

CODEAVOUR 8.0

INTERNATIONAL

Track 2 - Clean Energy AI-Robo Challenge

Arena Setup Guide



Energizing the Future Grid
through Innovation

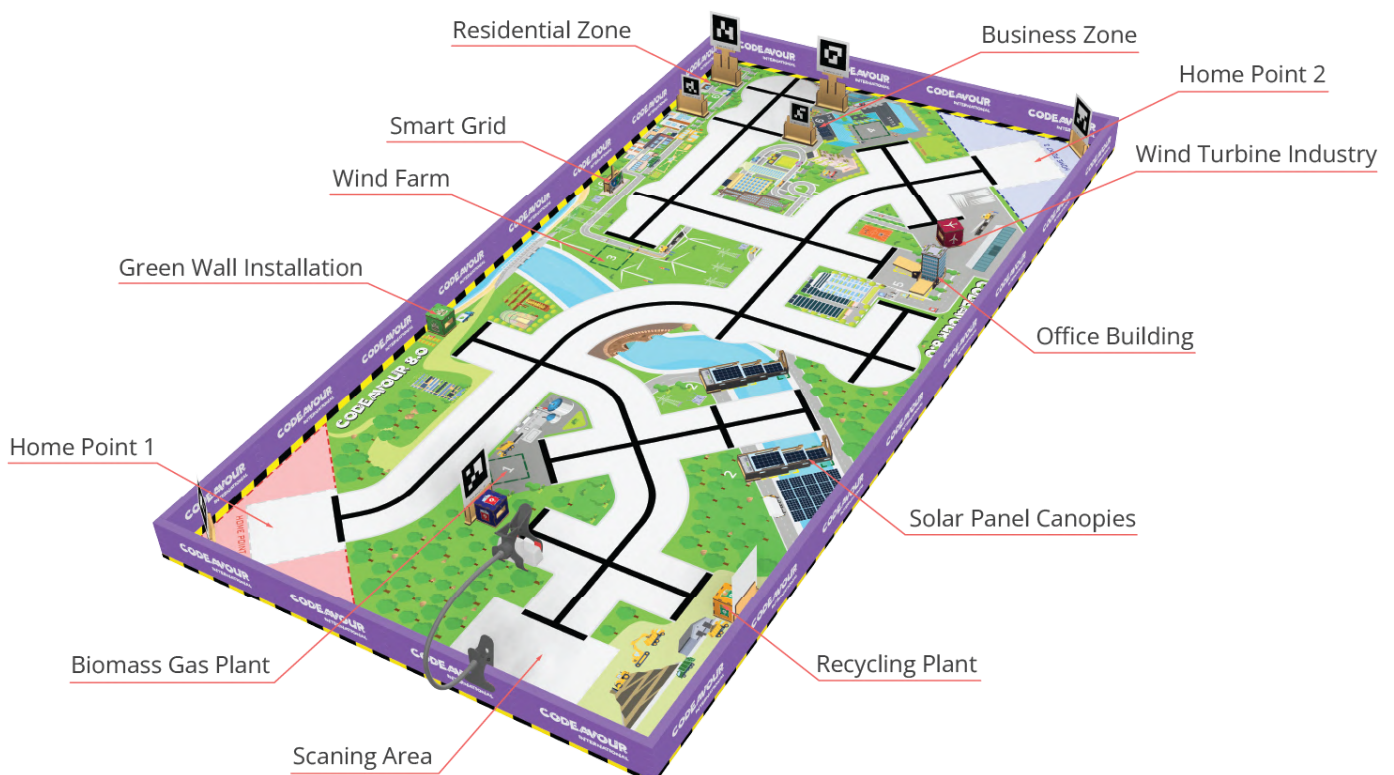
VERSION 1
Date: 25nd August, 2026

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Before You Begin:

1. This assembly guide provides instructions for assembling the arena and serves as a reference guide for the initial positions of game objects.
2. Please refer to the [Codeavour 8.0 Track 2 Rules and Regulations](#) document for game rules.
3. Images are only for representation purposes. Illustrations and actual items may vary slightly.
4. Refer to the component list provided with the Codeavour 8.0 Arena Objects Kit and Arena Fence Kit to identify the parts.
5. If you find the assembly process challenging, please seek assistance from your mentor.
6. All models should be aligned with the markings on the arena.
7. Additional Items Required: A Phillips screwdriver and super glue may be required to secure loose parts during arena assembly.
8. Carefully review the illustrations and instructions before assembling any part.
9. Handle all parts with care.

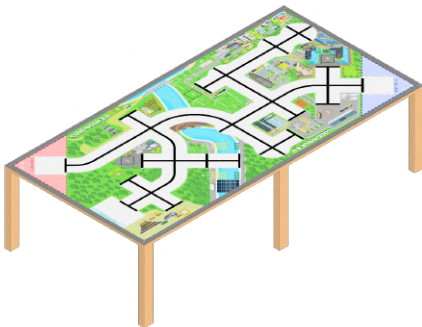
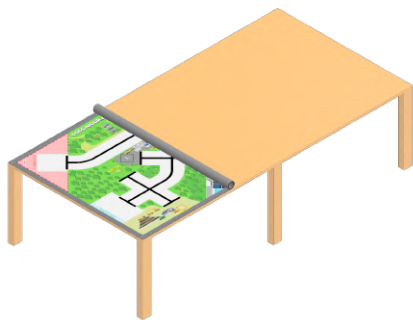


1. Arena Setup:

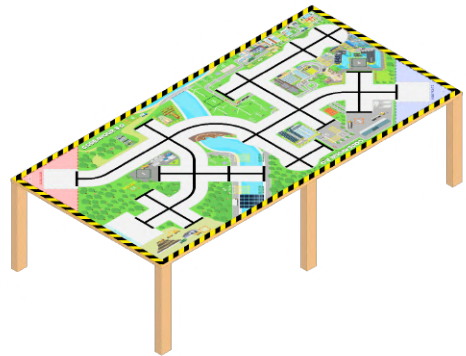
1.1 Arena Setup on the Table

1. Unroll the Printed Arena on an 8x4 feet Table with a smooth, flat surface and align it perfectly in the centre.

Note: Make sure to clean the top surface of the table before placing the arena.

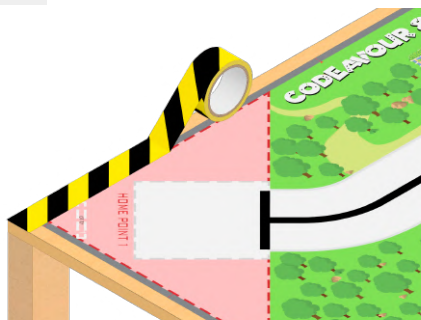


Complete:



2. Fix the arena on the table with the Black and Yellow Tape.

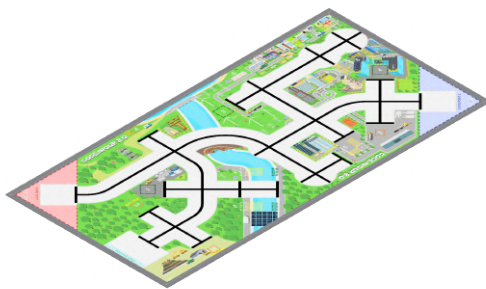
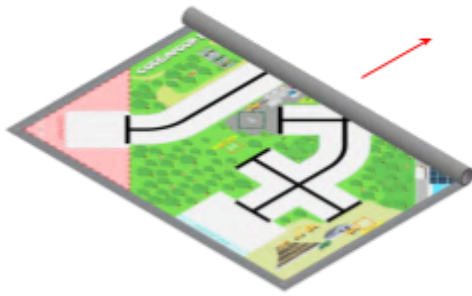
Note: The tape shouldn't cover the area inside the grey edge of the arena.



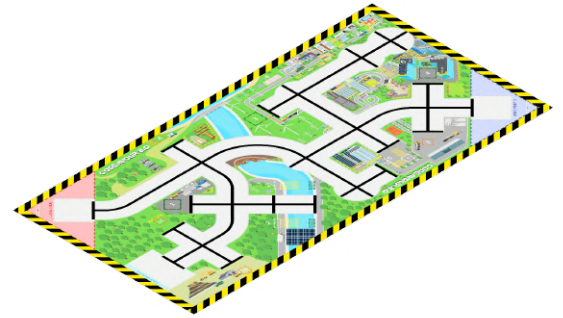
1.2 Arena Setup on the Floor

1. Unroll the Printed Arena flat on a smooth and flat floor.

Note: Make sure to clean the floor before placing the arena on it. Avoid grooves and uneven surfaces on the floor.

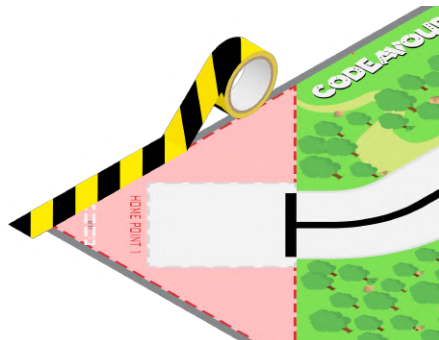


Complete:



2. Fix the arena on the floor by covering the grey edges of the arena with tape.

Note: The tape should be aligned to the inner edge of the grey border of the arena and shouldn't cover graphics of the arena.



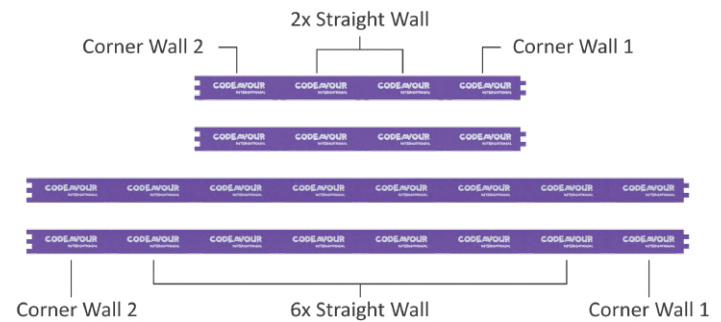
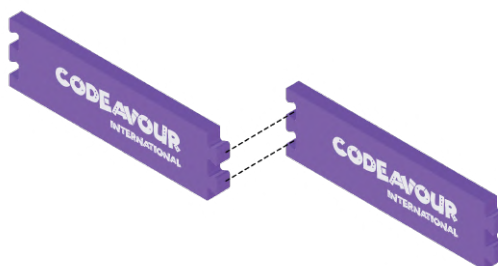
1.3 Wall Assembly

Note: For both on-table and on-floor arena assembly, wall assembly is common.

1. Cut and paste pieces of double-sided tape (about 2 cm in length) to the bottom of each wall piece.



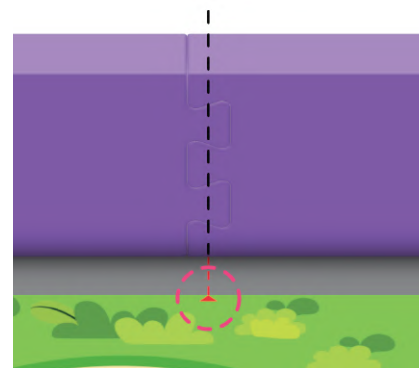
2. Assemble two sets of Straight Walls of x2 and x6 pieces along with Corner Wall 1 and Corner Wall 2.



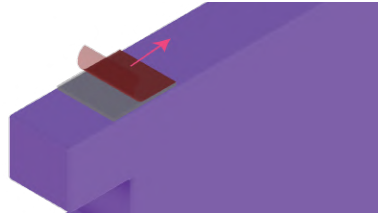
3. Assess how the wall assemblies will align with each other and with the arena.



Note: Straight Wall joints should align with the triangle marks on the arena as shown below.

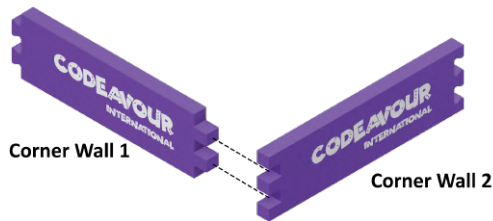


4. Peel off the top of all the double-sided tapes pasted on the walls.

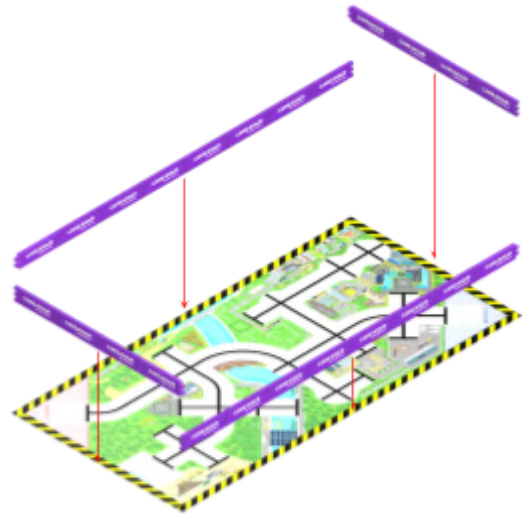


5. Fix the sets of walls with Corner walls on the Arena with care, confirming their marked placement on the Arena and also mending corner wall joints.

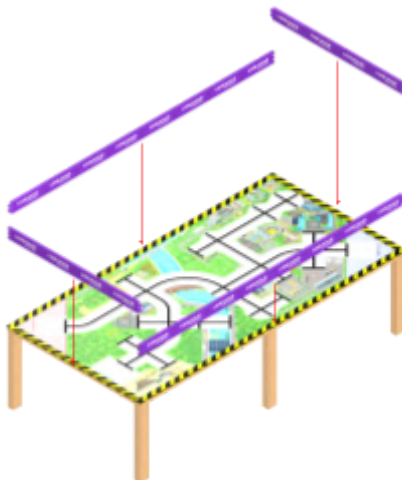
Example of Corner wall fixture:



Wall assembly on-floor arena:

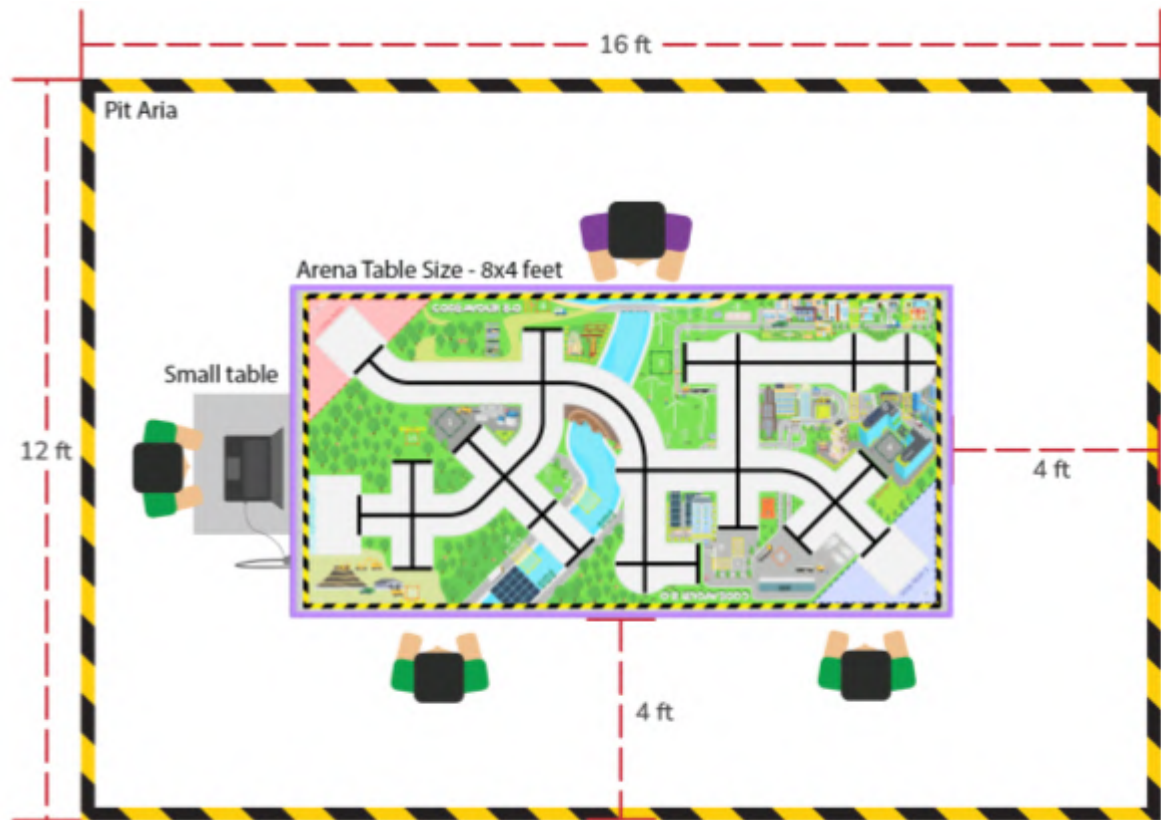


Wall assembly on-table arena:



1.4 Pit Area Marking

1. Apply **Black and Yellow tape** around the arena, leaving exactly **4 feet** from each side.



2. Arena Objects Assembly

2.1 Cubes Assembly

1. For each cube, there are 3 pairs of parts, as shown below:



Top/Bottom Plate x 2



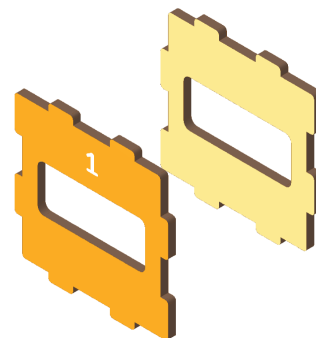
Side Wall x 2



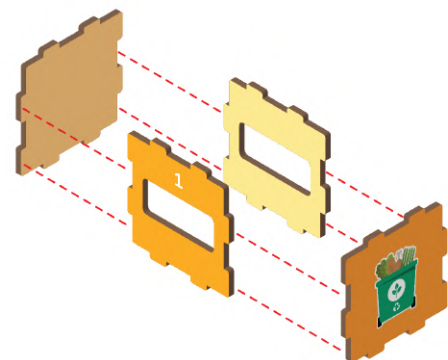
Side Wall with Window x 2

2. Form a square by placing the two **Side Walls with Windows** on opposite sides of each other and two of the **Side Walls** on the other two opposite sides.

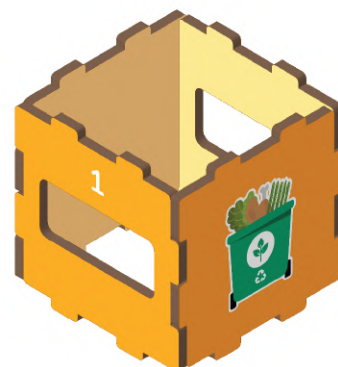
(a)



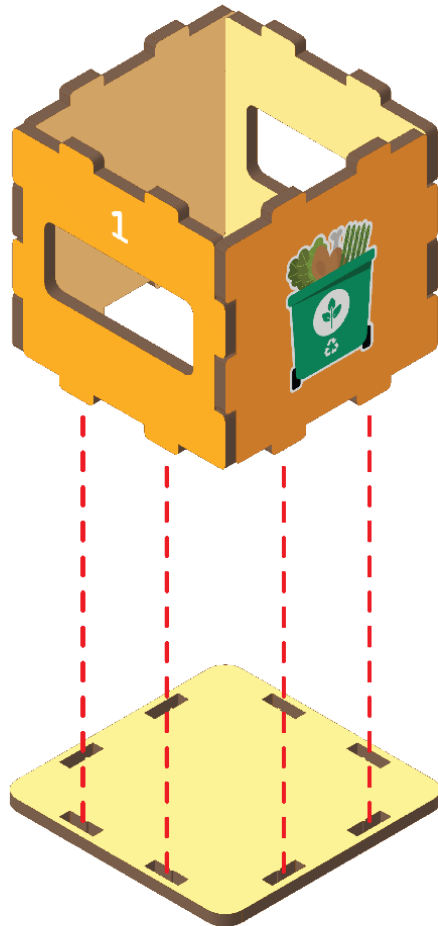
(b)



(c)



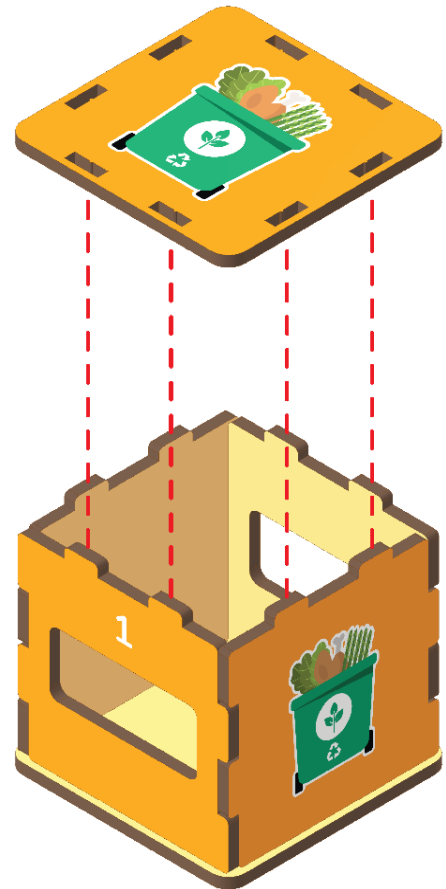
3. Attach the assembled walls to a **Top/Bottom Plate** as shown below.



Assembled View:



4. Attach another **Top/Bottom Plate** to the other end of the cube.



Complete:



5. In the same way, assemble all 6 cubes.



1. Organic Waste



2. Inorganic Waste



3. Number 1 Cube
(Inorganic Waste)



4. Number 2 Cube
(Organic Waste)



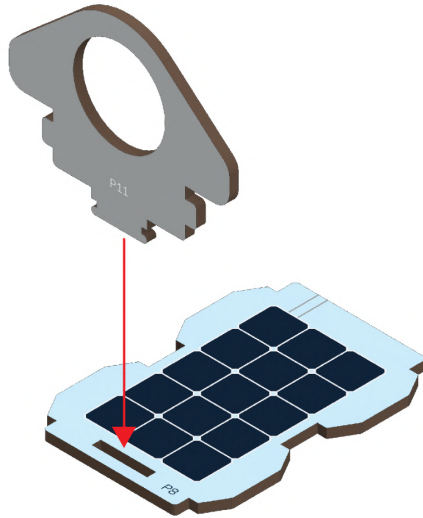
5. Wind Turbine



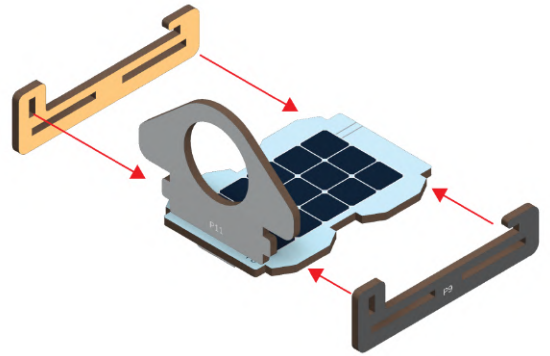
6. Green Installation

2.2 Object (A) : Solar Panel Canopies

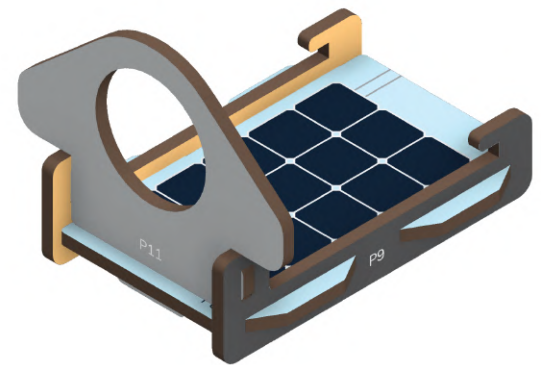
1. Insert part **P11** into the slot of part **P8** as shown below.



3. Insert parts **P9** and **P10** into the right and left sides of part **P8** as shown below.



Assembled View:



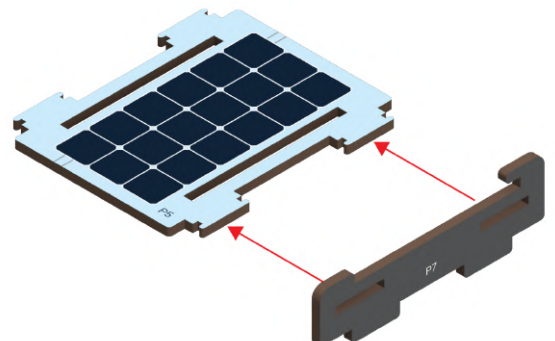
2. Secure part **P11** by attaching it with an **O-ring**.



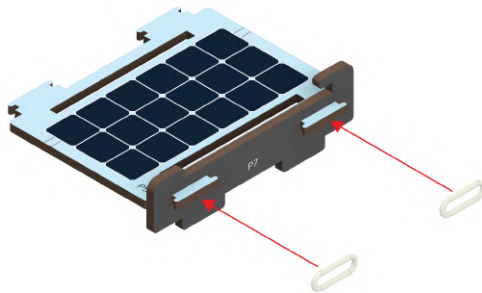
Assembled View:



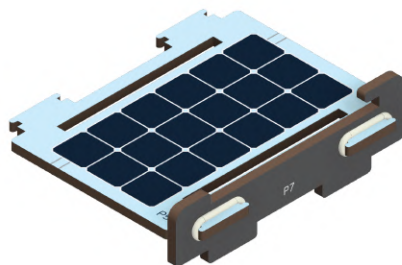
4. Attach part **P7** to the base part **P5** as shown below.



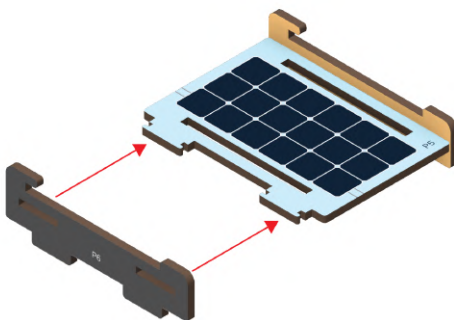
5. Secure part **P7** by attaching **O-rings** as shown below.



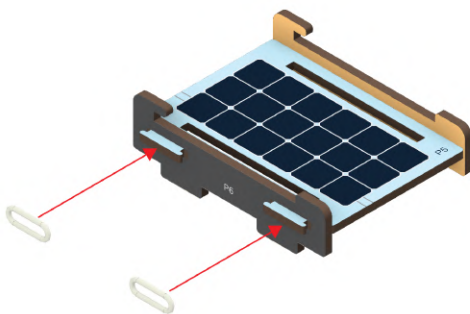
Assembled View:



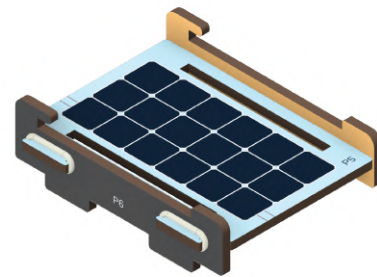
6. Attach part **P6** to the base part **P5** as shown below.



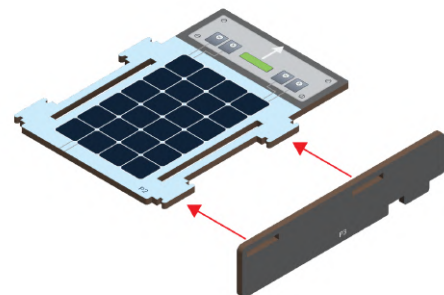
7. Secure part **P6** by attaching **O-rings** as shown below.



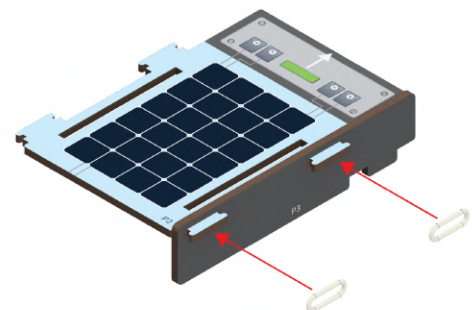
Assembled View:



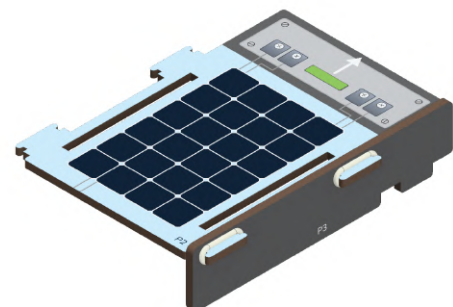
8. Attach part **P3** to the base part **P2** as shown below.



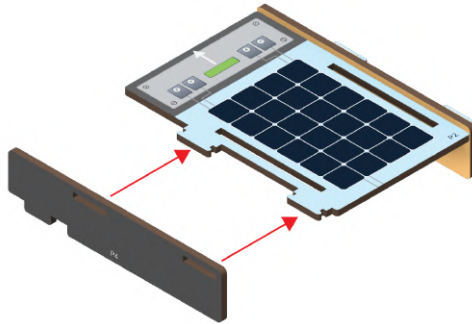
9. Secure part **P3** by attaching **O-rings** as shown below.



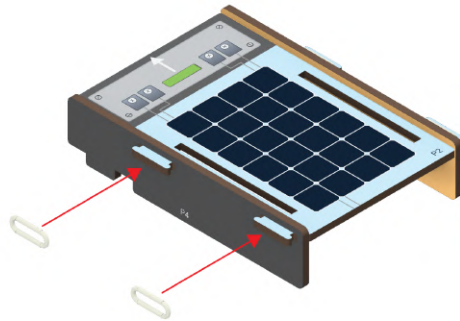
Assembled View:



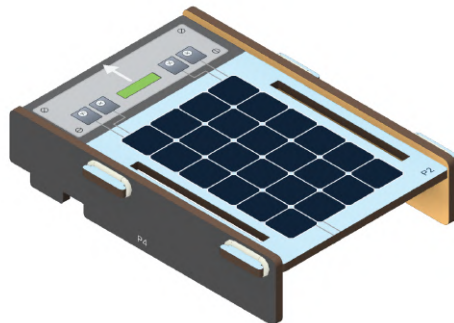
10. Attach part **P4** to the base part **P2** as shown below.



11. Secure part **P4** by attaching **O-rings** as shown below.



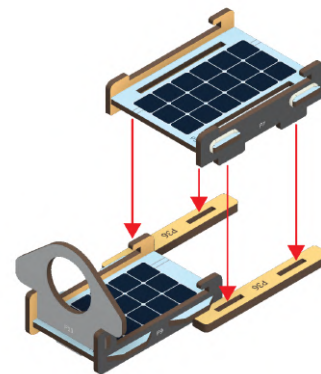
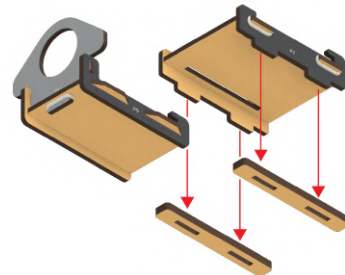
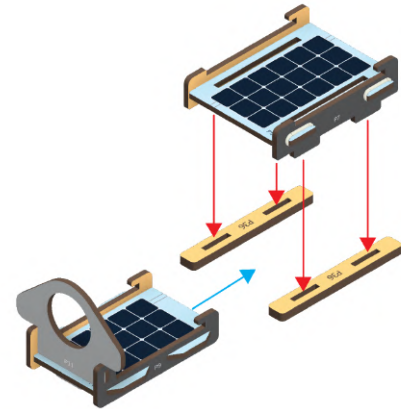
Assembled View:



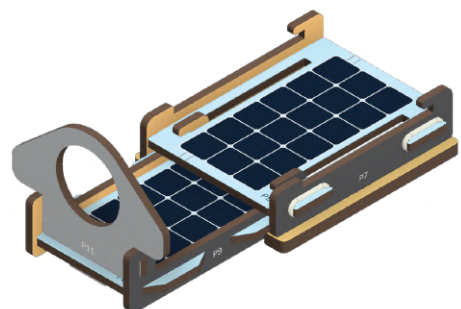
12. Gather the joined parts: **P5** and **P7**, **P11** and **P9**, along with part **P36** for both the left and right sides. Attach them as shown below.

*Note: Use **Super Glue** or **Fevikwik** to stick the acrylic parts together. Apply only a small amount of glue.*

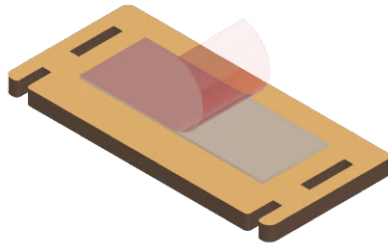
Note: The assembled parts would be aligned as shown. Please refer to the images below for placement reference.



Assembled View:



13. Paste double-sided tape on the bottom surface of part **P1**.



14. Remove the red layer of the double-sided tape and paste part **P1** on the white border around 'A' on the Arena.



15. Make sure the Arrow printed on the Arena and the Arrow engraved on Part **P1** are in the same direction.



16. Gather the previously assembled parts, along with part **P1**, as shown in the image below. The hooks of **P9** and **P10** will slide into the slits of **P5**.



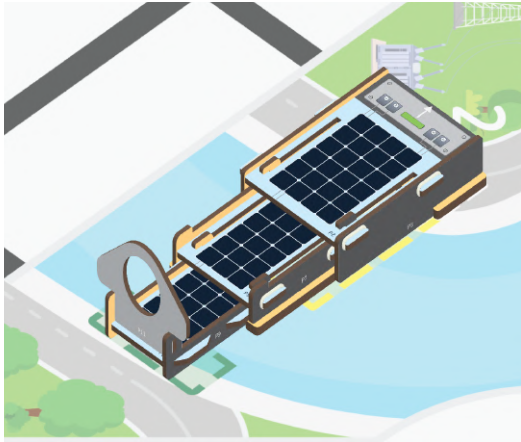
17. Assemble the gathered parts in the format shown below. The hooks of **P6** and **P7** will slide into the slits of **P2**.



Complete:



Note: It will function in the retractable manner showcased below.

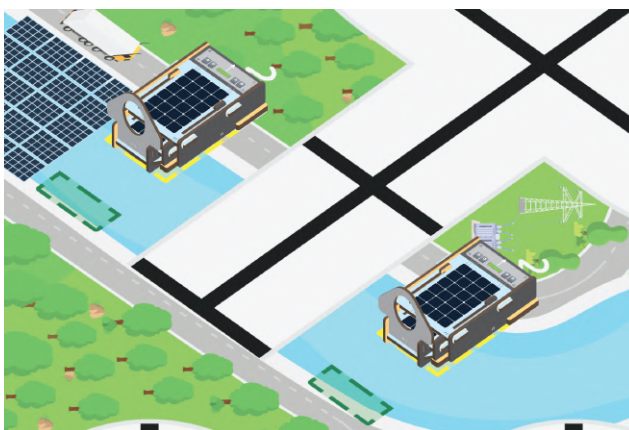


18. Repeat the step for the other side.

Final Assembled View (opened):

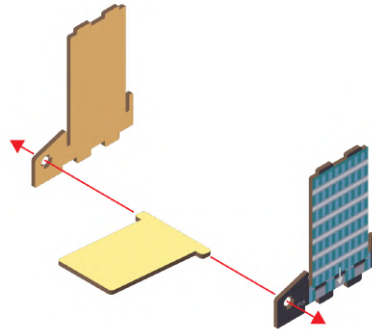


Final Assembled View (closed):

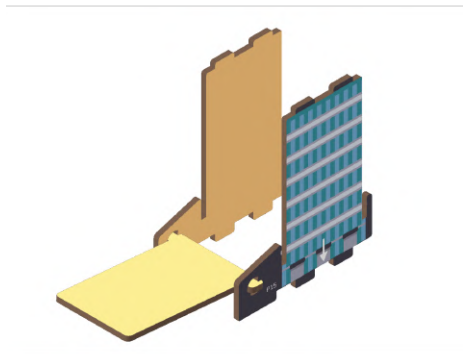


2.3 Object (B) : Office Building

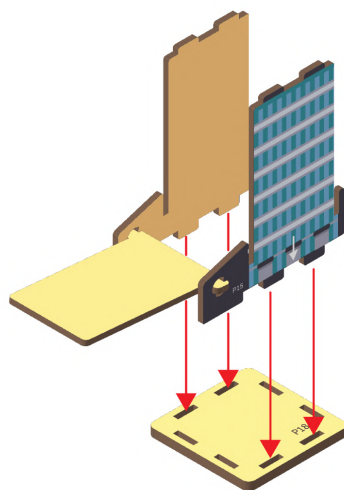
1. Insert part **P14** at one end of part **P12** and part **P15** at the other end of **P12**, as shown below.



Assembled View:



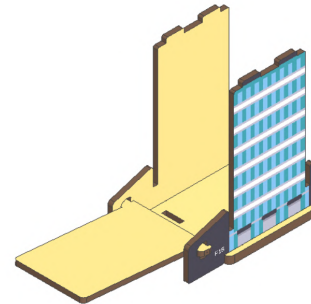
2. Hold the assembly carefully and insert parts **P14** and **P15** into the slots of part **P18**.



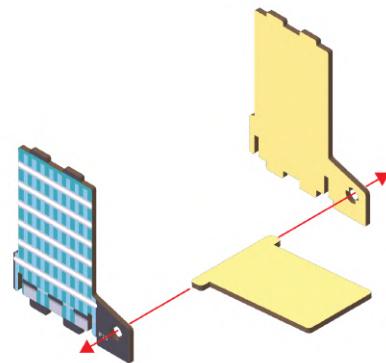
Assembled View:



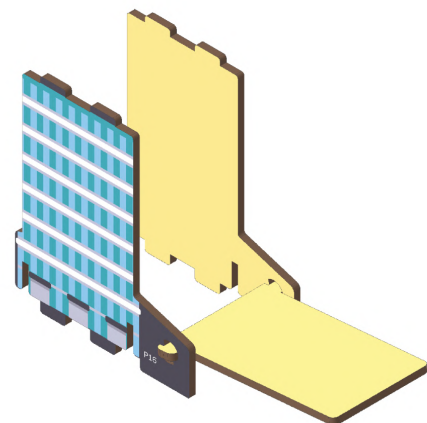
3. Insert part **P16** at one end of part **P12** and part **P17** at the other end of **P12**, as shown below.

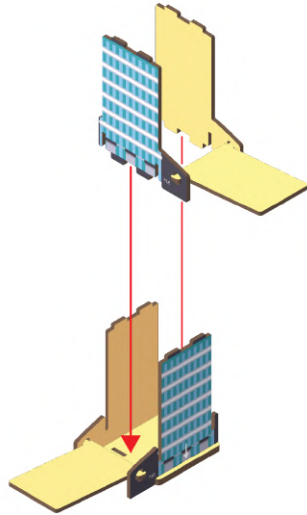


Assembled View:

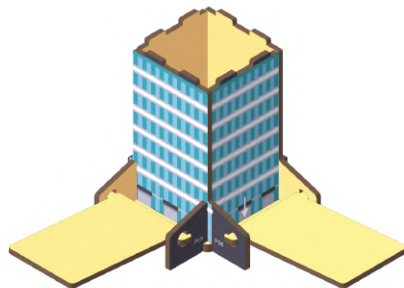


4. Insert the assembled parts from **Step 3** into the assembled parts of **Step 2**, as shown below.

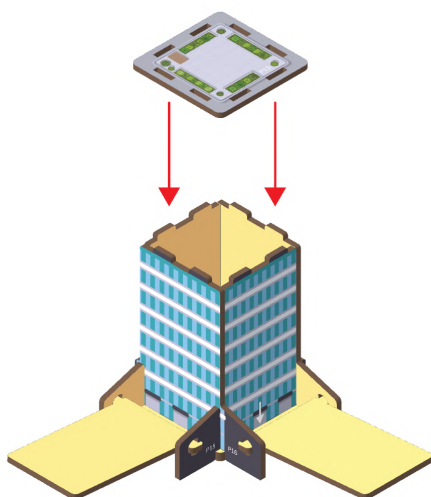




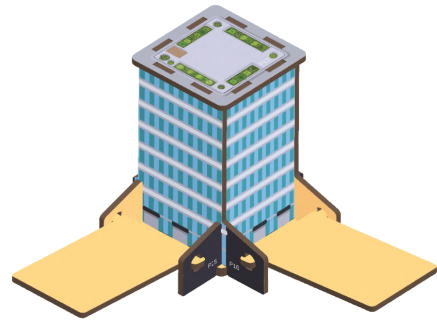
Assembled View:



5. Attach part **P13** to the assembled parts from the previous **Step 4**.

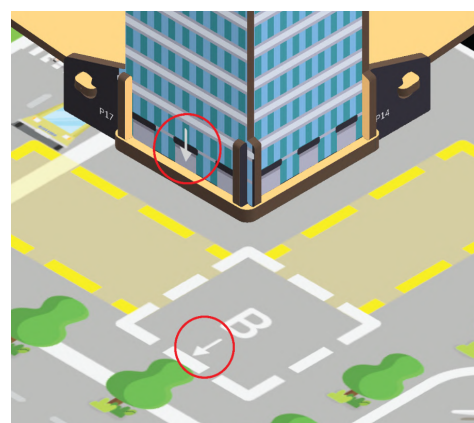


Assembled View:



6. Paste double-sided tape inside the dashed white border for object '**B**' on the arena.

Align the parts **P12** along with the yellow dashed border and make sure the arrow on part **P17** aligns with the arrow printed on the arena.

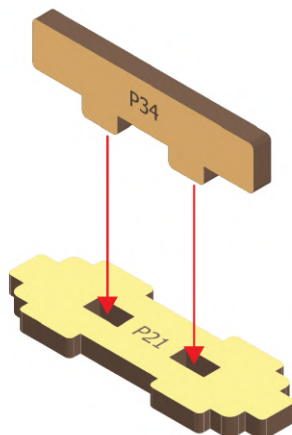


Complete:

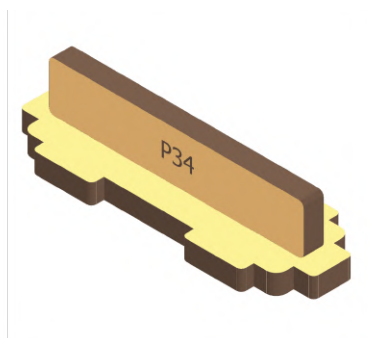


2.4 Object (C) : Smart Grid Load Balancer

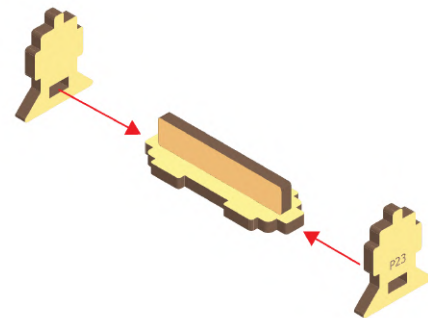
1. Insert Part **P34** into Part **P21** as shown below.



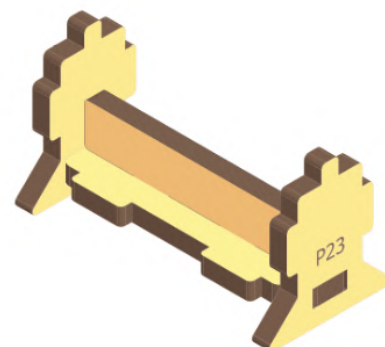
Assembled View:



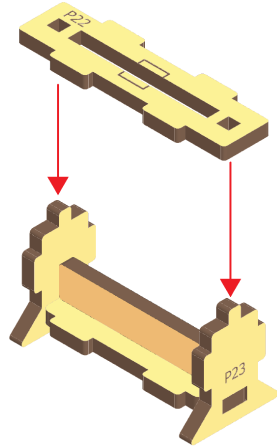
2. Attach two parts **P23** to each end of part **P21**.



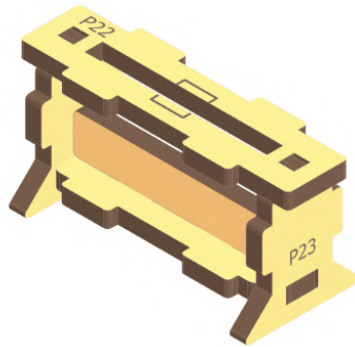
Assembled View:



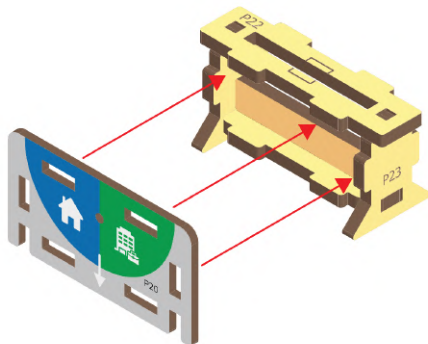
3. Insert part **P22** on the top of parts **P23** on both sides, as shown below.



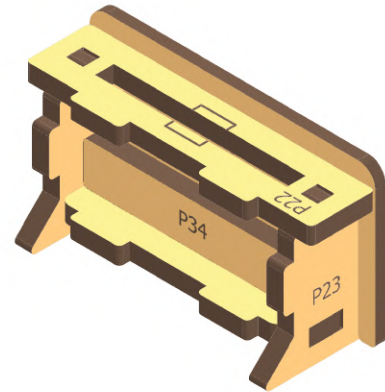
Assembled View:



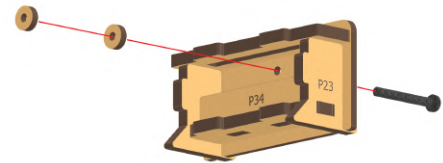
4. Insert part **P20** on one side of the assembled parts.



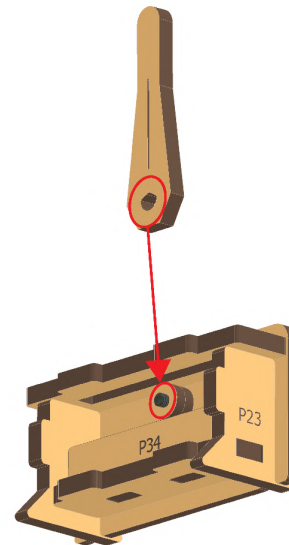
5. Flip the assembly for further steps.



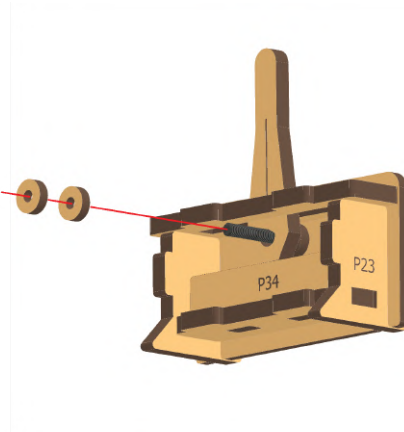
6. Insert an **M3 Bolt (25mm)** from the back side through the hole, and pass two spacers (part **P35**), as shown below.



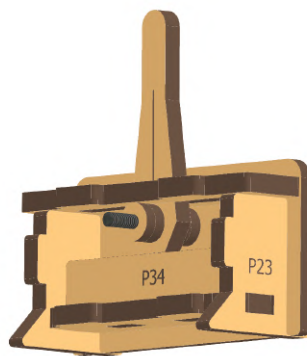
7. After placing the spacers (part **P35**) on the **M3 Bolt (25mm)**, slide in lever **P24**, and push in the **M3 Bolt (25mm)** to secure the lever.



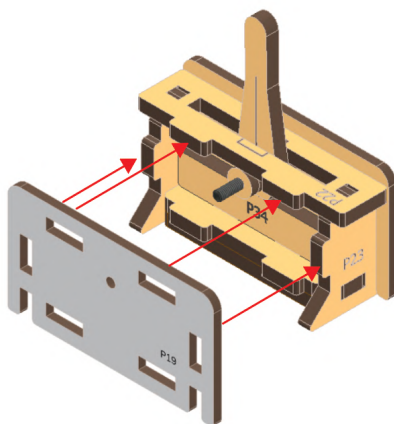
8. Add another spacer (part **P35**) on the **M3 Bolt (25mm)** after the lever **P24**, and push in the **M3 Bolt (25mm)** to secure the lever.



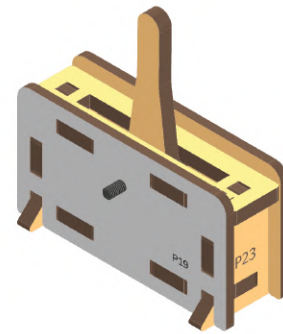
Assembled View:



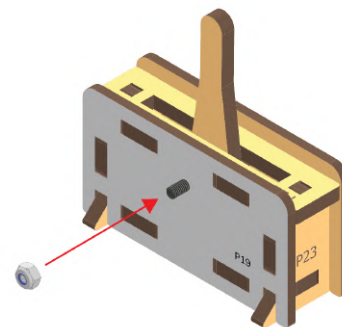
9. Insert part **P19**; the end of the M3 bolt should come out of the hole on part **P19**.



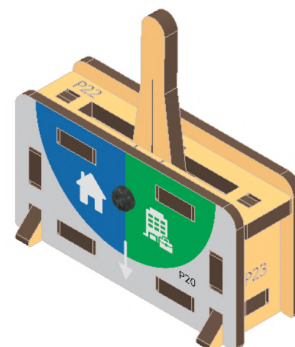
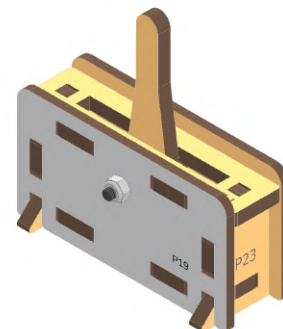
Assembled View:



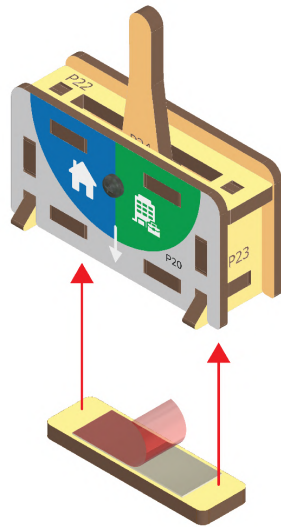
10. Insert M3 Lock Nut.



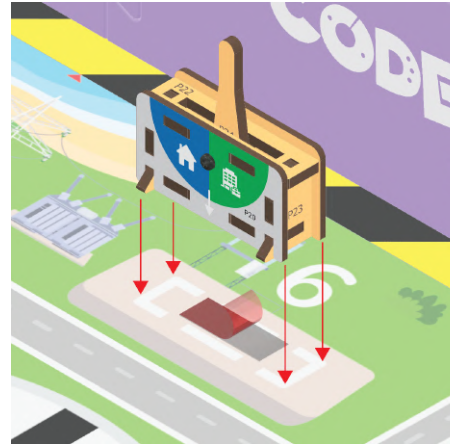
Assembled View:



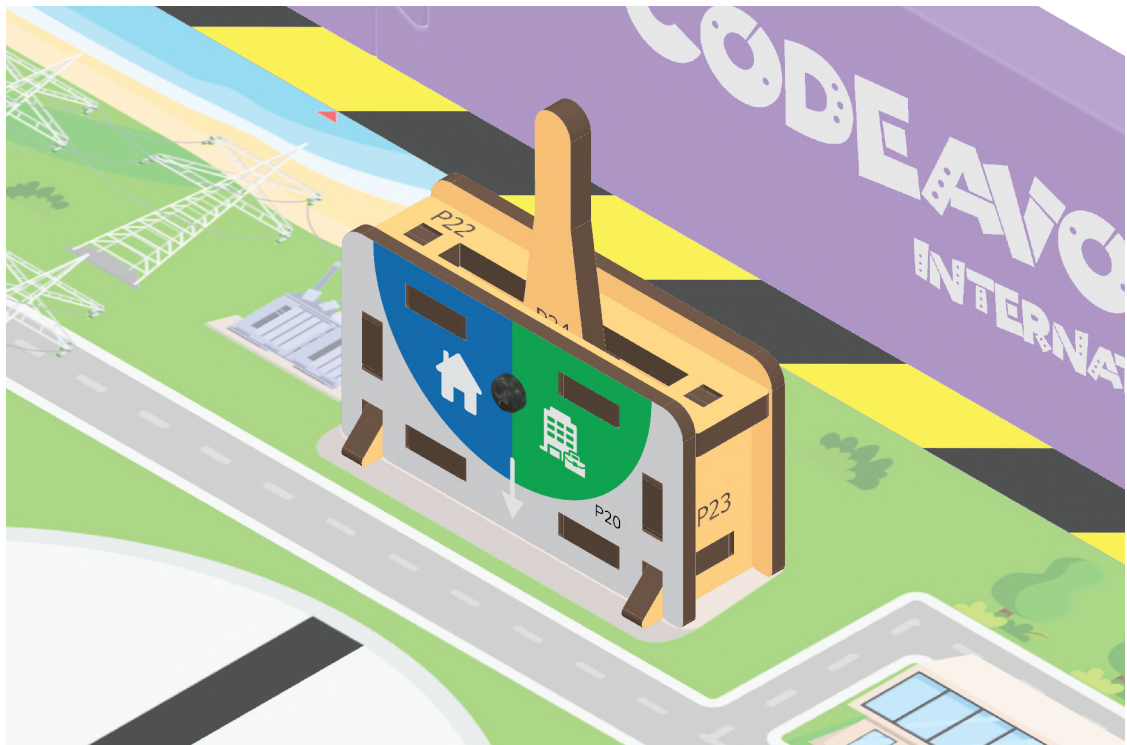
11. Paste part **P25** below the assembled structure of the switch, using double-sided tape.



12. Paste double-sided tape on the arena at the given space for object 'C'. Make sure the arrow printed on part **P20** aligns with the arrow inside the white dashed border on the arena.

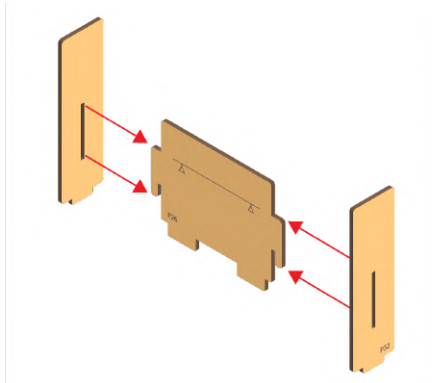


Complete:

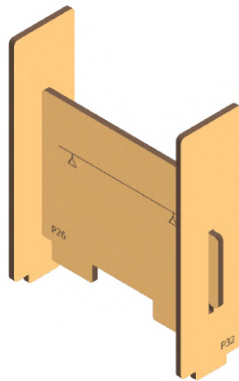


2.5 AprilTags 06-T1 and 06-T2

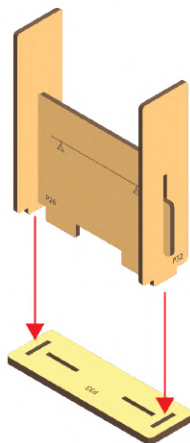
1. Insert parts **P32** on both ends of part **P26**, as shown below.



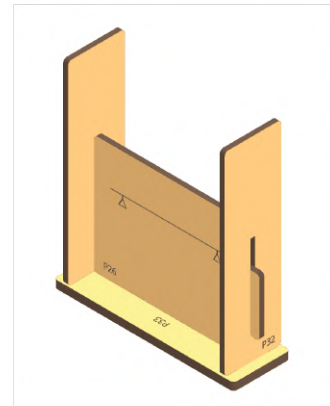
Assembled View:



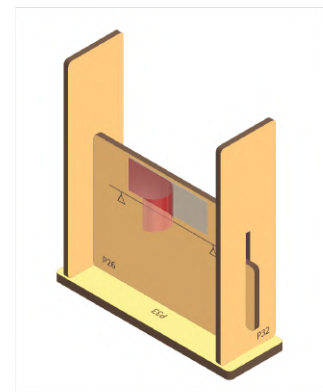
2. Now, insert the assembled parts into part **P33**, as shown below. The ends of part **P26** will pass through part **P33**, and the ends of part **P32** will flush with the bottom of part **P33**.



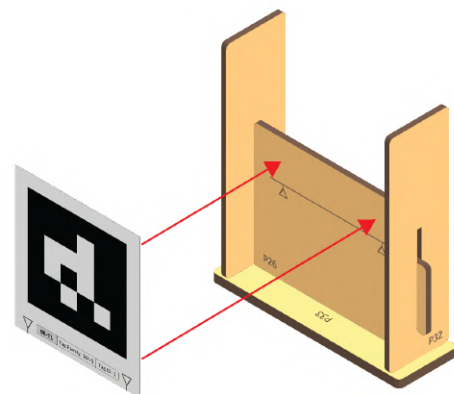
Assembled View:



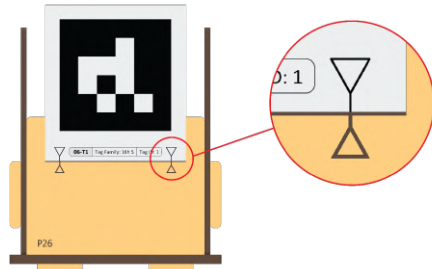
3. Apply double-sided tape above the engraved reference line on part **P33**, as shown below.



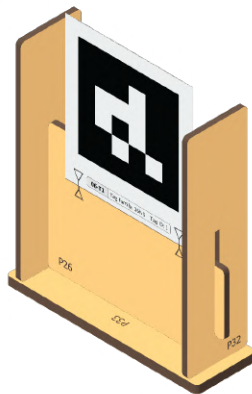
4. Now, peel off the cover of the double-sided tape and paste the printed AprilTag card '**06-T1**'.



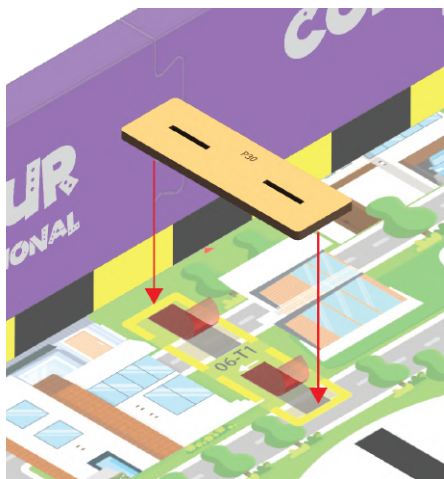
- While pasting the tag, make sure the reference line with triangular marks is aligned properly with each other. Below is a reference showing the alignment.



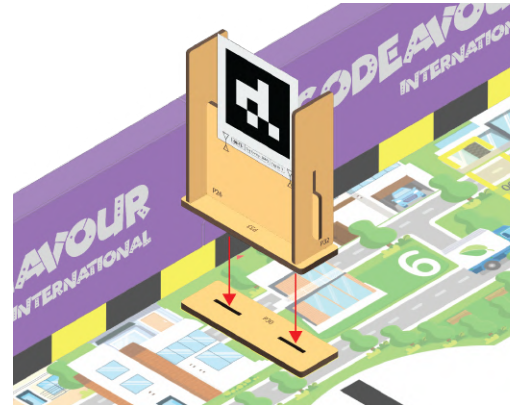
Assembled View:



- Take part **P30** and paste it on the white dashed border printed with tag '**06-T1**', on the arena using double-sided tape, as shown below.



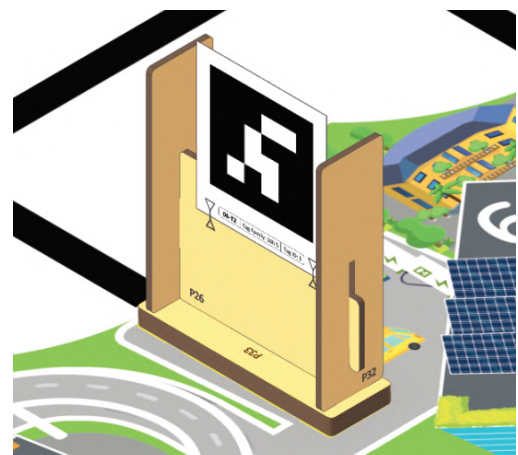
- The part **P30** will be permanently attached to the arena. The assembled tag **06-T1** can be attached and detached on the arena, as required in the activity.



Assembled View:

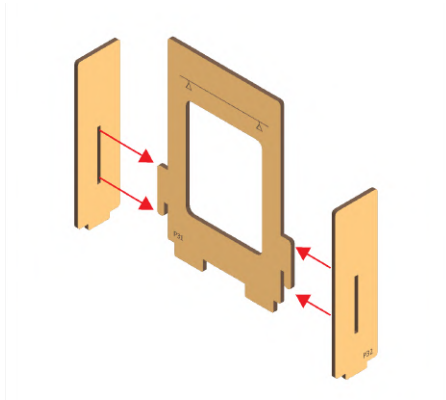


- Repeat the same steps for tag 06-T2.

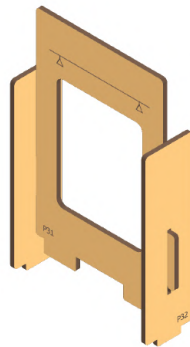


2.6 AprilTags 06-T3 and 06-T4

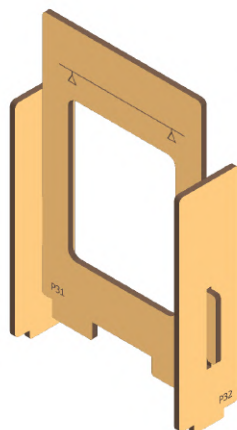
1. Insert parts **P32** on both ends of part **P31**, as shown below.



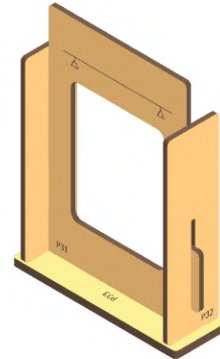
Assembled View:



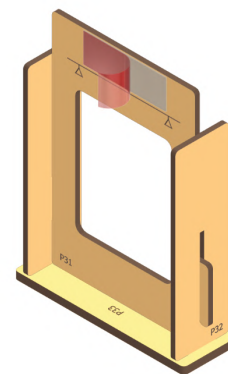
2. Now, insert the assembled parts into part **P33**, as shown below. The ends of part **P31** will pass through part **P33**, and the ends of part **P32** will flush with the bottom of part **P33**.



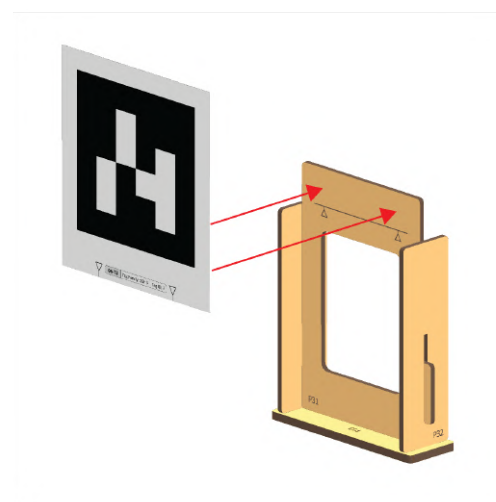
Assembled View:



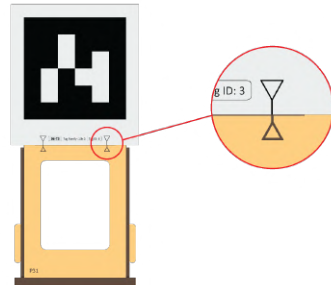
3. Apply double-sided tape above the engraved reference line on part **P33**, as shown below.



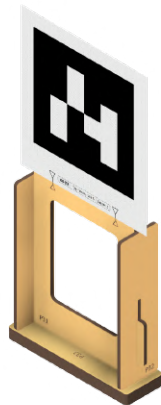
4. Now, peel off the cover of the double-sided tape and paste the printed AprilTag card '06-T3'.



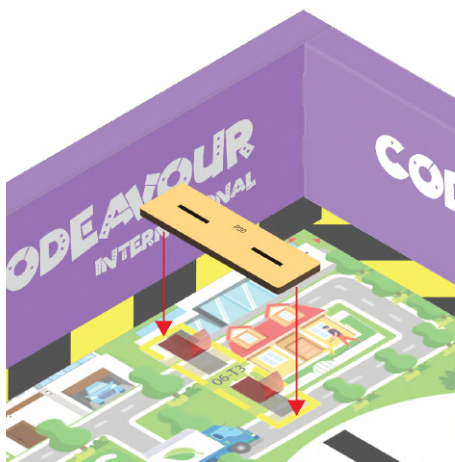
- While pasting the tag, make sure the reference line with triangular marks is aligned properly with each other. Below is a reference showing the alignment.



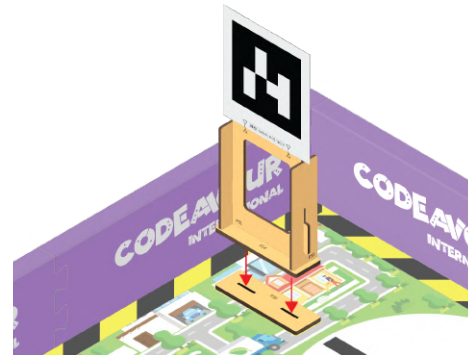
Assembled View:



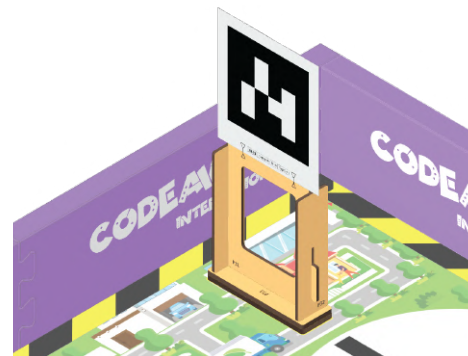
- Take part **P30** and paste it on the white dashed border printed with tag '**06-T3**', on the arena using double-sided tape, as shown below.



- The part **P30** will be permanently attached to the arena. The assembled tag **06-T3** can be attached and detached on the arena, as required in the activity.



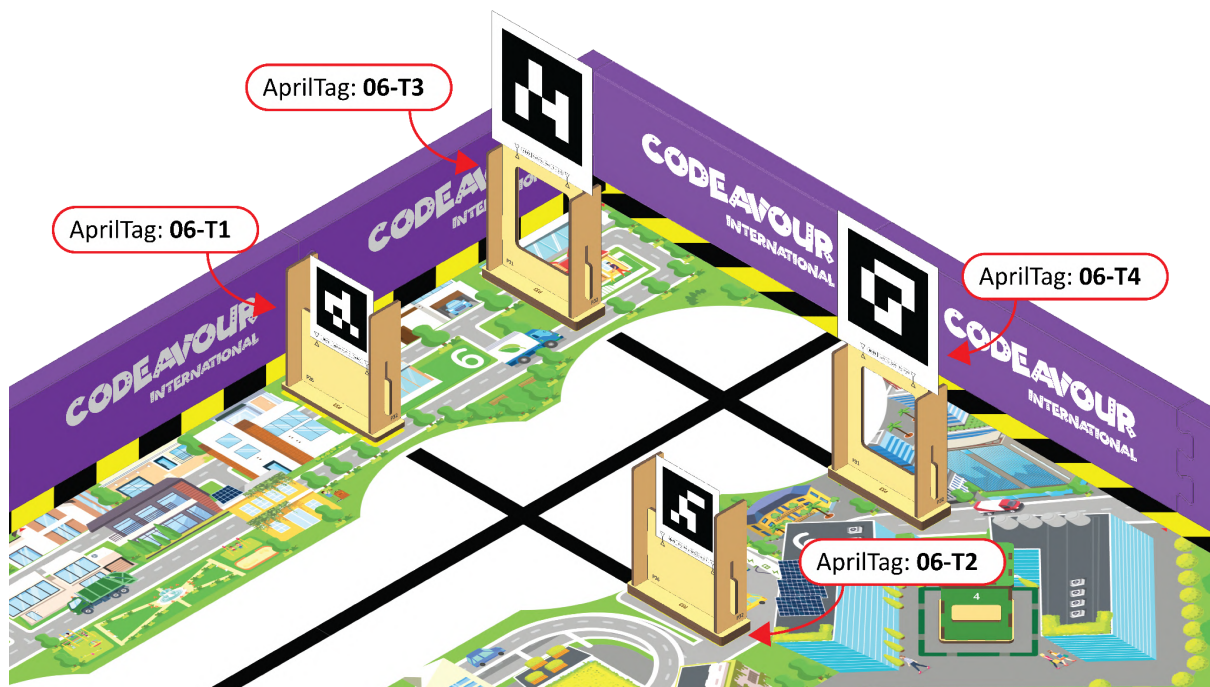
Assembled View:



- Repeat the same steps for tag **06-T4**.

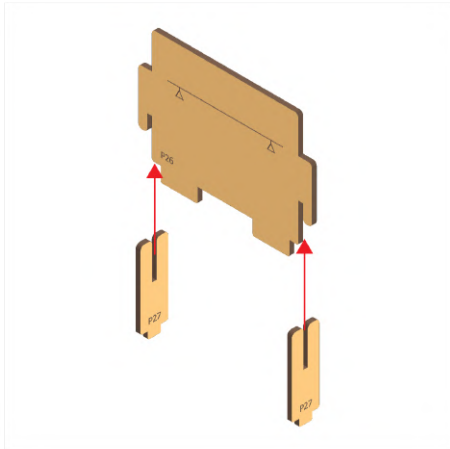


2.7 Placement of AprilTags 06-T1, 06-T2, 06-T3 and 06-T4

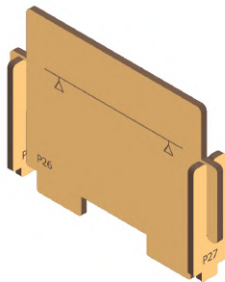


2.8 AprilTags 01-T5, 01-T6, 07-T7 and 07-T8

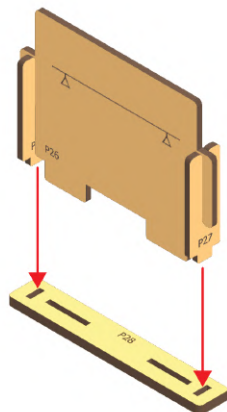
1. Insert parts **P27** on both ends of part **P26**, as shown below.



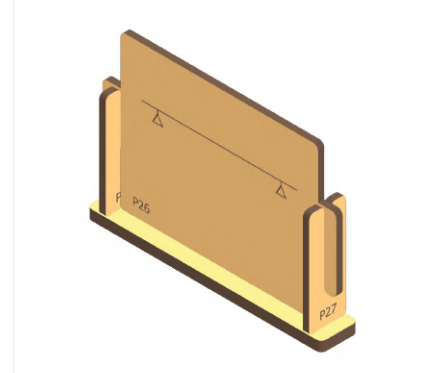
Assembled View:



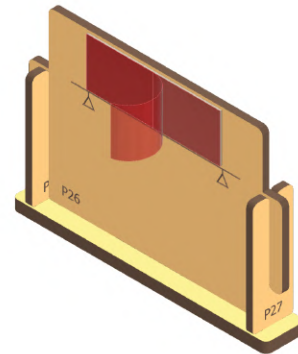
2. Now, insert the assembled parts into part **P28**, as shown below. The ends of part **P26** will pass through part **P28**, and the ends of part **P27** will flush with the bottom of part **P28**.



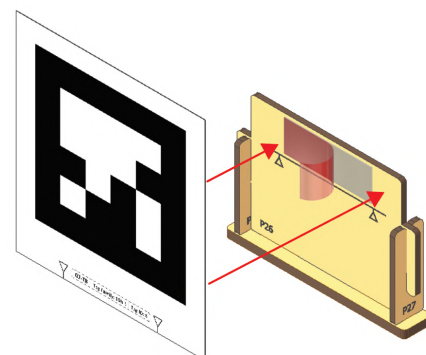
Assembled View:



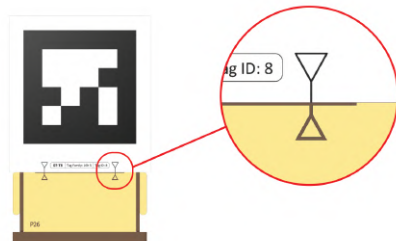
3. Apply double-sided tape above the engraved reference line on part **P26**, as shown below.



4. Now, peel off the cover of the double-sided tape and paste the printed AprilTag card '**07-T8**'.



- While pasting the tag, make sure the reference line with triangular marks is aligned properly with each other. Below is a reference showing the alignment.



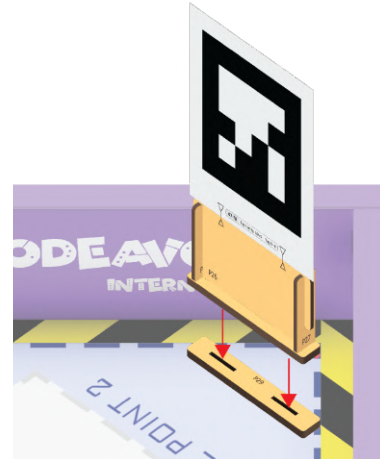
Assembled View:



- Take part **P29** and paste it on the white dashed border printed with tag '**07-T8**' on the arena using double-sided tape, as shown below.



- Part **P29** will be permanently attached to the arena. The assembled tag **07-T8** can be attached and detached on the arena.

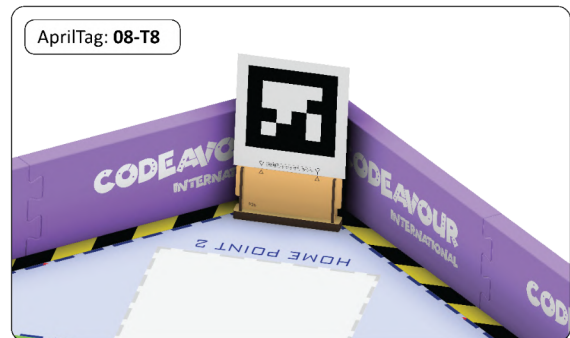
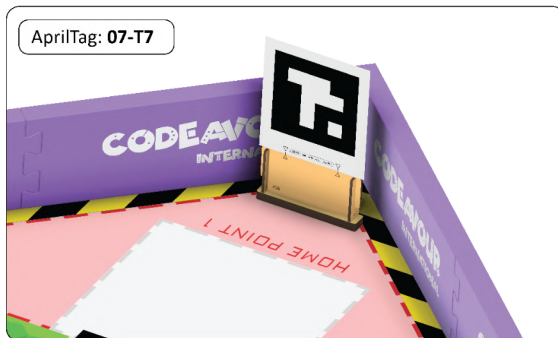
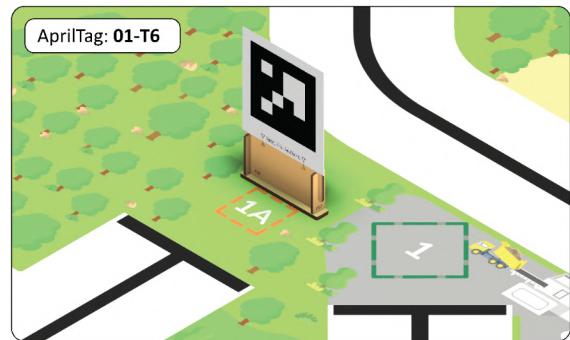
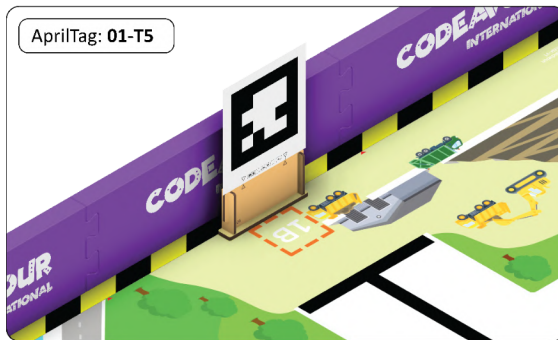


Assembled View:



- Repeat the same steps for the tags **01-T5**, **01-T6**, and **07-T7**.

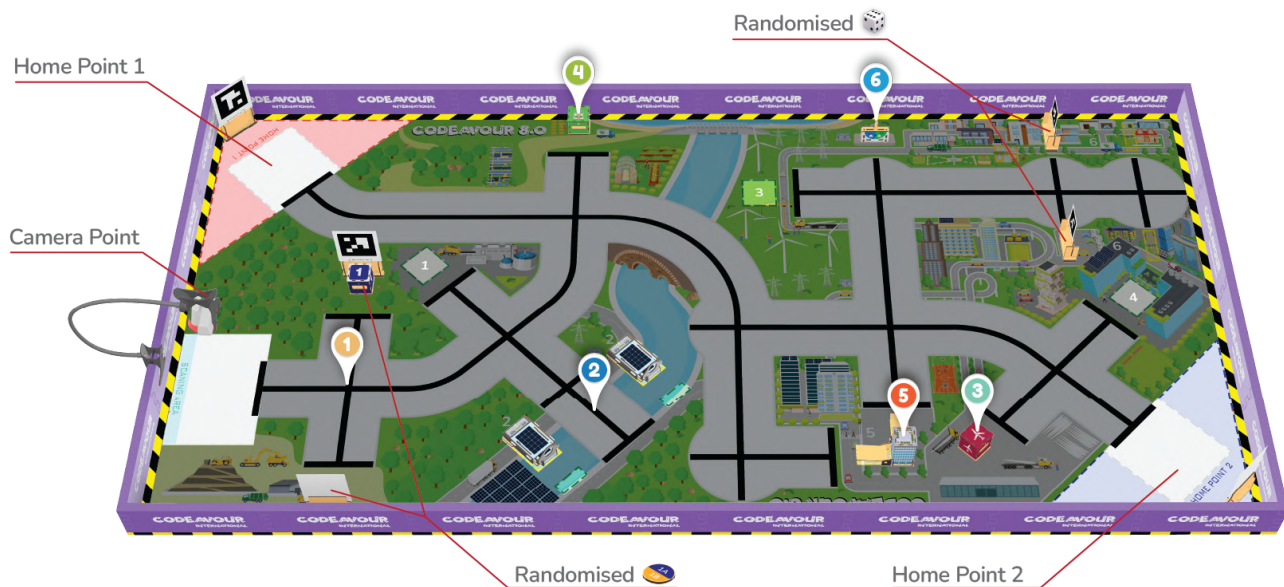
2.9 Placement of AprilTags 01-T5, 01-T6, 07-T7 and 07-T8



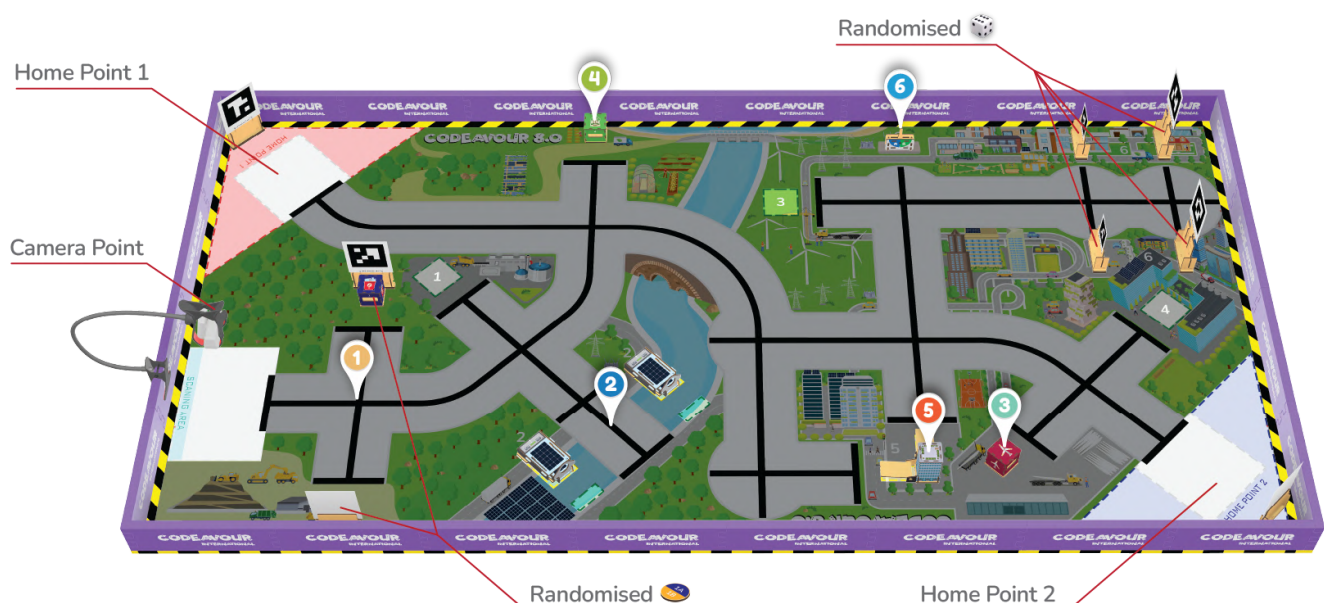
3. Cubes' Initial Configurations

All the Cubes will be arranged in the arena according to the provided setup diagrams below.

Note: The randomisation for Challenges 1 and 6 will be conducted by the Judge before the match. The outcome of the Decision Coin toss for Challenge 1 and the dice roll for Challenge 6 will determine the respective cube types, AprilTags, and arena arrangement to be used for the match.



Initial positions of game objects (Elementary)



Initial positions of game objects (Junior/Senior)

4. Camera Setup

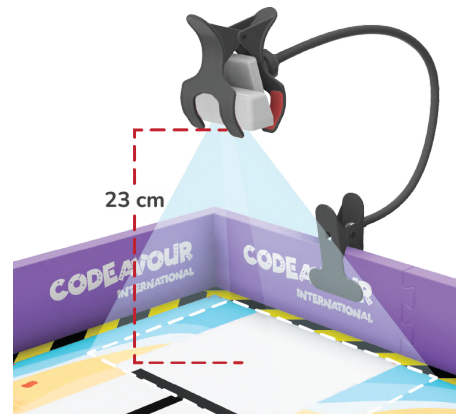
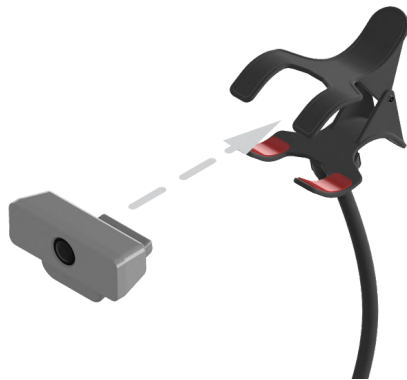
Note: The Arena Object Kit only includes the Camera mount. We recommend buying a webcam that has the following specifications:

Camera connection type: Wired, USB 2.0

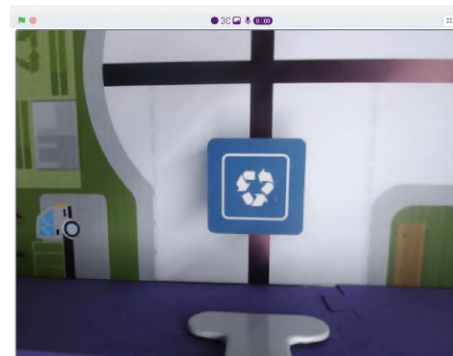
Camera FOV: DFOV 90°

Capture Resolution: FHD (1920 x 1080)

1. Clamp the camera to the camera mount and secure the cables using cable ties.

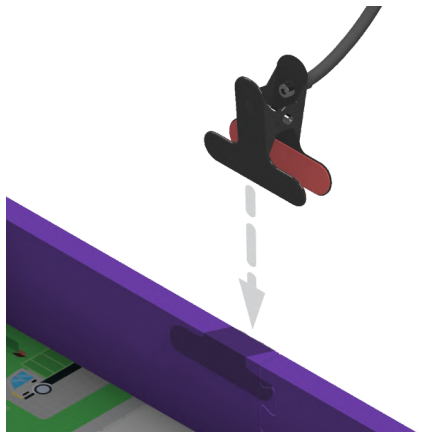


Camera Position



Camera Field of View in Pictoblox

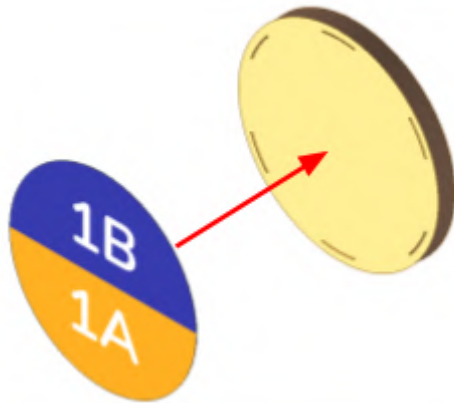
2. Install a camera mount on the arena wall near the recognition area.



3. Adjust the camera height to 23cm from the arena.

5. Decision Coin Assembly

1. Apply the **Decision Coin Front Sticker (1B-1A)** from the **Decision Coin** sticker sheet to one side of the **Decision Coin** as shown below.



Assembled View:



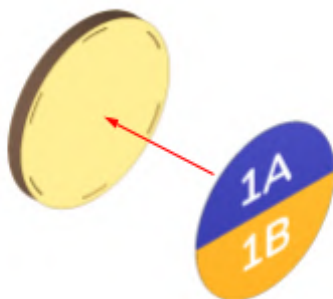
Assembled View:



Complete:



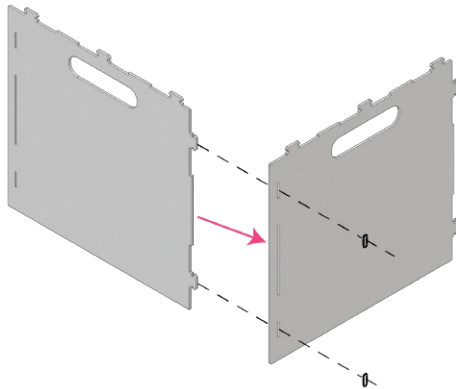
2. Apply the **Decision Coin Front Sticker (1A-1B)** from the **Decision Coin** sticker sheet to another side of the **Decision Coin** as shown below.



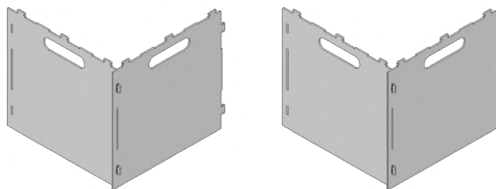
6. Bot Dimension Verification Box Assembly

Note: This Bot Dimension Verification Box is only available to Codeavour 8.0 event organizers and partners (not for sale).*

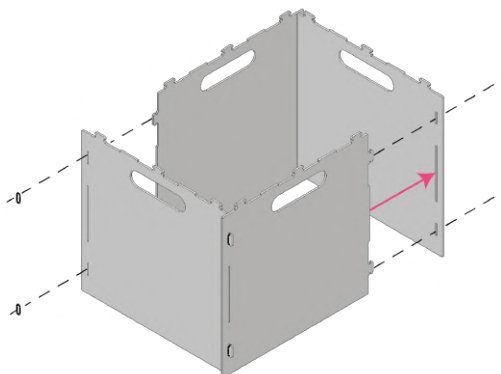
1. Attach two **Side Plates** with a couple of **O-rings**.



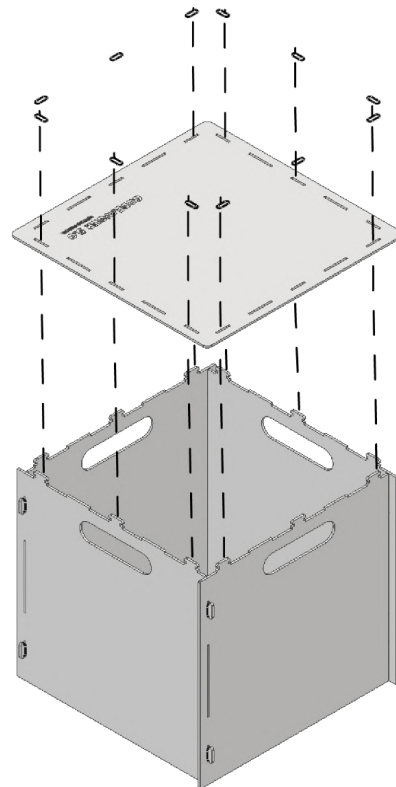
2. Similarly, assemble another two **Side Plates** and make two identical **Side Plate Assemblies**.



3. Attach both **Side Plate Assemblies** with **O-rings**.



4. Attach the **Top Plate** with **O-rings**.



Complete:



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