WRO 2012
Regular Category

Senior High School
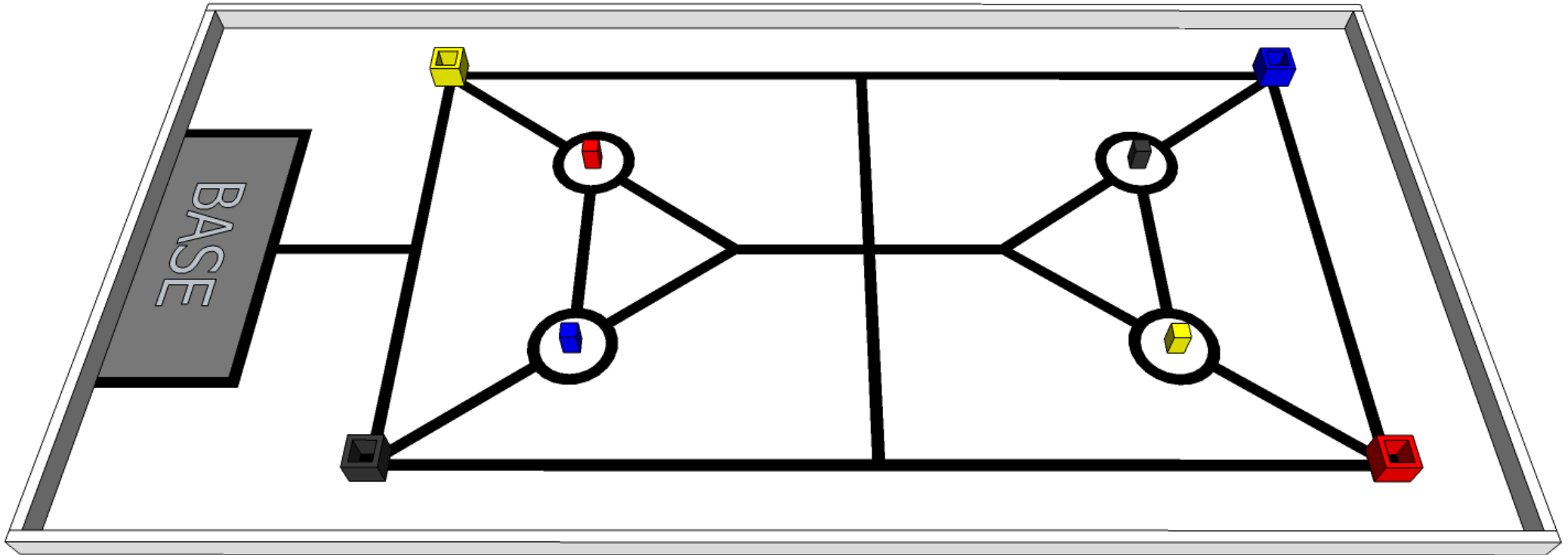
Game description, rules, scoring, & scenarios.

ROBOT VAN GOGH
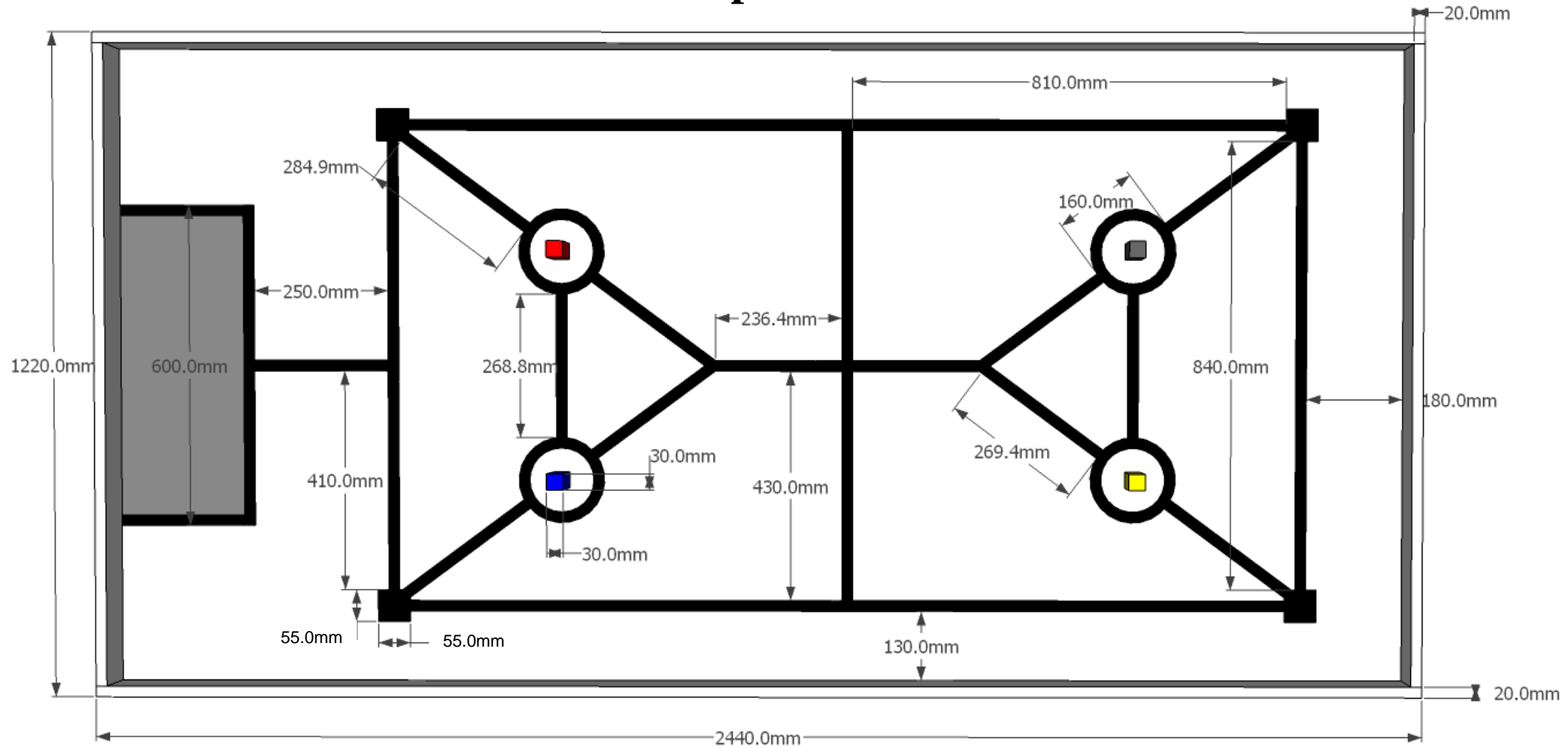
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Game Table in 3D

* Hollow cubes are randomly placed.

Table Specification I

Error: ± 50.0mm

Table Specification II

Pole Circle

Object Area

Pole

Hollow Cube

50.0mm

BASE

Error: ± 50.0mm

WRO™
World Robot Olympiad

Table Specification III

Hollow Cube
(20 x LEGO Technic 1x6 Bricks)

Table Specification IV

1. The size of the game table is 2440mm x 1220mm.

2. The size of the base area is 600mm x 250mm.

3. The diameter of the pole circle is 160mm.

4. The size of the object area (where hollow cubes are placed) is 55mm(l) x55mm(w).

5. The width of the black lines is 20mm.

6. For challenge objects, 4 hollow cubes will be used. The hollow cubes will be constructed from LEGO Technic 1x6 bricks. Each cube will require 20 bricks.

7. The size of the poles is 30mm(l) x 30mm(w) x 50mm(h). They will be made out of wood and screwed tight to the table.

Game Description

The name of this year's senior high school regular category challenge is "Robot Van Gogh".

This year's theme, "Robots Connecting People" encourages you to build robots that can fit in with human society. In order to achieve that, you must first explore and understand human nature.

Colours have always been a part of humankind. We use them to identify things, celebrate festivals, and create beautiful artworks. Colours elicit emotional responses, and people use them to express themselves. Red often means love and other strong emotions, yellow means bright and positive, while blue means trustworthy and confident. Colours are also a celebration of life, and in many countries particular colours are sometimes used to identify with their culture. For example, the colour yellow is identified with royalty in Malaysia!

This year's senior high school game invites you to celebrate the spirit of robotics, WRO style! Build a robot to "paint" the poles on the game table in their respective colours by slotting the hollow cube of the same colour onto them in the fastest time possible!

This document is accurate as of 25th October 2012. Downloaded at www.wro2012.org.
Prepared by Sasbadi Sdn. Bhd., head of technical organizing committee, WRO 2012 Malaysia.
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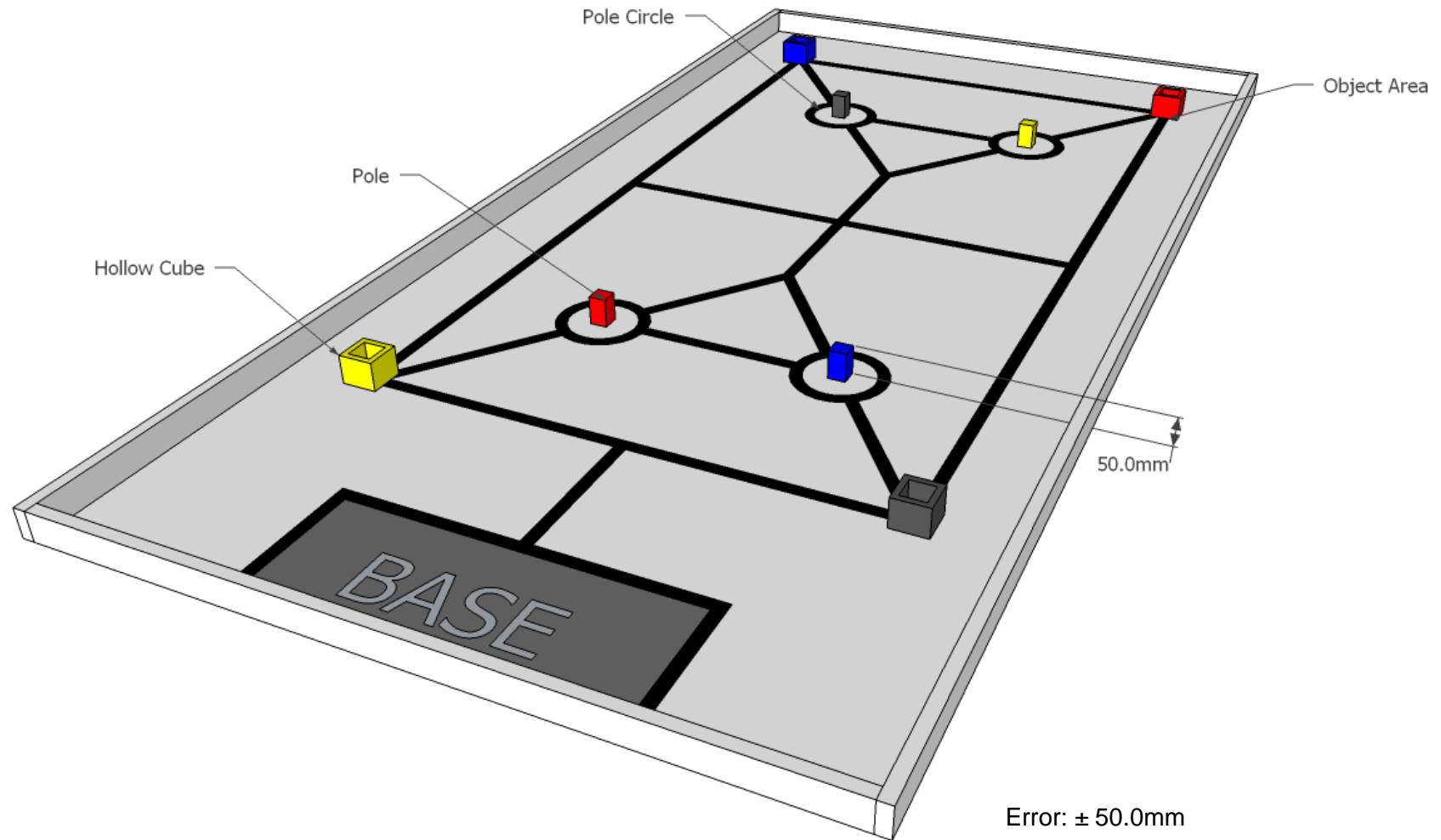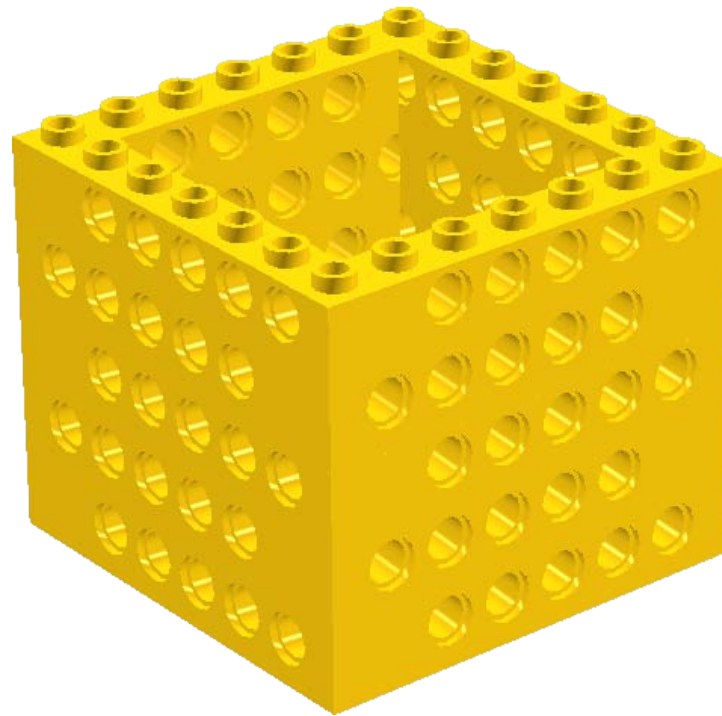
Rules & Regulations

1. All participants must be seated at their designated competition areas for check time prior to assembly time (refer General Rules 2012). Only participants are allowed in the competition areas from this point forward.

2. The competition format for this challenge is:
    a. 3 qualifying rounds (best score taken).
    b. Quarterfinals (1 round).
    c. Semifinals (1 round).
    d. Finals (1 round).

3. Assembly time for this challenge is 150 minutes and will occur before qualifying round 1.

4. Maintenance time for each subsequent round is as follows:
    a. For qualifying round 2, 45 minutes.
    b. For qualifying round 3, 30 minutes.
    c. For quarterfinals round, 15 minutes.
    d. For semifinals round, 15 minutes.
    e. For finals round, 10 minutes.

5. The time given for the robot to complete the challenge is 2 minutes. Time begins at the point when the judge gives the signal to start.

6. The robot must be placed in the Base area with the NXT/RCX brick switched off. Once physical adjustments have been made to the satisfaction of the participants, the judge will give the signal for the NXT/RCX brick to be switched on and a program to be selected (but not run). In the event where running a program immediately sets the robot in motion, wait for the judges's signal to start before running the program.

7. In the event where running a program *does not* immediately set the robot in motion, participants are allowed to run their program before the judges's signal to start, but no further human inputs are allowed after that. The only exception to this rule is when sensors are used to set the robot in motion, but even so participants are limited to just one interaction only.Judges must witness all of this, and upon his or her satisfaction, the signal to start will then be given.

8. The maximum dimensions of the robot before it starts must not be more than 250mm x 250mm x 250mm. After it starts, the dimensions of the robot are not restricted.

9. The robot must start in the Base area. Any part of the robot is not allowed to exceed the Base area before it starts.

10. The robot's mission is to travel around the game table, collect the hollow cubes, and slot them onto the respective poles by matching colours.There are 4 coloured hollow cubes in total:
    a. 1 red hollow cube.
    b. 1 blue hollow cube.
    c. 1 black hollow cube.
    d. 1 yellow hollow cube.

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11. The positions of the 4 hollow cubes will be randomly decided at the start of each round (post-quarantine), and will be placed in the 4 object areas located at the corners of the largest rectangle on the game table (see pages 4 and 5). The positions of the hollow cubes will be fixed for all participants in that particular round.

12. The position and colours of the pole are fixed as per table specifications I and II (see pages 4 and 5).

13. In the event of any ambiguity, note that the judge will pass the final verdict and will decide in the negative (i.e. the worst outcome available) according to the context of the situation.

14. Your attempt and time will end if:
    a. Robot is touched by any team member after it has been set in motion.
    b. Challenge time (2 minutes) has ended.
    c. All 4 hollow cubes have been slotted onto their respective poles.
    d. Violation of the rules and regulations herein.

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Scoring

1. Score will only be calculated at the end of the challenge or when time stops.

2. Each hollow cube *completely* slotted onto the right coloured pole = 50 points.

3. Each hollow cube *not completely slotted* but placed inside the pole circle surrounding the right coloured pole = 20 points.

4. Each hollow cube slotted onto the *wrong* coloured pole = 0 points.

5. Each hollow cube placed inside the pole circle surrounding the *wrong* coloured pole = 0 points.

6. Maximum score = 200 points (4 hollow cubes completely slotted onto their right coloured poles x 50 points).

7. If teams acquire the same score, ranking is decided by the fastest time recorded.

Scenarios

Q. In scoring rules number 3 and 5, how do you define "placed inside the pole circle"?

A. As long as any part of the hollow cube intersects any part of the white area encircled by the black line surrounding the pole, they are considered to be inside the pole circle. This applies even if they intersect at the boundary of the white area and the inner edge of the black line. Also, a hollow cube brought into contact with the pole in any manner automatically qualifies as being "placed inside the pole circle".

Q. Does that mean that in scoring rule 3, I will still get the 20 points if a cube is not slotted onto a pole but is placed on top of the pole instead (e.g. the cube is placed on its side on top of the pole)?

A. Yes, you will.

Q. Do I have to slot the cubes right side up, that is with their studs facing upwards, onto the poles to score any points?

A. No, you do not. As long as the cubes are slotted onto the pole you will score points regardless if the studs are facing upwards or downwards.

Q. Are the black lines printed or taped on?

A. All black lines are printed.

Q. For the last hollow cube, will I still score points if it was placed onto the right coloured pole with the robot still carrying it?

A. In order to score the full 50 points, all hollow cubes must be placed completely onto the right coloured pole and <u>touching the mat fully</u> at the end of your attempt, regardless if the robot is still carrying them or not. Otherwise, you will only score 20 points (counted as placed inside the pole circle). In the event where ambiguity arises, note that the judge will decide in the negative (i.e. the worst outcome available) according to the context of the situation.

Q. How do you treat parts that are detached from the robot?

A. Parts that are detached from the robot will no longer be considered to be a part of the robot.

Q. Can you give an example to illustrate what "the worst outcome available" means in Rules & Regulations point number 13?

A. Sure. An example would be whether a hollow cube has been placed "inside" the pole circle. If after a fair assessment of the situation, participants and judge(s) still cannot agree whether a hollow cube has been placed "inside" the pole circle (perhaps the edge of the hollow cube is extremely close to the outside border of the pole circle), the judge(s) will rule that the hollow cube <u>has not</u> been placed "inside" the pole circle and the team will not get the 20 points.

Q. [NEW] May I use any construction (which is not attached to robot) to assist my robot's movement?

A. No. It is because the construction is not considered as an integrated part of the robot. Hence, any construction that is not attached to the robot must be removed from the playing field before the judge's signal to start.

----- Please direct any questions you may have to jasontee@sasbadi.com -----

----- Thank you -----