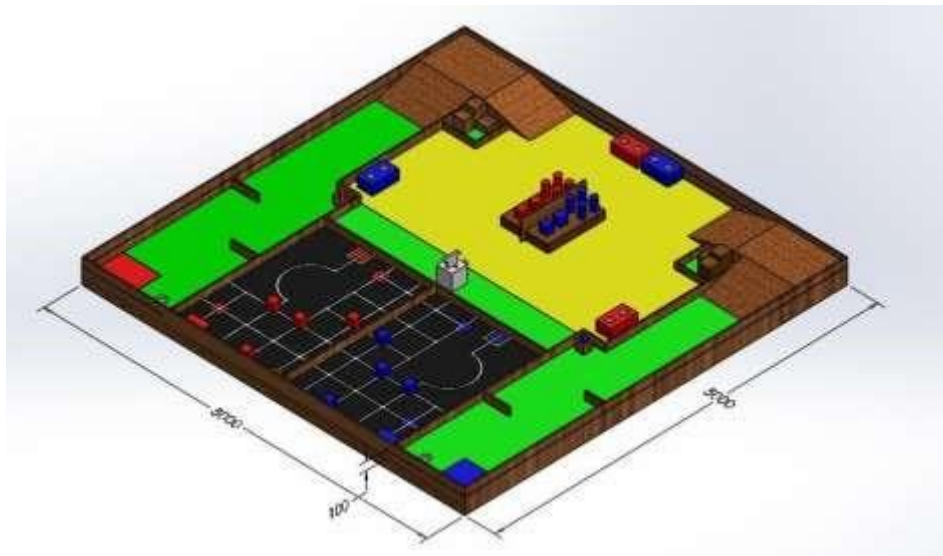


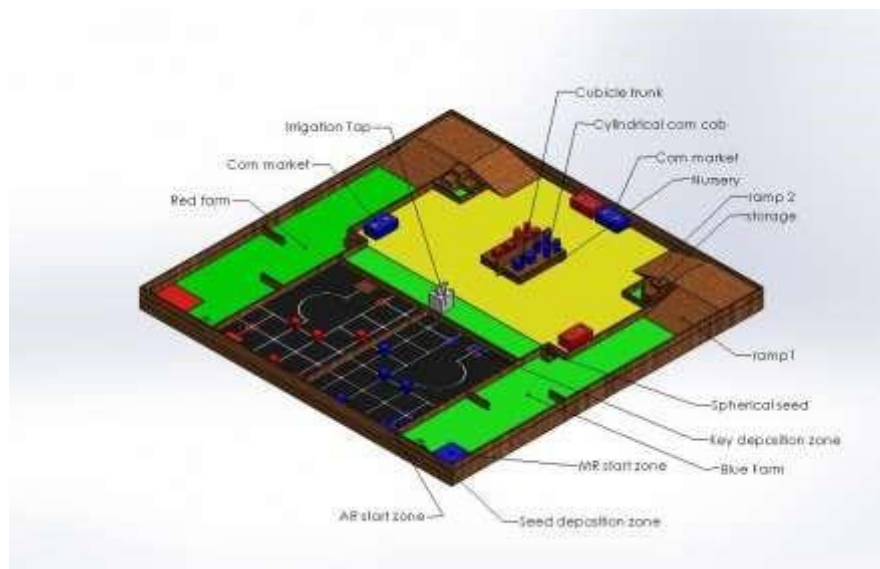
# DOGFIGHT

## **THEME:** PLANTATIONS

This year Mindspark is all about going green and being energy efficient. Robotics has been and will always play a part of green expedition. This year Dog Fight is about being a part of a plantation.



## **Gamefield:**



**Terms and Conditions:**

**MR: Manual Robot.** The robot can be controlled by wired or wireless remote control.

**AR: Autonomous Robot.** The robot should be Autonomous, so that it can perform its tasks on its own after once started. **MR Zone:** Area where MR is allowed to run. It's the area surrounding the gridlines.

**AR Zone:** Area where AR can perform its tasks. It's the area with white gridlines on black surface.

**Red farm:** The Red area zone denotes the farm and playing arena of Red team. The MR and AR of Red team is allowed to work in that zone. It has to pick and place Red objects.

**Blue farm:** The Blue area zone denotes the farm and playing arena of Blue team. The MR and AR of Blue team is allowed to work in that zone. It has to pick and place Blue objects.

**Yellow coloured zone:** Common manual zone. MR of both teams are allowed to move in that area.

**Seed:** It is a spherical object placed in the farm zone. Its material is plastic and has a 64 mm diameter.

**Nursery:** The area in the MR zone it contains various types of vegetables and plants (objects).

**Corn:** The cylindrical-shaped objects in MR zone has to be picked by MR. They are to be picked and placed in the corn market. The material is thermocol. The cylindrical objects denote Corn cobs. It has a diameter of 80 mm (approx.

3inch) and height of 150 mm.

**Market:** The MR has to pick and deposit the corn cobs from the nursery to the market.

**Cubical trunk:** The cubical boxes in the MR zone which are placed in the nursery. They have to be picked and deposited in the storage placed near the ramp. The size of object is **100\*100\*100mm**.

**Key Cubical Trunk:** The cubical box to be will be placed by the AR at the specified checkpoint.

**Storage:** The area in the MR zone where the trunks have to be placed. These are at different heights and is surrounded by a wall. Cubical objects will have to be picked and deposited here. Two of the objects are placed in the nursery and key object (trunk) will be received from the AR zone.

**Irrigation Tap:** It is the object in the MR zone. The object consists of 2 parts.

The removable part the tap, the 'knob' has to be removed upwards turned perpendicularly and placed back within the tap.

## **MR TASK**

**Task 1:** MR has to pick the seed (spherical object) and plant it in the hole near the wall. **Task 1 is compulsory, AR cannot start unless task 1 is completed.**

**Task 2:** MR can proceed to pick up the objects. Sequence can be decided by the team. After crossing the mountain (ramp) MR has to go towards the nursery to pick the objects, after which MR will have two options of which both are mandatory.

- There are 4 cylindrical corn cobs, Two have to be deposited within the specific team farm near the wall while the other two will have to be deposited in the opposite team farm.
- The cubical trunks will have to be deposited in the storage zone near the ramp. The Key trunk which will be placed by the AR at the checkpoint. The MR will have to pick the key object from this checkpoint.

**Task 3:** Here MR has to move towards the irrigation tap. The MR is expected to pick the removable part the tap, the 'knob', remove it upwards turn it perpendicularly and place it back within the tap. **MR can move to Task 3 only after completing Task 2.**

## **Miscellaneous:**

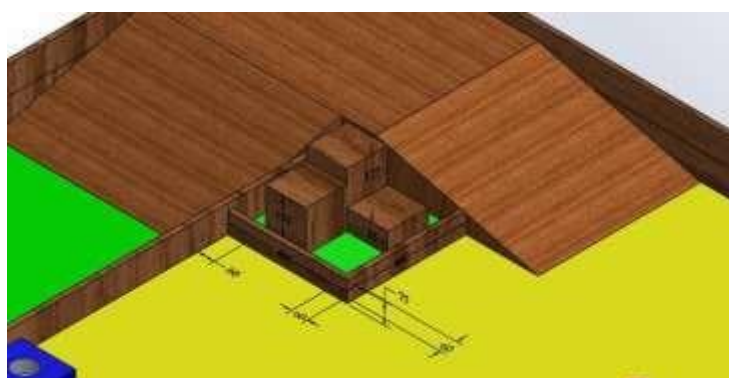
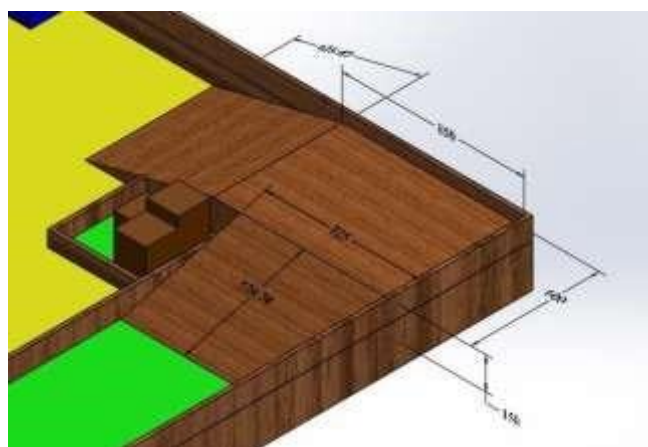
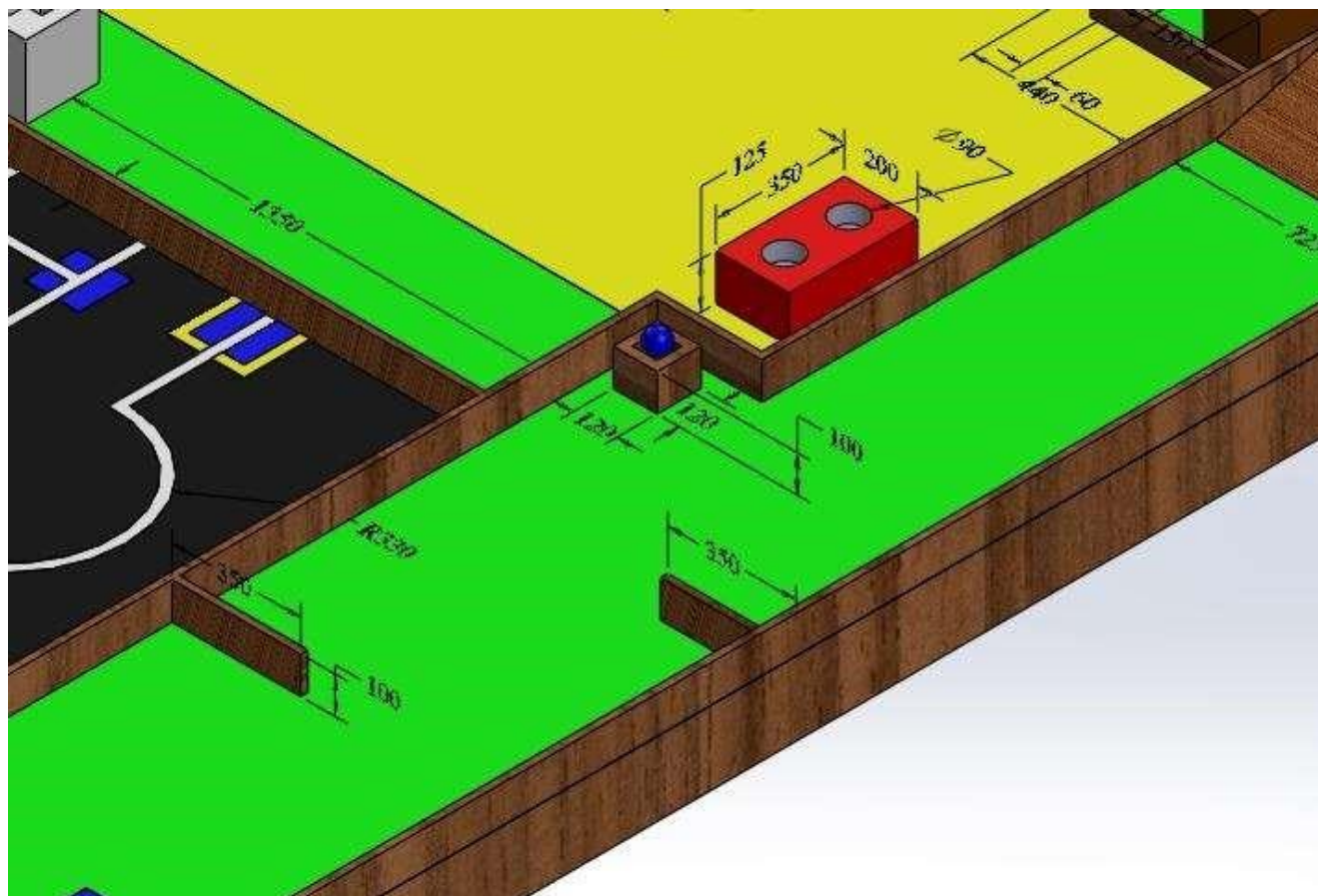
- Task 1 is compulsory
- MR can choose amongst the different types of objects to pick from the nursery.
- MR cannot pick the key block unless it is placed at the checkpoint.
- MR also cannot move to tap unless all the other objects are placed and approved.

## **AR TASK:**

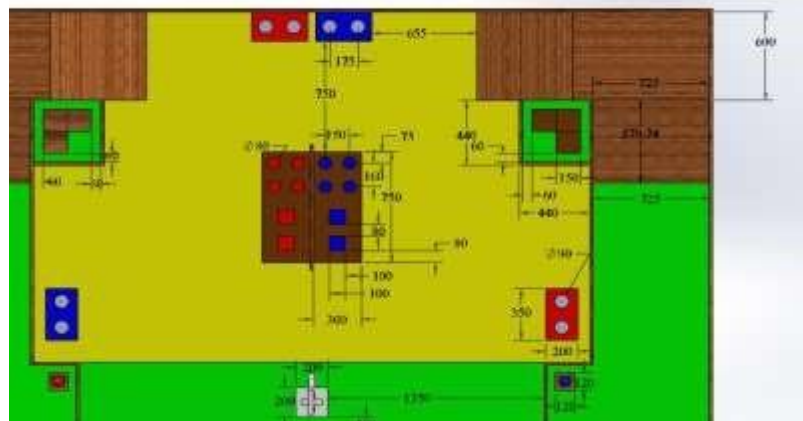
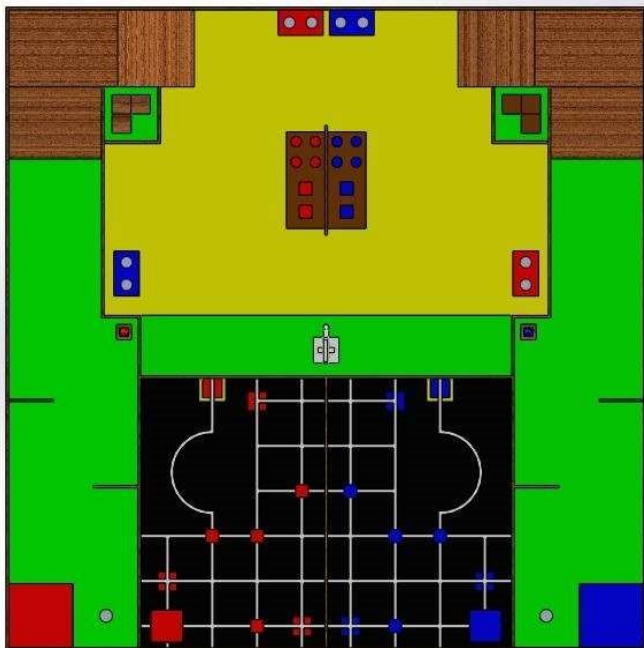
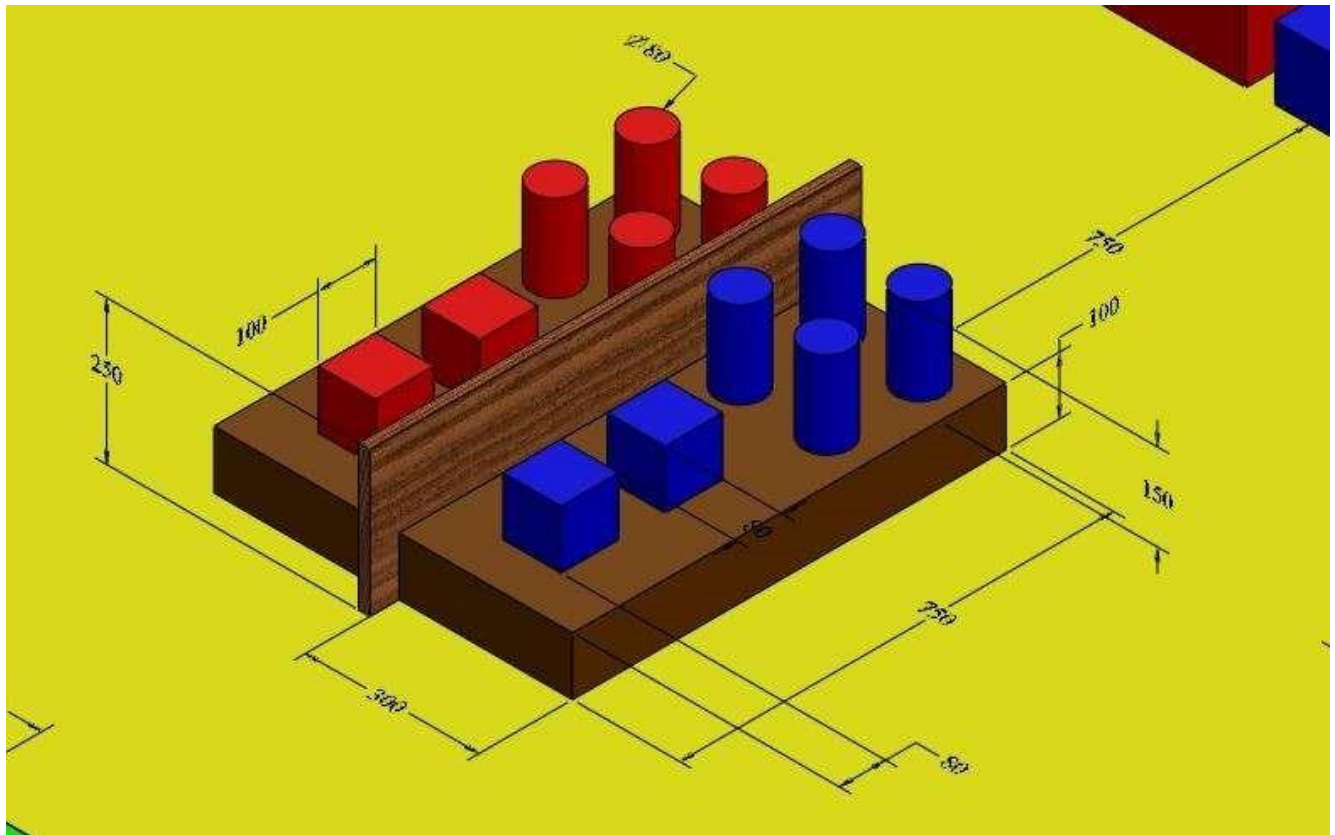
**Task 1:** AR has to deposit any three cubical objects to the deposition zone. **Task 2:** AR has to deposit the remaining block, crossing the semicircle, into the key deposition zone.

Points will be awarded only when the AR properly deposits the block to the key deposition zone.

**MR ZONE:**

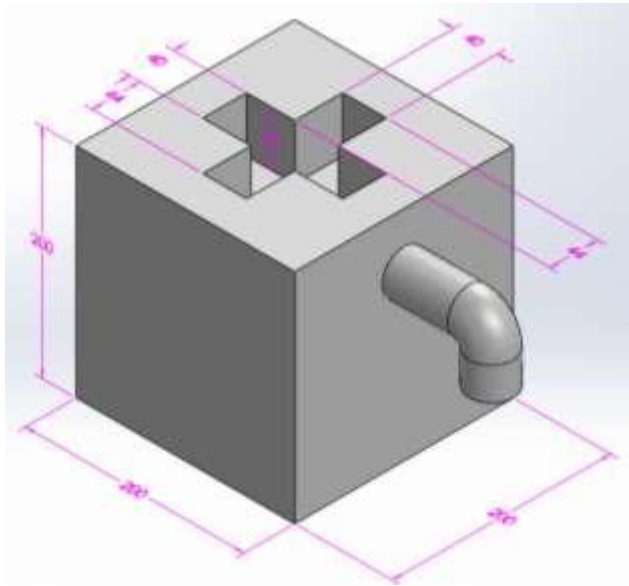


**NURSERY:**

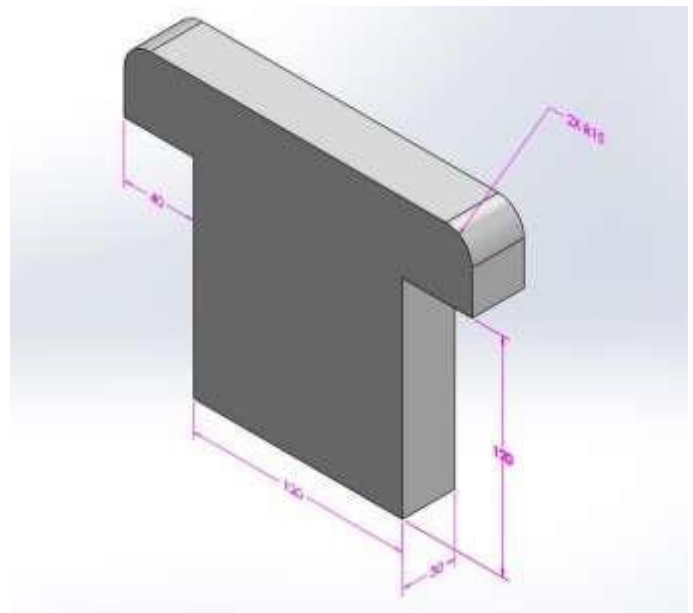




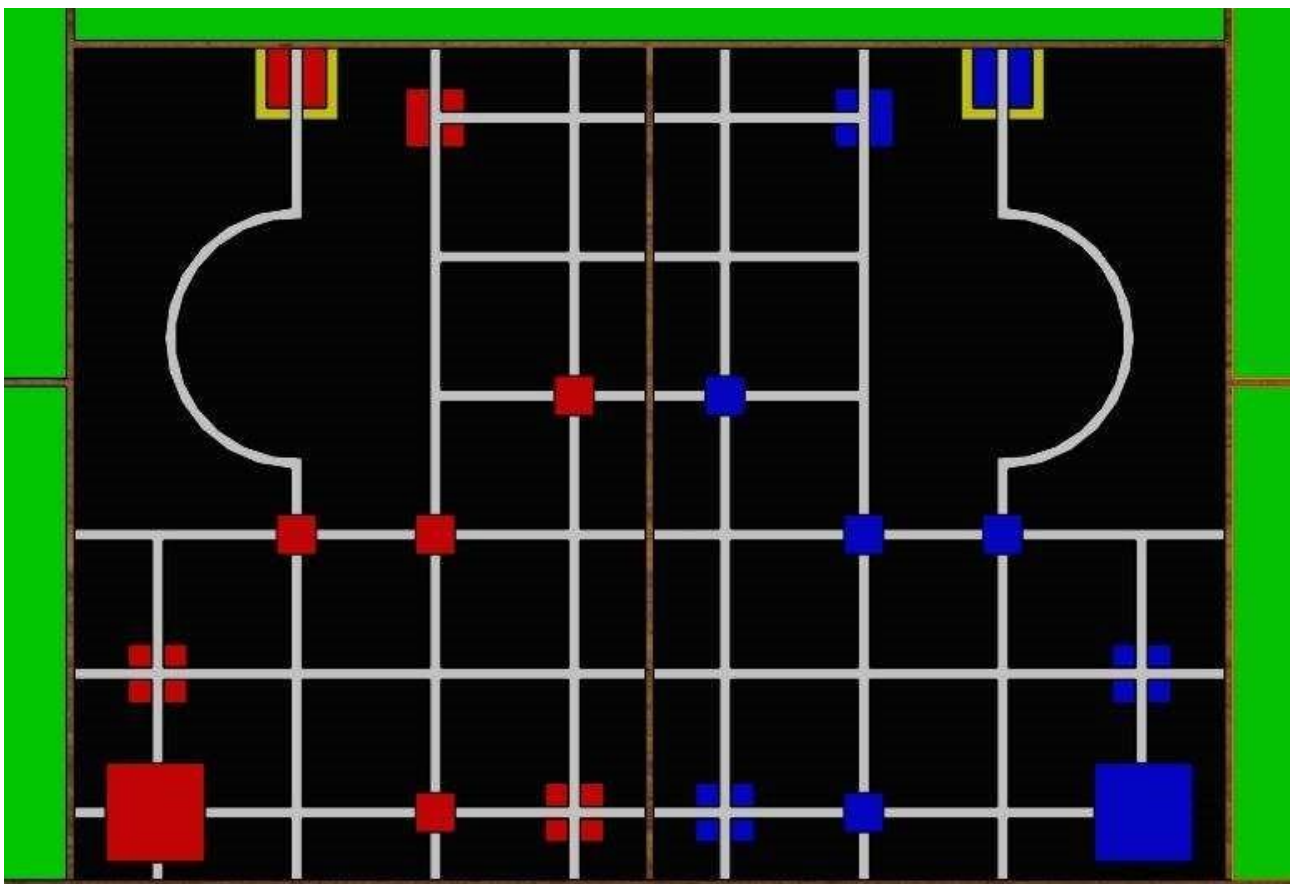
**Tap:**

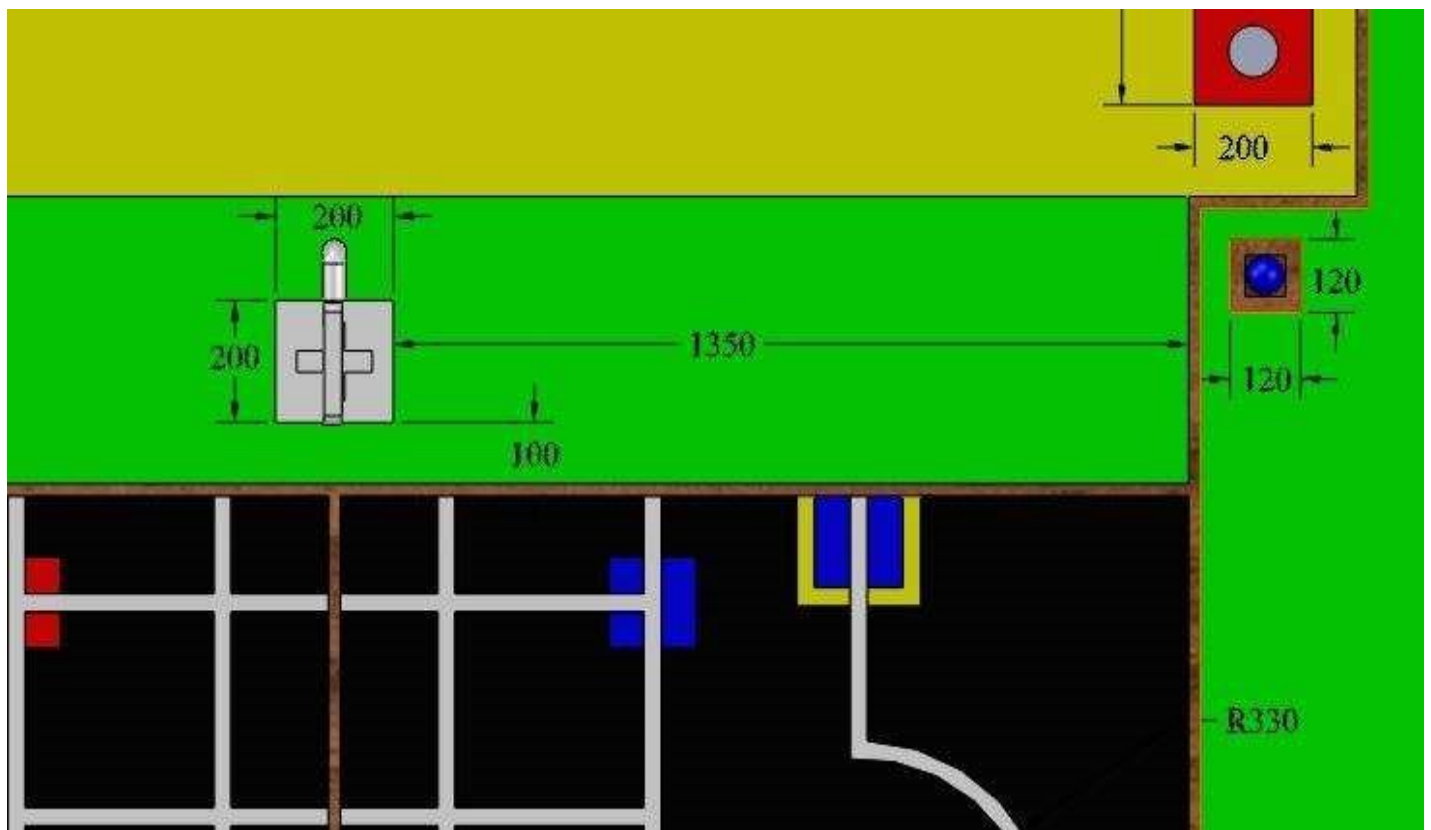
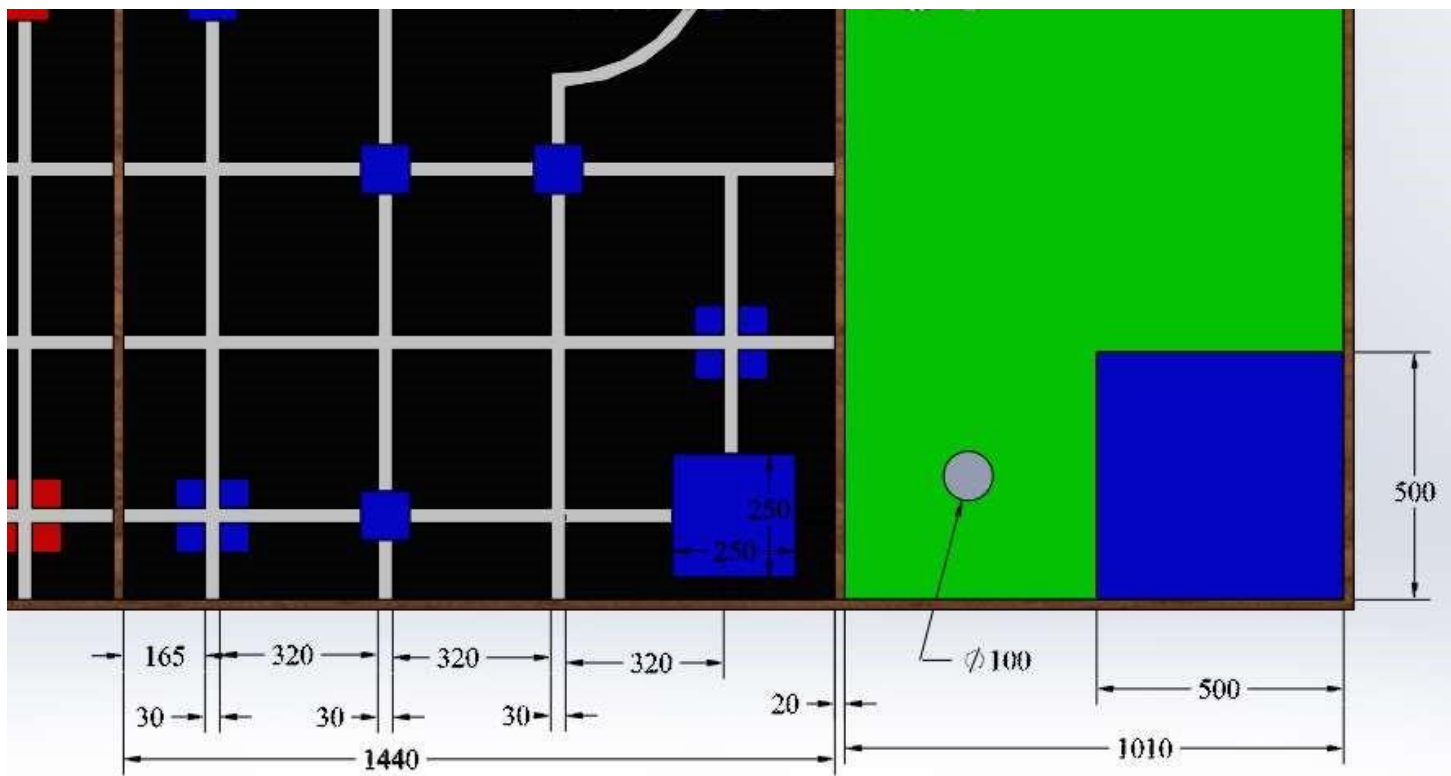


**Knob:**



**AR ZONE:**



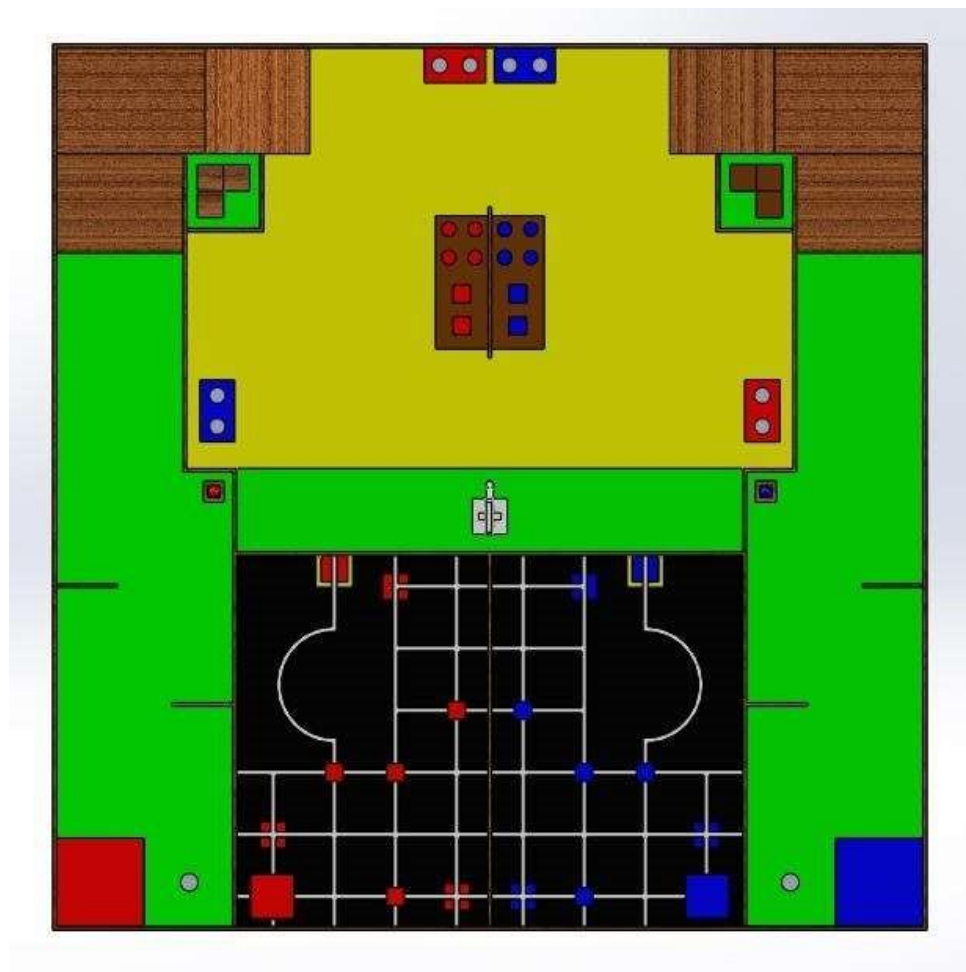


### THEME:

- Total game field is of the size 5000x5000 mm.
- Game field is surrounded by walls of 20 mm thick and 200 mm height.
- Arena is symmetrically divided into two ideal parts, Blue and Red except the

common area in MR zone.

- In each part there is a MR zone and an AR zone.
- MR of both teams are allowed in yellow coloured zone.



### Objects in the arena

Object	Material	Weight
Spherical Seed	Plastic	30 gm
Cylindrical Corn Cobs	Thermocol	150 gm
Cubical Trunks	Thermocol	200 gm
Knob of Tap	Thermocol	

### Miscellaneous:

- All objects & arena parts will be coated with vinyl sheets having respective colours.



- Internal wall will have thickness 20mm.
- Thickness of all the walls subject to change without any prior notice.
- Colour shades of the arena and the objects subject to vary within acceptable limits.
- The dimensions of static objects in the Arena may change subject to manufacturing difficulties.

**5% bidirectional** tolerance applicable to all the static objects in the arena.

- Any change in the arena will be informed to participants and will be highlighted on website.

### **MACHINE SPECIFICATIONS:**

- Only one MR and one AR is allowed. The Robot can't separate into two connected by just a wire.
- The combined weight of the MR and AR (including batteries & Pneumatic reservoirs) should NOT exceed 15 kg.
- The MR should fit in the box of 500\*500\*500mm. It should fit in the MR Start zone at the beginning of the game.
- AR dimensions should not be more than 250\*250mm. Use of Automatic Robots is not mandatory for task (only MR can participate). No restriction on height of AR. Robot may change during the course of the game.
- The MR can use on-board power supply or external power supply. -
- AR must use onboard power supply only.
- Participants will be provided with a 230 V AC power source and a standard 32V variable/2A DC power supply. Cost of any damage done will have to be borne by the participants. The voltage at any point on any of the robot should not exceed 24V DC. Participants can also bring their own power supply in this case maximum current and voltage limit are 5 ampere and 24 volts respectively. The voltage and current should not exceed this limit.

• Pressure of the pressurized non -inflammable gases in the Pneumatic Reservoir should not exceed **5 bar** at any stage of the match.

- The storage tank and pressure regulators used by teams need to be certified and teams using pneumatics are required to produce the Safety and Security letters at the Registration Desk at the venue. Failing to do so will lead to direct disqualification.

- Participants must be able to indicate the used pressure with integrated or

temporarily fitted pressure gauge. Also there should be provision to check the cylinder pressure on the bot.

- You must have a safe way of refilling the system and determining the on board pressure.
- All pneumatic components on board a robot must be securely mounted. Care must be taken while mounting the pressure vessel and armour to ensure that if ruptured it will not escape the robot.
- The control for the machines can be wired or wireless. There can be only one Manual Operator for the MR & only one Autonomous operator for the AR in a particular match. In case of Wireless Controls, the participants are requested to use dual channel remotes so that there are no issues of interference during the event. The remote control and wires will not be included in the machine sizes.
- The minimum length of wire extending from the robot up to remote should be 4 meter. The wire should always be in slacked condition.

## **RULES:**

### **Scoring System:**

#### **MR**

<b>TASK</b>	<b>POINTS</b>
Deposition of Spherical object seed	15
Deposition of Cylindrical object cob	15
Deposition of Key Cubical block trunk	30
Deposition of Cubical box	15
Placement of Tap in correct position	55
Score : $15 + (15 \times 4) + 30 + (15 \times 2) + 55 = 200$	

## AR

TASK	POINTS
Deposition of cubical object to the deposition point	20
Deposition of cubical object to the KEY deposition block	40
Bonus 50 points will be awarded for AR (completing the task) depositing all the boxes to the deposition zones in the first trial	
<b>Score : <math>20 \times 3 + 40 + (50) = 100 + (50) = 150</math></b>	

### Miscellaneous:

- Points will be awarded only if object is deposited correctly i.e. it is fully within respective zone and not in contact with any part of the robot.
- Objects deposited after the allotted time limit will not be given any points.
- Points will be awarded with clear indication from judges.

### Match Result:

- Match will end if a single team completes following tasks:
- MR places knob in the Tap (holder).
- Team completing all the above tasks will be declared winner of the match.
- If both teams fail to complete above tasks in 4 minutes, then the match result will be decided on the basis of points scored by the teams.
- Team scoring maximum points will be declared winner of the match in such case.
- In case of clash at the Tap zone, both the MR will start at their respective start zone.
- In case of Tie, preferences will be as follows
  - No. of Boxes deposited by the AR.
  - No. of objects deposited by MR.
  - Rematch.

**Violations:** • At any time, if the wire is seen to be pulling the robot, it will be considered as violation.

- Any part of the robot extending out of arena will lead to violation (not including aerial zone)

- Hand touch without prior permission will cause violation.
- Any part of MR extending in AR zone (Except while depositing Key Block)

and any part of AR in MR zone will be considered as violation.

- MR entering the opponent city zone without first depositing all the waste objects of its city zone.

- MR of one team touching MR of another team will be considered as violation (except when in the Yellow Zone).

- MR running in opponent's area beyond yellow zone will be violation.

Every violation will cost the team '-5' points. Five points will be deducted for every violation.

### **Restart Rules:**

- For both robots unlimited number of retry will be allowed.
- The operators will first have to ask the judges for a hand touch/restart and

take the hand-touch/restart only when allowed. The M.R. will have to restart from its start zone after hand touch. A.R. will have to restart from its start zone after hand touch.

- The orientation of the robot after the hand touch will be decided by the

judges.

The timer will continue to run in this period and the other team will continue.

**General Rules:** • If the machine is stuck or rendered immobile and cannot proceed further on

its own, the hand touch will be allowed. If both the robots are stuck, then hand touch is allowed only when both the manual operators want to take hand touch.

MR can pick the block in the key deposition zone only after AR deposits a block in the key deposition zone and is approved.

- In case, the wires of the Manual Robots of both the teams getting entangled with each other, the judges will call for a time-out in the game. The Manual Robots will be restarted from the same position after the wires have been sorted out and the autonomous robot will continue its work till it calls for retry but retry will not be given till the wires of manual robots have been sorted out.

- At each hand -touch, all the objects in touch with the robot of that team (except for the ones already deposited) will be returned to their original positions.
- Objects, Knob will be placed in original position after retry if they were wrongly placed.
  - Any part of MR is not allowed to enter in AR zone (the zone having grid in arena) except while transferring Key Block. Any attempt to enter the zone or touch or damage an autonomous robot deliberately will lead to disqualification of the team.
  - Maximum Five violations are allowed, any violations after that would lead to disqualification.
- Any team that is not ready at the specified time will be disqualified from the competition.
- The robot will be checked for its safety before the match and will be discarded if found unsafe for other participants, spectators or arena.
- The name of your robot must be prominently displayed on the robot.
- Operators can't step on arena unless permitted by judges.
- MR operator has to operate from outside the arena.
- AR operator must wear socks.
- Judges' decision shall be treated as final and binding to all.
- The organizers reserve the rights to change any or all of the above rules as they deem fit.
- Change in rules, if any, will be highlighted on the website.

**Readymade Robots are not allowed, but readymade sensors kits are allowed. Safety Rules:**

- Use of fire, water, spraying chemicals is not allowed. This would lead to immediate disqualification of the team.
- The robot can block the opponent's robot only by pushing/pulling or lifting the opponent's robot. However, the robot is not allowed to destroy the opponent's robot.
- NO mechanism should be used to attack the opponent's robot or cause any harm to the opponent's robot or its wires or to the arena. Doing so will lead to disqualification. The judges' decision in this matter will be final and binding.
- Participants can expect that their robots may be pushed or lifted and hence should be balanced enough to bear the fall.
- Jamming of RF control signals is NOT allowed. Teams MUST inform the



judges about the RF signals involved in its robot during the Registration of the robot and before the start of the game.

- No deliberate damage must be done to the arena. The mechanism to carry objects should NOT damage them and any part of the Arena. Any damage caused after prior warning has been given will lead to disqualification.
- Decision of Mind Spark team will be considered as final in case of any dispute.

## **COMPETITION STRUCTURE:**

### **Elimination Round:**

- Each team will be given total time of 4 minutes. Only one team will play at a time. They have to complete the task & score maximum points during this round.
- Teams will be ranked according to following preferences:
- Task completion.
- Scores in the elimination round.
- The top 16 teams will qualify for the next round.
- The score of the team from the elimination round will not be considered in the next round.

### **Knock-Out Round:**

The knock-out round will start with top 16 teams. Each match will last for maximum 4 minutes.

## **TEAM AND FEE STRUCTURE:**

Team size : Maximum 5 participants per team.

Registration Fee : ₹250 per team.

- A team, once registered, cannot register again, even with a different name.
- A team may consist of a maximum of 5 members.
- All students with a valid identity card of their respective educational institutes are eligible to participate.

Teams will be required to show the I-Cards of all of its team members during the matches.

- A team may consist of members from different educational institutes.

## **EVENT HEADS:**

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MindSpark'16

Event Book

