NATIONAL ROBOTICS COMPETITION

WRO® RoboMission 2022

Elementary (Primary), Junior (Secondary), Senior (Tertiary)

GENERAL RULES

Version: 25 May 2022

Main Organiser:

SCIENCE CENTRE singapore

Sponsored by:

Ministry of Education
SINGAPORE

Co-Organiser:

DUCK LEARNING
opportunities in education

Supported by:

WRO®

NRC 2022 WRO® ROBOMISSION CATEGORY

CHALLENGE BOOKLET CHANGE LOG

Version	Release Date	Description
1.0	25 May 2022	Official Challenge Booklet release
1.1	15 July 2022	Updated Section 7: • Standardisation of game play
1.2	15 July 2022	Updated Section 7: • Clarification of Surprise Ruling Updated Section 8: • Removal of Extra Challenge definition Updated Section 10: • Reiterate Championship team representation for Singapore in WRO
1.3	25 July 2022	Updated Section 8: • Clarification of Robot Assembly

Contents

1. General information

1.1. National Robotics Competition (NRC) 2022

National Robotics Competition (NRC) has been an ongoing competition organised annually by Science Centre Singapore for the past 23 years with support from the Ministry of Education, various partners and sponsors. NRC has attracted more than 60,000 participants and 240,000 supporters to date.

NRC spurs students' interest and innovation in Science, Technology, Engineering and Mathematics (STEM). Students will be able to put their knowledge to practice and engage in hands-on STEM learning. With NRC as a stage for students to develop kinaesthetic learning and collaboration, it encourages students to develop problem solving skills, entrepreneurial skills, creative thinking skills and team spirit among the participants. This is in line with Science Centre Singapore's mission "To promote interest, learning and creativity in science and technology, through imaginative and enjoyable experience and contribute to the nation's development of its human resource.

NRC 2022 tournaments comprise of:

- WRO® RoboMission (previously known as WRO® Regular Category)
- WRO® Future Innovators (Previously known as WRO® Open Category)
- WRO® Future Engineers
- NRC WeDo
- NRC Preschool (New)
- CoderZ Coding Challenge

In 2022, NRC emerged a new initiative to include NRC Preschool category, for age group 5-6.

Registration for these category challenges will be via https://www.gevme.com/NRC2022. Competition registration opens from **1st May to 31st July 2022.**

1.2. Introduction to WRO® RoboMission

In the WRO® RoboMission category teams design robots that solve challenges on a competition field. The robots are fully autonomous.

For each age group a new field and mission are developed each year. On the day of the competition a surprise rule adds a new element/rule to the mission.

1.3. Focus Areas

Every NRC category and game has a special focus on learning with robots. In the WRO® RoboMission category, students will focus on developing in the following areas:

- General coding skills & basic robotics concepts (perception of environment, control, navigation).
- General engineering skills (building a robot that can push/lift objects of certain sizes).
- Developing optimal strategies to solve concrete missions.
- Computational Thinking (e.g., tinkering, debugging, collaboration etc.).
- Teamwork, communication, problem solving, creativity.

1.4. Age-appropriate missions

The fields and missions are designed with a growing difficulty and complexity from Elementary (Primary) to Senior (Tertiary) age group. The rising complexity is seen in the:

- Route on the field (e.g., line following or only markers).
- Technical complexity of the missions (e.g., pushing, lifting, grabbing game objects).
- Randomness of the game elements (e.g., one or multiple random situations).
- Variety of game elements (e.g., number of different coloured and/or shaped objects).
- Required accuracy of the solutions to the missions (e.g., a big target area or a small spot).
- Overall complexity in the combination of the elements mentioned before.

All these aspects lead to different requirements for the mechanical design of the robot and the complexity of the code. When participating in NRC for multiple seasons, the teams can grow and develop with the program, solving increasingly complex missions as they get older.

1.5. Learning is most important

WRO® wants to inspire students around the world for STEM related subjects and we want the students to develop their skills through playful learning in our competitions. This is why the following aspects are key for all our competition programs:

- Teachers, parents or other adults can help, guide and inspire the team, but are not allowed to build or code/program the robot.
- On a competition day, Teams and Coaches respect the final decision judges take and work with other teams and judges on a fair competition.

2. Team and Age Groups definitions

2.1. Team Definition

A team consists of two (2) to three (3) team members. One (1) team member is not considered a team. A team may only participate in one of the NRC categories in a season. A student may only participate in one team.

The age groups in WRO® RoboMission Competition are:

- Primary: students 8-12 years old (in season 2022: born years 2010-2014)
- Secondary: students 13-16 years old (in season 2022: born years 2006-2009)
- Tertiary: students 16-19 years old (in season 2022: born years 2003-2006)

The maximum age reflects the age that the team member turns in the calendar year of the competition, not his/her age at the competition day. It is strictly enforced that student cannot be older than specified age group for the respective competition category. If all members of a team are younger than required, then the team must participate in the corresponding age group category. Team members are not confined to school-going students. Anyone can participate in the corresponding age groups.

**** Members of the Championship winning team, at the age of 16 (in the competition year), will not be eligible to compete in the WRO® RoboMission, Junior Category (11 – 15 years old). The next best ranking team with the appropriate age requirements will qualify.***

2.2. Coach Definition

The minimum age of a coach in the NRC tournament is age 20 at the time of registration.

Coaches may work with more than one team. Coaches may offer students advice and guidance prior to the competition. However, all work related to preparation and submission, and the actual competition must be performed by the student members of the team.

3. Responsibilities and team's own work

A team should play fair and be respectful towards teams, coaches, judges and competition organizers. By competing in NRC, teams and coaches accept the WRO® Guiding Principles that can be found at: https://wro-association.org/wp-content/uploads/2021/08/WRO-Guiding-Principles-and-Ethics-Code-2022.pdf .

The construction and coding of the robot may be done only by the team. The task of the coach is to accompany the team organizationally and to support them in advance in case of questions or problems, but not to do the construction and programming of the robot themselves. This applies to both the day of the competition and the preparation.

A team is not allowed to communicate in any way with people outside of the competition area while the competition is running. If communication is necessary, a judge may allow team members to communicate with others under supervision of a judge.

Team members are not allowed to bring and use mobile phones or any other communication device into the competition area.

It is not allowed to use a solution (hardware and / or software) that is (a.) the same or too similar to solutions sold or posted online or (b.) the same or too similar to another solution at the competition and clearly not the own work of the team. This includes solutions from teams of the same institution and/or country.

If there is a suspicion in relation to above rules, the team will be subjection for investigation and any consequences can apply. The organizing team reserves the right to not allow this team to progress to the next competition, even if the team would win the competition with the solution that is likely not their own.

If any of the rules mentioned in this document are broken or violated, the judges can decide on one or more of the following consequences. All decisions by judges are final. Before, a team or individual team members may be interviewed to find out more about the possible violation of the rules.
This can include questions about the robot or the program.

- A team may be given a time penalty of max. 15 minutes. In this time, teams are not allowed to do any changes on their robot and program.
- A team may get up to a 50% reduced score in one or more runs.
- A team may not qualify for the next round of the tournament (e.g. Finals).
- A team may not qualify for the national / international final.
- A team may be disqualified completely from the tournament immediately.

4. Game documents and rule hierarchy

Every year, WRO® publishes new game documents for the specific age group field missions and a new version of the general rules for this category. These rules are the base for all international WRO® events.

During a season, NRC may publish additional Question & Answers (Q&As) that can clarify, extend or re-define rules in game and general rule documents. Teams should read these Q&As before the competition.

Game documents, the general rule document and Q&As may be different in a country due to local adaptations through the National Organizer. Teams need to inform themselves about the rules that apply in their country. For any international WRO® event, only the information WRO® has published is relevant. Teams that qualified for any international WRO® event should inform themselves about possible differences to their local rules.

At the competition day in both NRC and WRO®, the following rule hierarchy applies:

- General rule document builds the base for rules in this category.
- Game documents of the age group clarify the missions on the field and may add special game definitions (e.g. the orientation of the mat or another starting position of the robot).
- Questions & Answers (Q&As) can overwrite rules in game and general rule documents.
- The judge on the competition day has the final word in any decision.

5. Robot material & regulations

Every team builds one robot to solve the challenges on the field. The maximum robot dimensions before the robots starts a run are 250 mm x 250 mm x 250 mm. Cables must be included in these dimensions. After the robot has started, the dimensions of the robot are not restricted.

Teams are allowed to use only the following materials to build the robot:

Controller	LEGO® Education MINDSTORMS® NXT or EV3; LEGO® Education SPIKE™ PRIME; LEGO® MINDSTORMS® NXT, EV3 or Robot Inventor.
Motors	Only motors from the platforms/sets mentioned at "Controller".
Sensors	From the platforms/sets mentioned at "Controller". In addition, it is allowed to use the following materials: • HiTechnic Color Sensor
Batteries	Only official LEGO rechargeable batteries (no. 9798 or 9693 for NXT, no. 45501 for EV3, no. 45610 or no. 6299315 for SPIKE/Robot Inventor).
Building Materials	For the construction of the robot only LEGO® branded elements are allowed.

It is allowed to cut the size of original LEGO® ropes or tubes. Any other modification on any other original LEGO® or electronical part is not allowed and it is not allowed to use screws, glues or tape or any other Non-LEGO® material to fasten any components on robots.

The number of motors and sensors to be used is not restricted. However, it is only allowed to use official LEGO® materials to connect motors and sensors to the controller.

If a team wants to use any equipment to align in the start area, this equipment must be built out of LEGO® materials, it must fit into maximum robot dimensions.

A team is allowed to bring and use only one controller during practice time or robot runs. The team can bring spare controllers but the team should leave it with the coach. If the team needs a spare controller, the team should contact the judge before getting the spare part.

A team should place the controller in the robot in a way that makes it easy to check the program and stop the robot by a judge.

A robot must be autonomous and finish the missions by itself. Any radio communication, remote control and wired control systems are not allowed while the robot is running.

A team is not allowed to perform any actions or movements to interfere or assist the robot after the robot started with the run.

Any software to code the robot is allowed and teams can prepare the code before the competition day. If a team uses a software that requires an online connection (e.g. a browser-based tool), the team should check if there is an offline version for the competition day. The competition organizer is not responsible to provide an online infrastructure (e.g. WiFi for everyone).

Bluetooth, Wi-Fi or any remote connection must be switched off during check time and robot runs. Only teams can use remote connections if there is no other way to transfer the code from a device (e.g. a tablet) to the controller. However, it is strongly recommended to transfer code via cable to avoid problems (e.g. multiple devices with the same name) at the competition day. Of course, it is not allowed to interfere or obstruct any other team or robot with the remote connections a team uses.

Use of SD cards to store programs is allowed. SD cards must be inserted before check time and may not be removed until the next practice time starts.

A team should prepare and bring all the equipment, enough spare parts, software and portable computers it needs during the tournament. Teams are not allowed to share a laptop and / or the program for a robot on the competition day. The competition organizer is not responsible for the maintenance or replacement of any material, not even in case of any accidents or malfunctions.

The robot can be marked (label, ribbons, etc.) to prevent participants from losing it or confusing it with the robots of the other teams, as long as this does not change its performance or give clues about the assembly process.

6. Game table and equipment

In this category, the robot solves missions on a field. Every field consists of a game table (an even ground with boarders) and a printed mat that is put into the game table. Every age group has its own mat because in every age group there are different missions to solve.

The dimensions of a WRO® mat in an age group are 2362 mm x 1143 mm. Game Tables have the same size or max. +/- 5mm in each dimension. The official height of the boarders of a game table is 50mm, higher boarders can be used as well.

The game mat must be printed with a matt finish/overlay (without reflecting colours!). The preferred printing material is a PVC tarp with around 510 g/m² (Frontlit). The material of the game mat should not be too soft (e.g. no mesh banner material).

All black lines that a robot could follow have at least a width of 20mm. Other colours that should be identified by the robot will follow the limitations of the allowed sensors.

The game elements are built from the WRO® Brick Set (no. 45811). Other materials, e.g. bricks from an EV3/SPIKE Core Set or wood, paper or plastic, may be used to a limited extent to make the games even more interesting.

If the position of game objects on the field is not clearly defined and the specified area for the game object is larger than the object itself, the object should be place centred in an area.

7. Surprise Rule

Every NRC tournament has a surprise element/rule for every age group. This rule will be announced during the opening of the competition. The surprise rule can change rules or tasks, extend them and even allow for extra or penalty points. Teams will get the surprise rule at the start of competition day. In the case of competitions lasting several days, different surprise rules may apply to different competition days.

The surprise rule will be orientated on the challenges on the field of the specific age group, so that teams that have prepared themselves for the regular missions will be able to solve the surprise rule as well.

The teams have time to react to the surprise rule before and during their practice times. If the surprise rule brings additional game elements, teams are not allowed to remove these elements from the playing field if they do not want to solve the surprise rule.

The surprise rule does not count towards the regular missions on the playing field. Regular missions on the playing field must still be solved.

8. Tournament Format and Procedure

8.1 Competition Format

NRC will follow the gameplay of WRO® Challenge for the Elementary, Junior and Senior categories. The respective categories in NRC are suitable for participants in Primary, Secondary and Tertiary.

Teams will first present their robot project during Presentation Week from **29th August – 2nd September 2022**. Shortlisted teams will then compete in the Presentation Finals held on **3rd September 2022.**

Teams will then participate in Robot Runs scheduled from **5th – 9th September 2022**. Top 20 teams from Primary and Secondary category and Top 10 teams from Tertiary category will be shortlisted for the Robot Run Finals held on **10th September 2022**.

The tournament in this category consists of the following elements:

- **Practice times**
- **Robot rounds**

The tournament in this category may consist of the following elements:

- A **surprise rule**
- Robot assembly. Note: NRC 2022 will not require assembly of robots on-site. Participants can bring fully assembled robots to the tournament.
- Teams work in designated team areas and are only allowed to modify the construction or code of the robot during practice times. If teams want to make test runs, they need to queue with their robots (controller included). No laptops should be brought to the competition table and no own mats should be brought to the team area. Teams need to calibrate their robots during practice time, not directly before an attempt. If there are different tables for practice and official robot attempts, the team may ask the judges to calibrate the sensors on the official game tables.
- Coaches are not allowed to enter team areas to provide any instructions and guidance during the competition. Specified coaching times, where teams and coaches meet, can be defined.
- Before practice time is over, the teams must place their robots on the robot parking. A robot that is not handed in on time cannot participate in the respective round.
- Once the practice time is over, the judges prepare the competition tables for the next round (including possible randomization of game robots) and robot check-time starts.
- Before the robot is placed on the robot parking, the robot is only allowed to have one executable program (sub-programs that belong to one core program are OK). Judges must have the opportunity to clearly identify one program on the robot, ideally (and if possible) name the one executable program “runWRO” (NXT/EV3) or use one program on slot one (SPIKE) on the robot. If a naming is not possible in your programming environment, please inform the judges about the program name beforehand (e.g. by writing the program name on the sheet in quarantine area next to your team name). If there is no program on the robot, the team cannot join this round and is disqualified for this attempt (see 9.10).

- During check-time, the judges will inspect the robot and check all regulations. If a violation is found at the inspection, the judge will give the team three minutes to convert the violation. It is not allowed to transfer new programs during these three minutes. If the violation cannot be solved during the time, the team is disqualified for this attempt (see 9.10).
- In the case of a competition lasting several days, the robots must remain overnight in the robot parking areas. If charging at the robot parking is not possible, the battery may be removed and charged overnight.
- It is suggested, that every participant receives a participation, bronze, silver and gold certificate based on the robot performance based on the following table (see below). Competition organizer can decide to only to a ranking based on these criteria (without a ranking of placements 1st, 2nd, 3rd) or to award these certificates additional.

8.2 Competition Procedure

8.3 Presentation Format

Presentations are scheduled from **29th August** to **2nd September 2022**. Participants will be notified on their scheduled date. Shortlisted teams will then compete in the Presentation Finals held on **3rd September 2022**.

The details of the Presentation are as follows:

1. Teams will present to a panel of Judges on their scheduled day and session at Science Centre Singapore.

2. Teams will have to prepare a **5-minute presentation** followed by a **5-minute Q&A by the Judges**.

3. The goal of the presentation is to help the judges understand the team's project and hence prepare questions for the team. This will enable judges to have a better understanding of the team's learning processes.

4. The presentation will be on the team's robot and building process, as well as research into the respective themes of your challenge category:
   - Primary – The Garden Robot
   - Secondary – The Rescue Robot
   - Tertiary – The Care Robot

5. Suggestions for content structure include:
   - Team introduction and roles of individuals
   - Research into respective themes of challenge category:
     i. Primary – The Garden Robot. For example, how robots can and have helped in the maintenance of private and public garden spaces.
     ii. Secondary – The Rescue Robot. For example, how rescue robots are playing increasingly important roles in saving lives in natural disasters or calamities.
     iii. Tertiary –The Care Robot. For example, how robots are increasingly deployed in healthcare facilities. How robots in such settings fulfil not only physical tasks but perhaps psychological ones as well.
   - Presentation of the robotic solution including:
     i. Evolution of project idea
     ii. Research into similar ideas that are available (if any)
     iii. Construction of the solution
     iv. Coding of the solution
     v. Challenges during the development process

6. Teams will also be required to showcase their physical robot that they have built for the mission. Presentation scoring breakdown is shown in table 1.

7. Visual materials are allowed in the presentation (e.g. PowerPoint slides, boards, charts etc.).
    - Teams are to provide for their own equipment needed for their presentations. For example, laptops (charged and ready to present) or boards and charts.
    - There is no limit on number of slides used as long as presentations remain within the 5-minute timeframe.

8. All the members in the team are required to attend the presentation, unless under exceptional circumstances.

9. The official language for all presentation is English. Interpreters are not allowed.

10. Teams that fail to report at their allocated presentation time slot will be disqualified.

Judging Criteria for RoboMission Category Presentation:

Category	Criteria	Points
Programming (Total Points: 50)	**Automation** - The project uses appropriate inputs from sensors to run specific routines and clearly demonstrates automation in the completing of the tasks.	**15**
	Good Logic - The programming options used make sense, work reliably, are relevant in terms of their use, complexity and design.	**15**
	Strategy - Use of sub-routines and sub-functions, how the team complete mission objectives, Coming up with different strategies to see what works.	**20**
Engineering Design (Total Points: 50)	**Technical Understanding** - Team members are able to produce clear, precise, and convincing explanations about each step of the mechanical and programming process	**10**
	Engineering Concepts - The project shows evidence and good use of engineering concepts and team members are able to explain the concepts and need for use. Designer / Builder applications.	**10**
	Mechanical Efficiency - Parts and energy have been used efficiently - evidence of proper use of mechanical concepts / principles (gears/pulleys/levers/wheels & axles)	**10**
	Structural Stability - The project (robots and structures) are strong, sturdy and the demonstration can be run repeatedly - parts don't detach - little need for repairs.	**10**
	Aesthetics - The Robot design is functional yet unique and aesthetically appealing.	**10**
Presentation (Total Points: 50)	**Successful Demonstration** - Interesting method of presentation to translate the Theme.	**15**
	Communication & Reasoning Skills - The team are able to present their project idea in clear, concise and engaging way.	**15**
	Quick Thinking - The team are able to easily answer questions about their project. They are also able to deal with any problems that arose during the presentation.	**10**
	Visuals and Decorations / Props - The materials used to communicate the project to others are unique, interesting and aesthetically appealing.	**10**
Content (Total Points: 50)	**Contents** - There is evidence that team members explain the depth of the content relevant to the theme.	**15**
	Research skills - The team is able to show how they conduct their research & the sources they obtained their information from. E.g. Internet, survey.	**15**
	Learning value - The team is able to explain the research journey and give an insight to what they have learnt.	**20**
	Maximum Points	**200**

9. Robot attempt

The Qualifying Robot Runs are scheduled from **5th September** to **9th September 2022**. Participants will be notified on their scheduled date. Top 20 teams from Primary and Secondary category and Top 10 teams from Tertiary category will be shortlisted for the Robot Run Finals held on **10th September 2022**.

NRC will follow the gameplay of WRO® Challenge for the Elementary, Junior and Senior categories. The respective categories in NRC are suitable for participants in Primary, Secondary and Tertiary.

The rules of competition are constituted by World Robot Olympiad Association. Teams are to prepare for the Robot Run in accordance with the rules outlined in **the WRO® Challenge Booklet.**

Each robot attempt is 2 minutes. Time begins when the judge gives the signal to start.

The robot must be placed in the starting area so the projection of the robot on the game mat is completely within the start area. The participants are allowed to make physical adjustments to the robot in the starting area. However, it is not allowed to enter data to a program by changing positions or orientation of the robot parts or to make any sensor calibrations of the robot.

In the event that starting a program directly sets the robot in motion, the team needs to wait for the start signal of the judge before starting the program.

In the event that starting a program does not directly set the robot in motion, participants are allowed to start the program before the start signal. After that, it is allowed to set the robot in motion by pressing the central button on the controller, no other buttons or sensors are allowed to start the robot. If a SPIKE PRIME/Robot Inventor controller is used, it is allowed to use the left button on the controller to set the robot in motion.

If there is any uncertainty during the robot attempt, the judge makes the final decision. The judge should decide in favor of the team if no clear decision is possible.

A robot attempt will end if…

- the robot attempt time (2 minutes) has ended.
- any team member touches the robot. or any mission objects on the table during the run.
- the robot has completely left the game table.
- the robot or the team violated rules or regulations.
- a team member shouts “STOP” and robot does not move anymore. If the robot is still moving, the robot attempt will only end once the robot stops by itself or is stopped by the team or judge.

Once the robot attempt has ended, time is stopped and the judge scores the attempt. The scores are noted on a scoring sheet (on paper or digital), the team need to sign off the scores (on paper or digital signature/checkbox). Once the score is signed off no further complaint is possible.

If a team does not want to sign off after a certain period of time, the judge can decide to disqualify the team for this round. It is not allowed that a team coach joins the discussion with judges on the scoring of the run. Video or photo proofs will not be accepted.

If a team touches or changes the task objects on the playing field during the attempt, the team will be disqualified for this round.

A disqualification of a team in a round will result into a robot attempt with maximum negative score and maximum time (120 seconds).

If a team finishes an attempt without having solved a (partial) task that yields positive points, the time of that run will be set at 120 seconds.

The ranking of teams depends on the overall tournament format. For example, the best attempt out of three rounds could be used and if competing teams have the same points, the ranking is decided by the record of time.

10. Awards

Tournaments	Awards	Rank	Criteria and Remarks
WRO® RoboMission, Primary, Secondary, Tertiary	Best Presentation Award	1st	Participated in Presentation
		2nd	
		3rd	
	Best Content Award	1st	
		2nd	
		3rd	
	Best Programming Award	1st	
		2nd	
		3rd	
	Best Engineering Design Award	1st	
		2nd	
		3rd	
	Best Robot Performance Award	1st	Competed in the Robot Run
		2nd	
		3rd	
	Championship Awards*	1st	Competed in both Presentation Finals and Robot Run Finals
	Judges Award		

10.1 *The Championship Awards

This is the most prestigious award that a team can win. It is bestowed on the team that embodies the NRC spirit.

Teams are considered for the Championship Award based on their overall excellence and total learning experience during the competition.

As a Championship Award recipient, the winning team is recognized as being outstanding and the assessment is based on the scores of the top finalists according to the following weightage:

- **60% Robot Performance (Based on Robot Run Finals)**
- **40% Presentation Score (Based on Robot Run Finals)**

(10% Programming, 10% Engineering Design, 10% Presentation and 10% Content)

Championship Award recipients are eligible to represent Singapore to compete in the WRO® International Final. In the event that an International School win any of the top two awards, they will be acknowledged and given medals and trophies, but the next best local team will represent Singapore for the WRO International. This year the competition will be held in Dortmund, Germany from 17 – 19 November 2022. NRC's participation to WRO® International Final will depend on the prevailing guidelines from MOE.

Glossary

Check Time	During the check time, the judge will take a look at the robot and check the measurements (e.g. with a cube or a folding rule) and other technical requirements (e.g. only one program, Bluetooth off etc.). A check needs to be done before every official robot attempt, not during practice time.
Coach	A person assisting a team in the process to learn different robotics aspects, teamwork, problem solving, time management, etc. The role of the coach is not to win the competition for the team, but to teach them and guide them through the problem identification and in discovering ways to solve the competition challenge.
Competition organizer	The competition organizer is the entity that hosts the competition a team is visiting. This can be a local school, the National Organizer of a country that runs the National Final or a WRO® Host Country together with WRO® Association running the International WRO® Final.
Coaching time	This is an optional time the competition organizer can include in the schedule. The coaches are allowed to talk with the team and discuss the strategy for the competition. It is not allowed that any programs or robot parts are handed over or that the coach helps coding or building during this time.
NRC	In this document, NRC stands for National Robotics Competition.
Practice Time	During the practice time, the team can test the robot on the field and the team can change mechanical aspects or the coding of the robot. In case of an event where teams need to assemble the robot, the teams will do that at the start of the first practice time.
Randomization	Randomization of playfield elements for each age category. The extent of randomization can be found in each category's game rules.
(Robot) Attempt	A robot attempt is the official try to solve the missions on the field. A robot attempt will be scored by judges and is maximum 2 minutes long. Teams usually do multiple attempts during practice time to test the robot before the official attempts.
Robot Round	During one robot round, every team will run their robot on the game field. Every round contains a Check-Time before the actual runs start. Before the round starts with the first team but after all robots are placed on the robot parking, randomizations to game fields (if any) are done.
Robot Parking	Robot parking is the place where all teams must place their robot before the practice time is over.
Team	In this document the word team includes the 2-3 participants (students) of a team, not the coach who should only support the team.
WRO®	In this document, WRO® stands for World Robot Olympiad Association Ltd., the non-profit organization running WRO® world-wide and that prepares all the game and rule documents.