Open Robotics Challenge
zone01.ca

Creative Challenge

Log Driver

Crédit photo : Photo by Intricate Explorer on Unsplash

# Introduction

After spending several days on the islands of Planet Z, you are curious to sail to the mainland visible in the distance. You want to discover more but need to find a way to cross this large body of water.

Fortunately, large logs of "spira", an abundant vegetation on the islands, are floating on the shore.

Will you be able to keep your balance in the manner of the log drivers and make your way across the logs?

# Description of the robot

## Dimensions

The robots participating in the challenge must respect the following constraints:

1. Maximum dimensions of the robot at the start: 30cm X 30cm
2. Only one controller (EV3 brick, Spike Prime)

# Mode of travel

The robot moves on logs of spira that roll under the robot. The robot has no driving wheels and must move forward by balancing on the logs.
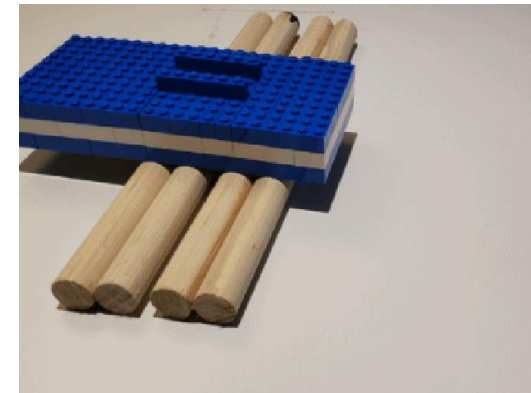


The spira logs are not attached to each other and turn freely.

You are doing the same thing as the old-time log drivers who used pike poles to push and pull. The robot will use one or more LEGO pike poles of your own creation to push off the ground and move forward on the logs.

The pike poles are used to apply frictional pressure to the playing surface. They are not wheels!

**Log driver using a pike pole**



**Photo credit:** histoire forestière outaouais

Your team is allowed a maximum of 6 logs of spira. As the number of logs is limited, you will have to take the logs that become available behind the robot to place them in front of it and continue moving.

# Description of the playing field

## Mat used : Z01-H mat

The mat is highly recommended for practicing the challenge, as the lines on the mat define the precise locations of the objects.

## View in 2-dimensions
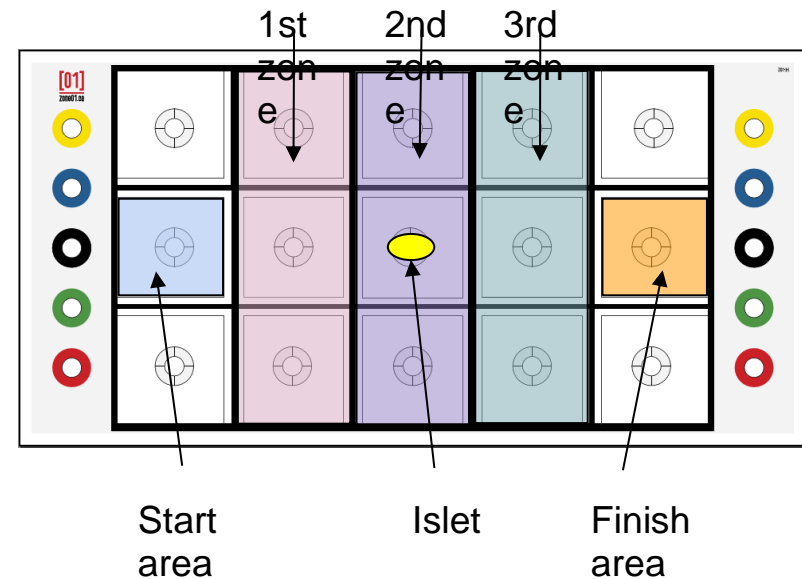
# Description of the game objects

**Spira logs**

Spira logs are made from a ¾ inch diameter hardwood dowel cut into 30 cm lengths.



The dowel can be found in most home improvement centers such as Rona, Canac, Lowe's, etc., in 4 foot, 6 foot or 8 foot lengths.

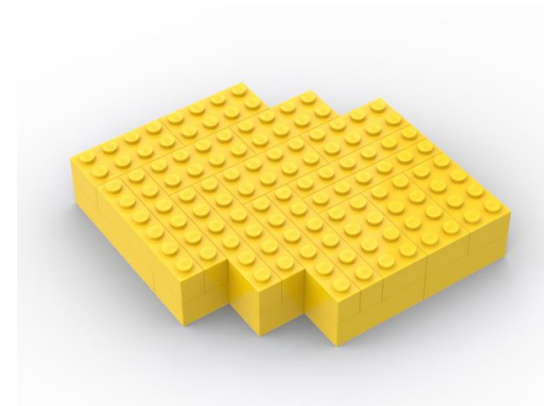Spira logs will be painted in blue and magenta in Zone01 events.

**Flag**

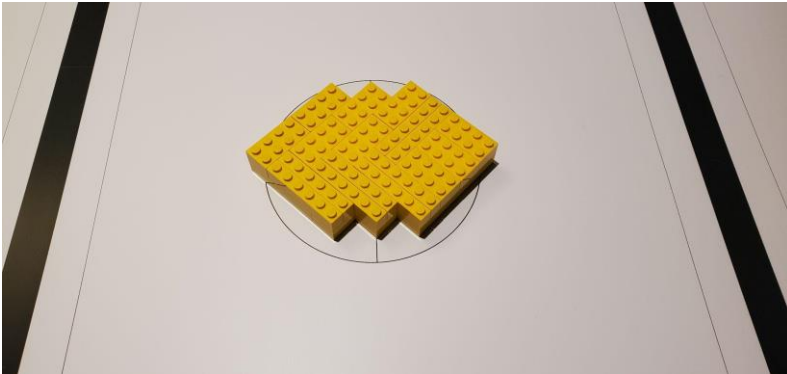The flag is made of red LEGO 2X2 and 2X4 bricks.
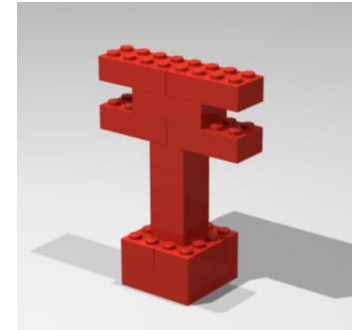


**Islet**

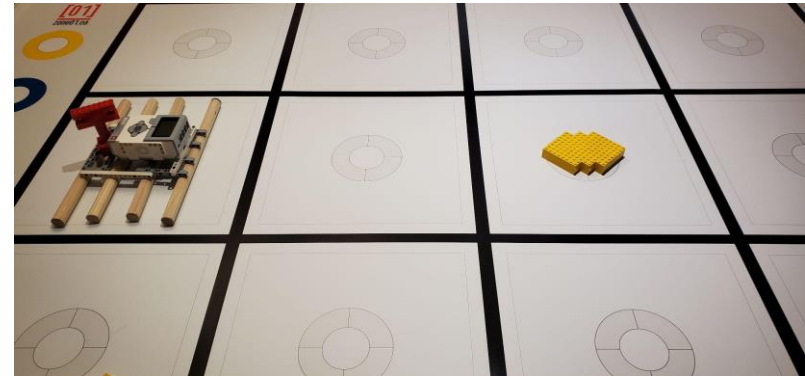The islet is made of 1X6 and 2X4 yellow LEGO bricks.

## Positioning of game objects

The islet is placed in the center of the playing field on the large circle, the length in the same direction as the length of the mat.



The team places the desired number of spira logs in the starting area.



The flag is in the starting area, with or on the robot.



## Detailed description of the game

The robot is installed on the spira logs completely in the starting area, including its pike poles.

At the judge's signal, the robot may deploy and begin the mission.

The robot must advance on the spira logs using only its pike poles to push itself against the ground.

The robot earns points each time it reaches one of the 3 rectangular zones of the playing field.

If the body of the robot touches the ground, the round stops immediately and the points are counted.
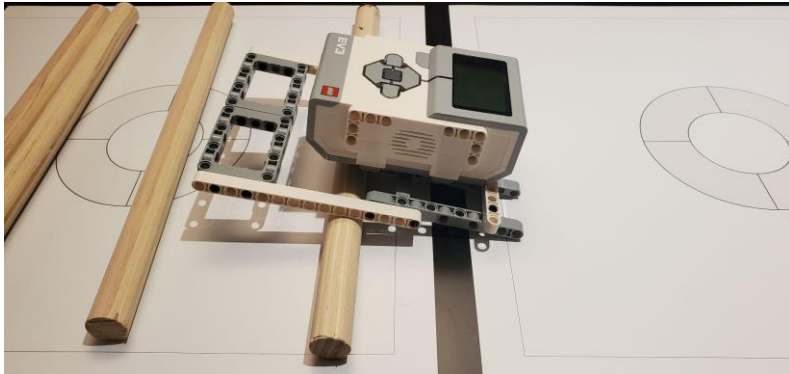


The robot must go around the islet located in the center of the mat. To earn extra points, the robot may deposit a flag standing on the islet before continuing its journey.

A penalty will be given if the islet is moved completely out of its large circle.

There are 2 levels of difficulty for this challenge, White and Black.

| Level | WHITE | BLACK |
|---|---|---|
| Spira logs | **Students can** retrieve the logs when they become available behind the robot to place them back in front | **The robot itself must** retrieve the logs when they become available behind the robot to place them back in front |
| Flag | **Students can** tell the robot when to drop the flag using a sensor, but without touching the robot | **The robot itself must** determine when to drop the flag |

The game is completed when a team member says "Stop", when the time is up **(max 2 minutes)** or if the robot's body touches the mat.

**Levels of difficulty**

## Scoring table

| Missions | Pts max |
|---|---|
| Reach each of the 3 rectangular areas (24) | 72 |
| Flag deposited laying down on the islet | *8* |
| Flag deposited standing on the islet | 12 |
| Reach the finish area | 16 |

| Penalty | |
|---|---|
| Move the islet completely out of its large circle | -6 |

| Total points max | 100 |
|---|---|

In case of equal scores, the time will be used to rank the teams.

## Scoring in images

**Reach each of the 3 rectangular areas**
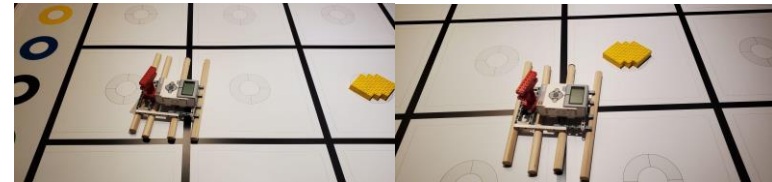


1st zone reached = 24 points          2nd zone reached = 48 points
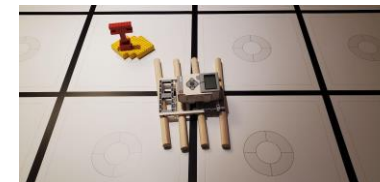


3rd zone reached = 72 points

**Reach the finish area**



Finish area reached = 16 points

**Deposit the flag on the islet**



Flag standing = 12 points          Flag laying down = 8 points
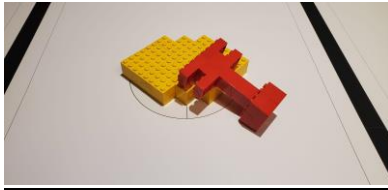


Flag not on the islet = 0 point

**Penalty**
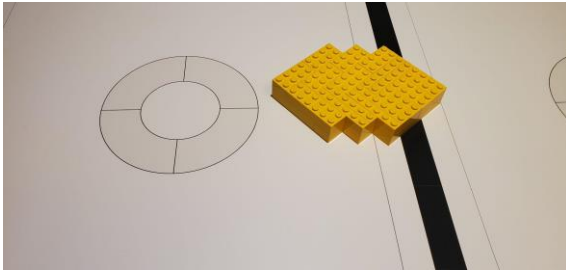


Islet completely out of its large circle = -6 points
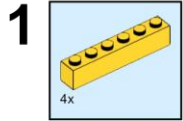
# Frequently asked questions

**Q1. Is it permissible to hold the logs under the robot so that they do not have to be placed back in front of the robot?**
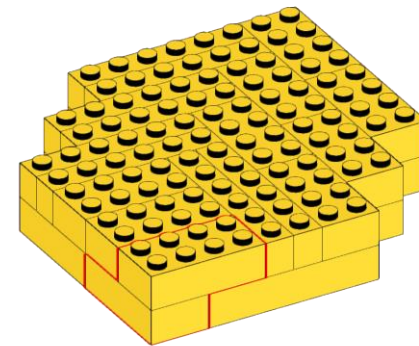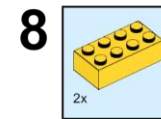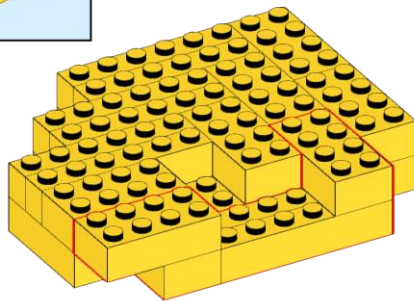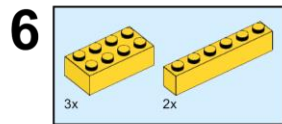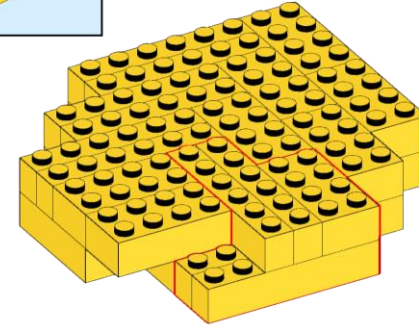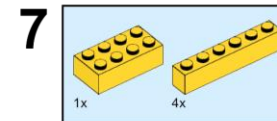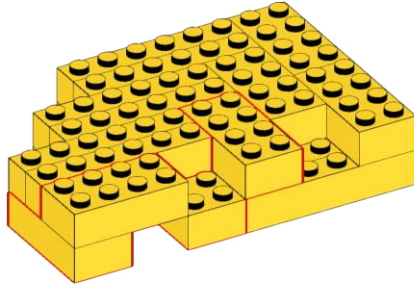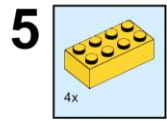
A1. In the White level only, it is allowed to hold the logs under the robot as long as there are no motorized wheels or tracks in contact with the logs.
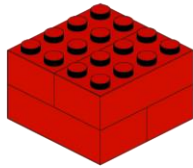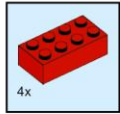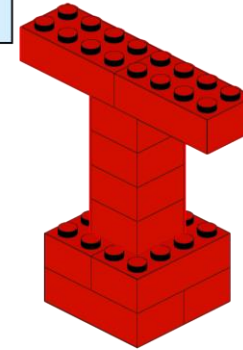
# Building instructions

**Islet**
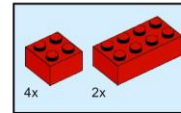
**1**



**2**



**3**



**4**

**5**

4x



**6**

3x    2x



**7**

1x    4x



**8**

2x

**Flag**

**1**

4x

**2**

4x    2x

**3**

3x