



Eurobot^{Open} and Eurobot^{Open} Junior 2025 Rules

32nd edition of the robotic contest - Eurobot
BETA 1.0 version



NOTE: all images in this document are provided as a guide to illustrate the various paragraphs. In no case they can serve as a reference. Only the dimensions, colors and materials indicated in the appendix shall be taken into consideration.

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A. NOTICE

WARNING!

General remarks are annotated in the document. Please, pay special attention to these points.

The rules have been split up in several documents. Most parts remain the same for the Eurobot^{Open} and Eurobot^{Open} Junior contests, but to avoid confusion, each contest has its own rules as a single document.

Thus the particular cases specific to one of the competitions appears only in the document concerning it.

You will find the Eurobot^{Open} and the Eurobot^{Open} Junior rules and other information on the Eurobot^{Open} website (www.eurobot.org/)

Please note that the version of this release is noted down at the end of this page. For any inquiry, only an OFFICIAL version should be considered. The current document is the BETA version. No complaints arising from this document will be taken into account during official meetings.

Changes or clarifications of the rules may be made during the year. We therefore strongly encourage all participants to check our website regularly (www.eurobot.org/) as well as your NOC's own website for news. You can also follow discussions, ask questions or get further assistance on our faq (www.eurobot.org/faq/).

Any changes to the specifications will, if necessary, be set out in a supplementary document which will be available on the website of your national organising committee¹ and Eurobot (<https://www.eurobot.org/>).

The FAQ responses from a referee are official responses taken into account for match refereeing and homologation stages.

In case of doubt regarding any point of the rules or the homologation of robots, the referee committee may also be contacted at referee@planete-sciences.org.

Have a good reading!

As is the case every year, a number of parameters in these rules have been modified. As a result, please reread in detail all the parts of these rules, even those that seem familiar to you.

¹For example: for France <https://www.coupederobotique.fr/>, for Belgium <https://sparkoh.be/projet-robotix/>, for Switzerland <https://swisseurobot.ch/>

B. CONTEST PRESENTATION

Eurobot^{Open} and Eurobot^{Open} Junior are two international amateur robotics competitions for young people organised in clubs, groups of friends or schools. Their common aim is to enable young people to take charge of their own learning and put their knowledge, technical and social skills into practice, by taking part in a fun and friendly event. The technical challenge involves building one or more robots.

Eurobot^{Open} and Eurobot^{Open} Junior have for only ambitions those described above. As an actor of the popular education movement and as a youth movement, inclusiveness is a strong value for Planète Sciences and its European partners. The organizers do not (and will never) impose a team model; whether you participate to discover robotics, to practice your skills, as part of teaching or for competition, you are (and always will be) welcome.

The Eurobot^{Open} and Eurobot^{Open} Junior meetings are prepared passionately throughout the year by volunteers of all nationalities who believe in the educational values of this experience and are themselves, often, former participants.

The rules for both contest, Eurobot^{Open} and Eurobot^{Open} Junior, are based on the same concept. As organisers, we intend to provide a common platform for the Eurobot^{Open} event. This platform is dedicated to autonomous robots for Eurobot^{Open} while for Eurobot^{Open} Junior, the robots are remote controlled. In this way, a Eurobot^{Open} organiser can easily set up a Eurobot Junior contest and vice versa.

**You're currently reading version
Eurobot^{Open} and Eurobot^{Open} Junior BETA 1.0 of 2025 rules.**

This document is supplemented by the general Eurobot and Eurobot Junior rules in version 1 (latest sub-version)

C. THEME PRESENTATION

This year the robots want to do even more competitions, more matches for more fun, but this comes with a cost. And in order to raise the necessary funds, some big charity concerts are planned: the Robot-Rock-Tour! But putting on a show is a lot of work and that's why the robots are working extra hard to finish the preparations as quickly as possible, so that the show can take place on time. The show must go on!

The missions will be:

- **Prepare the concert hall,**
- **Ensure the promotion of the show,**
- **It's show time!**
- **Store tools,**
- **Estimate the entries.**

Please note: All actions are independent from one another and no specific sequence is imposed whatsoever. No single action is mandatory. Give careful thoughts to your strategy. It is strongly recommended to design simple and reliable systems with a limited number of actions.

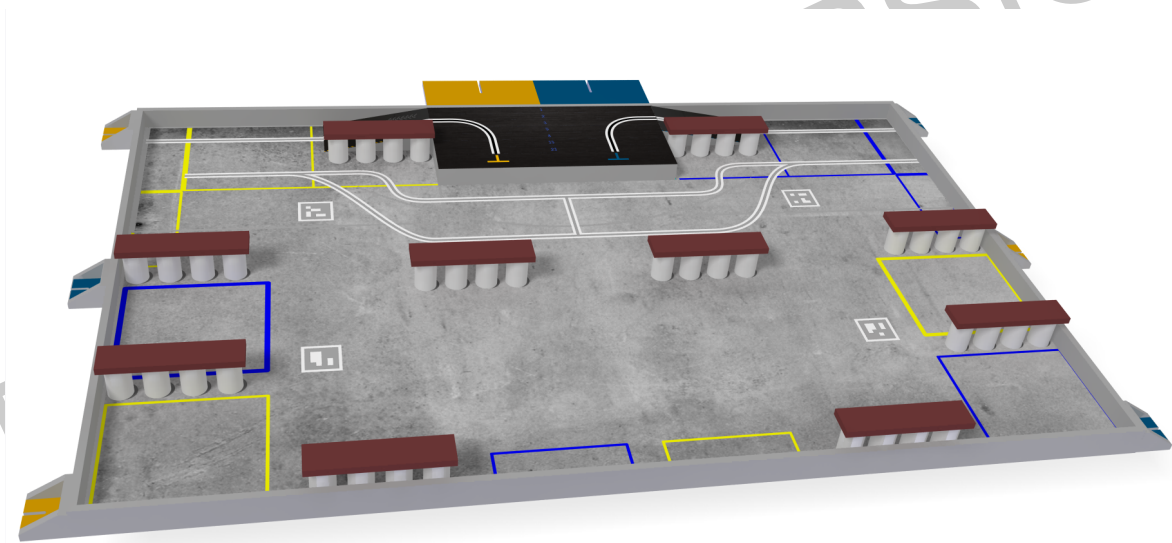


Figure 1: Overview of the playing area

D. PLAYING AREA AND ACTIONS

D.1. IMPORTANT INFORMATION

The organizers are committed to build the playing area with as much accuracy as possible. Nevertheless, minor tolerances may be observed depending on manufacturing constraints.

No complaints regarding dimensional deviations will be taken into account.

Teams are warned that the surface condition may differ from one playing area to another and may also degrade over time.

Graphics displayed in this document represent the Eurobot^{Open} playing area and not the Eurobot^{Open} Junior one. Thus figures show elements not useful in this version of the rules such as fixed beacon supports and remote computing device.

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D.2. PLAYING AREA

The playing area is a horizontal rectangular plane of 3000 mm by 2000 mm with 70 mm height, 22mm thick borders on each outer side. Depending on the construction process, it may consist of one or several parts (eg 3 parts of 1000 mm per 2000 mm). Please note that the joints may have imperfections, and it will not be possible to contest these imperfections during the competition.

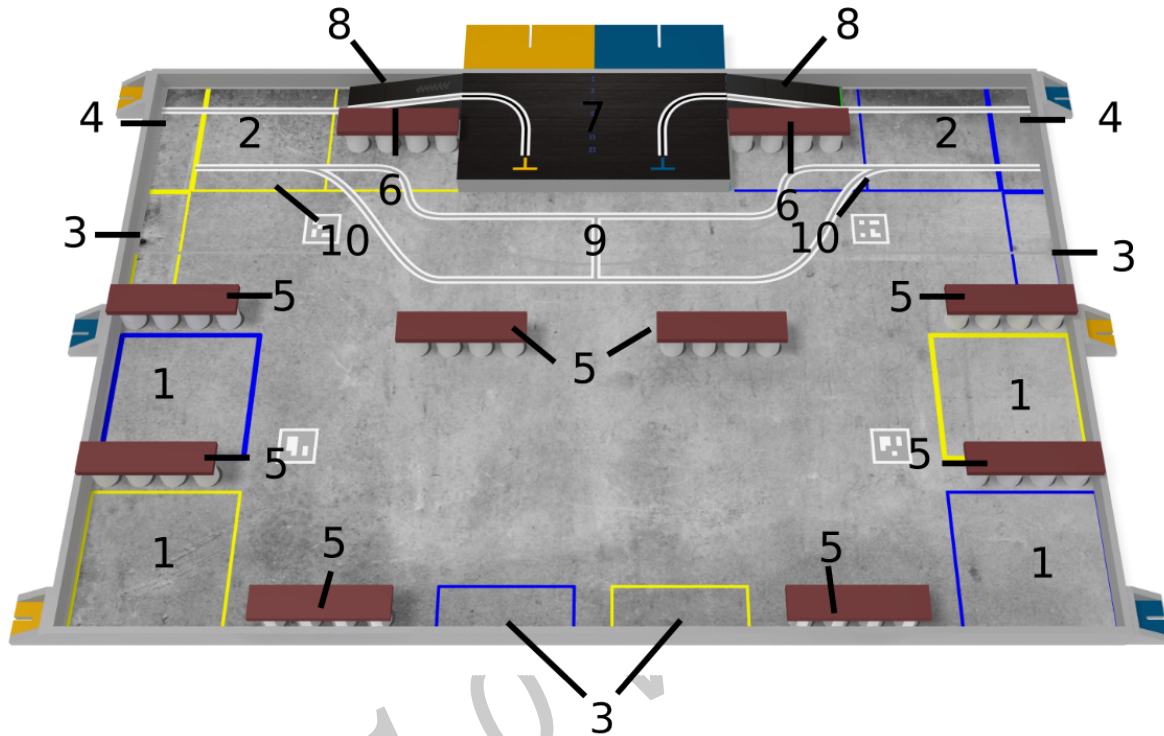


Figure 2: Detailed view of the playing area

- | | |
|--|--------------------------------|
| 1. Starting and construction areas | 6. Reserved raw material stock |
| 2. Starting and finishing areas | 7. Scene |
| 3. Construction areas | 8. Ramp |
| 4. SIMA Starting areas (dressing room) | 9. Pit |
| 5. Raw material stock | 10. Backstage zone |

Full specifications of the playing area and game elements (dimensions, positions at the beginning of the match, colors and other references) are listed in the appendix.

In the remainder of this document, horizontal and vertical directions are stated relative to the playing area. Notions of “left”, “right”, “front” and “back” are stated with respect to the spectator’s point of view.

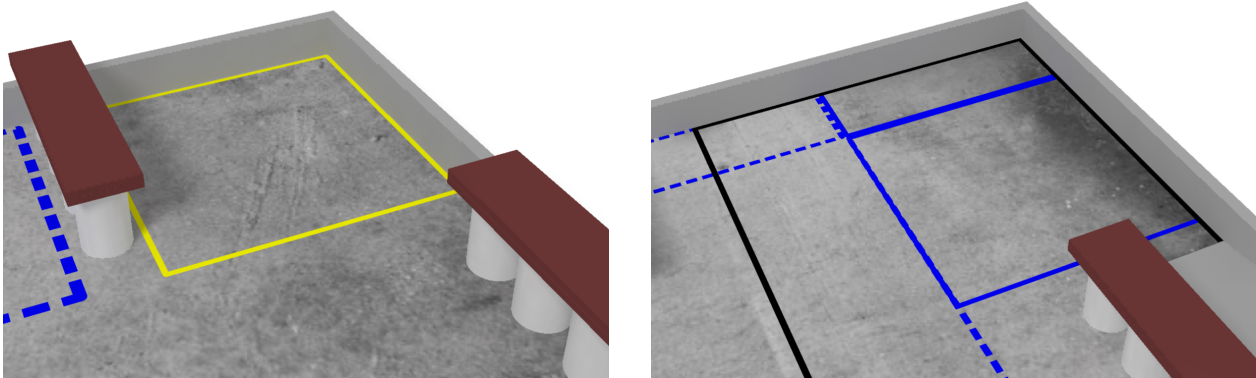
D.3. STARTING AREAS

D.3.a. DESCRIPTION

Each team has 3 starting areas and 1 finishing area. The starting areas are the square surfaces of 45 cm side, delimited by a line on the table, which is itself included in this zone and of the color of the team; they are placed in the corners and at the side of the table.

The finishing area is the surface at the back of the table measuring 45 cm by 100 cm, delimited by a line on the table, which is itself included in this zone and is the color of the team.

(See the distribution of the construction areas in the description of the playing area)



(a) Team yellow starting area

(b) Team blue finishing area

Figure 3: Detailed view of the blue and yellow teams areas

D.3.b. CONSTRAINTS

At the end of the setup time, the vertical projection of the robots must not exceed the limits of their starting area.

Make sure your robot can fully enter its starting area. The colored lines and the edge of the table next to the area are also included in the starting area.

D.4. DESCRIPTION AND LAYOUT OF THE PLAYING ELEMENTS

The columns: The columns are standard size 1/2 high cans (i.e. 73 mm in diameter by 109 mm high). They are open on the top side, closed on the underside, with the circumference covered in vinyl with the aruco tag number 47.

There are 40 of them, and they are placed vertically on the table in rows of 4, in the raw material stock areas.

The platforms: The platforms are wooden planks 400 mm long by 100 mm wide and 15 mm thick. There are 20 of them, and are placed on the table in stacks of 2 on the columns, in the raw material stock areas.

The scene: Support built into the bottom of the table and fixed in relation to the table. Its surface is 450mm by 900mm, and is 70mm high. It is accessible by two ramps, located on each side of the stage and against the edge of the table, and 400 mm in horizontal length. It is divided into 9 zones of 50mm depth over the entire width of the stage and are numbered, a number which is used for counting additional points.

The pit: Area present in front of the stage, its surface is 300mm by 900mm, and it is divided into 3 areas of identical size.

The backstage: Area at the back of the table including the dressing room and the team's finishing area. It is marked out in black and its access is exclusive to the team's robots and SIMAs.

The groupies: Made by the team, the groupie is a small independent mobile actuator activated at the end of the match for "the show". It will initially be placed in the dressing room.

The superstar: Made by the team, the superstar is a small independent mobile actuator activated at the end of the match for "the show". It will initially be placed in the dressing room.

The banner: Made by the team, it must be unfolded on the front of the table.

D.5. PREPARE THE CONCERT ROOM

The big day is approaching and the robots will have to set up the stands in order to accommodate as many spectators as possible for the grand show.

D.5.a. DESCRIPTION AND LAYOUT OF THE PLAYING ELEMENTS

For this action, columns and platforms are used with construction areas.

D.5.b. ACTIONS AND CONSTRAINTS

Actions:

- The robots have to pick up the columns and platforms on the table and build a tribune in the construction areas with these columns and platforms.

Constraints:

- A tribune is made up of 2 columns positioned vertically, topped by 1 platform positioned flat and resting on these two columns. Any excess item will not be counted, only the platforms which directly touch the columns and the furthest columns will be taken into account.
- For a tribune to be valid, the two columns which support it must themselves be valid for the team. To be considered valid for a team, a column must have all or part of its contact surface with the ground in a construction area of the same team..
- The level of a tribune corresponds to the number of tribune floors from the ground. A tribune placed directly on the ground is therefore level 1, a tribune resting on a tribune of level 1 is level 2. The maximum level is 3.
- A tribune stack is valid if the tribune of level 1 is valid.
- A tribune placed in a construction area is for the use of the team exclusively. Any removal of elements from these construction areas by the opposing team will result in their forfeit.
- An element still under control by a robot at the end of the match will not be counted.

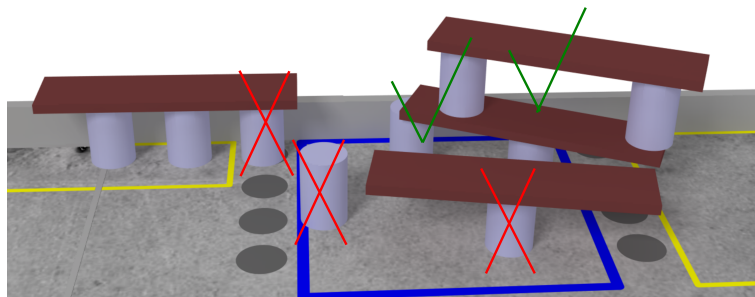


Figure 4: Different valid and invalid tribunes.

D.5.c. POINTS

- **p1 points** per level 1 tribune.
- **p2 points** per level 2 tribune.
- **p3 points** per level 3 tribune.

D.6. ENSURE THE PROMOTION OF THE SHOW

In order to be sure that the public will come to the concert, the robots will also have to promote the show by deploying a beautiful banner on the facade of the hall.

D.6.a. DESCRIPTION AND LAYOUT OF THE PLAYING ELEMENTS

This action involves banners.

D.6.b. ACTIONS AND CONSTRAINTS

Actions:

- Display a banner made by the team at the front of the table.

Constraints:

- At the start of the match, the banner will be loaded in the robot and will be part of its undeployed perimeter.
- The goal is to hang and deploy the banner on the front edge of the table.
- The deployed banner must be at least 500mm long and 250mm high. It must be contained in half of the border which is on the team's side.
- The banner will be hung and deployed on the edge of the table by a means left to the discretion of the team, but which must not damage the table.
- The banner and its fixings must not exceed more than 50mm inside the table.
- If the banner or its attachments contain electronic components or a battery, they are subject to the same safety rules as the robot and SIMAs.
- The robot or SIMAs have the right to deploy the banner at any time during the match.
- If the banner is made up of several elements, then for it to be valid, the elements must completely fill the surface provided for the banner.

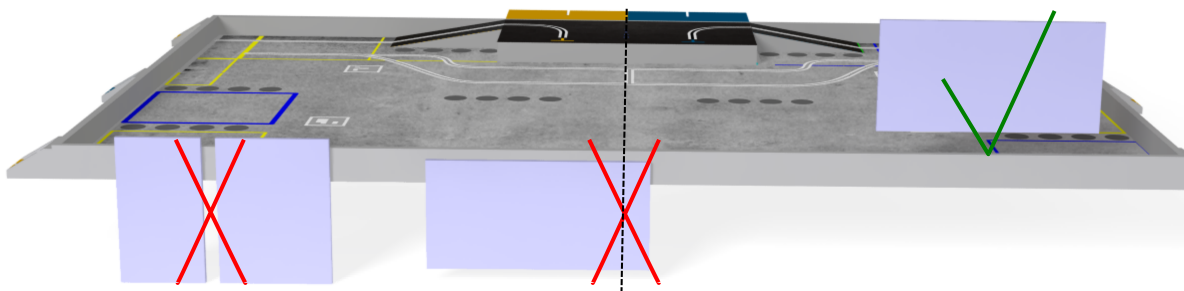


Figure 5: Examples of a deployed banner, valid and invalid.

D.6.c. POINTS

- **p4 points** if the team banner is deployed.

D.7. IT'S SHOW TIME!

The room is ready and it's show time, the superstar and the groupies are having fun in the dressing rooms but now it's time to go, they have to do the show, even if the construction is not finished.

D.7.a. DESCRIPTION AND LAYOUT OF THE PLAYING ELEMENTS

This action involves the superstar and the groupies (SIMA), as well as the stage and the pit.

D.7.b. ACTIONS AND CONSTRAINTS

Actions:

- The team must release one or more PAMIs, and ensure that they reach their respective zones before the end of the match.
- The superstar aims to get on stage and get as close to the front edge of the stage as possible.
- The groupies aim to occupy the areas of the pit.
- The superstar and the groupies must keep partying all night long.
- The superstar and groupies are small independent mobile actuators (SIMA) designed by the team. For reasons of ease of identification, harmonization of design and colors between the SIMAs and the robot is desired.

Constraints:

- During the preparation, the SIMAs will be deposited in the starting zone of the SIMA (dressing room) and all must be contained within the limits of the zone. The colored lines and the edge of the table (on its 22mm thickness) around the area are also included in the starting area.
- A team can have as many groupies as they wish and a maximum of 1 superstar. They must all be contained in the SIMA starting zone and are not stackable. They have the right to leave their zone only after the 85th seconds of the match (invalidation of the SIMA otherwise). The SIMAs will have until the 100th second to achieve their objectives.
- The superstar is valid as being on stage if all or part of his vertical projection is on the stage at the end of the match and if it is in contact only with the stage or the ramp.
- A stage area is considered free if it is between the superstar and the back of the stage, and the vertical projection of the superstar does not intersect this area.
- A groupie is considered to be valid in zone if all or part of its vertical projection is in a zone of the pit at the end of the match.
- The groupies and the superstar must keep an actuator moving and visible to the public after the end of the match; while standing still to be considered partying.
- A groupie can only validate one zone.

D.7.c. POINTS

- **p5 points** per area of the pit occupied by at least one team groupie at the end of the match
- **p6 points** if the team's superstar is valid on stage at the end of the match.
- **p7 additional points** if all SIMA make the party.
- **X additional points** per free stage area behind the superstar at the end of the match, the number of points depends on the number indicated on the highest free area.

D.8. STORE THE TOOLS

Once their work is finished, the robots must clear their way to welcome the spectators. They will therefore have to go and recharge their batteries backstage!

D.8.a. DESCRIPTION AND LAYOUT OF THE PLAYING ELEMENTS

This action involves robots and backstage (SIMA are excluded from this action).

D.8.b. ACTIONS AND CONSTRAINTS

Actions:

- At the end of the match, the robot must be stopped in their own finishing area.

Constraints:

- To be considered valid in the zone, the main robot's vertical projection must be at least partially inside the limits of the finishing area of the team.

D.8.c. POINTS

- **p8 points** if team's robot is in its own valid area.

D.9. ESTIMATE THE ENTRIES

In order to know if the venue will be big enough and that we will have enough income to continue the matches, we must estimate the tickets to the concert and the level of atmosphere that we will obtain.

D.9.a. POINTS

The estimation is based on all the following actions.

- PREPARE THE CONCERT ROOM.
- ENSURE THE PROMOTION OF THE SHOW.
- STORE THE TOOLS.

The estimation bonus is calculated as follows: **Bonus = min(20 points - Delta/2, score done)**

- The score is the one scored by the team during the match on actions listed above.
- The delta is the difference between the score made by the team during the match and the score estimated by the team. This one is always positive (Absolute value).
- The bonus cannot be higher than the score made by the team during the match.
- The bonus is added to the points of the team.
- A bonus is rounded up to the next integer.
- A negative bonus is reduced to 0.
- The penalties are not included in the performance estimation.

ATTENTION PLEASE :

This year, point balancing is not available in the beta version of the settlement. We leave it to you to propose your point balances.

The rules for point balancing are as follows:

- Start on a basis of 1, 2 or 5 points for the simplest action.
- Always have a integer number of points
- Avoid selfish balancing where only the actions you are able to perform have points
- Think of all the teams, from the most experienced to the beginners, so that everyone can score points and not leave the cup frustrated
- As much as possible, have a balance that facilitates the counting of points (ex: total for a tribune with columns and platform = 10pts)
- Only one answer per team, we will select the most recent in case of multiple answers.

You have until October 13 to answer the form, after which we will analyze your answers and weight the planned balancing according to your answers. For this you must go to the following address and complete the online form: www.eurobot.org/balancing_proposal
We will publish the balance with the final version of the rules.

Points summary

D.10.a. PREPARE THE CONCERT HALL

- **p1 points** per level 1 tribune.
- **p2 points** per level 2 tribune.
- **p3 points** per level 3 tribune.

D.10.b. ENSURE THE PROMOTION OF THE SHOW

- **p4 points** if the team banner is deployed.

D.10.c. IT'S SHOW TIME!

- **p5 points** per area of the pit occupied by at least one team groupie at the end of the match
- **p6 points** if the team's superstar is valid on stage at the end of the match.
- **p7 additional points** if all SIMA make the party.
- **X additional points** per free stage area behind the superstar at the end of the match, the number of points depends on the number indicated on the highest free area.

D.10.d. STORE TOOLS

- **p8 points** if team's robot is in its own valid area.

D.10.e. ESTIMATE THE ENTRIES

The estimation is based on all the following actions.

- PREPARE THE CONCERT ROOM.

- ENSURE THE PROMOTION OF THE SHOW.
- STORE THE TOOLS.

The estimation bonus is calculated as follows: **Bonus = min(20 points - Delta/2, score done)**

- The score is the one scored by the team during the match on actions listed above.
- The delta is the difference between the score made by the team during the match and the score estimated by the team. This one is always positive (Absolute value).
- The bonus cannot be higher than the score made by the team during the match.
- The bonus is added to the points of the team.
- A bonus is rounded up to the next integer.
- A negative bonus is reduced to 0.
- The penalties are not included in the performance estimation.

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E. APPENDIX

E.1. GENERAL DRAWINGS

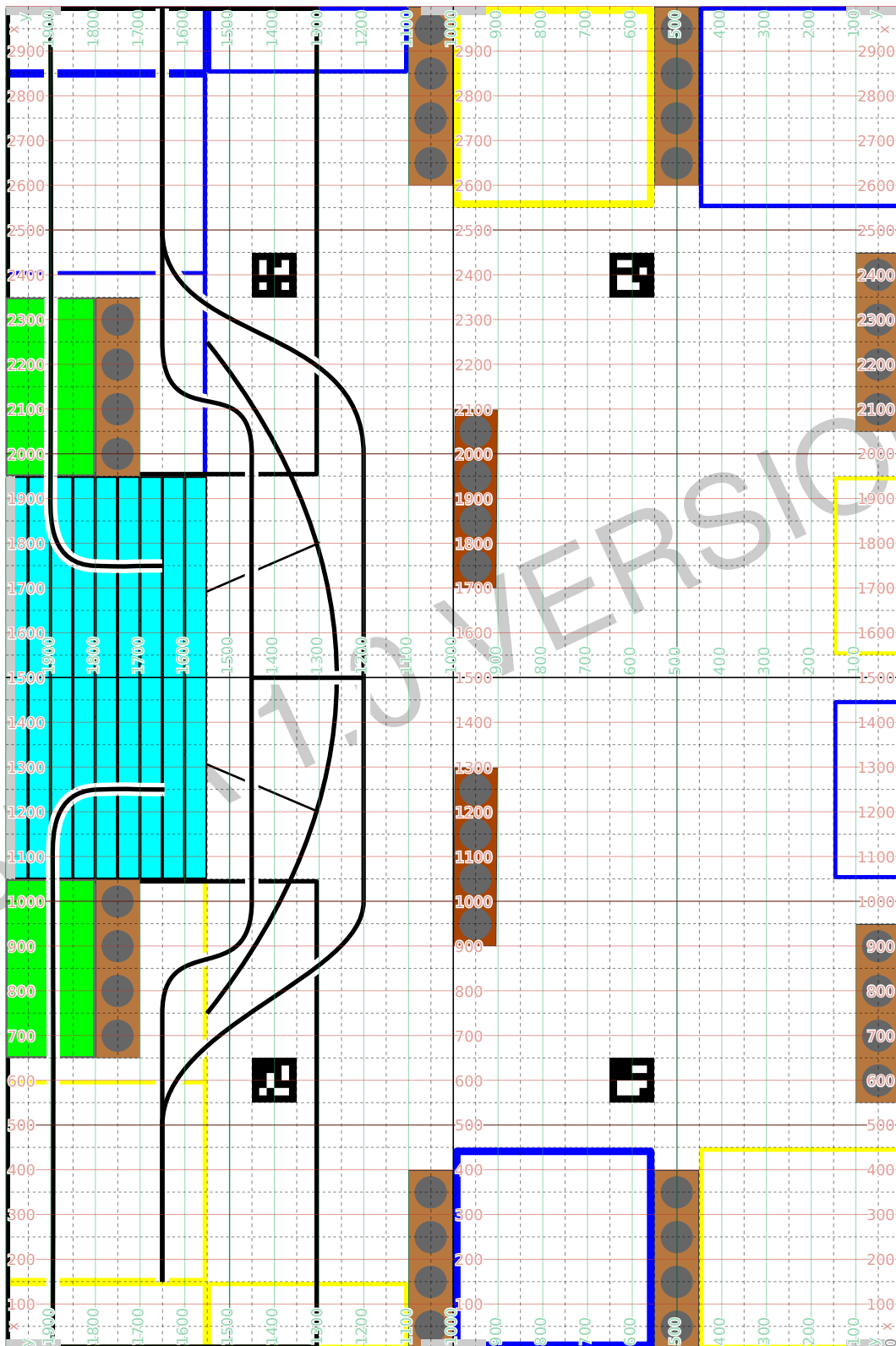


Figure 6: Top view of the playing area.

E.1.a. THE SCENE

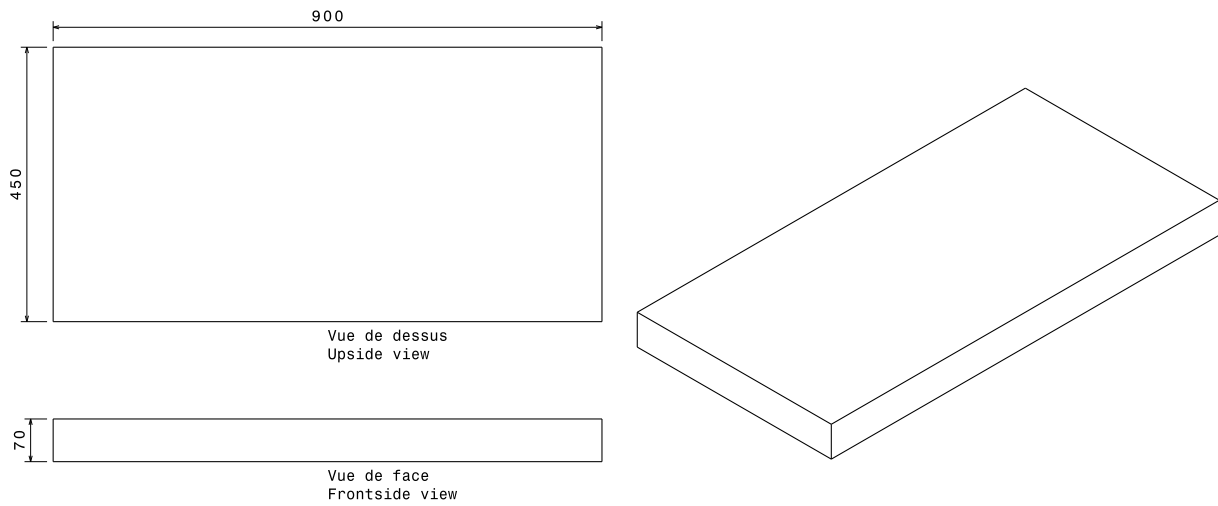


Figure 7: Scene

E.1.b. RAMP

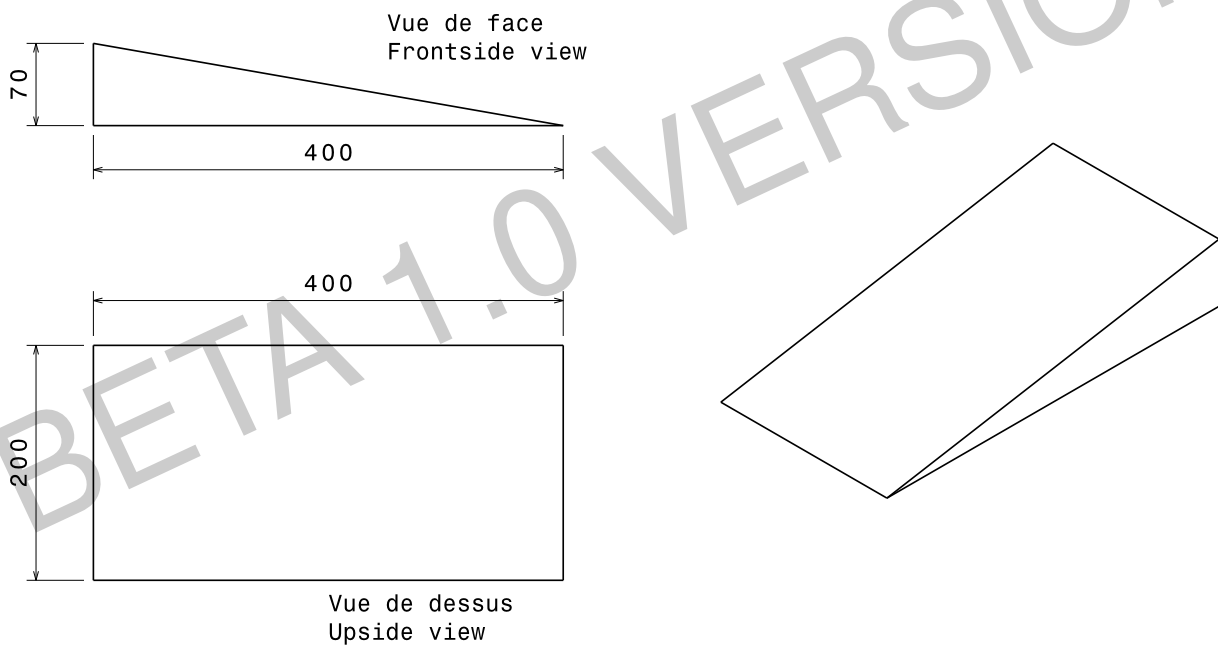


Figure 8: Ramp

E.2. MATERIAL REFERENCES

Elements	Material or reference	Comments
Columns	Standard size 1/2 high tin cans (i.e. 73 mm in diameter by 109 mm high)	
Platform	Wooden planks 400 mm long by 100 mm wide and 15 mm thick	
Scene and ramps	Wooden planks cover with printed monomeric gripping vinyl	
Game floor	Printed monomeric gripping vinyl	Ordering information will be provided by Planète Sciences
Planter	Wood cover by printed monomeric gripping vinyl	

In the case of game elements with two versions, the organization undertakes as much as possible to provide the purchased version of the game element. The second 3D printed version is present in case supply is no longer available during official meetings. For private meetings, the choice is left to the organizer.

E.3. COLOUR REFERENCES

Colors	References	CMYK	RGB
Team blue	RAL 5017 Mat	100% , 60% , 0% , 10%	0, 91, 140
Team yellow	RAL 1023 Mat	0% , 25% , 100% , 0%	247, 181, 0
Borders and non-colored elements	RAL 7032 Mat	15% , 10% , 25% , 20%	181, 176, 161

RAL hues can vary from a printed soil mat to another.