STEM ACTIVITY – LEGO MINDSTORMS

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Student aged 12-15

Duration: 2 teaching periods

First teaching period (50 minutes)
1ˢᵗ Activity
Time: 20 minutes

Type of activity: PowerPoint presentation about the robot LEGO MINDSTORMS EV3

Class organisation: the whole class

Actions/Tasks: The teacher presents the main components of an EV3 Lego robot: brick, motors (2 large motors and one medium motor), sensors (color sensor, touch sensor, infrared sensor) and different models that can be build with these components.

2nd Activity

Time: 30 min.

Type of activity: exercise, problem solving

Class organisation: the class is divided into 4 groups

Actions/Tasks: The teacher first explains how the robot is connected to the laptop and how to use the software: LEGO MINDSTORMS Education EV3, for control the robot.

https://www.youtube.com/watch?v=IuHaIE-auLQ
The students use the blocks: Move Steering, Large Motor and Medium motor with

different parameters to make the robot go forward, backward, turn left or right, move

the accessories.

Second teaching period (50 minutes)
1ˢᵗ Activity
Time: 20 min.

Type of activity: programming with blocks

Class organisation: the class is divided into 4 groups

Actions/Tasks: The teacher explains how to program the robot to work with the remote and presents the necessary blocks for that. To be able to use the remote control, the robot is also equipped with an infrared sensor (connected to port 4). To create the

program for the remote control, the students will use, beside the movement blocks, the **Loop** block (used to repeat certain actions indefinitely) and **Switch** block from the Flow Control tab.

The result is this ev3 [program](#).

2nd Activity

Time: 20 min.

Type of activity: strategy, problem solving

Class organisation: the class is divided into 4 groups

Actions/Tasks: The teacher presents the first challenge: each team receives 1 balloon, 1 straw, 1 needle and adhesive tape. Using these elements, each team must equip its robot and try to pop the balloon of the opposing team.

Students find different ways to place the elements on the robot in order to solve the challenge. They also use the previously created program to control the robot with the remote.

3rd Activity

Time: 10 min.

Type of activity: exercise, problem solving

Class organisation: the class is divided into 4 groups

Actions/Tasks: The teacher presents the second challenge: in one corner there are different types of food (some healthy and others less healthy). The student must use the robots (control it with the remote) to put the unhealthy food to the trash and the good food in a basket.