....)	(.....)	(.....)	(.....)
Usage and tests of the developed application	(.....)	(.....)	(.....)	(.....)
Total				

Links

- Freepik Company, S. L. Images. Retrieved 12.09.2022 from www.freepik.com
- MIT, A. I. (2022). MIT. Retrieved 11.09.2022 from appinventor.mit.edu
- MIT, A. I., Emulator. (2022). Application. appinventor.mit.edu/explore/ai2/setup-emulator.html
- Wolber, D., Abelson, H., Spertus, E., & Looney, L. (2011). App inventor. " O'Reilly Media, Inc."
- Map It: Displaying Locations on a Google Map, appinventor.mit.edu/explore/displaying-maps