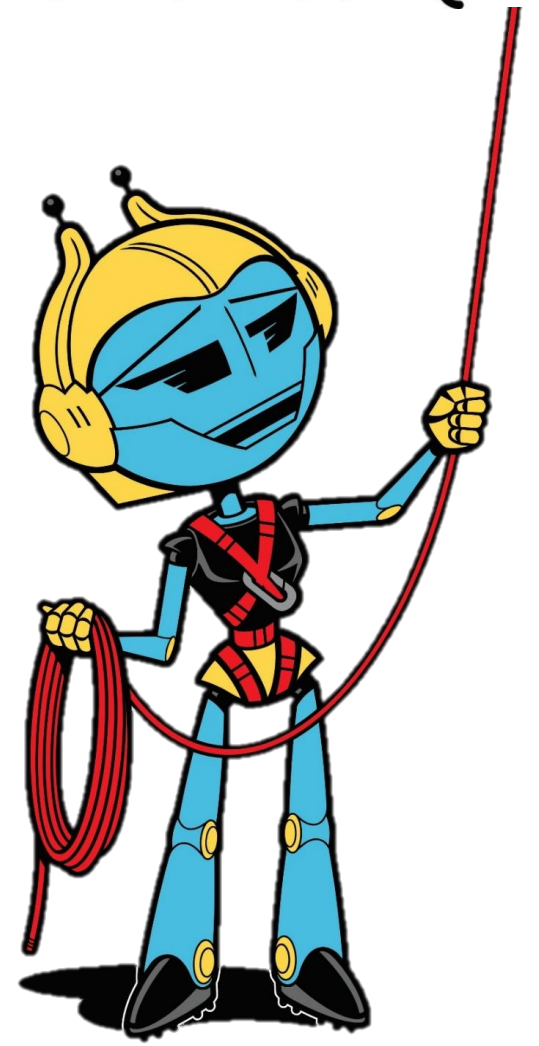




A U S T R A L I A

RoboCup Junior Australia

INTRODUCTION TO MAZE SPRINT
RESCUE FOR EV3 AND SPIKE
PRIME



Overview of Competition



“Real world” robot challenge



Modular, flexible game design



Accessible to a wide range of robot platforms



Many possible solutions



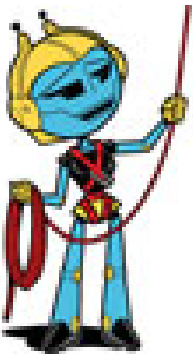
Easy for beginners but with a high ceiling



Simple scoring



Two ways of competing – even if you don't have a robot!

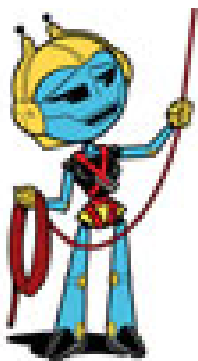


Scenario

- There has been a disaster in a factory building.
- Several workers are trapped inside but it is not safe to send in rescue teams. Tokens have been placed to represent trapped (green) and seriously injured (red) victims
- The role of your sprint robot is to enter the building, identify the number and classification of victims, and exit the building as quickly as possible.
- Your robot will then report on the victims found.



The Competition



You have 2 minutes to calibrate your robot, find the victims and exit the maze.

There is a minimum of 5 victims in the maze. You get points for each one you find. The red victims are worth more points than the red

Bonus points for exiting the maze before the time has elapsed and for accurately reporting the type of victims

The robot must avoid black holes

The robot can be return to last found victim if stuck without penalty but program cannot be restarted

Robot run can be restarted with loss of points at any time

Two divisions

- Standard for EV3 and Spike - with or without a robot!
- Virtual for any robot design running through set mazes.

How it will work

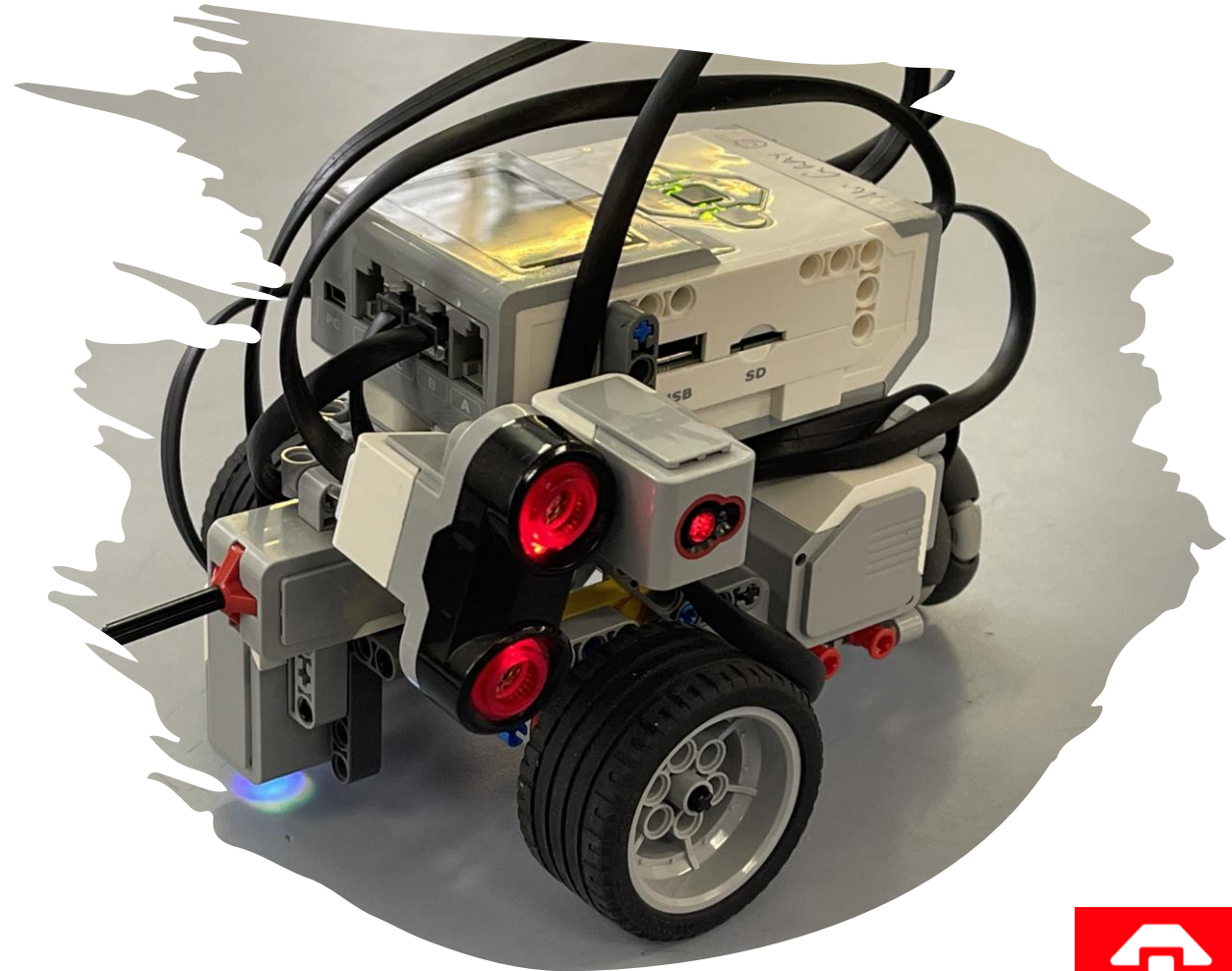
- Decide which competition to enter
 - Standard – standard designs that we run for you. You do the software. You will need to be available for Day 1 and 2 (9/10-10/10) of the competition.
 - Virtual – Any design of hardware and software that meets the Maze Rules. You will need to submit 3 recorded by the 5th October. runs and then compete remotely on Day 2 (10/10) of the competition. You will need to setup the mazes and submit your runs for scoring.

Other Requirements

- Recommended training course will be available. You will need to source the materials
- You will also receive a list of resources required for building the competition mazes.
- Your team (and mentor) will need to be available for a scheduled interview via video link to discuss your robot over the competition weekend.

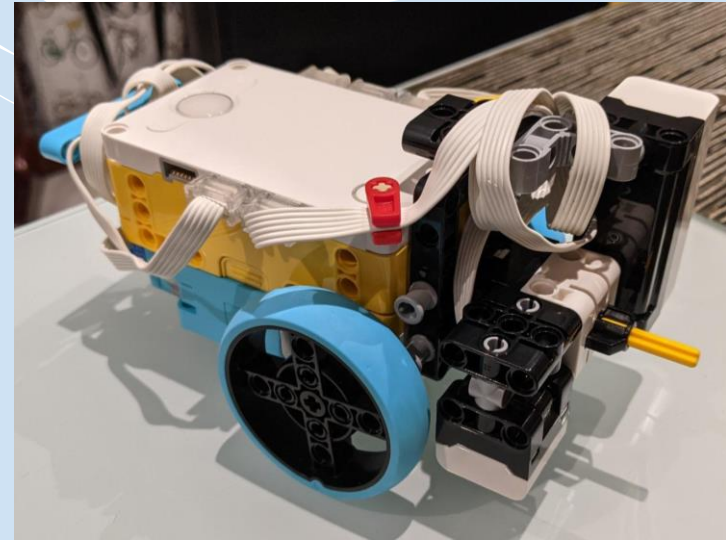
The Standard EV3 – what you need

- Basic EV3 robot
- 1 X Colour sensor (pointing down).
- 1 X Ultrasonic (facing wall)
- 1 X Touch sensor facing forward
- The design can be downloaded as a html document from [here](#).



The Standard Spike – what you need

- Basic Spike Prime robot kit
- 1 X Colour sensors (pointing down)
- 1 X Ultrasonic (facing side)
- 1 X Touch sensor on front of robot
- A video of the robot construction is [here](#).



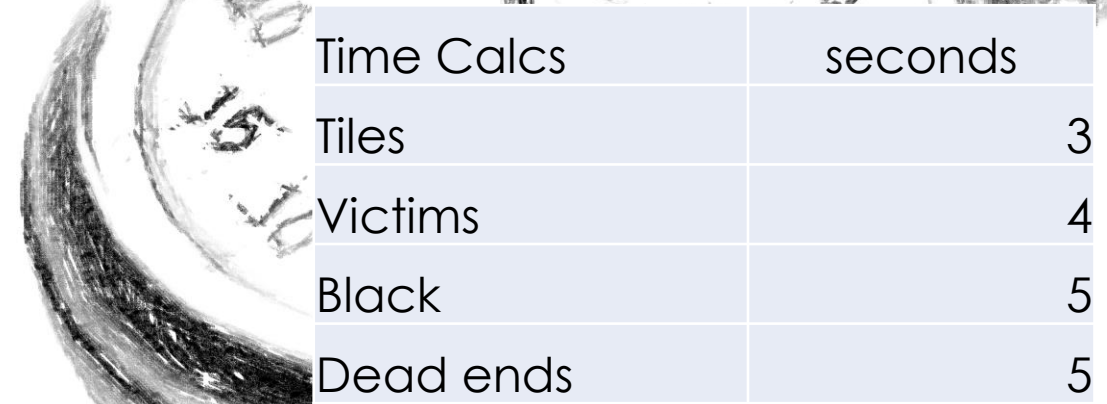
SCORING

ACTION	POINTS	COMMENTS
Found green victim	10	Robot must stop and clearly signal
Found red victim	20	Robot must stop and clearly signal
Time Bonus	2 points for each second less than Target Time	Robot must stop on exit within the Total Time (Target Time plus 60 seconds)
Reporting Bonus green victims	25 Points	Robot must stop on exit and display the correct number of green victims
Reporting Bonus red victims	50 points	Robot must stop on exit and display the correct number of red victims

The champion teams is decided by the cumulative total over several rounds

Target Time

- The Target Time is calculated by an algorithm that considers the following
 - Number of 30cm X 30cm “tiles” X time calc
 - Number of victims X time calc
 - Number of Black tiles X time calc
 - Number of Dead Ends on shortest route X time calc
 - A Challenge Factor (0.8-1.2) for each round.
 - Add up the times and divide by the Challenge Factor
 - 0.8 or early rounds rising ads we proceed.



Time Calcs	seconds
Tiles	3
Victims	4
Black	5
Dead ends	5

For a maze with 20 tiles, 5 victims, 2 Black tiles and 3 Dead ends would be calculated as 110 seconds. This is then divided by the Challenge Factor to give the Target Time

Important Links

Everything you need will be accessible through the RoboCup junior Australia web site.

I can be contacted at neil.gray@robocupjunior.org.au

- [RCJA Website](#)
- [2021 Maze Rescue Rules](#)
- [Introduction to Maze Sprint](#)
- [Maze Sprint Rules](#)
- [EV3 Standard Design](#)
- [Spike Standard Design Video \(opens in a new tab\)](#)