Space Walk (Section 2)

Difficulty: ⅓
Duration: 45 minutes
Material: EV3 Kit - Black electric or adhesive tape

Background

Space Walk mission background

During the Perseids, the space station, which encountered many meteors in its orbit, was damaged. To repair the damage caused, it will first be necessary to remove the pieces of rock that block the space station. The external environment is still too dangerous for astronauts. So how do we proceed? A robot moving on a rail will hopefully be able to perform the various tasks.

Youtube video link about the perseids:
https://www.youtube.com/watch?v=9zpUu3ncH94

Section 2 background

In order to move outside the space station, the robot will have to orient itself with lines drawn directly on the structure. This is how he will be able to navigate and get to the different places on the structure without touching important parts or pieces!

Mission Description

(Space Walk): Participants must build and program a robot capable of detecting the different objects that are distributed along the rail (beam). Then, the robot will have to remove these objects and place them in a place provided for this purpose. This will allow the robot to access the parts of the space station that have been damaged. Participants must go back and forth with their robot on the beam.

(Section 2): Participants will have to install a color sensor that looks down on the base robot (after assembling it according to the steps in the Mindstorms software). They will have to program their robot to move in a

straight line and then stop when it crosses a black line. Then, participants will be able to program the robot to follow a path.

Mission 1:

1. Follow the basic robot assembly instructions available in the Mindstorms application.

Mission 2 :

1. Add a color sensor to your robot, which looks down. The sensor must be about 1 cm above the ground for your data to be taken correctly.

Mission 3 :

1. With black electrical tape or a black sheet that you put on the ground, program your robot to move in a straight line and then stop when it sees the line.
2. Create a path with black electrical tape or ground sheets so that your robot can move forward in a straight line, stop when it sees black, move back a little, turn 90 degrees, move forward in line and stop when it sees red but make a sound if it sees yellow, then change your path and program as many times as you want to create different paths!

Timeline:

Description	**Duration**
Session background	**2 min**
Mission 1	**10 min**

Mission 2	**5 min**
Mission 3	**20 min**
Try	**8 min**
Total	**45 min**

Purpose: To develop programming skills with repetitive sequences. Use and learning of the loop to be more efficient.

Objectives: At the end of the activity, participants will be able to:

- Easily use a color sensor to navigate on a surface
- Perform different actions depending on the path the robot detects

Preparation :

Material :

- EV3 Kit
- Black electric or adhesive tape or black or colored sheets on the floor