Erasmus+

EARLY

EARLY Teaching Scenario

Topic: The Robot's senses - programming mBot

Learning outcome:

Familiarization with the mBot kit

Introduction to coding by blocks

Introduction to ultrasonic sensors and light sensors

Specific knowledge of mBlock programming software

Skills pupils develop during the scenario (connect to curriculum →)**(with reference to "Learning, the treasure within", UNESCO, 1996 and "Defining and Selecting Key Competences", OCDE, 1999)**:

Thinking and learning to learn

Cultural competence, interaction and expression

ICT competence

Participation and influence in building a sustainable future

Target group: Middle school

Age of students: 11 to 13 years old

Number of pupils: Maximum of 20

Duration (estimated time/number of lessons): 3 x 1h

Prerequisites (necessary materials and online resources):

One pc for each group with App mBlock installed

MAKEBLOCK mBot Kit (Explorer kit)

Work surfaces (tables arranged in islands) or free space on the floor

Adhesive tape

Introduction to the scenario:

The teaching scenario includes a series of activities that will allow students to become familiar with the mBot kit and the basics of programming. Starting from a collective reflection on what a robot is and what characteristics a machine must have to be defined as a "robot", at the end of the cycle of lessons students will come to understand the basic principles of programming. They will be able to use the mBlock software, autonomously program the movements of mBot in space and - through the use of the light sensor - its interaction with the environment.

- risks and possible applications:

The scenario can be used as a starting point for a wider activity on the topic to be developed in the classroom.

Before the program begins:

Charge PCs

Download and install the mBlock application

Divide the pupils into groups (3/4 pupils per group)

Assemble the robot (once assembled it does not have to be disassembled, it is possible to have the assembly operation carried out by the students following the instructions inside the kit package).

Set up the space

Main part of the scenario(no. of lessons :

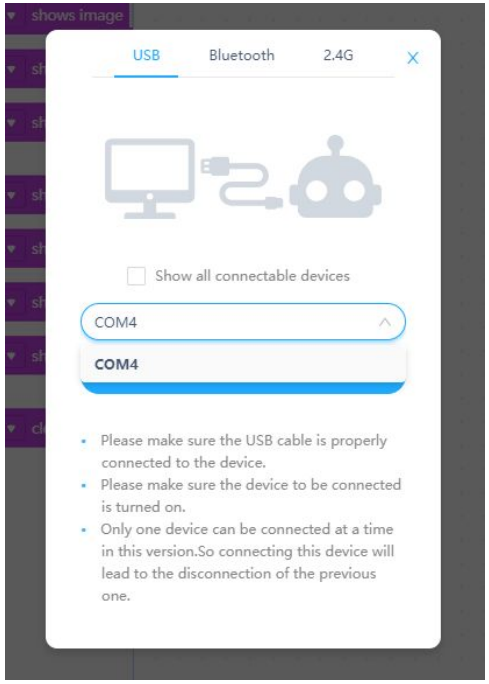
- **lesson one:**

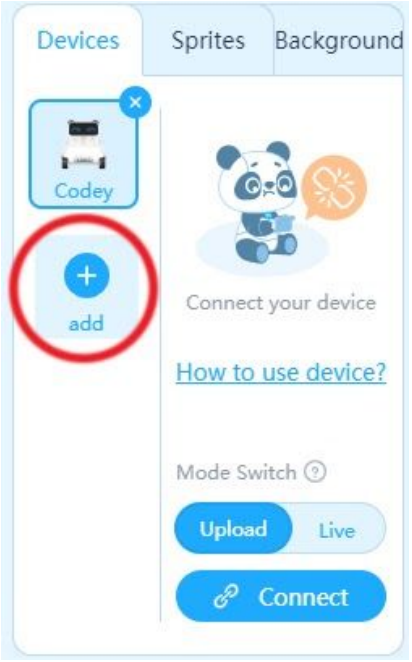
Introduction to what a robot is and what the essential characteristics are for it to be defined as different from other machines.

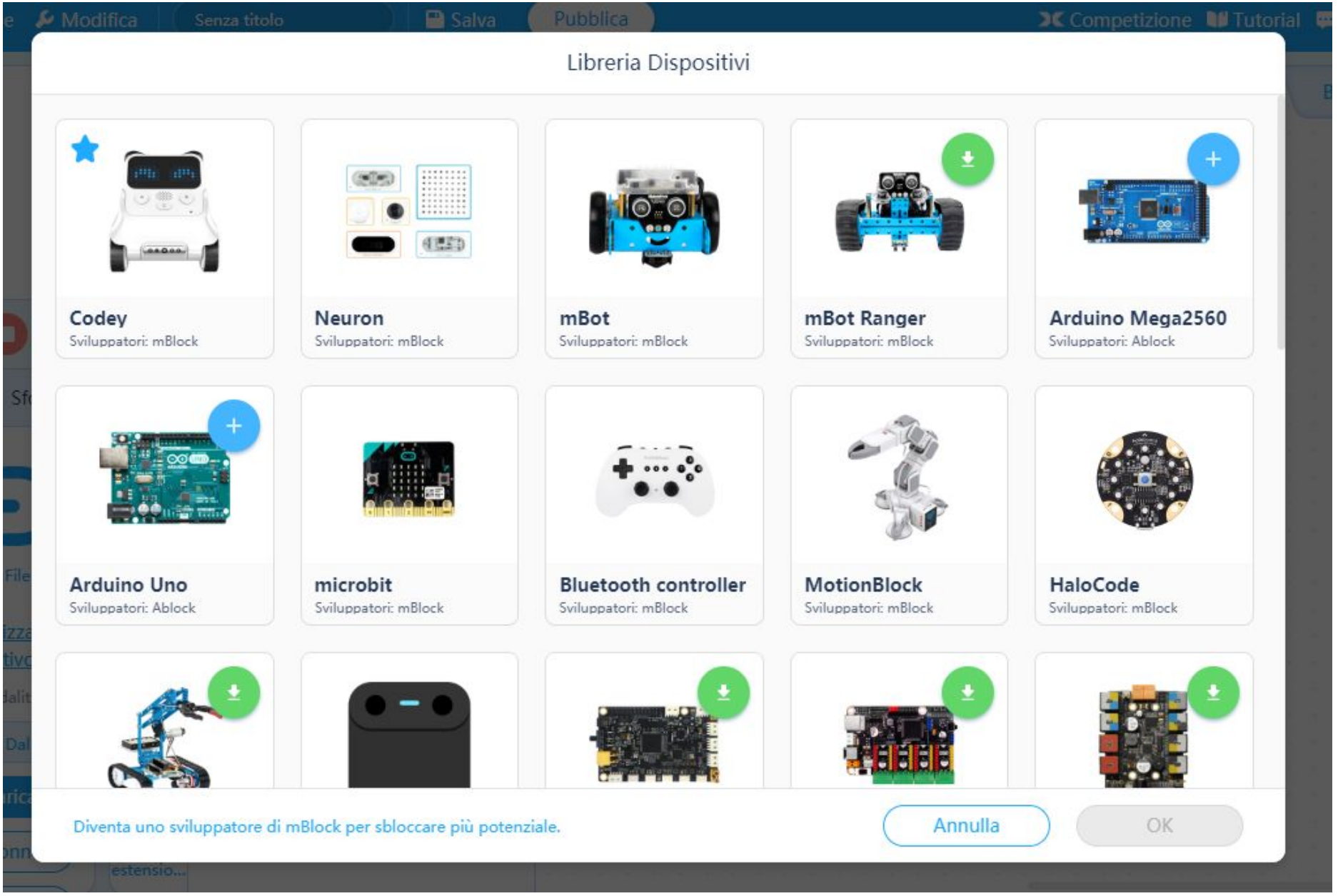
A robot is a programmable machine, equipped with sensors and motors.

Introduction to the mBot kit and observation with the students on how it is made up, how many motors and sensors are already mounted in the basic kit and what they are used for.

The mBlock software and the blocks needed for the robot to make its first movements are presented. The teacher will show the students how to connect the robot and then invite them to experiment with this basic movement. Students will learn how to connect the robot.






Modifica
Senza titolo
Salva
Pubblica
Competizione
Tutorial
Libreria Dispositivi
Codey
Sviluppatori: mBlock
Neuron
Sviluppatori: mBlock
mBot
Sviluppatori: mBlock
mBot Ranger
Sviluppatori: mBlock
Arduino Mega2560
Sviluppatori: Ablock
Arduino Uno
Sviluppatori: Ablock
microbit
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Sviluppatori: mBlock
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Diventa uno sviluppatore di mBlock per sbloccare più potenziale.
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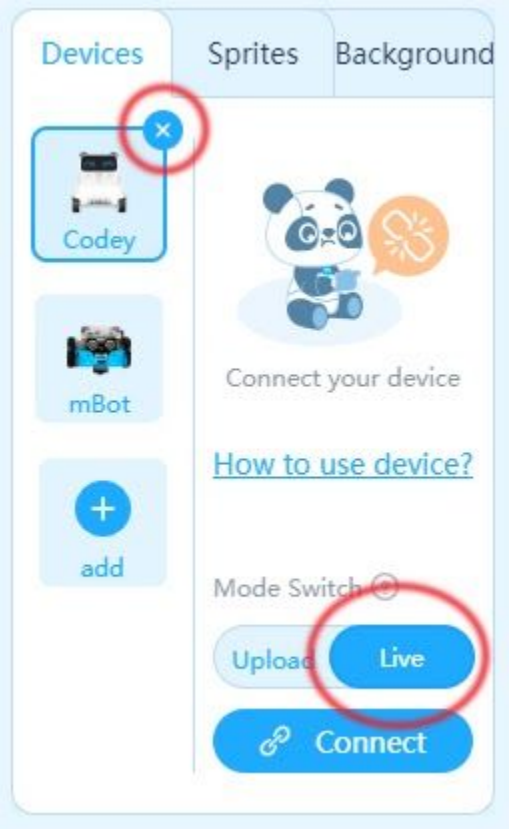
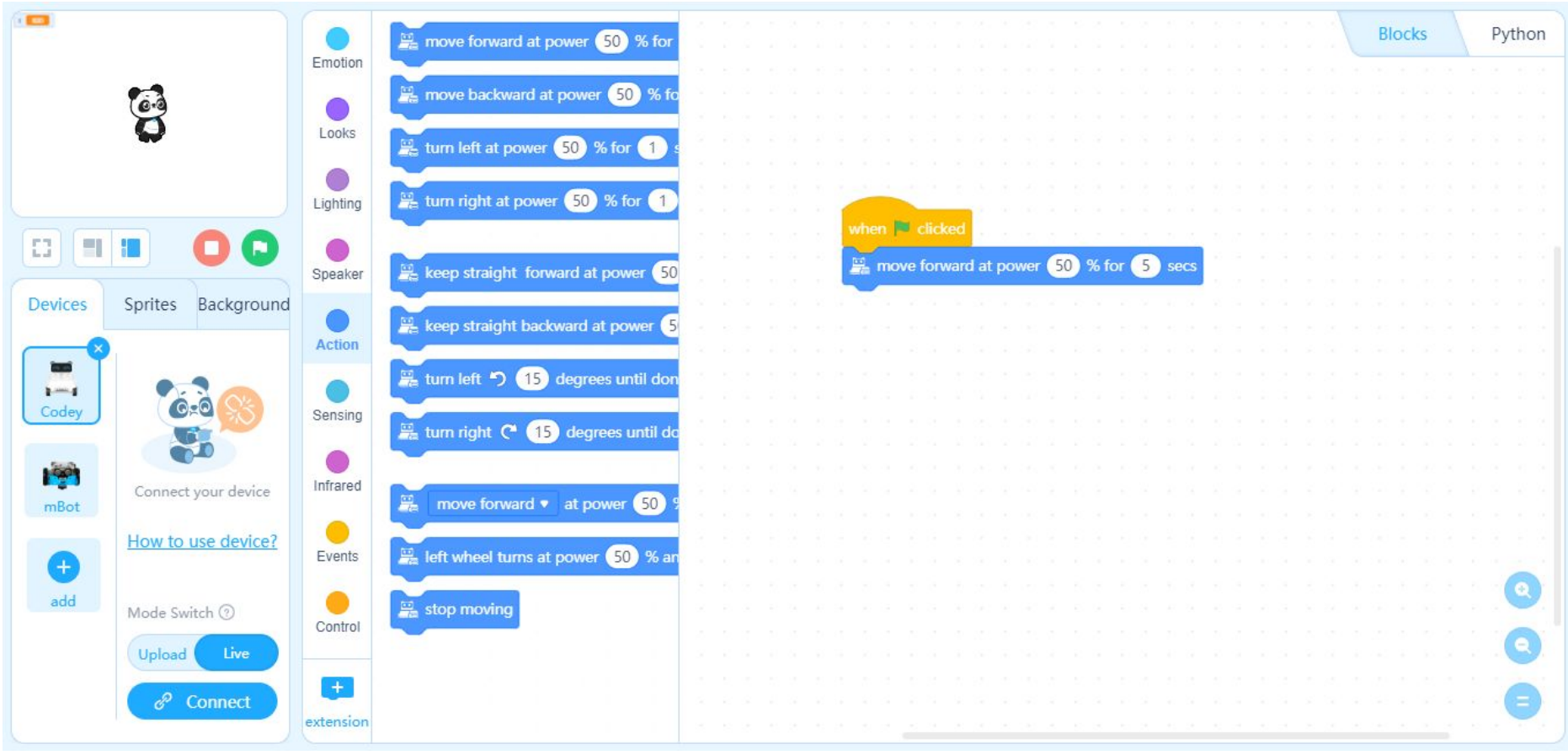
OK

Delete all the other devices and set the mode on “Live”:

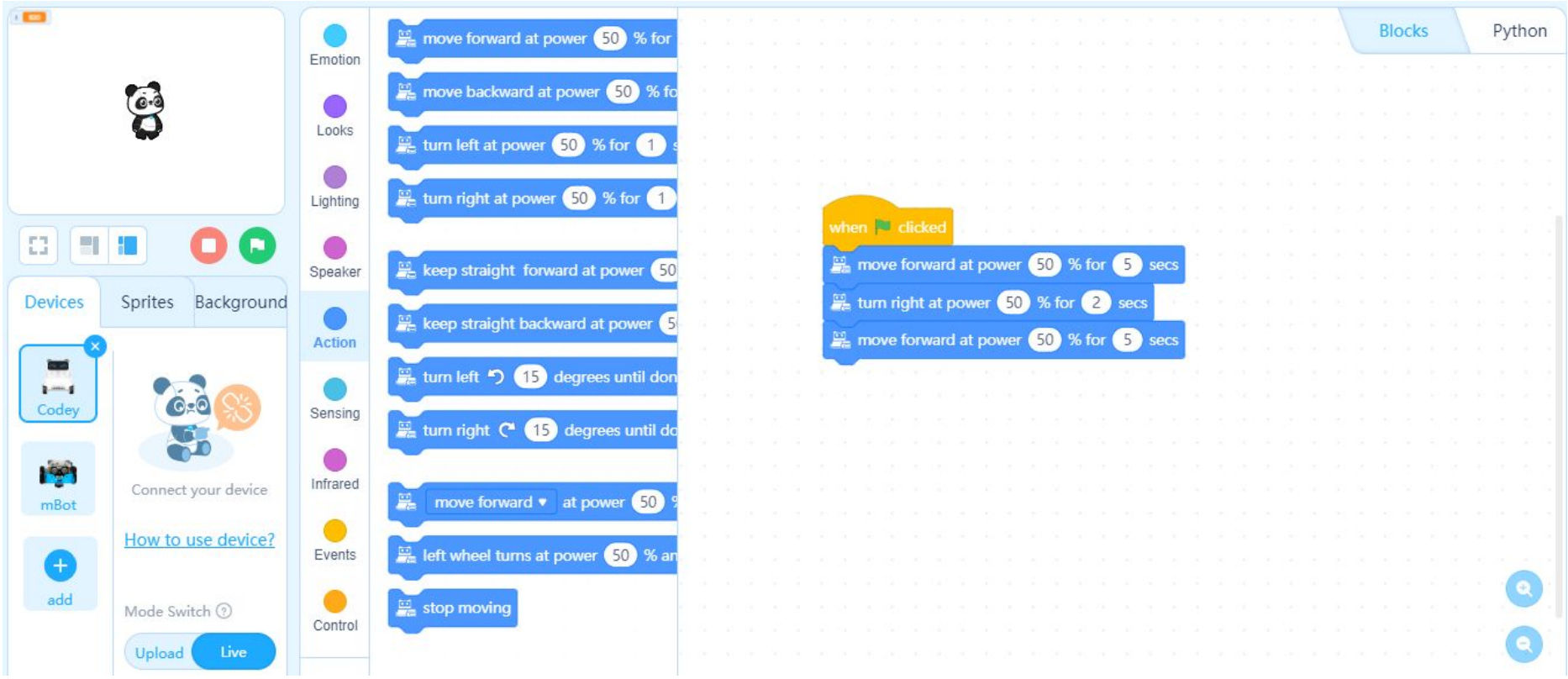


Program the basic movement:



Mission: "how do we get our robot to turn?"

Solution:

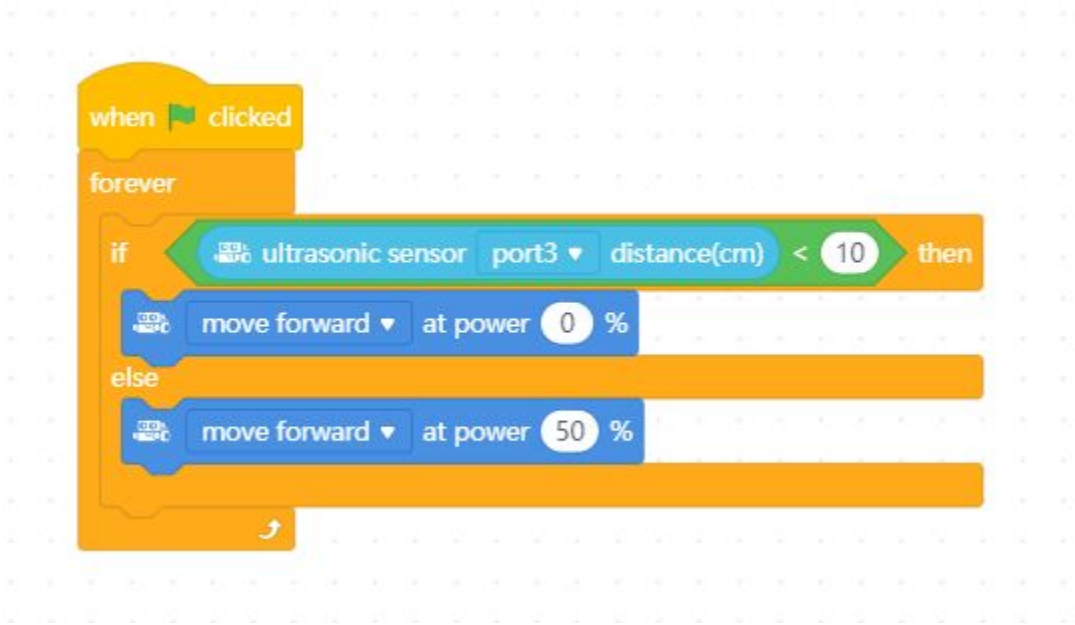


Mark with tape a specific area on the floor or the table to be used as a "parking area" for the robot and invite the students to make a program that allows the robot to perfectly reverse into the parking area.

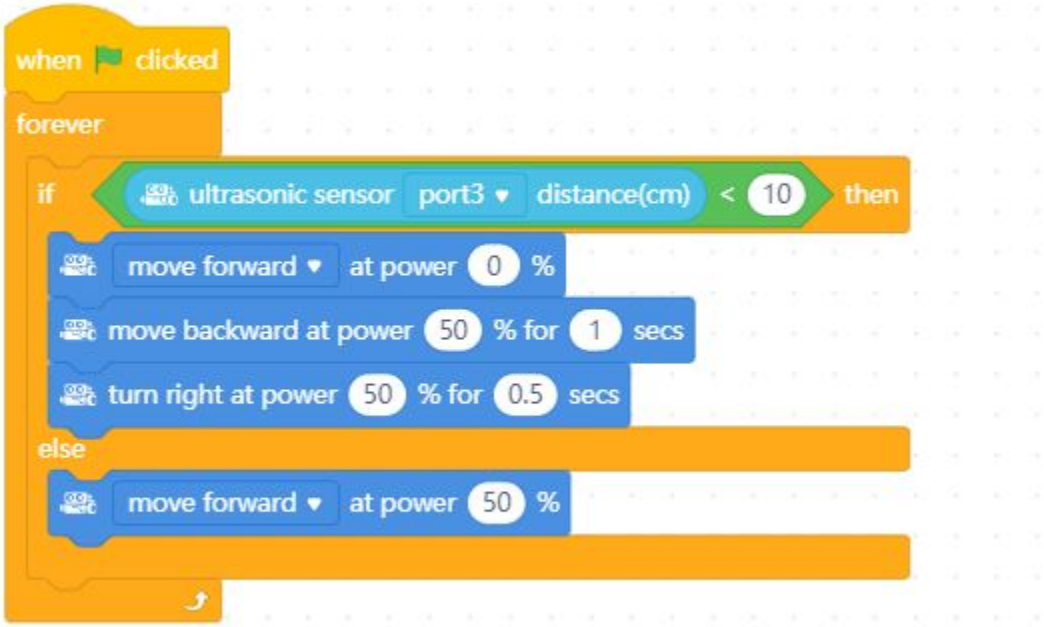
- **lesson two:**

introduction of the ultrasonic sensor and in-depth study of its operation with reference to bat sonar.

Step 1: Children are invited to program mBot so that it stops when it encounters an obstacle.



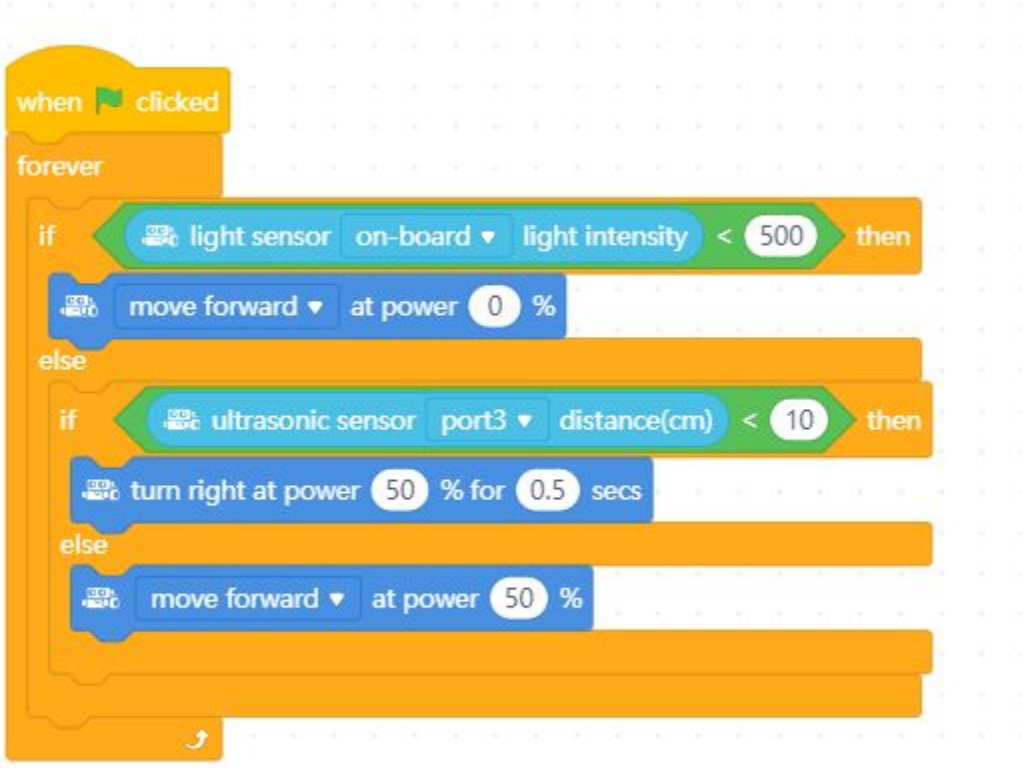
Step 2: Children are encouraged to program mBot so that when it encounters an obstacle it stops, backs up, curves and then starts again.



- **lesson three:**

Introduction of the mBot mounted light sensor and integration of its functions on the existing programming.

Step 1: Teacher invites children to rebuild a program that allows the robot to avoid obstacles and suggests making the robot move only and exclusively when the ambient light falls below a certain value.



Learning outcomes

- In-depth study of the machine and concept of what a robot is
- Understanding what a sensor is in relation to its links with the organs of the senses and the natural world
- Block-programming skills