



World Robot Olympiad 2021

Regular Category

Senior Advanced Level

Power Mix



June 24 Version

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General Rules

1. All teams must consist of 2 or 3 competitors.
2. The team must be from the category age group or younger. The competitor must never be older than the category age group.
3. **It is not allowed to make changes in the environment before, after and during the simulation.**
On Advanced level is allowed to import your own robot.
4. **The only change allowed is to import a robot and rotate it within the Start Zone before the simulation starts. This robot can only be a maximum of 30 cm. in width, height and length.**
5. When the simulation starts, the competitor can only use the camera's tools and the scoreboard button.
6. All the tasks need to be solved only by using the code created by the participant for the robot.
7. **In case, the Judging Team suspects of the score/time of any competitor, they can request a video or a conference from the participant, to prove how their result was gotten according to the rules and requirements allowed. In case the competitor doesn't accept the video, conference or doesn't prove how the score/time was gotten, the result will be deleted from the ranking.**



8. In all the categories the top 20 must send a video of their robot solving the challenge.
9. In the video, the robot must get the same points as displayed on the leaderboard. The robot's time must be the same as the time on the leaderboard \pm 1.2 seconds.

In case of any unforeseen circumstances in which the rules have to be altered, the judges will have the final say in the results.

The judges have the utmost authority to amend the rules and regulations.

The judges have the utmost authority to disqualify a result if:

1. Participants pause and resume the simulator in between the code.
2. Participants create any other situations which judges deem unacceptable

Format of the competition

There will be three newly designed VRT Mat Challenges.

On each WRO Age Group, there will be two challenges with the same Mat. One will be a Beginners Challenge and another will be an Advanced Challenge. The Advanced Challenge will be more complex and the teams are allowed to import their own robot.

You can only participate in one of the two challenges per Age Group. That means that you must choose between Beginners and the Advanced Challenge.

	Elementary Category Beginners Level	Junior Category Beginners Level	Senior Category Beginners Level	Elementary Category Advanced Level	Junior Category Advanced Level	Senior Category Advanced Level
Age	Max. 12 years	13-15 years	16-19 years	Max. 12 years	13-15 years	16-19 years
Team Size	2 or 3 competitors per team					
Official Simulator	Virtual Robotics Toolkit					
Robot	It's not allowed to import your own robot.		Is allowed to import your own robot.			
Software	Open to any control software that can connect to Virtual Robotic Toolkit					

Robot Missions

Solar Island:

The robot must move 3 solar units to the transport area.

The robot must move 1 solar unit to the warehouse.

Wind Island:

The robot must move 2 wind units to the transport area.

The robot must move 2 wind unit to the warehouse.

City Island:

The robot must move 2 solar units to the yellow building.

The robot must move one solar unit to the yellow-green building.

The robot must move one wind unit to the green-blue building.

The robot must move one solar unit to the yellow-green building.

The mission is complete when the robot parks into the final area and the chassis of the robot is entirely (top-view) within the area.

For more understanding you can see the next sample video:

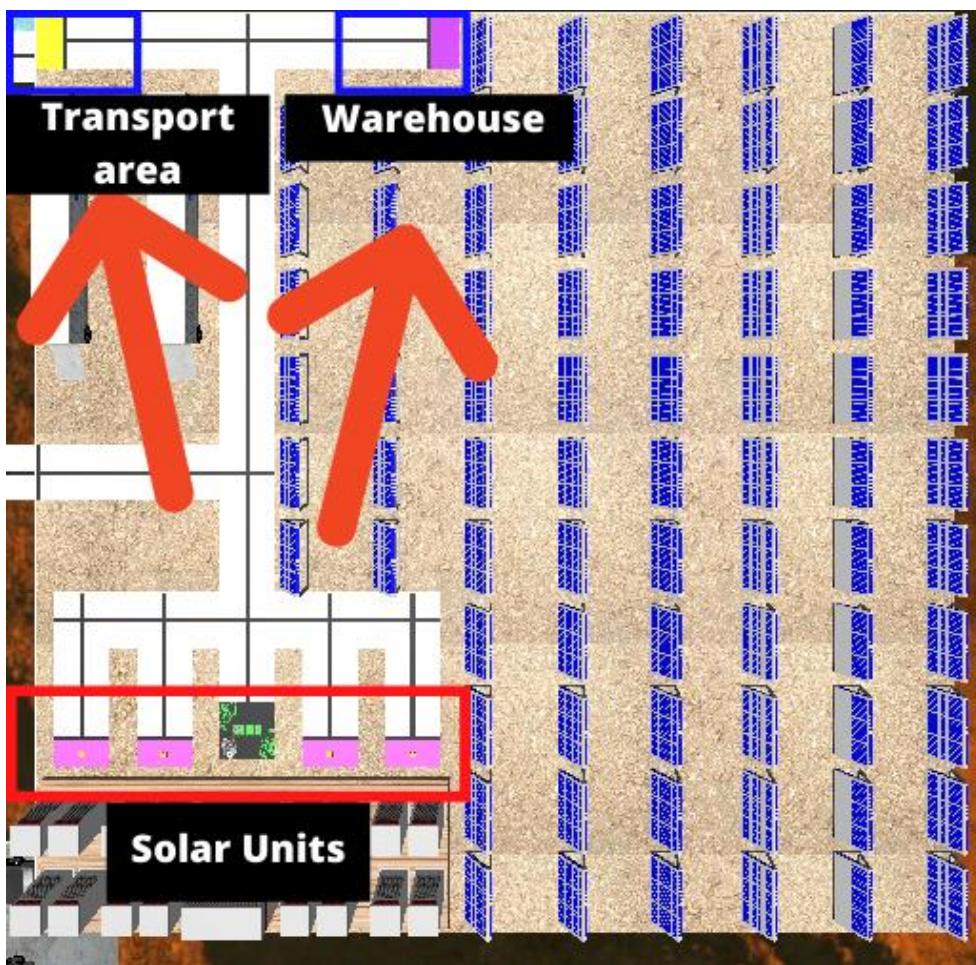
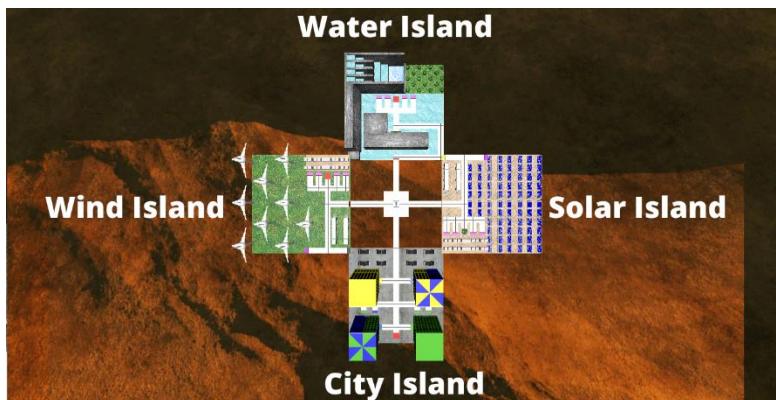
<https://youtu.be/SMF4zh1snms>

Score

Senior Advanced Category Power Mix	Each	Total
Solar Island		
Solar unit delivered completely in the transport area (Only need to delivered 3 solar units).	7	21
Solar unit delivered completely in the warehouse (Only need to delivered one solar unit).	7	7
Wind Island		
Wind unit delivered completely in the transport area (Only need to delivered 2 solar units).	7	14
Wind unit delivered completely in the warehouse (Only need to delivered 2 solar unit).	7	14
City Island		
Solar unit delivered completely in the yellow building (Only need to delivered 2 solar units).	7	14
Solar unit delivered completely in the yellow-green building.	7	7
Wind unit delivered completely in the green-blue building	7	7

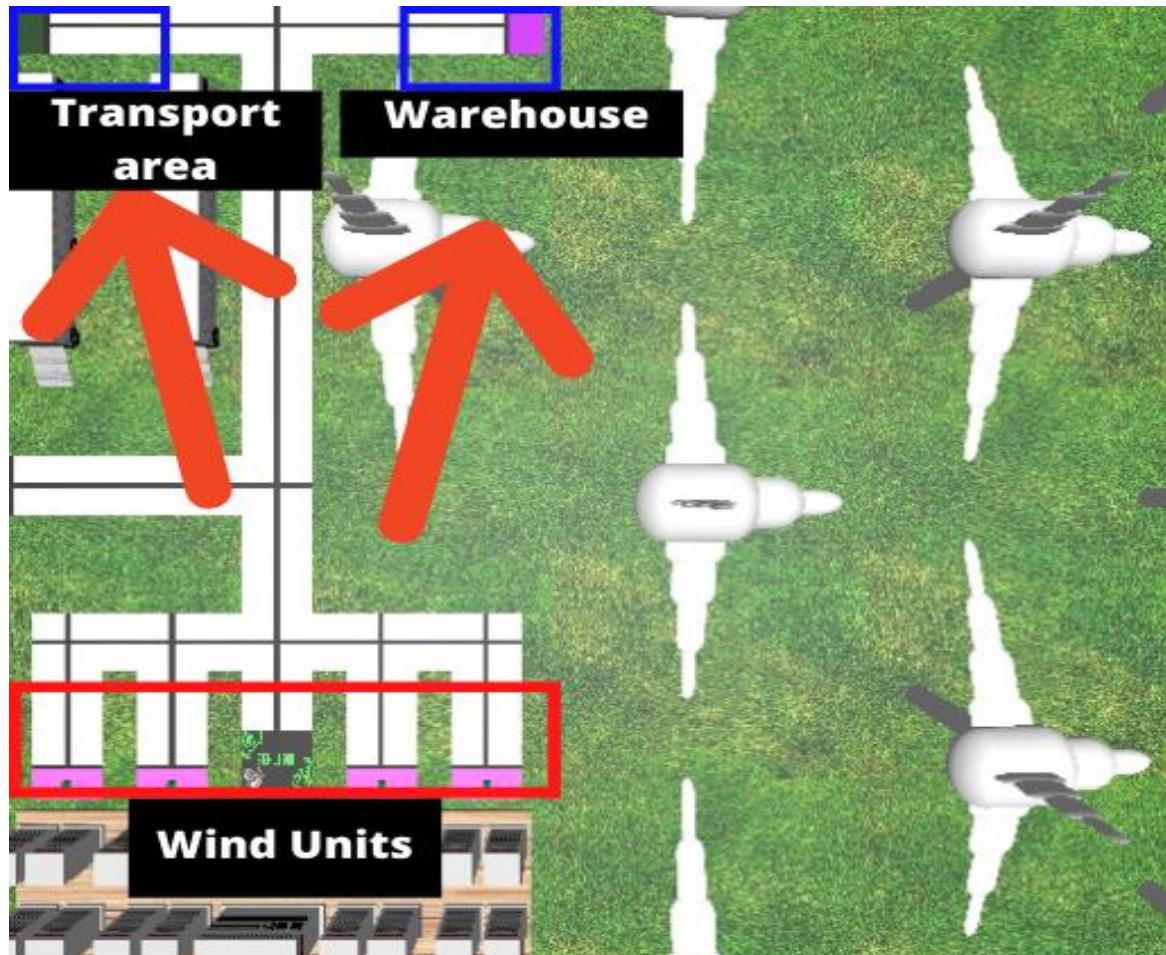
Wind unit delivered completely in the yellow-green building.	7	7
Park the robot		
Robot stops on Finish Area and simulation stops. (only if other points are assigned)	9	9
Maximum Score		100

Scoring Interpretation



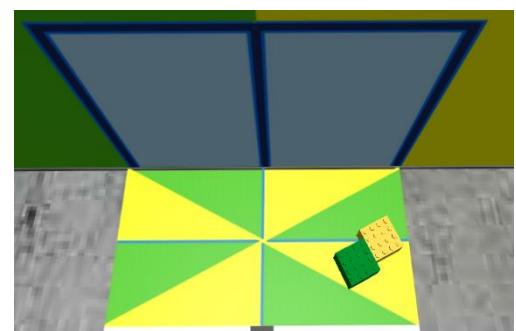
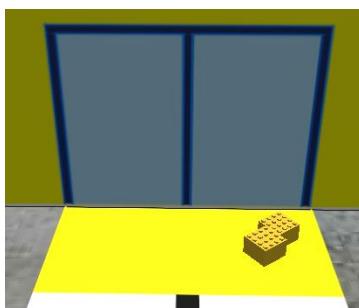
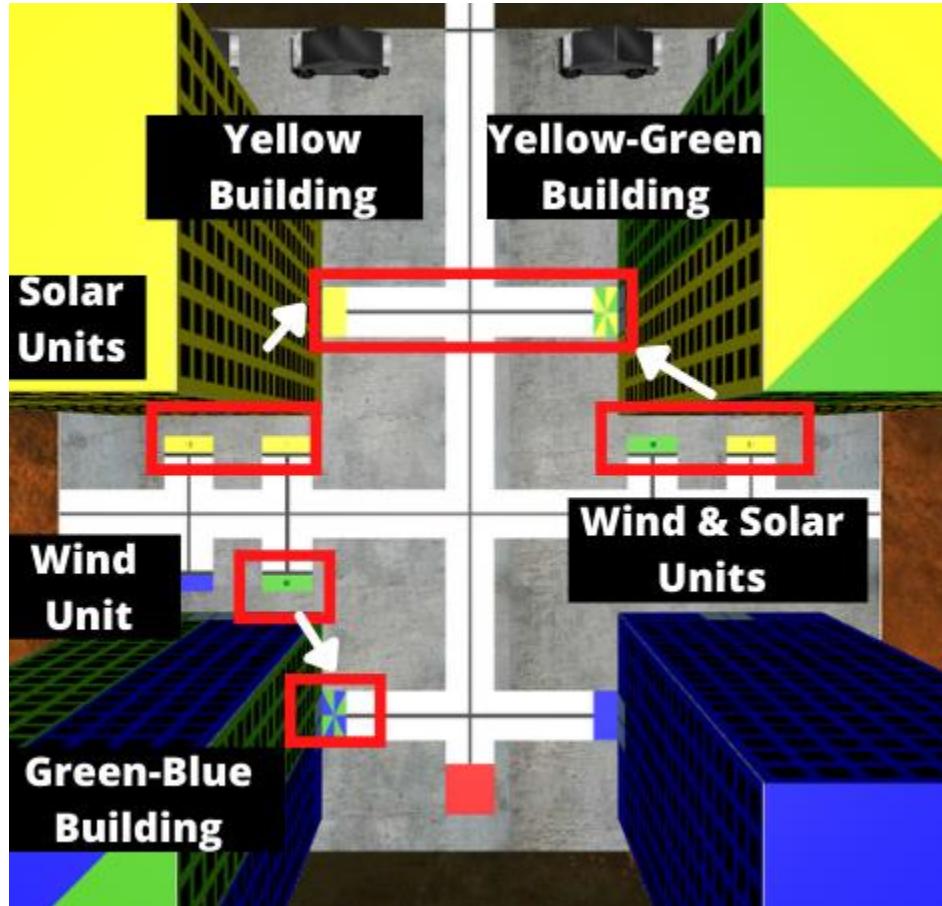
Three Solar Units delivered completely in transport area and one Solar Unit delivered completely in warehouse.

It is not important if the solar unit is standing or lying but it is important the object to stay completely inside the area.



Three Wind Units delivered completely in transport area and one Wind Unit delivered completely in warehouse.

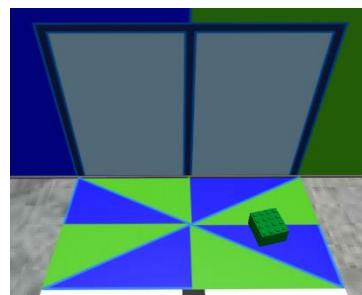
It is not important if the solar unit is standing or lying but it is important the object to stay completely inside the area.



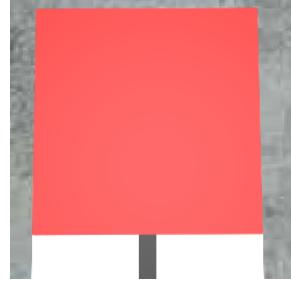
Solar units delivered completely in the Yellow Building.
It is not important if the battery is standing or lying but it is
important the object to stay completely inside the zone.

One Solar unit & one wind solar unit delivered completely in
the Yellow-green Building.

It is not important if the battery is standing or lying but it is
important the object to stay completely inside the zone.

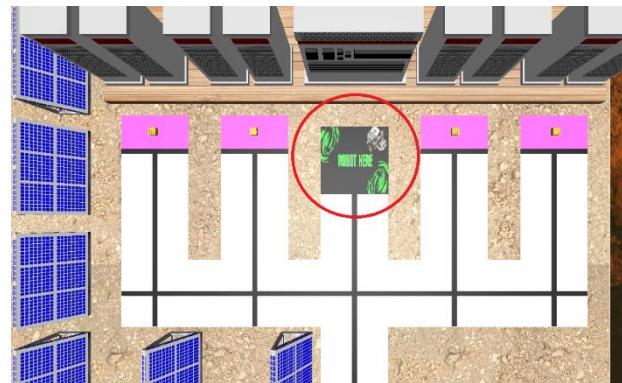


Solar units delivered completely in the Green-blue Building.
It is not important if the battery is standing or lying but it is
important the object to stay completely inside the zone.



Robot stops on Finish Area and simulation stops.
(only if other points are assigned)

Checkpoints



In the challenge you can find a checkpoint, the robot can go inside and you will be able to submit your result.

If the robot is inside the checkpoint you will not get the point of the final zone.

Important Information

Details of specific tasks (**To be announced**)

The end time to **submit results** is (**To be announced**)

The end time to **fill the form** is (**To be announced**)

Closing Ceremony is (**To be announced**)

If a top 20 participant doesn't fill the form we will take the score out of the leaderboard.

Recommendation:

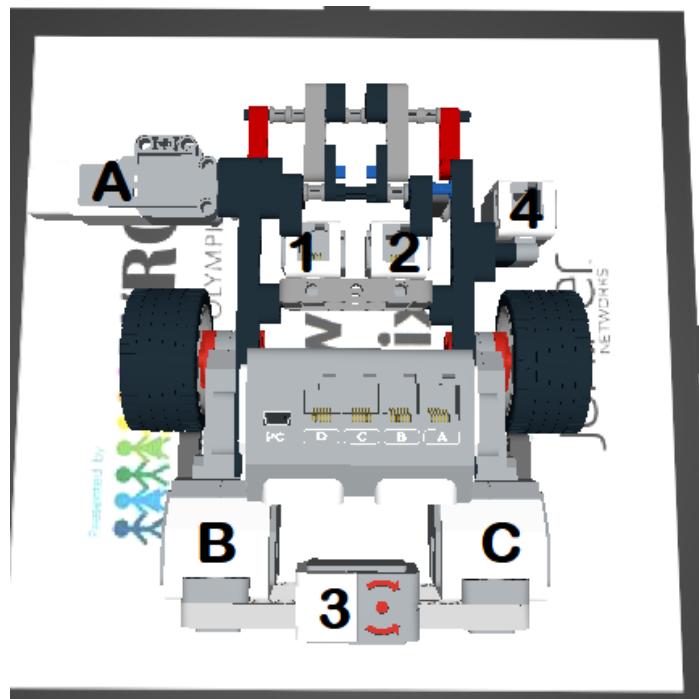
If you think your result will be on top 20 you can fill the form before (To be announced).

Robot Ports

Advanced Level: *Remember, it is allowed import a new robot.

On this link you can find the robot on LEGO® Digital Designer or Studio 2.0

<https://drive.google.com/drive/folders/1yesTfSnWDTWPQ2rrF8XXBmSwzscbi8V?usp=sharing>



Tie Result

18		Participant 1	2020-11-05	5	100	00:55.955
18			2020-11-05	3	100	00:55.955



Participant 2

If participants have the same result on the leaderboard the judging team will review the next highest results of the participants.

When the judging team knows who get better results will take out 0.001 seconds to the time on the leaderboard of the participant winner to tiebreaker the result.

On the example “Participant 2” get a second better high score, it means we will take 0.001 seconds of the participant time result.

18	 Participant 2	2020-11-05	3	100	00:55.954
19	 Participant 1	2020-11-05	5	100	00:55.955

If one of the participants only have 1 submitted round the other participants will be the winner of the tiebreaker.

Difference from the Real Time Result

Judging team detected less than 1% of the users have a PC issue where the time result that it submits takes out the decimal seconds.

Example:

Real time result: 00:55.230

Submitted time result: 00:55.000

If the participant has this issue and is on the Top 20, we will exchange with the time displayed in the video.

Remember if you are in the Top 20, it is very important to fill the form with your video, in case the participant hadn't fill the form with the video the result will be taken out of the leaderboard.

How to create your video?

You need to record computer screen using Windows 10 Function, QuickTime player, OBS or other option to record screen.

Screen record Windows 10

https://youtu.be/mVJsm_000c0

Screen record Mac

<https://youtu.be/s9xnsj6ditM>

Screen record OBS

<https://youtu.be/QKmrDUJFRkM>

Install OBS:

<https://obsproject.com/>

The participant must upload the video on YouTube, Vimeo, Google Drive, etc.

How to upload a video on YouTube?

<https://youtu.be/4RZ3FooBKYE>

If you upload your video on YouTube, you have to publish it as Public or Unlisted.

Record Details

-On the video, the participant has to show the robot solving all the challenge. If the video starts after the robot begins solving the challenge or cuts the video before the robot finishes the task, the video will not be valid.

-The robot and the scoreboard must be visible all the time.

-On the video the participant must use “Top Camera” and “Tether” tracking type.

Top Camera and Tether tracking type

1) Need to open Advanced Mode.

To access "Advanced Mode", all you have to do is press "F12" on your keyboard.
Could be:

-F12
 -Ctrl+F12
 -Fn+F12
 -Alt+F12
 -Cmd+F12

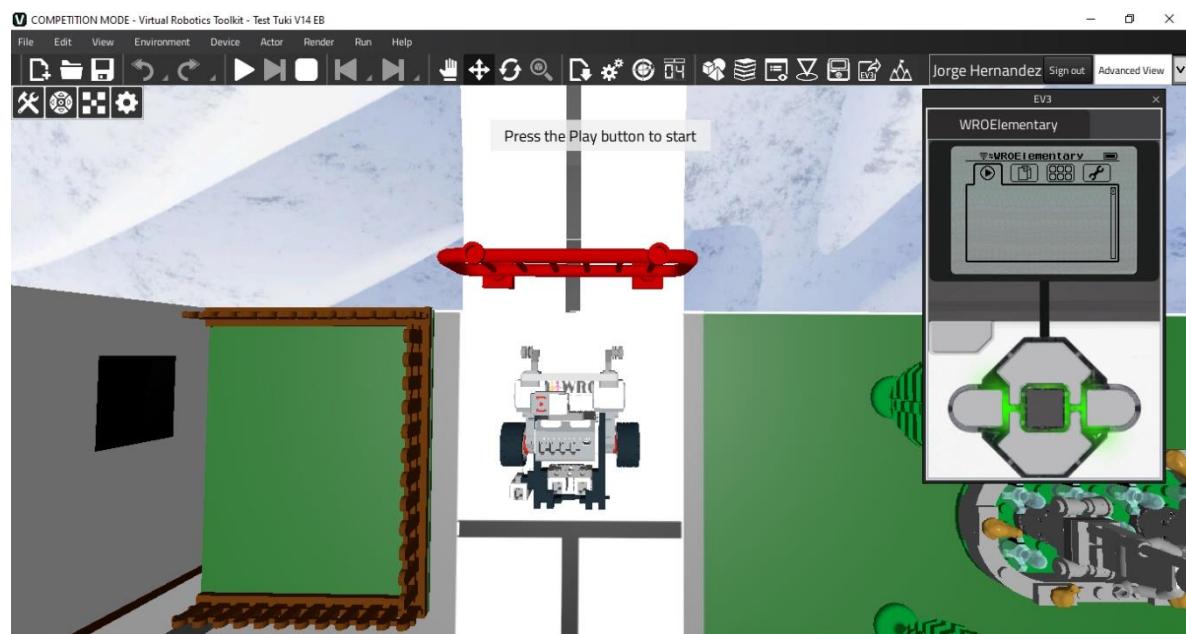
Simple Mode



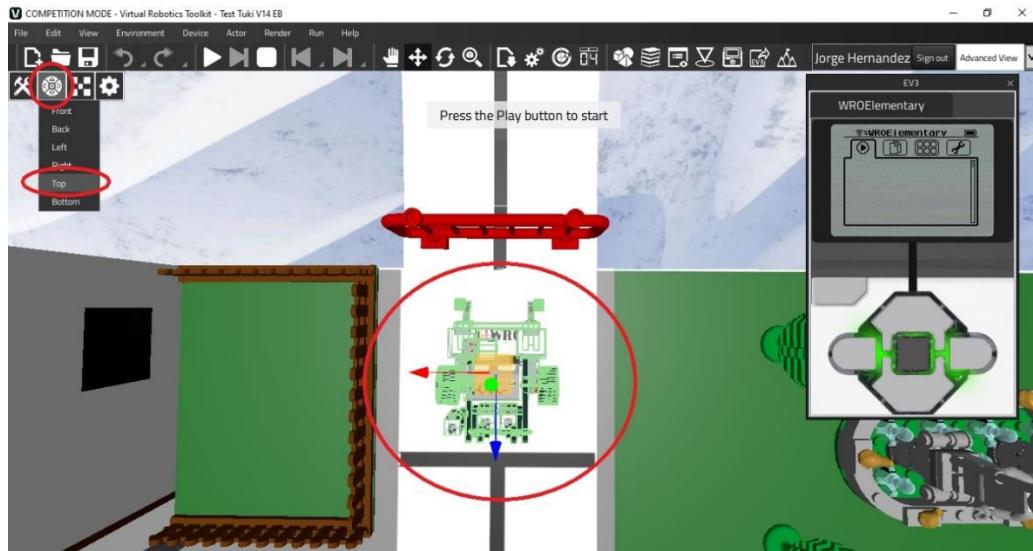
Advanced Mode



2) Move the Virtual EV3 Brick.

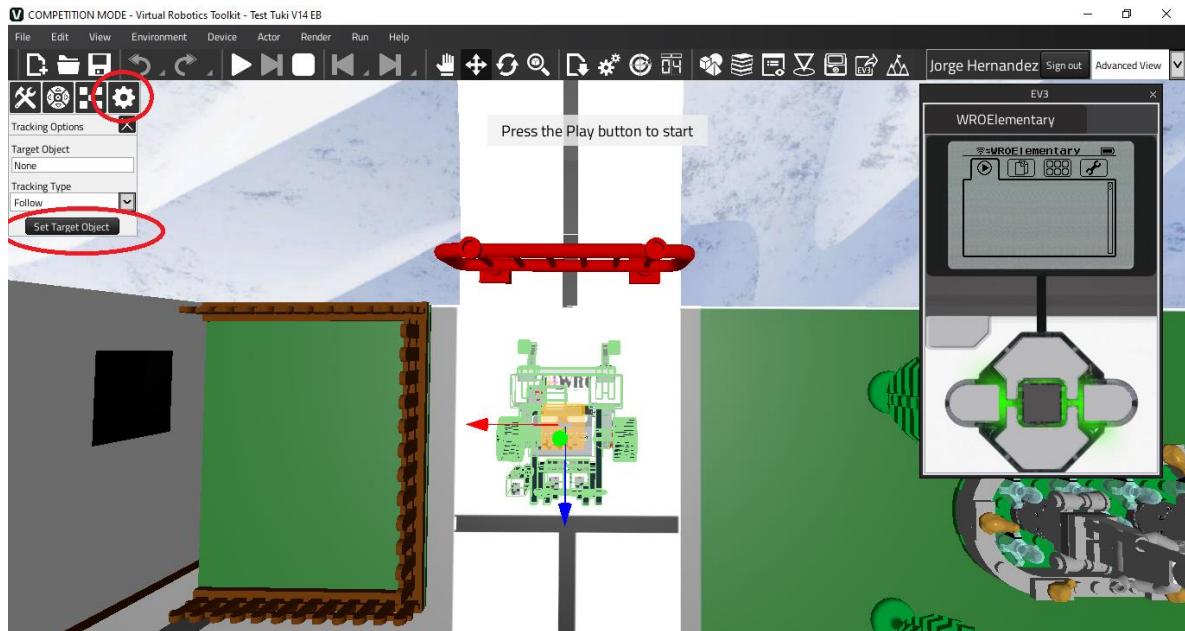


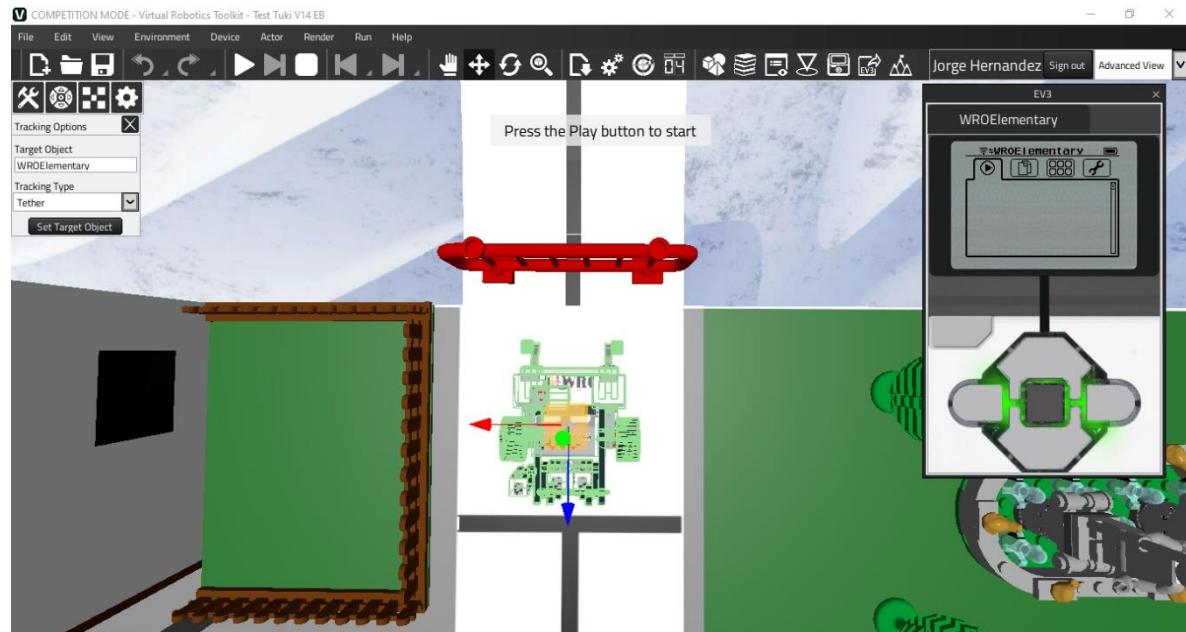
3) Select the robot and use Top Camera.



4) Use “Tether” Tracking type.

The robot must be selected and then click on “Set Target object”.
Change Tracking type to “Tether”.





Top Camera & Tether Tracking type tutorial:

<https://youtu.be/hNvJNMnV9dM>

How to share your video to us?

The participant needs to click on the link and fill the form.

Please be aware of your email, because in case there's a problem with your video or your results, we will contact you.

Forms will be available near the competition.

*Please be careful, the form is specific for this category