STEM ACTIVITY – MY BLOCKS

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Student aged 12-15

Duration: 2 teaching periods

First teaching period (50 minutes)

1st Activity

Time: 15 minutes

Type of activity: exercise, problem solving

Class organisation: the class is divided into 4 groups

Actions/Tasks: The teacher presents the tasks for the students:

1. Make the robot move continuously on the trajectory of an equilateral triangle of any dimensions.
2. Make the robot move continuously on the trajectory of a square of any dimensions.
3. Make the robot move in a triangle that has all sides equal to one meter.
4. Make the robot move in a square that has all sides equal to one meter.

The students and the teacher discuss the properties of the equilateral triangle, the value of the angles and therefore the value of the angle for the robot to turn.

The students use the Move Steering and Large Motor for the robot to move and turn, then Loop to repeat 3 times these moves. For the robot to move on the trajectory of a square the program is similar. But the problem occurs when the robot must move 1 meter, because the Move Steering parameters are for rotations, degrees or seconds, and not for centimeters or meters.

2nd Activity

Time: 35 min.

Type of activity: PowerPoint presentation about My BLOCK, exercise

Class organisation: the whole class

Actions/Tasks: The teacher presents My Block using the PowerPoint presentation. The students follow the steps in order to create a My Block with inputs and outputs. They also discuss why it is useful to create a My Block.

The students can watch a video to see the steps for creating a My Block:

https://www.youtube.com/watch?v=CApCoGQJRcU&list=PLJ9p4vPU79w6sm21Asp29uyqpHCRHngAj&index=8

Second teaching period (50 minutes)

1st Activity

Time: 35 min.

Type of activity: programming with blocks, problem solving

Class organisation: the class is divided into 4 groups

Actions/Tasks: The students create 2 My Blocks:

- The first My Block to make the robot move a certain number of centimeters and
- The second My Block to make the robot turn a certain number of degrees

Both My Blocks will have 2 parameters: one for centimeters/degrees and the second one for the power of the motors.

To create the first My Block, the students need to use a ruler and to measure how many centimeters moves the robot for 1 rotation, then for 2 rotations. They will put the numbers in the Calculator Worksheet and calculate how many rotations are necessary for the robot to move 1cm.

They will make similar measurements to calculate the number of rotations the robot must make to turn 1 degree.

2nd Activity

Time: 15 min.

Type of activity: programming with blocks

Class organisation: the class is divided into 4 groups

Actions/Tasks: The students use the My Blocks they have created to make the programs which solve the challenges given at the beginning of the activity. They must attach a marker to the robots to draw the outline of the shapes and check if they worked correctly.

The result is this ev3 program.