Hands on Learning Online:
Gaining Results through
Advanced Methods

HOLOGRAM

Funded by
the European Union

ACTIVITY REPORT FROM NOVEMBER 2022 TO FEBRUARY 2023

Liceul Tehnologic “Costache Conachi”, Pechea/România

Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

Despite the increase in students' interest in STEAM subject areas over the last decade, the correspondence between students' needs and the approaches of teaching various STEAM subjects continues to be problematic, leading to a shortage of skilled graduates and workers in this area. Moreover, the Covid pandemic has put extra pressure on STEAM teaching around the globe. Teachers and students worldwide struggled to find a way to work on their various learning projects, trying hard to overcome the barriers caused by difficulties with online teamwork, lack of tools, and last but not least, teachers' lack of an approved and practically checked inventory of methodological approaches meant to support the productive and meaningful implementation of the distance learning process for the students in STEAM subject areas.

Therefore, within PR1 of the HOLOGRAM project, we have investigated teachers' and students' current needs in our local community related to teaching STEAM subjects online, in order to understand the various gaps at local levels and to design more effective models to support teaching and learning in STEAM subjects online. This investigation led to the identification of various teacher needs in a number of domains related to a comparison of how STEAM subjects have been taught before and during the pandemic as well as the identification of practices that teachers feel are important to enhance students learning experience during online STEAM teaching and learning. Applying Robotics in teaching subjects in this area seems to be a powerful solution able to open new horizons in STEAM education making it possible for both students and teachers to remotely collaborate and engage in effective learning.

Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

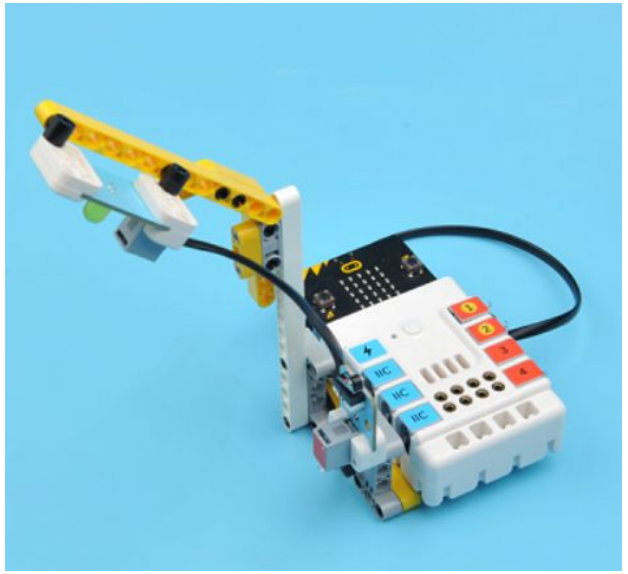
HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

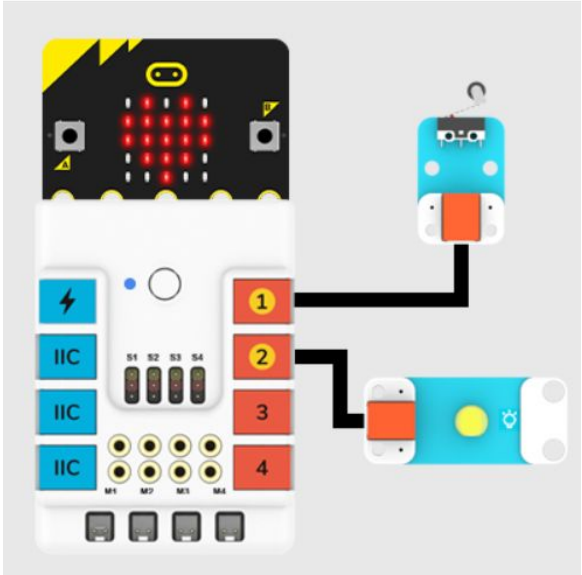
I. Mini Table Lamps

1.Introduction

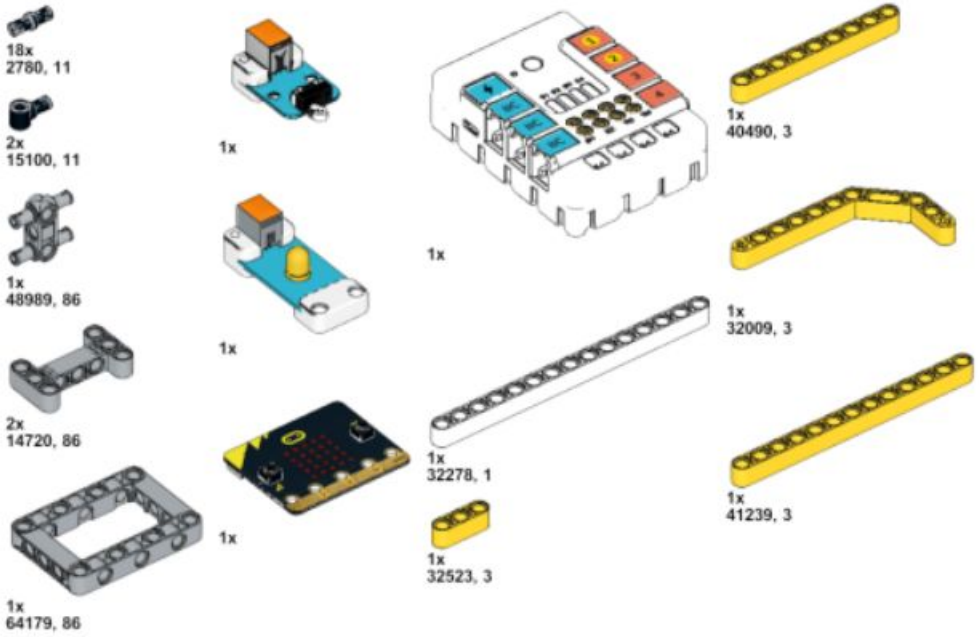
Use micro:bit to make a mini desk lamp, and control the LED light to turn on or off through a crash sensor.



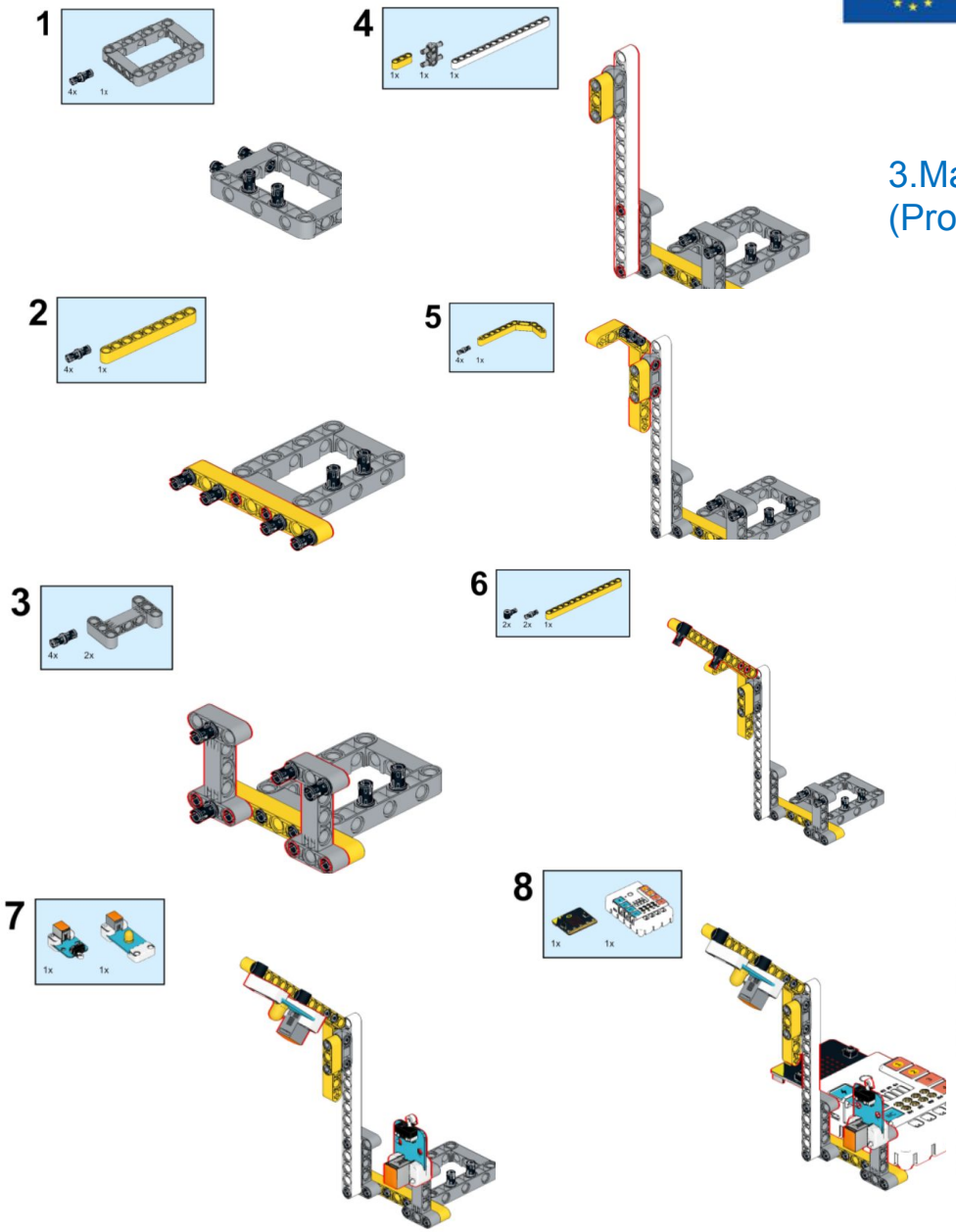
Materials Required
Nezha expansion board × 1 micro:bit × 1 LED-yellow × 1 Crash sensor × 1 RJ11 wires × 2
Connection Diagram
Connect the crash sensor to J1 and the yellow LED to J2 on the Nezha expansion board as the picture shows.



2.Assembly Steps



Steps



Funded by the European Union

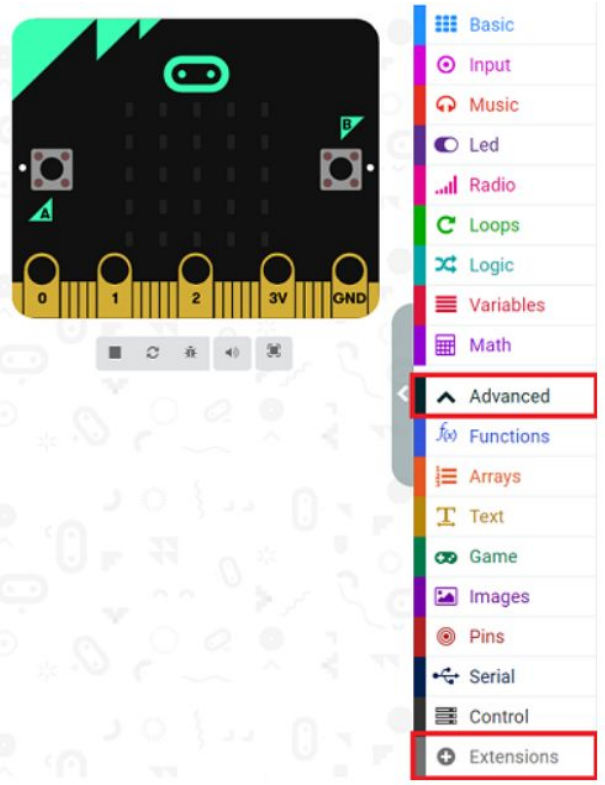
Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

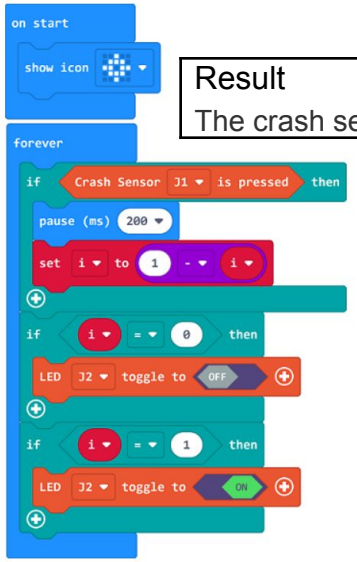
3.MakeCode Programming (Programare MakeCode)

Click “Advanced” in the MakeCode to see more choices.



For programming, we need to add a package: click “Extensions” at the bottom of the MakeCode drawer and search with “PlanetX” in the dialogue box to download it.

Notice: If you met a tip indicating that some codebases would be deleted due to incompatibility, you may continue as the tips say or create a new project in the menu.



Result

The crash sensor controls the on/off of the LED.

Work Sheet for the Students

Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

Mini Table Lamps

Name: .....

1.

What is the port for connecting the sensor?	Care este portul pentru conectarea senzorului?

a)J1 b) J2 c)J3

2.

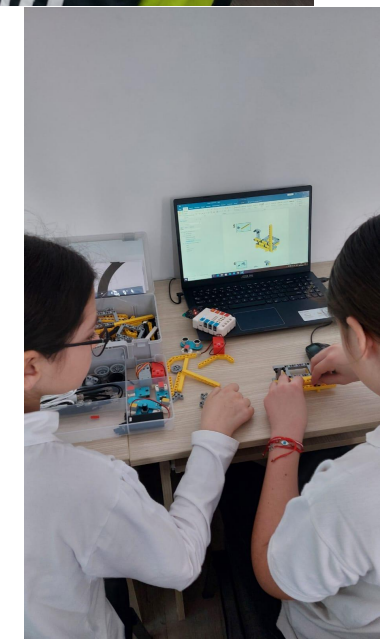
What is the port for connecting the led?	Care este portul pentru conectarea led-ului?

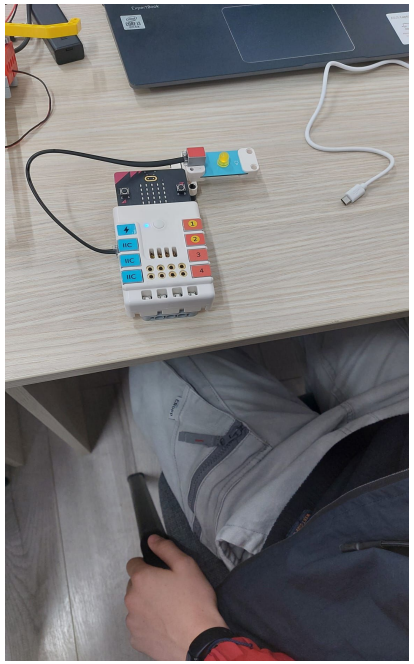
a)J1 b) J2 c)J3

3.

To see more options in MakeCode, click on?	Pentru a vedea mai multe opțiuni în MakeCode facem click pe opțiunea?

a) Advanced b) PlanetXBase c)Variables





II. Automatic Gate

Funded by the European Union

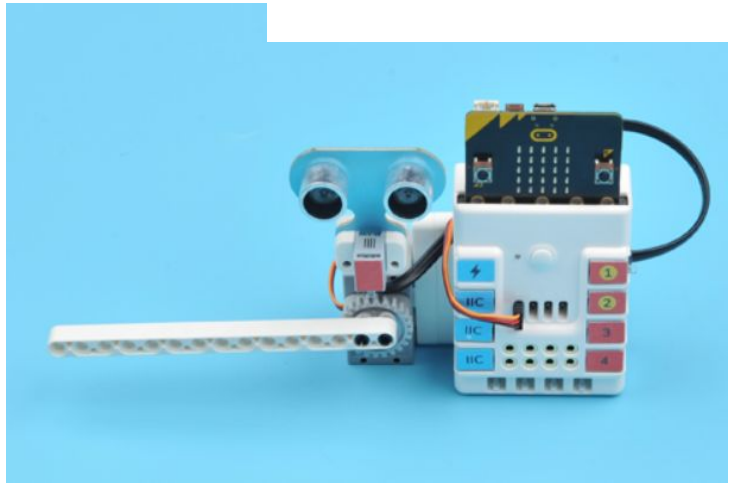
Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

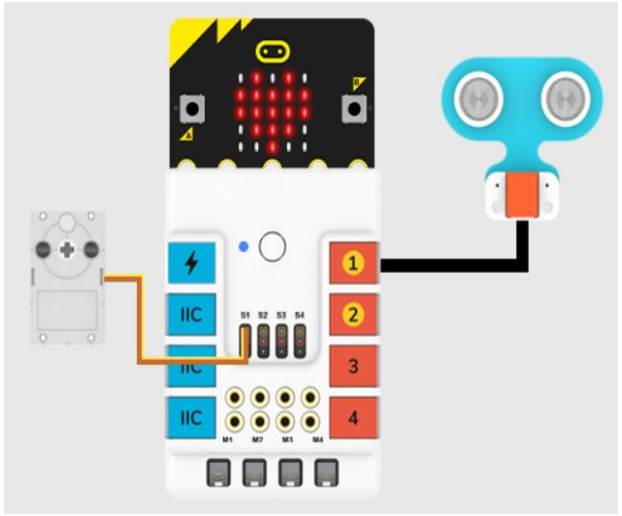
LICEUL TEHNOLOGIC COSTACHE CONACHI

1. Introduction

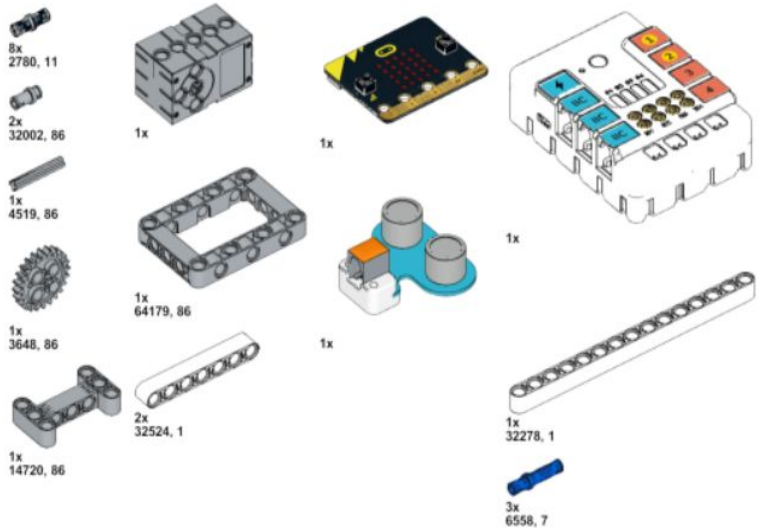
A simple automatic sensor door. When the ultrasonic sensor detects that a person is approaching, the micro:bit controls the servo to automatically open the door. When no person is approaching, the micro:bit controls the servo to automatically close the door.



Materials Required
Nezha expansion board × 1 micro:bit × 1 360° servo × 1 Sonar:bit × 1 RJ11 wire × 1
Connection Diagram Connect the 360° servo to S1 and the ultrasonic sound sensor to J1 on the Nezha expansion board as the picture shows.



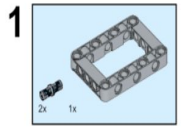
2. Assembly Steps

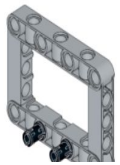


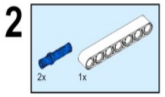
Funded by the European Union

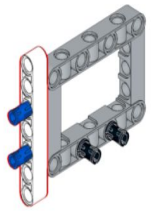
Hands on Learning Online: Gaining Results through Advanced Methods
HOLOGRAM

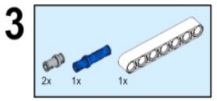
LICEUL TEHNOLOGIC COSTACHE CONACHI

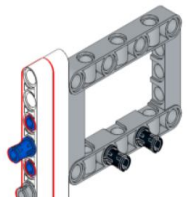


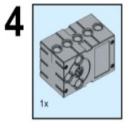


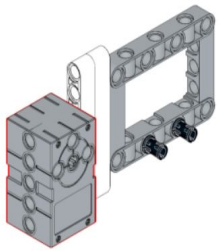


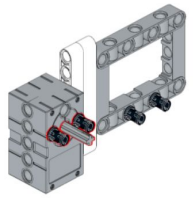


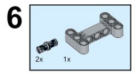


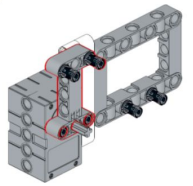


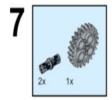


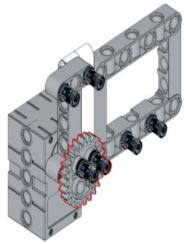


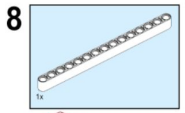


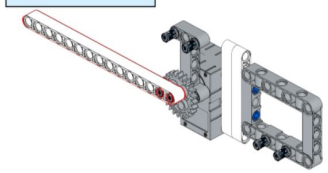


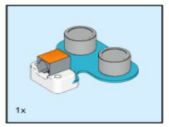


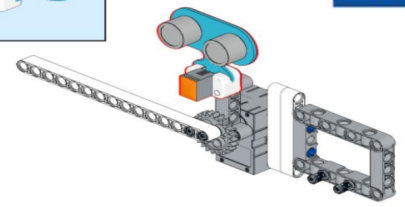


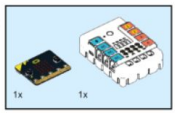


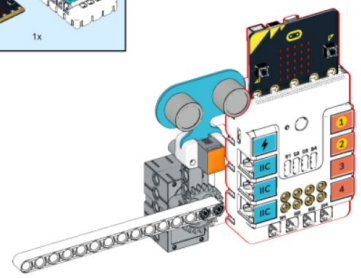












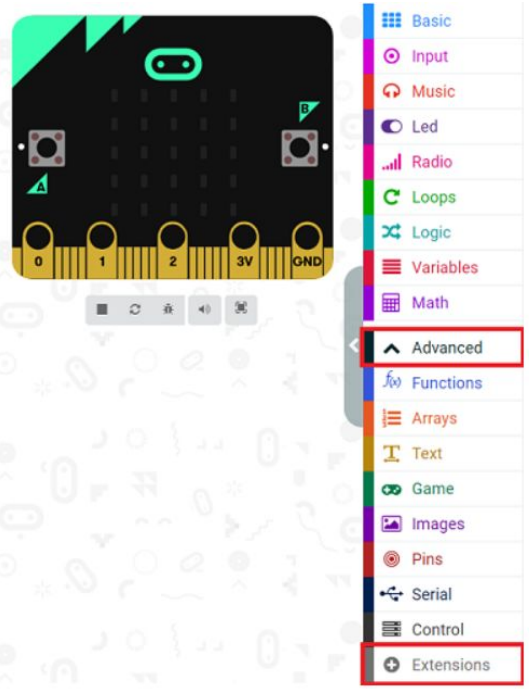
3.MakeCode Programming

Step 1
Click “Advanced” in the MakeCode to see more choices.

For programming, we need to add a package: click “Extensions” at the bottom of the MakeCode drawer and search with “PlanetX” in the dialogue box to download it.

Notice: If you met a tip indicating that some codebases would be deleted due to incompatibility, you may continue as the tips say or create a new project in the menu.

Step 2
Code as below:



Work Sheet for the Students

Funded by the European Union

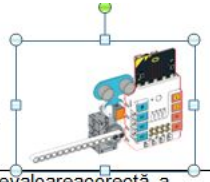
Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

Automatic Gate

Name: .....



1.

Specify the correct angle value for the program section?	Precizati care estevaloareacorectă a unghiuluipentrusectiunea de program?

a)180 b) 240 c)360

2.

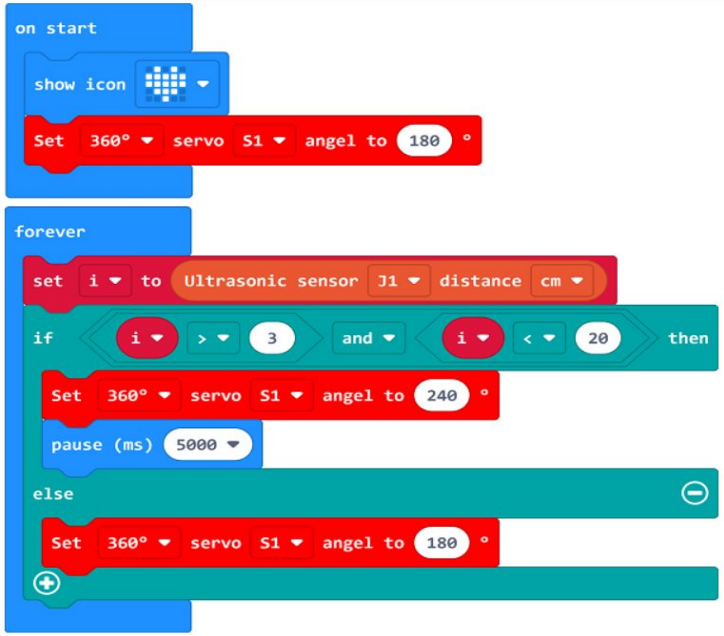
At what distance (expressed in cm) can the ultrasonic sensor detect objects?	La cedistanță (exprimatăîn cm) senzorul ultrasonic poatedetectaobiecte?

a)50 b) 20 c)100

3.

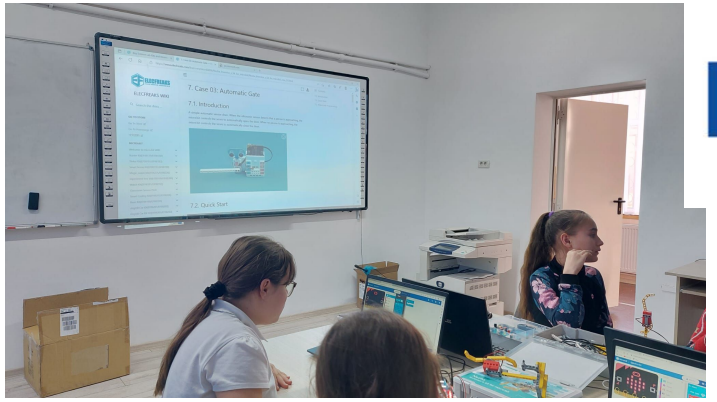
Specify the correct angle value for the program section?	Precizati care estevaloareacorectă a unghiuluipentrusectiunea de program?

a) 240b) 180 c)360



Result

While the ultrasonic sound sensor detects any object, the gate opens automatically.

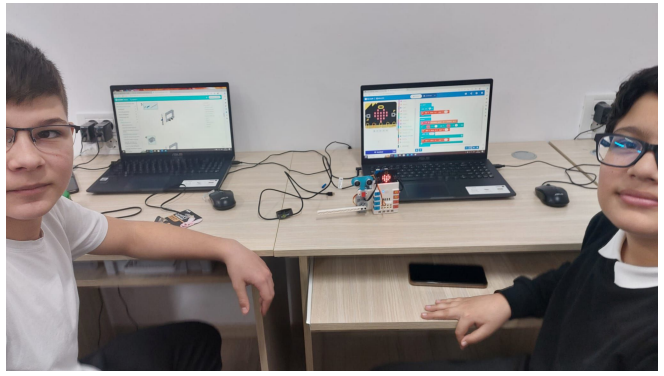


Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI



III. Automatic Dryer

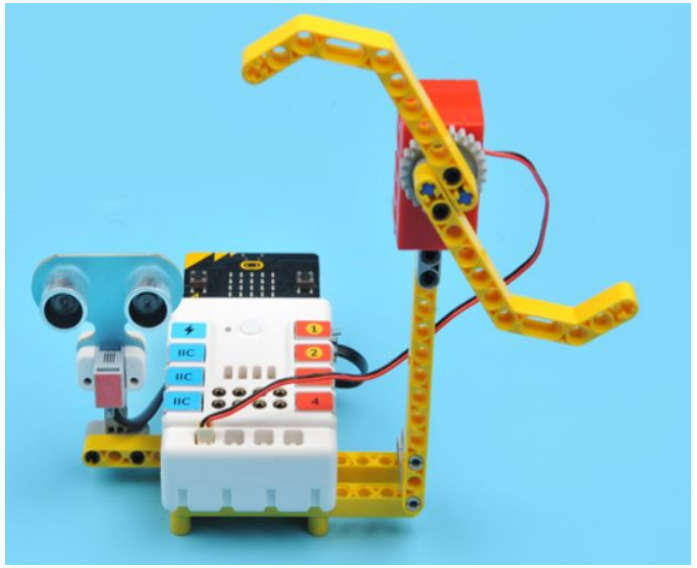
1. Introduction

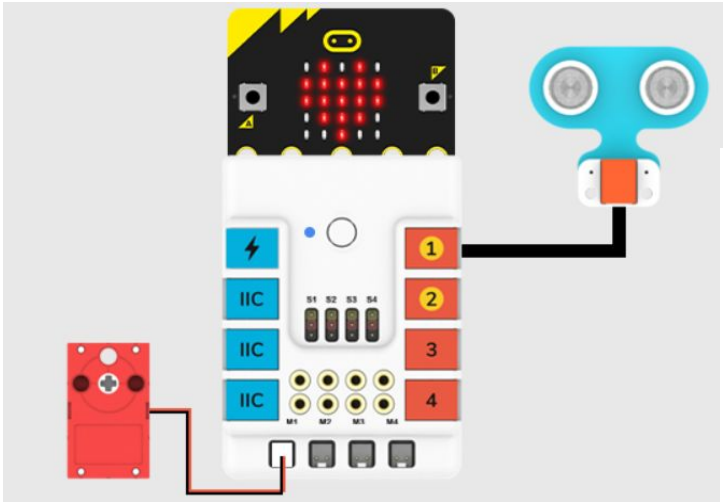
Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI





Put your hands under the air outlet of the automatic hand dryer, it will automatically send out the wind to dehumidify and dry your hands, and then automatically stop the wind and shut down. It can meet the requirements of not using towels to dry hands and preventing cross-infection of diseases. Thus, we can use micro:bit to make an automatic dryer.

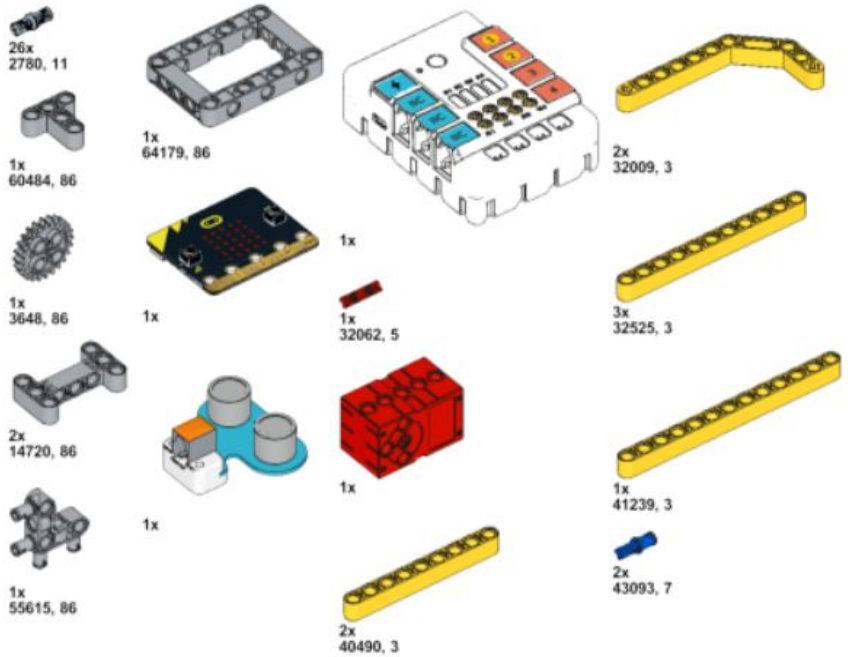
Materials Required

Nezha expansion board × 1
micro:bit × 1
Sonar:bit × 1
Motor × 1
RJ11 wires × 1

Connection Diagram

Connect the sonar:bit to J1 and the motor to M1 on the Nezha expansion board as the picture shows.

2. Assembly Steps



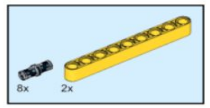
Funded by the European Union

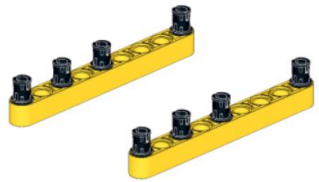
Hands on Learning Online: Gaining Results through Advanced Methods

LICEUL TEHNOLOGIC COSTACHE CONACHI

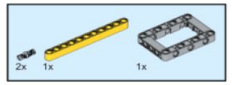
HOLOGRAM

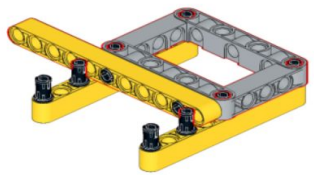
1



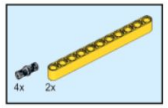


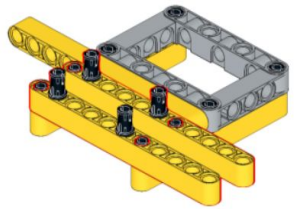
2



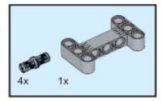


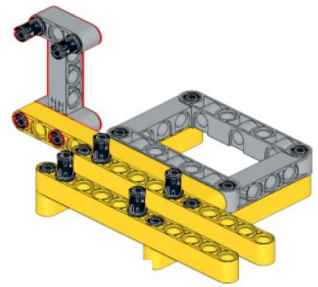
3



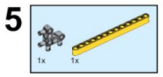


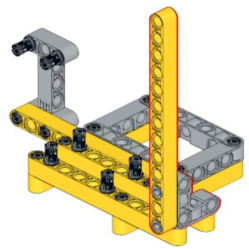
4



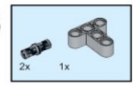


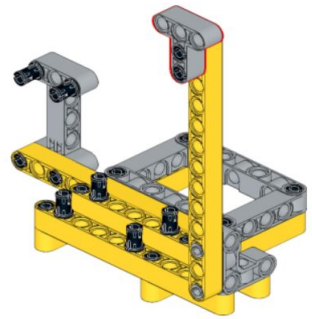
5



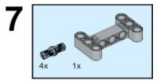


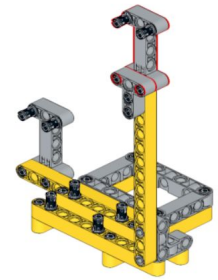
6



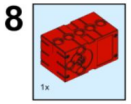


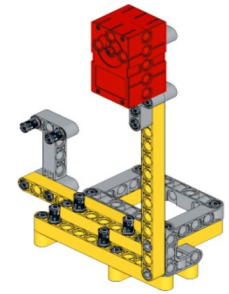
7



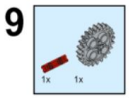


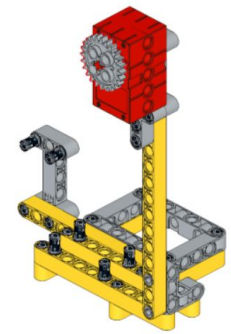
8



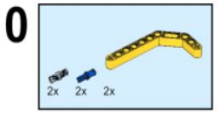


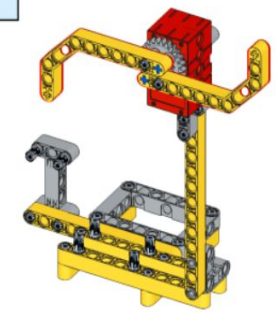
9



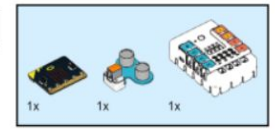


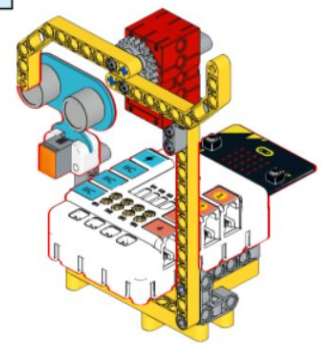
10





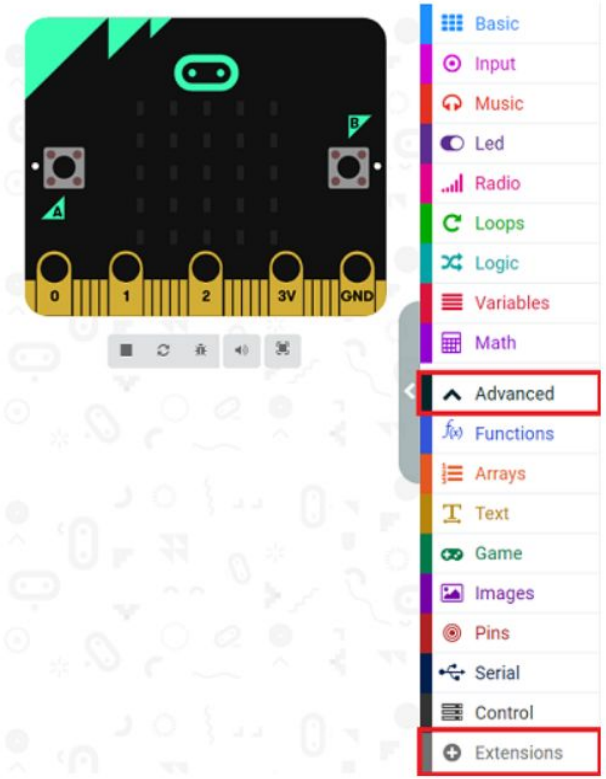
11

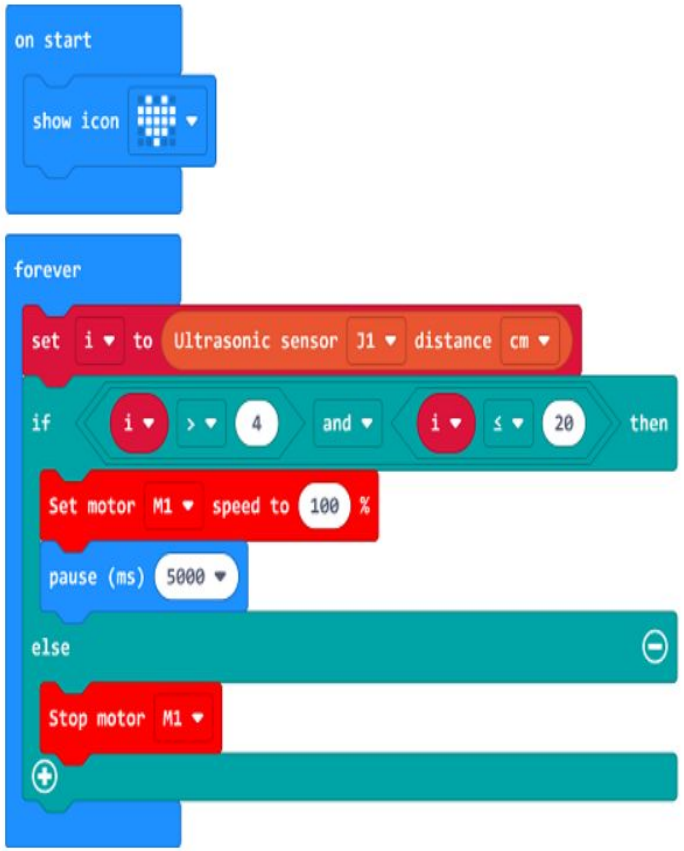




3. MakeCode Programming

Step 1
Click “Advanced” in the MakeCode to see more choices.





For programming, we need to add a package: click “Extensions” at the bottom of the MakeCode drawer and search with “PlanetX” in the dialogue box to download it.

Notice: If you met a tip indicating that some codebases would be deleted due to incompatibility, you may continue as the tips say or create a new project in the menu.

Step 2
Code as below:

Result
While there is any object detected by the Sonar:bit, the fan moves automatically.

Work Sheet for the Students

Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

Automatic Dryer

Name .....

1.

To see more options in MakeCode, click on?	Pentru a vedea mai multe optiuni în MakeCode facem click pe optiunea?

a) Advanced b) PlanetXBase c)Variables

2.

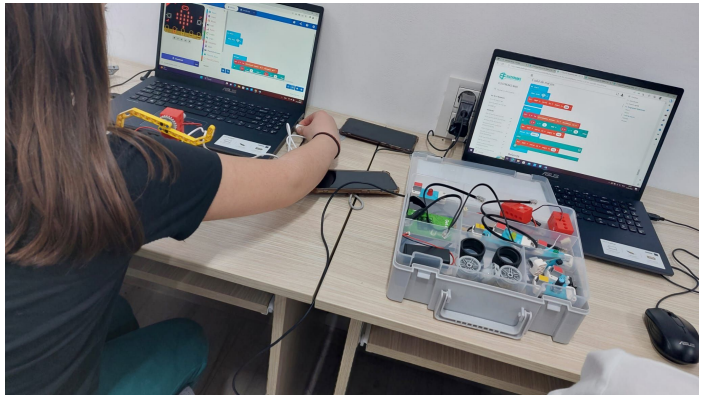
At what distance (expressed in cm) can the ultrasonic sensor detect objects?	La ce distanță (exprimată în cm) senzorul ultrasonic poate detecta obiecte?

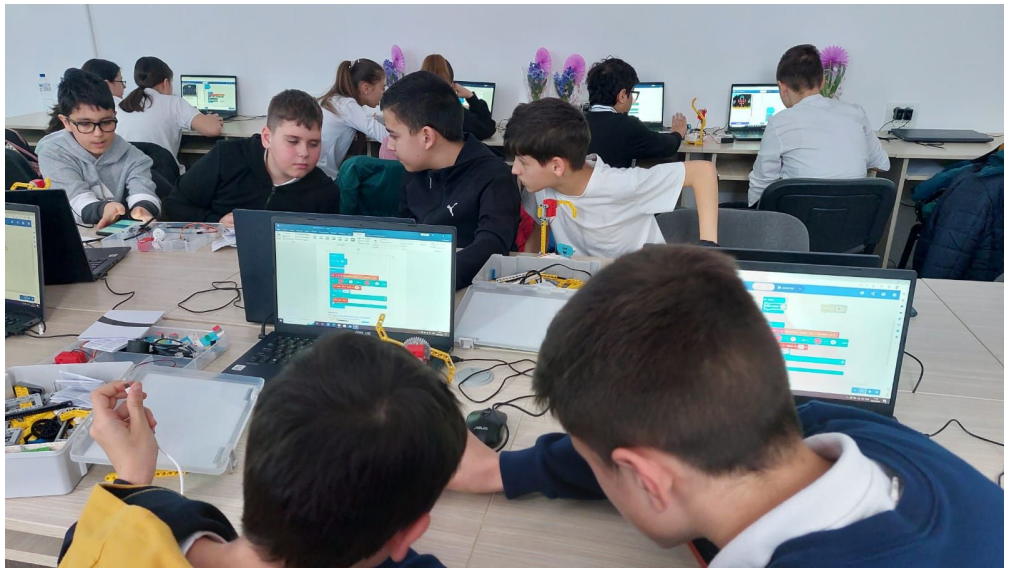
a)50 b) 20 c)100

3.

What is the value indicated for the engine speed in the section below?	Care este valoarea indicate pentru viteza motorului în sectiunea de mai jos?

a) 100 b) 50 c)75



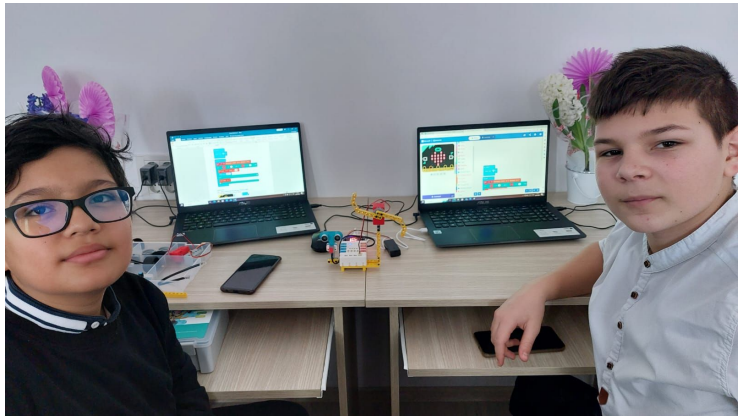


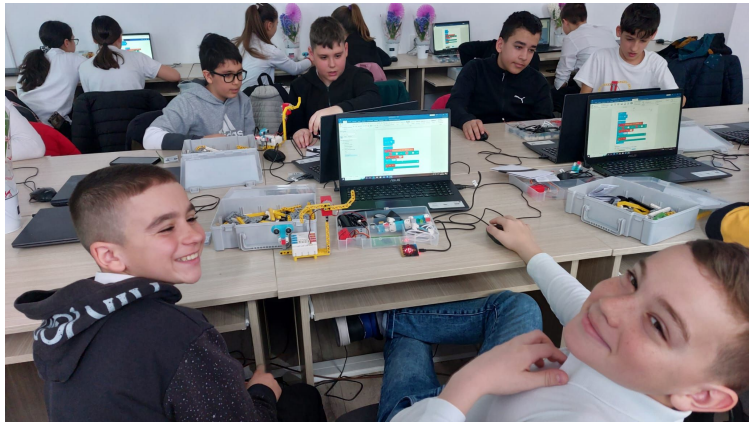
Funded by the European Union

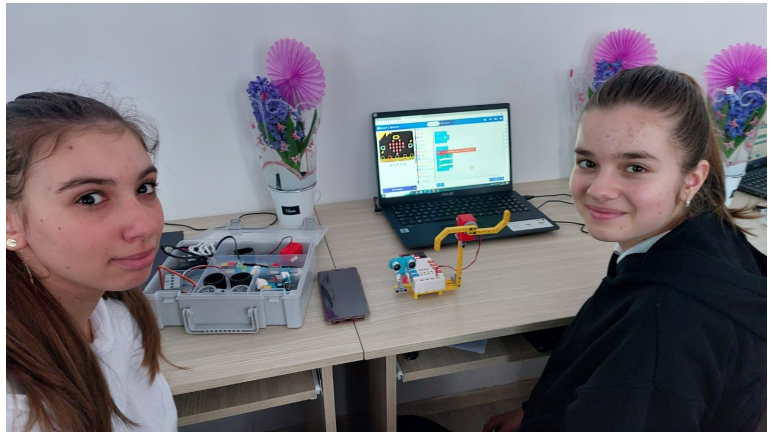
Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI







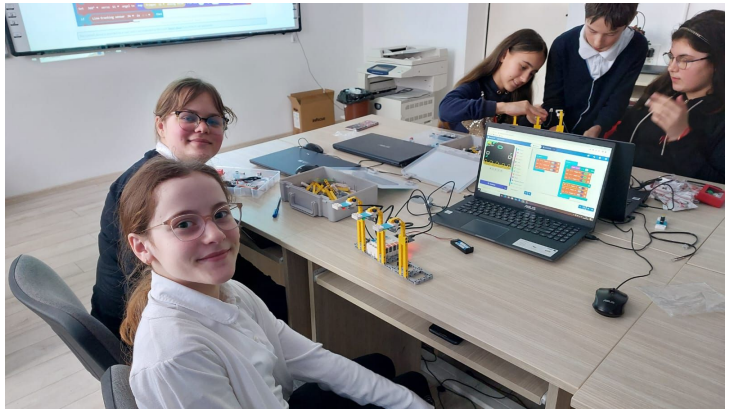
IV. Smart Lighting

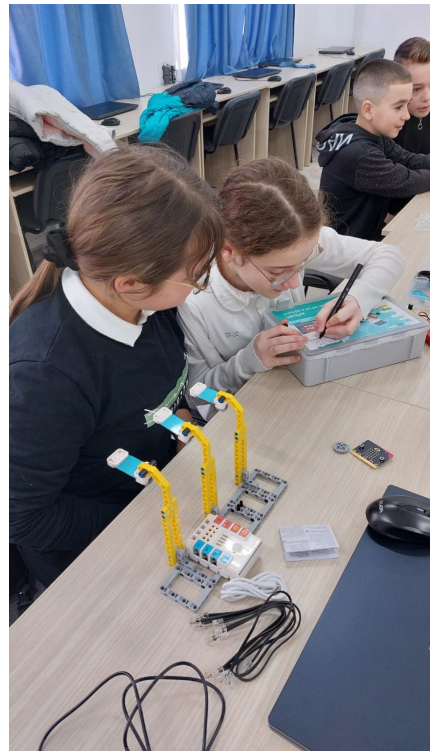
Funded by the European Union

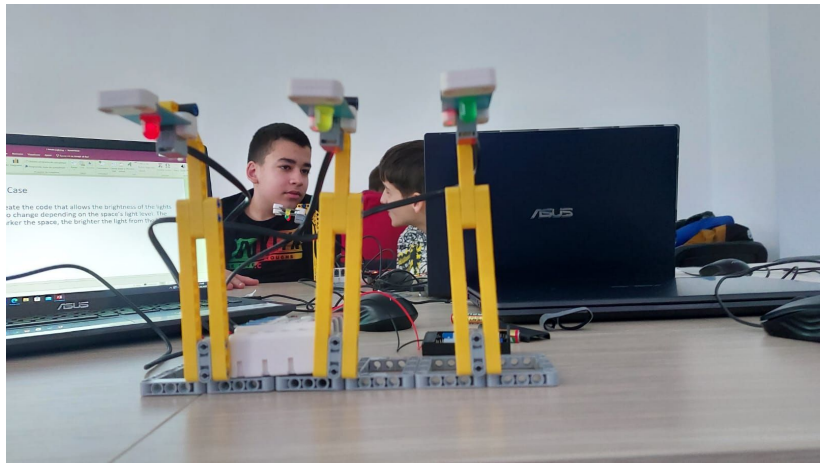
Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI







Funded by the European Union

Hands on Learning Online: Gaining Results through Advanced Methods

HOLOGRAM

LICEUL TEHNOLOGIC COSTACHE CONACHI

STUDENTS' THOUGHTS

"I found the Hologram project very interesting. In this project, we learned that teamwork is the basis of most activities and that robotics is a sister to physics and mathematics. This project developed in me a passion for robotics. The kits I used reminded me of my childhood when I was playing with Lego pieces. Hologram - a wonderful project!" 🥰

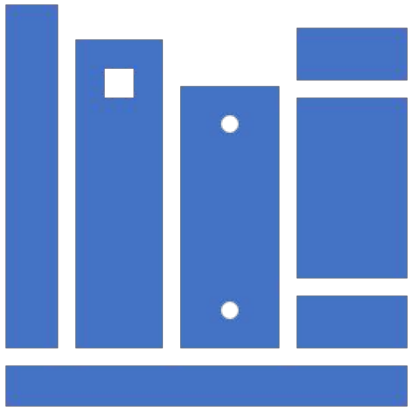
Irina

"This project is an extraordinary one! To say straight when I heard that we were going to do it I was not very happy, I was thinking that there would only be an extra hour at school and that I would get terribly bored..... buuut it was not like that at all. Everything is very beautiful! The projects are simple, the kits are easy to use and the guiding teachers are great! I love this project!"

Alexia

"This project made me realize that there is no such a thing as 'I can't ' and that 'Teamwork does the dream work'. When I was little I thought that if you want to make a little robot you need at least 6 months of planning, but I found out that, with the help of this program, I don't have to stress myself anymore if I want to make a little robot."

Andreea



HOLOGRAM

Erasmus+ funded project