



## Junior Robotics Competition 2018 RoboJunior Triathlon Rules



### **Preface:**

The main goal is to construct a robot to perform tasks that challenge motor and sensor skills. The challenges are designed to test these skills either individually or in harmony with other sensors. Unless otherwise stated in the specific game, the general global rules include the following limits:

- a. The maximum power supply voltage is: 10 volts.
- b. The maximum weight for a robot is 2 kg.
- c. The robot size must not exceed 32 cm in height and must fit in a cylinder with a diameter of 32 cm (with parts fully extended)
- d. There is no limit to the number of wheels.
- e. The results each division (elementary and secondary) and each event will be compiled, the team with the highest overall standing will win the triathlon.
- f. It is important that the spirit of these rules be followed. If there are any questions regarding the changes to the event, please do not hesitate to contact with the chief judge, **Akim Munro (asamunro@gmail.com)**. If during the competition, a judge has a doubt that the spirit of the competition is not being respected, the chief judge reserves the right to disqualify the team.

### **Rules and Regulations:**

**The Robots are required to have full autonomy. The team members competing must build and program their robots without any help or interference from their teachers or mentors.**

The Judge will apply all the rules fairly and without prejudice. All decisions made by the Judge during the games are final. Any argument by a team member, teacher, or chaperon with the judges will result in a warning. Continued or repeated arguments will result in immediate disqualification of the team. At the conclusion of each game, the Judge will ask the captains to sign the score sheet. By signing the score sheet the captains accept the final score on behalf of the entire team.

**The three challenges in this year's Triathlon event are:**

- **One motor drag race**
- **One motor tug of war**
- **Rope climber**



## One motor drag race

### Task

You will be placed on a black strip of wood and will have to race towards a red patch where your robot must brake.

The challenge: tests building and programming skills, using light sensors and their ability to recognize colour.



### Rules and Specifications

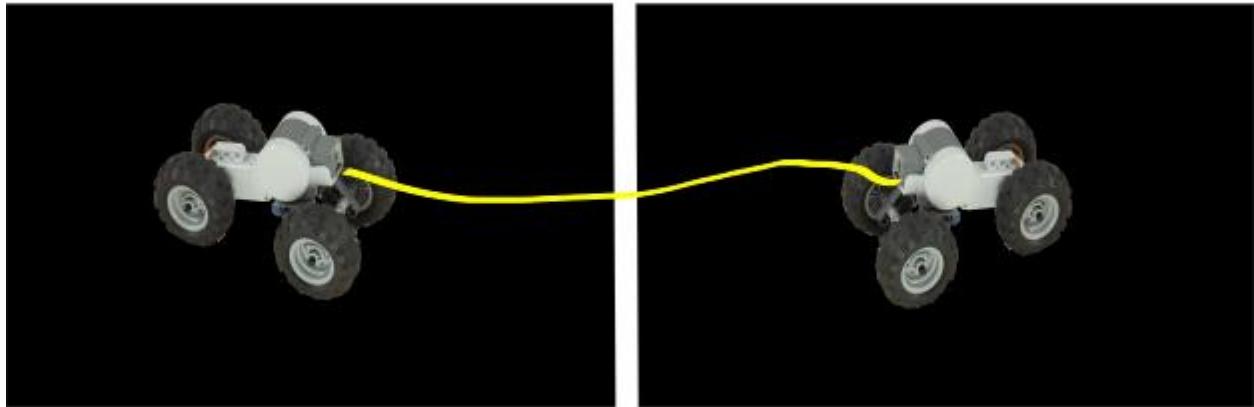
1. Robots may only use one motor (10 Volts max) to move
2. The surface will be plywood painted black
3. Two white stripes will be placed on either side of the 50 cm wide field. If a robot touches these strips, it will be disqualified
4. The field will be approximately 2 m long
5. Robots must have a button (**not the buttons on the EV3 / NXT brick**) that will allow the robot to start moving.
6. The judge will give each team a countdown, once the judge says go, the team captain will press the start button
7. At the end of the field there will be a red rectangle of width 15 cm. upon arriving in the red strip, the robot must brake.
8. The time will stop once the robot has fully stopped.
9. For every 1 cm that the FRONT wheels have gone beyond the red rectangle, 1 second will be added to the time.
10. The winner of the competition will be the robot that can complete the course in the shortest time.
11. The maximum time allowed is 2 minutes, if your robot does not complete the course in that time it will be disqualified



## One motor tug of war

### Task

In this “tug-o-war” game, you must construct and program a robot that is capable of pulling another robot across a line.



The challenge: test design, speed vs. strength, understanding of frictional force, and strategy

### Rules and Specifications

1. Robots may only use one motor (10 Volts max) to move
2. The surface will be plywood painted black with a white line in the middle
3. Robots must have a button (**not the buttons on the EV3 / NXT brick**) that will allow the robot to start moving.
1. The two robots will be tied together with a cable.
2. The captain is responsible for providing a secure place where the referee can attach a 3/16” carabiner (see picture in annex A). If the robot falls apart or releases the cable for any reason, it will be disqualified.
3. The referee will place the robots close together so that the cable is slightly loose.
4. When the teams are ready, the referee will give the signal and the captain will activate his/her robot.
5. To win the heat, one robot must pull the other completely over the line. The line will be a 2 cm thick white line.
6. If, after 2 minutes, neither robot has successfully pulled the opponent over the line, the winner will be the robot that weighs the least.

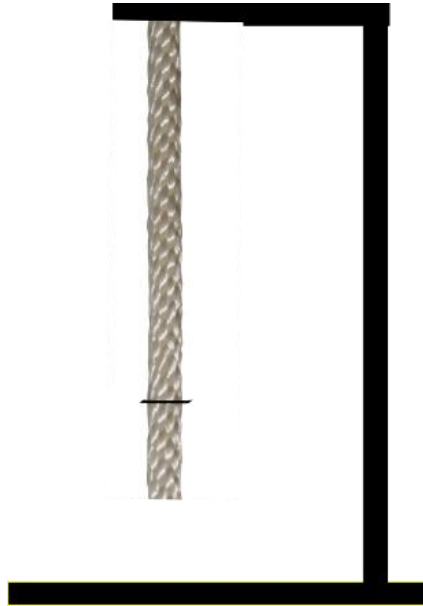
*\*\*\*Unless specifically stated here, the restrictions described in the General Rules will apply to this challenge.*



## Rope climber

### Task

Climb a 60 cm rope in the shortest time



The challenge: test design, understanding of frictional force, balance, weight and power.

### Rules and Specifications

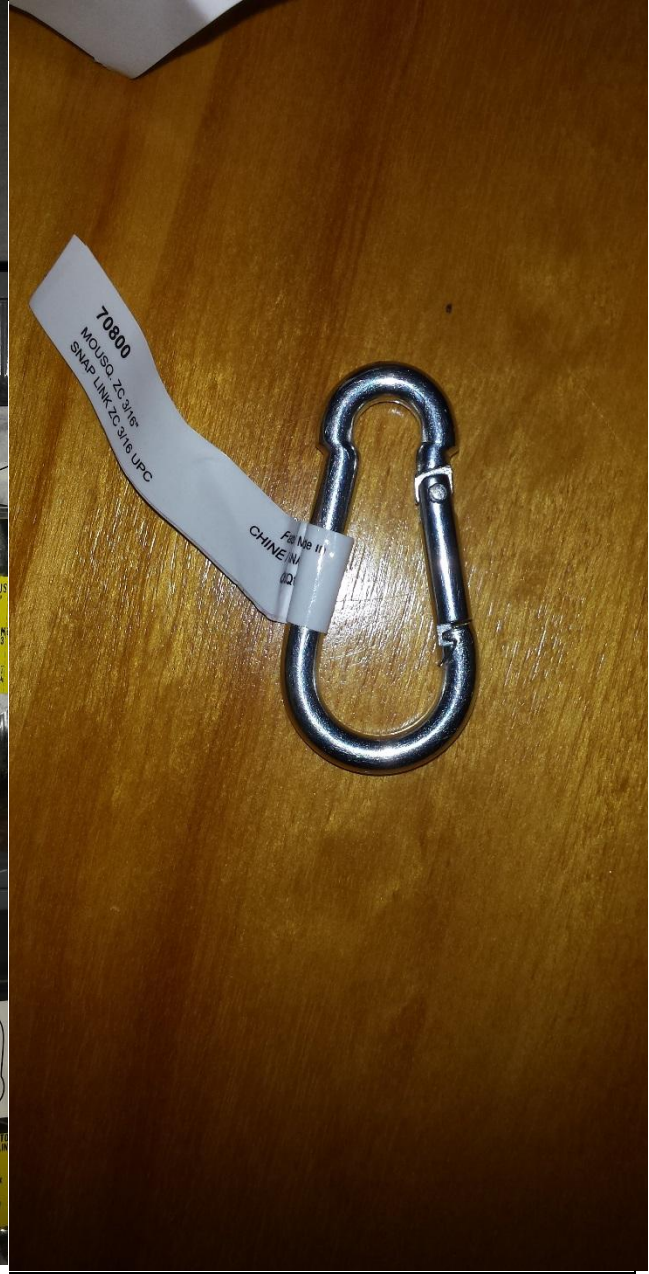
1. The rope is a ½ inch double weaved nylon. (available at most large hardware stores - see picture in annex A)
2. There will be a line on the rope 40 cm above the ground. Your robot must be able to fit below this line without touching the ground.
3. Robots must have a button (**not the buttons on the EV3/nxt brick**) that will allow the robot to start moving.
4. Your robot must climb the rope in the shortest time possible, the trial will end when the robot touches the top of the rope.
5. The robot may only be in contact with the rope to perform the climb.
6. The robot will have a maximum of 3 minutes to climb the rope.
7. The winner will be the robot that climbs the fastest

*\*\*\*Unless specifically stated here, the restrictions described in the General Rules will apply to this challenge.*



# Annex A – Pictures

## Tug of war Carabiner



**Rope Climber Rope**

