Version 1.0

THE CRC ROBOTICS SENIOR COMPETITION

RULEBOOK

Outlining the preliminary rules for

A program of

AEST EAST

ALLIANCE POUR L'ENSEIGNEMENT DE LA SCIENCE ET DE LA TECHNOLOGIE
EDUCATIONAL ALLIANCE FOR SCIENCE AND TECHNOLOGY

Foreword

i. Welcome to the CRC Robotics Competition

On behalf of the Educational Alliance for Science and Technology (EAST) and CRC Robotics, welcome and congratulations to all the participants on joining your school's/organisation's robotics team and embarking on the CRC Robotics Competition journey! Take it from the current leaders of CRC Robotics, who were all former student participants in the CRC Robotics Competition: you will remember this unparalleled experience for many years to come.

We wish to welcome and thank the many teachers, staff, parents, and mentors for embarking on this journey and for all the hard work you will put in to enrich your students' lives throughout this activity. A big thank-you to all the volunteers involved in CRC Robotics, whose dedication has allowed us to hold Kryptik 2024, our 23rd annual competition.

In addition, we wish to acknowledge all our partners, without whom CRC Robotics could not exist.

The 2023-2024 CRC Robotics season will have a lot to offer: a fresh take on a gym-class classic, a larger and modernised presence on social media, more junior teams and a high proportion of new teams in the senior division!

We wish to thank the Director General, Stéphane Côté, and the Curé-Antoine-Labelle team led by Christian Robert and Dominic Ouimet for their warm welcome as the host school for a third year in a row and for the time and energy they've put towards the success of this event.

Good luck to all and we will see you at Kryptik 2024 from April 11-13, 2024 at Curé-Antoine-Labelle High School in Laval.

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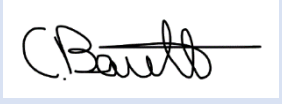

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ii. About CRC Robotics

CRC Robotics was founded in 2001 by a group of young professionals and teachers, fueled by their passion for robotics and education. Unsatisfied with the robotics competitions available for high schools and CEGEPs in Canada, they created an annual competition linking science, technology, engineering and mathematics (STEM) with computers, arts and languages.

We've since grown into an organisation run by former participants willing to give other students the chance to participate in the CRC Robotics adventure that has been so much fun for them. The Competition now welcomes elementary, high school and CEGEP teams from coast to coast in a 3-day, action-packed event held annually.

We believe in providing exciting learning opportunities to students with various interests and goals. Under the umbrella of the Educational Alliance for Science and Technology (EAST), we hold events allowing tomorrow's leaders to find their passion and develop key skills that will serve as assets in an ever-changing, global world.

In essence, the CRC Robotics Competition is:

- A coherent body of several competitions, integrating different disciplines and unique challenges, including languages, computers, mathematics, science, art and much more;
- An experience that develops the qualities of a leader and teaches students about organisation and teamwork, since everything is directed and performed by the students;
- An event that involves students from elementary schools, high schools, CEGEPs and professional vocational centres from all over Canada;
- A challenge that allows students to apply the theoretical knowledge gained in the classroom to a practical application in order to familiarize the students with technology outside of the classroom;
- A chance to take part in an extracurricular activity and work with students and mentors from different backgrounds and domains (engineers, technicians, university professors, etc.).

iii. Roles within the CRC Robotics Competition

In the CRC Robotics Competition, there are three different roles: students, teachers, and mentors. We have laid out the following responsibilities for each:

1. **Students are to do all the planning and building**. They should be creating the strategies, designing the critical paths, and controlling all aspects of the team. Any work done on any aspect of the Competition must be done entirely by the students.

2. **Teachers are available to provide the support that students may need, only if they need it.** They should not be directing the students, but instead, acting as advisors. If a student has a question, the teacher may point the student toward the answer or show the student how to find the solution. If a student is unsure of how to accomplish a specific task, the teacher may demonstrate, but any pieces attached to the robot are to be touched **only by the students**. However, we do realise that there may be times when an educator must step in for academic reasons. We believe that every teacher is a competent professional that can differentiate between teaching students how to do things and doing it in their place.

3. **Mentors are external professionals who may be consulted throughout the course of this activity.** Their job is to help with questions which exceed both the students' and teachers' knowledge. An engineer would have more practical experience; however, the engineer may not direct the students as he/she is acting only as an advisor.

We value the participation of your team, but always keep in mind that this is the students' project. Let them show you what they are made of and let them develop their own skills! Their own work is what truly matters and that is what makes the CRC Robotics Competition so unique and relevant.

iv. Participating Schools

Team Number	School/Organization Name	Division	Rookie
1	West Island College	2	
2	Marianopolis College	1	
3	John Abbott College	1	
4	Vanier College	1	
5	École secondaire Antoine de Saint-Exupéry	2	x
6	École secondaire Curé-Antoine-Labelle	2	
7	Cégep de Victoriaville	1	x
8	Cégep du Vieux-Montréal	1	Returning
9	Collège Citoyen	2	
10	LaurenHill Academy	1	
11	École Secondaire Monseigneur-Richard	1	
12	Collège Saint-Sacrement	2	x
13	Lower Canada College	1	
14	Cégep André-Laurendeau	1	x
15	Collège Sainte-Marcelline	1	
16	Lake of Two Mountains High School	2	
17	Royal West Academy	1	
18	St. George's School of Montreal	2	
19	Collège de Bois-de-Boulogne	1	
20	Dawson College	1	
21	Cégep Limoilou	2	
22	École secondaire Jules-Verne	2	
23	Collège André-Grasset	2	
24	Collège Sainte-Anne de Lachine	2	x
25	Vanguard Québec	2	x

26	Collège Letendre	2	

v. Our Partners

One of the most important aspects of the CRC Robotics Competition is that it keeps registration fees for schools at a bare minimum to ensure an easy and equal access for schools from all socio-economic situations. This would not be possible without the help of our generous partners that, year after year, help us prepare this wonderful event for the students.

We are always seeking to establish new partnerships to achieve our goal of positively improving as many student lives as possible. If you or someone you know is willing to help us in any way, please contact our Partnerships Team at partnerships.crc@sciencetech.ca. On behalf of the students, a heartfelt thank-you!

vi. Season Calendar

Item	Date & Location	Description
Information Sessions	Year-Round	The CRC Robotics Organizing Committee is always available to meet you and present what the Competition is all about and what it entails for students, teachers and their school or community organisation. Interested parties may contact us via info.crc@sciencetech.ca.
Registration Period	August 28, 2023 to October 13, 2023	Registration to the senior competition is open to all high schools, CEGEPs and professional vocational centres in Canada. Late registration may be possible. Please contact info.crc@sciencetech.ca for more information.
Training Day	Year-Round	The Training Day is a hands-on tutorial and training day for teachers and mentors who wish to familiarise themselves with the technology involved in the CRC Robotics Competition as well as with the Competition structure and dynamics. The Training Day is organised according to the demand. Interested parties may contact us via info.crc@sciencetech.ca.
Preliminary Rulebook Release	November 6, 2023	A partial version of the rulebook is made available to participants on www.robo-crc.ca/participant-portal/ one week prior to Kickoff. This way, participants can familiarise themselves with this year's game and prepare questions to be asked at Kickoff.

Kickoff	November 13, 2023 at 7pm *Doors open at 6:30pm* Curé-Antoine-Labelle H.S. 216 Boul Marc-Aurèle-Fortin, Laval, QC, H7L 1Z5	The Kickoff officially marks the beginning of the season for the participants. The complete rulebook and the playing field are revealed, and the participant kit is distributed to the teams. For logistical reasons, a maximum of 10 individuals per team may attend.
Website, Video, and Tutorial Submission	March 11, 2024 at 11:59:59pm EST Using the Participant Portal: www.robo-crc.ca/participant-portal	Having the website up and running and uploading the video to YouTube might take several hours. We therefore recommend you not to wait until the very last minute before starting the upload and going through the submission procedure. If you encounter any problems, send a detailed explanation to sarah.zidle@sciencetech.ca **before** the submission date and time. The Submission Form will be made available as of February 5, 2024.
Deadline to make Website, Video, and Tutorial Public	April 11, 2023 at 7:59:59 am EST	Teams must make their website, video and tutorial available to the general public and the other teams prior to the start of the competition. For more information, refer to the specific sections outlining the details of these components.
23rd Annual CRC Senior Robotics Competition Kryptik 2024	April 11 to 13, 2023 Curé-Antoine-Labelle H.S. 216 Boul Marc-Aurèle-Fortin, Laval, QC, H7L 1Z5	Join us in the pinnacle of the 2023-2024 CRC Robotics season. After over five months of hard work, 26 teams will show off what their robot can do. An exciting, action-packed, 3-day event not to be missed!

Table of Contents

0. The Competition

The Competition is a three-day event that takes place annually at one of the participating schools. The final Competition rules are made public at Kickoff, approximately four months before the Competition.

The following presents the typical Competition schedule. The official and detailed schedule is made available a few weeks before the Competition at www.robo-crc.ca/participant-portal.

	Thursday	Friday	Saturday
Morning	Team Arrival Safety Certification Kiosk Setup Kiosk and Robot Certification	Block 3 of heats CRC Junior Robot Design Finals	Knock-out Rounds Team Pictures
Afternoon	Captains' Meeting Opening Ceremony Block 1 of heats Evaluations for Robot Design	CRC Junior Closing ceremonies Robot Construction Finals Block 4 of heats Programming	Quarter Finals Semi Finals Kiosk Takedown
Evening	Block 2 of heats Evaluations for Robot Construction and Kiosk Programming	Block 5 of heats Kiosk Finals	Finals Continuing kiosk Takedown Closing Ceremonies

0.1. Competition Components

The Competition is divided into seven (7) distinct components, which allows students to demonstrate their strengths in different ways and across various disciplines. While not mandatory, teams may choose a theme that would be applicable to all components of the Competition.

0.1.1. Game

The teams must participate in a tournament with their own radio-commanded robot and must ensure that they follow this year's game's specific rules and regulations. More information on the game can be found in Section 1 of this rulebook.

0.1.2. Robot; design and construction

The design and construction of the robot primarily involve the application of engineering, science, technology and mathematics to ensure that the robot can participate in this year's game. Since the game changes from year to year, the students cannot reuse the exact same robot from previous years; however, certain parts and mechanisms may be reused. More information on the robot can be found in Section 2 of the full rulebook.

0.1.3. Kiosk

The kiosk acts as an information booth, which presents the team's hard work to judges, fellow participants, and visitors to the Competition. It also acts as a workshop for the team's robot between the heats. The kiosk often represents the team's theme for this year's Competition and essentially involves the application of art and communication. More information on the kiosk can be found in Section 3 of the full rulebook.

0.1.4. Programming

The programming component is designed to foster and hone the skills and thinking process required to code professionally. In a truly unique way, participants will tackle various online programming challenges that have real-life applications. Each challenge will provide participants with the required tools to succeed, and challenges will become more complex as teams move forward in the competition. More information on the programming competition can be found in Section 4 of the full rulebook.

0.1.5. Video

A fully bilingual video must be submitted and be publicly available prior to the Competition and must present a description of the CRC Robotics Competition in a creative and

innovative way. This aspect involves the application of technology, computers and languages. More information on the video can be found in Section 5 of the full rulebook.

0.1.6. Website; design and content

A fully bilingual website must be created and publicly published prior to the Competition, with the goal of demonstrating the hard work of the team to the public. The website must include, but is not limited to, a list of participating students, a description of this year's game and the design and construction of the robot. This aspect involves the application of technology, computers and languages. More information on the website can be found in Section 6 of the full rulebook.

0.1.7. Tutorial

The tutorial component allows teams to demonstrate their mechanical, electrical, programming, video and coding talents, among others, by providing a step-by-step explanation to achieve any particular task. The tutorial must be accessible on the team's website and can hold various media formats. More information on the tutorial can be found in Section 7 of the full rulebook.

0.2. Divisions

With a goal of making the Competition as fair as possible to teams with less experience, the CRC Robotics Organizing Committee has introduced a two-division system for certain elements of the Competition.

0.2.1. Teams are divided among Division 1 and Division 2 for the following components:

A. Robot Design
B. Robot Construction
C. Kiosk
D. Video
E. Web Content
F. Web Design

0.2.2. The team's Division is the same for all previously mentioned components.

0.2.3. Teams are divided by High School and CEGEP for the Programming component.

0.2.4. This year's Division is based on the overall result obtained by the team in last year's Competition; the top half of the overall ranking will be assigned to Division 1. If there is an odd number of teams, the median team will be in Division 2.

0.2.5. The divisions are re-assigned every year and will be provided in the full rulebook.

0.2.6. New high school teams are automatically placed in Division 2 while new CEGEP teams and vocational centres are automatically placed in Division 1.

0.2.7. A team in Division 2 can win the Overall Ranking award.

0.2.8. The best Division 1 and Division 2 teams will receive separate awards for the components based on the ranking for each component.

0.2.9. Teams will know their division on the night of the Competition Kickoff. However, if a team registers afterwards, these assignments can be modified. If it is the case, teams will be advised.

0.2.10. A Division 2 team can request to be upgraded into Division 1, but the CRC has the final say in the division distribution.

0.3. Awards and Recognitions

Awards and recognitions are presented to the most performing team(s) in each component. If the division system is used for the ranking of a particular component, then awards are presented to the most performing team(s) in each division for the component. Refer to Section 0.2 for details on components for which teams will be ranked within their division only. In the event of a tie, both teams receive an award and/or recognition. In this section, an "award" is a prize that is presented for a component whose score counts towards the overall ranking and a "recognition" is a prize that is presented for a component whose score does not count towards the overall ranking.

0.3.1. Game

The Game award is presented to each team that was a finalist in this year's game. Finalists are the teams that participated in the final round of the game.

0.3.2. Robot Design

The Robot Design award is presented to the three teams in each division that received the greatest scores from our engineering judges and that were deemed to have best designed their robot for the purpose of this year's game.

0.3.3. Robot Construction

The Robot Construction award is presented to the three teams in each division that received the greatest scores from our engineering judges and that were deemed to have best constructed their robot for the purpose of this year's game.

0.3.4. Kiosk

The Kiosk award is presented to the three teams in each division that received the greatest scores from our pedagogical judges and that were deemed to have the best designed, best constructed, best maintained kiosk, and above all, best presented.

0.3.5. Programming

The Programming award is presented to the three teams that achieved the highest scores in the programming component of the Competition and that were deemed to have the best executed code to accomplish the tasks at hand.

0.3.6. Video

The Video award is presented to the three teams in each division that received the greatest scores from our judges and that were deemed to have the best executed video.

0.3.7. Website Design

The Website Design award is presented to the three teams in each division that received the greatest scores from our professional/expert judges and that were deemed to have the best website from a technical standpoint.

0.3.8. Website Content

The Website Content award is presented to the three teams in each division that received the greatest scores from our professional/expert judges and that were deemed to have the best written content on their website.

0.3.9. Tutorial

The Tutorial recognition is presented to the team that was deemed to have the best explanation of the task selected. This winner is selected by the CRC Robotics Organizing Committee.

0.3.10. Never Say Die

The Never Say Die recognition is presented to the team that encountered many obstacles throughout the course of the Competition and that persevered to finally overcome those hurdles despite all hurdles. This winner is selected by the CRC Robotics Organizing Committee and receives a trophy that symbolises all their hard work and perseverance.

0.3.11. Sportsmanship

The Sportsmanship recognition is presented to the three teams that are deemed the most respectful towards their peers and exhibit behaviour based on values of respect and integrity that go beyond the Competition's rules and etiquette. The winning teams are selected by their peers and the team in first place also receives a trophy that symbolises their sportsmanlike conduct: The Founders' Trophy.

0.3.12. Golden Benchy

The Golden Benchy recognition is presented to the team that is deemed to have the most creative and innovative use of a 3D printed component used on either their robot and/or their kiosk. This winner is selected by the CRC Robotics Organizing Committee.

0.3.13. Best Shot

The Best Shot recognition is presented to the team that was deemed to have had the best submission of a picture, photomontage, short video, or clip taken at the competition. This winner is selected by the CRC Robotics Organizing Committee.

0.4. Overall Ranking

0.4.1. Scoring Logic

- For each component of the Competition, the number of points equal to the total number of teams is given to a first-place ranking. The score given to other ranks can be calculated using the following formula:

$$Score = Total\ Number\ of\ Teams - Rank + 1$$

- Kiosk, Programming, Robot Design, Robot Construction, Website Design, Website Content, and Video components follow the formula mentioned above.
- The game component counts for double the value of the formula mentioned above.
- In the case of a tie, the teams receive the same score for that category.
- The total number of points for all components determines the overall ranking.

0.4.2. Overall Ranking Award

The Overall Ranking award is presented to the three teams that receive the greatest score after combining the points in each component. They are deemed to be the best performing teams in the Competition as a whole. The team in first place also receives a trophy that symbolises their success.

1. Game

The game component requires robots to score the greatest number of points while working in teams. It is the main component of the CRC Robotics Competition, giving each school an equal opportunity to demonstrate their robot design, robot construction and strategic playing skills.

CRC Robotics reserves the right to modify any and all values outlined in the following subsections at any time throughout the season. All teams will be promptly notified if a modification is made. All the visual renderings in this document are not to scale. Please refer to the technical drawings for the field dimensions.

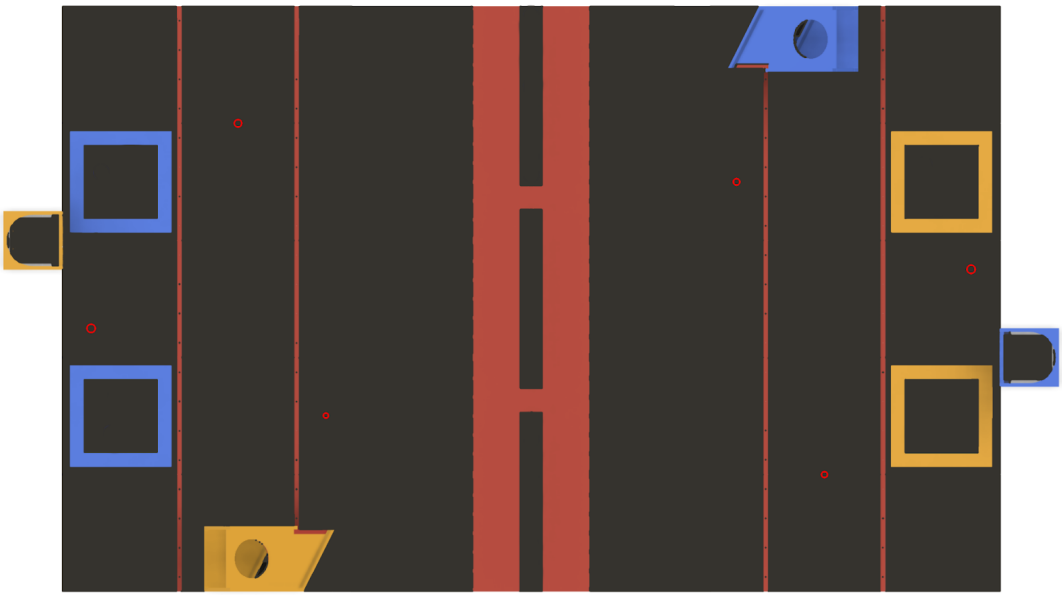
1.1. Teams

Two teams, blue and yellow, composed of two robots each, play against each other during each heat.

Robots will change partners between heats based on the schedule provided by the CRC; partners are assigned at random and will not be changed once the schedule is released.

1.2. Playing Field

1.2.1. The image below shows a visual rendering of the playing field.



1.2.2. The playing field is a single level, divided by a [...] with 3 gutters in the middle. There is a 12.7 cm tall red border all around the whole playing field.

1.2.3. Blue and yellow starting zones are located [...] of the playing field and are represented by a coloured outline. Each robot begins the heat in one of the starting zones of their team's colour and each starting zone is limited to a single robot at the start of the heat.

1.2.4. Each side of the playing field is divided into three zones by red bumper strips and the neutral red zone.

1.2.5. Robots can only manoeuvre [...].

1.2.6. The red zone in the middle is a neutral zone [...]. Going beyond the neutral zone [...] is not permitted and may warrant a penalty to the offending robot. Intentionally blocking other robots from entering the neutral zone is liable to a penalty.

1.2.7. A tall target and a small target are located on each half of the playing field.

1.2.8. Three multiplier pillars are located on each half of the playing field.

1.3. Game Pieces

1.3.1. All game pieces (subsequently referred to as GP) are [...] of various colours.

1.3.2. The colours of the GPs will be [...] and [...] on the scoring of the game.

1.3.3. A total of [...] GPs will be available at the start of each heat.

1.3.4. While the CRC will replace damaged GPs as much as possible, the GPs are subject to normal wear from being used on the playing field; as the competition progresses, each GP may vary slightly physically, such as their size, shape, weight, surface aspect, etc. Each robot's design should account for this variability in order to have the best chance in progressing through the competition.

1.3.5. Should GPs be considered intentionally damaged by a robot, that robot and their team may face a penalty. If the piece is no longer adequate for game use, the team may be asked to replace the GP.

1.4. Putting Game Pieces into Play

1.4.1. [...] GPs start on the playing field, divided equally into the 3 gutters at centerfield.

1.4.2. Each robot is allowed to start the game with up to [...] preloaded GPs. If a robot starts the game with less than [...] preloaded GPs, the remaining GPs will be left on that robot's starting zone.

1.4.3. GPs that leave the field will be considered out of play and can no longer be retrieved or used by a robot.

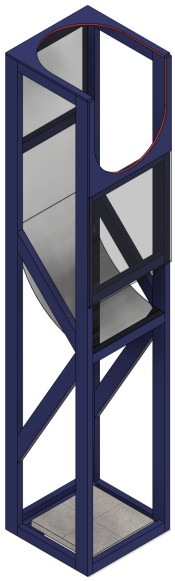
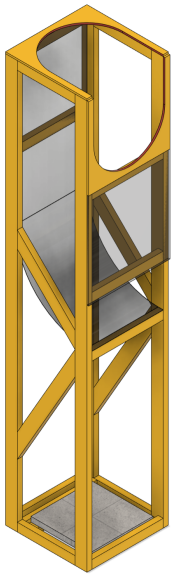
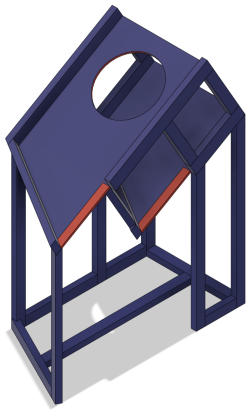
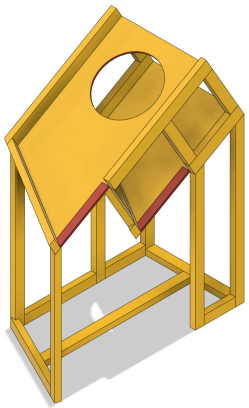
1.4.4. It is not permitted to remove GPs from the playing field. [...]

1.4.5. A robot can carry a maximum of [...] GPs at all times. A GP is considered carried when it is lifted off the playing field floor and in contact with a robot, robot part or another carried GP.

1.4.6. [...] reasonable compression can be applied to the GPs [...]. Any compression applied must comply with the Robot section of this rulebook; failure to do so will result in a damage penalty.

1.5. Targets

1.5.1. The images below show a visual rendering of each target.

			
Tall target (BLUE)	Tall target (YELLOW)	Small target (BLUE)	Small target (YELLOW)

1.5.2. The tall targets are located on tall structures at the back of the playing field. A GP scores it by entering by one of the two half-ovals on top or the front of the target. They are put back above the playing field from a hole in the front of the target.

1.5.3. The small targets are two-decked. A GP gets to the lower deck by falling into the hole located on the top deck. A GP scores it by exiting the target on a deck's red taped line.

1.5.4. Targets are colour-coded to represent the team for which they earn points.

1.6. Multiplier Pillars

1.6.1. There are three pillars of various lengths and diameters on each side of the field. The image below shows a visual rendering of the pillars.

			
Tall pillar (BLUE)	Tall pillar (YELLOW)	Small pillar (YELLOW)	Small pillar (BLUE)

1.6.2. Each pillar can be activated by placing a GP on top of it. The GP must stay in place without being carried by a robot for the pillar to remain active.

1.6.3. A pillar can be deactivated, intentionally or not, by removing the GP activating it.

1.6.4. The table below defines the multiplier awarded to each team depending on how many of their pillars are active on each side of the playing field at the end of the heat. That multiplier is then applied to each team's final score for that heat.

BLUE points multiplier					
		BLUE			
		0	**1**	**2**	**3**
YELLOW	**0**	*1*	*1.5*	*2*	*2.5*
	1	*1*	*1*	*1.5*	*2*
	2	*1*	*1*	*1*	*1.5*
	3	*1*	*1*	*1*	*1*

YELLOW points multiplier					
		BLUE			
		0	**1**	**2**	**3**
YELLOW	**0**	1	1	1	1
	1	1.5	1	1	1
	2	2	1.5	1	1
	3	2.5	2	1.5	1

1.7. Scoring Points

1.7.1. The small targets are worth [...] points per GP scoring from the lower deck. Otherwise, the small target is worth [...] points per GP scoring from the upper deck.

1.7.2. Each tall target is worth [...] points per GP scoring in it.

1.7.3. At the end of the heat, GPs that are being carried are considered to be on the ground in the zone worth the most points that the robot or robot part carrying them is in contact with.

1.7.4. At the end of the heat, GPs on the ground are worth points depending on where they are. The following image indicates the points values of each zone, delimited by red bumpers, the sides of the playing field and the neutral zone [...]. The numbers are colour-coded to represent the team for which they earn points.

1.8. Heat Progress

1.8.1. All heats are 5 minutes in duration. Estimated time and scores might appear on the screens near the playing field. The remaining time until the end of a heat is controlled by the head referee.

1.8.2. When the heat time is over, all parts of the robots must stop moving. GPs will be considered only when they stop moving, even if that occurs after the heat time is over.

1.8.3. All the points generated by a team due to the motion of their robots after the heat ends will be cancelled.

1.8.4. Following the end of the heat signal, team members are not allowed to enter the field, touch any robot, or touch the GPs before they are cleared to do so by the head referee. It is essential that the configuration of the GPs, at the end of the heat, remains intact for scoring purposes. Teams must give back the GPs on board of their robot before leaving the playing field.

1.9. Requirements and Penalties

1.9.1. Identification

All robots must be identified using the CRC-provided coloured signage of that robot's team colour for the heat. Identification must be clearly visible to the crowd, referees and announcer. If these elements are not all clearly visible, the robot will not be allowed to participate in the heat. Adding the robot's name (if any) is optional and does not substitute the required identification elements.

1.9.2. Inactive Robot

A robot is considered inactive if:

- It is unable to leave its starting zone and attempt to actively score points (these will be removed after 30 seconds of inactivity if they are blocking play);
- It is absent from the heat.

An inactive robot will receive a score of 0 for the heat if no points were scored by said robot during that heat; the teammate of an inactive robot will have its score multiplied by 1.5 to compensate for the disadvantage of playing alone.

1.9.3. Broken Robot

If a robot makes it out of its starting zone and stops moving for whatever reason, it will be considered a broken robot. If the robot breaks before it meets the score sharing requirements as decided by the referee on a case by case basis, then it will not share the team's score, but the other robot's score (from the same team) will not be multiplied by 1.5, because, initially, the broken robot was an active robot. Broken robots will be removed from the playing field after 30 seconds of inactivity if they are blocking play.

1.9.4. Requesting Referee Intervention

If a team judges that its robot needs assistance on the playing field during a heat, its pilot may ask the referee to assist their robot. The assisted robot will be liable to an assistance penalty of 20% of its total score for the heat. The referees reserve the right not to assist the robot even if asked to do so by the pilot.

1.9.5. Robot Safety

Any robot that is deemed dangerous based on its design, construction or behaviour by any of the referees runs the risk of being disqualified from the heat, and even from the tournament until the components in question are altered to conform with the safety standards imposed by the CRC.

Should a referee decide that a robot's components or behaviour is presenting reasonable risk of injury or damage to the field, the GPs or another robot, the team in question will be first met with a warning and, if unresolved or not deactivated, risk disqualification from the heat, and even from the tournament.

1.9.6. Unsportsmanlike Conduct

While we trust that all participants will provide clear intentions and respect the rules, the referees, and other competitors, certain actions may occur that require sanctions, especially during the heat of the moment. To avoid such penalties, please remain courteous at all times. These penalties are considered Unsportsmanlike Conduct and have a series of escalating consequences, depending on the severity of the issue. The number of points deducted from the robot's total score for that heat will be at the discretion of the head referee and will be proportional to the severity of the action. Some examples of the types of behaviour that signal a lapse of sportsmanlike behaviour are:

- A deliberate attempt to disable or damage another robot;
- A deliberate attempt to hit another robot with a GP, robot part or playing field element;

- Inappropriate behaviour directed at a referee, a volunteer, another participant, or the public.

1.9.7. Removal of GPs

Any deliberate attempt to throw a GP or put a GP out of play will result in a 20% penalty of the robot's total score for the heat for each GP affected.

1.9.8. Junk Penalties

Various robot parts may be placed, intentionally or not, on the playing field by a robot, on the condition that they are removed from the playing field by the robot before the end of the heat.

If the parts released by a robot block another robot or their access to a GP, or pose a risk of injury or physical damage to the field, GPs or another robot, they will be immediately removed by the referee and a junk penalty will automatically be applied.

If items are no longer in contact with the robot by the end of the heat, the robot that released these items will be liable to an individual junk penalty of 4% of its total score for the heat for **each** item left on or around the playing field. If multiple items are in contact with each other at the end of the heat, they are considered a single item.

If liquid leaks from a robot during the heat, the robot that is leaking will be given a score of 0 for that heat.

1.9.9. Minimum Score

The minimum score that can be awarded for any given heat is 0 points. If a penalty brings a robot's total score to below 0, the final score awarded to the robot for the heat will be 0.

1.10. Pilot and Co-Pilot

1.10.1. Each team's pilot, co-pilot (spotter), and robot participating in the next heat must be in the designated "On Deck" area when the buzzer sounds to end the previous heat. If not, the team is considered as a forfeit for the heat in question. It is the team's responsibility to make sure the team is on time, even if the schedule is delayed.

1.10.2. If a team's robot, pilot, or co-pilot is not ready to start, the heat will start without that team. Though encouraged, the presence of a co-pilot is not mandatory.

1.10.3. The pilot and co-pilot must remain seated during the entire game in their designated seats provided by CRC Robotics, which are placed within the designated areas surrounding the playing field. If a pilot or copilot wishes to move their chair, it is allowed to do so before the heat begins.

1.10.4. Team members may not interfere with or touch any element of the playing field, robots or GPs during the heat.

1.10.5. Team members and the public in the stands may not interact with the pilot or co-pilot during a heat; backseat driving will be met with an initial warning, then the offender will be asked to leave the playing field area.

1.10.6. Each person is responsible for taking all necessary precautions to ensure their own safety.

1.11. Referees and Rulings

1.11.1. The referees on the playing field have full authority to judge all aspects of the game. In particular, the referees will:

- Prevent robots, robot extensions and dropped robot parts from negatively blocking other robots;
- Prevent robots from damaging the playing field and GPs;
- Prevent robots from violating the air space on the edges of the playing field;
- Try their best to make sure the numbers displayed on the screens are accurate and updated as soon as possible; however, their ruling overrides whatever is displayed on the screens.

1.11.2. Our referees are experts in calling and assessing penalties and always have the final word on the playing field.

1.11.3. All challenges must be brought with video evidence by the pilot to the Team Resource CRC volunteer within 15 minutes of the end of the heat being challenged. Teams are asked to not approach the CRC scoring table, as this area is off-limits to the public.

1.11.4. A team may be deprived by the CRC of its right to challenge if it is unnecessarily abusing it.

1.12. Tournament Progress

The tournament consists of 5 rounds:

a. **Preliminary Round**: These heats are played on Thursday and Friday by all teams. After all the preliminary heats have been completed, each robot will cast out their two lowest scoring heats. Heats affected by an unsportsmanlike penalty cannot be cast out. The total of all other heats will be summed to determine each robot's final rank for the preliminary round. Depending on a team's rank, teams can advance directly to the semi-finals or quarterfinals, or they will play in the knock-out round.

b. **Knock-Out Round:** These heats are played on Saturday morning by teams that did not directly advance to the quarterfinals or semi-finals. This round provides teams with an opportunity to advance further in the tournament. The final score of all the heats played by a robot in the knock-out round will be added to determine its ranking in this round.

c. **Quarterfinals:** Top teams from the preliminary and knock-out rounds advance to this stage of the tournament. The final score of all the heats played by a robot in the quarterfinals will be added to determine its ranking in this round.

d. **Semi-Finals:** Top teams from the preliminary rounds and quarterfinals advance to this stage of the tournament. The final score of all the heats played by a robot in the semi-finals will be added to determine its ranking in this round.

e. **Finals:** Top teams from the semi-finals advance to this stage of the tournament. The final score of all the heats played by a robot in the finals will be added to determine its ranking in this round.

The schedule for the various rounds will be published at the beginning of the Competition.

2. Robot

This section outlines the robot design and construction constraints on which robots will be evaluated at the Competition. Non-compliance with the following rules will cause robots to fail certification. Uncertified robots are not allowed to compete. Refer to the Wiki for tips and suggestions. The evaluation rubrics used by the judges to evaluate the robot design and robot construction as well as the Robot Certification Form may be found at the end of this section.

2.1. Transmission and Controls

2.1.1. Authorised Controller and Functionality

The controller acts as the robot brain. All robot control signals must originate from a CRC 9880B or CRC 9880C controller, referred to as the "CRCduino" in the rest of this document. The CRCduino must be programmed using the CrcLib for all the code related to the communications between the *CRCduino* and the *CRCconnect*.

2.1.2. Remote Control

The robot may only be remotely controlled by any wired remote control connected to the CrcConnect module provided by CRC Robotics, linking the remote control to the controller. The remote control must send all commands to the controller. However, the robot may perform autonomous actions.

2.1.3. Other Transmitters

It is forbidden to use any transmission methods or any method disrupting other robots in any way.

2.1.4. Other Control Systems

Other onboard control systems are allowed if and only if a motor, a servo, any actuator type or a 12V motor controller is not connected to them. Sensors can be connected to an onboard control system other than the CRCduino.

2.1.5. Onboard Cameras

Cameras may be attached to robots, but the live transmission of images is prohibited during the heats.

2.2. Low-Voltage Control Circuit and Motorization

The low-voltage circuitry refers to the controller power source and all sensors and servos powered through a 5V controller port and the controller power source.

2.2.1. Low-Voltage Sensors

Usage of any onboard sensors to give feedback to the controller is allowed. Encoders using I2C communication are allowed.

2.2.2. Low-Voltage Continuous Rotation Servos

All “Radio-Controlled Hobby”-type continuous rotation servos are allowed. Low-voltage continuous servos must be powered through a 5V controller port. Standard partial-rotation servos that have been internally modified to run continuously are allowed and count as “low-voltage continuous rotation servos”. For reference, the following are some examples of legal continuous rotation servos: VEX EDR 3-wire motors, VEX EDR 2-wire 393 motors, VEX EDR 2-wire 269 motors, POWER HD 1501MG, FEETECH FS0403 and HITEC HSR-1425CR. Thousands of different models are available on the market. When in doubt, contact CRC Robotics.

2.2.3. Low-Voltage Standard Servos

Standard servos are closed-loop systems that can only partially rotate. All “Radio-Controlled Hobby” type standard servos are allowed. Low-voltage standard servos must be powered through a 5V controller port. For reference, the following are some examples of legal partial-rotation servos: VEX EDR 3-wire servo, POWER HD DSP33, FEETECH FT5313M and HITEC HS-625MG. Thousands of different models are available on the market. When in doubt, contact CRC Robotics.

2.2.4. Low-Voltage Servo Controller

External motor controllers are permitted if and only if they are used to control a low-voltage servo (continuous or standard) that is not equipped with an internal motor controller. For reference, the following are some examples of legal servos: VEX EDR 2-wire 393 motors and VEX EDR 2-wire 269 motors. Low-voltage servo controllers must be powered through a 5V robot controller port.

2.2.5. Controller Power Source

The controller must be powered by the 12V power circuit.

2.3. Power Circuit and Motorization

The power circuitry refers to all components powered by the 12V batteries.

2.3.1. Power Circuit Source

The power circuit must be fed by one 12V, maximum 8Ah lead-acid or Nickel-Cadmium sealed battery or two 12V, maximum 4Ah parallel-wired lead-acid or Nickel-Cadmium sealed batteries.

2.3.2. Mounting of the Batteries

For safety reasons, the batteries must be securely attached to the robot frame and must remain so during the heat. A securely attached battery must not move relative to the robot frame before, during or after a heat. If the battery mounting is deemed unsafe by the CRC certification team, a robot can be denied technical certification.

2.3.3. Kill Switch

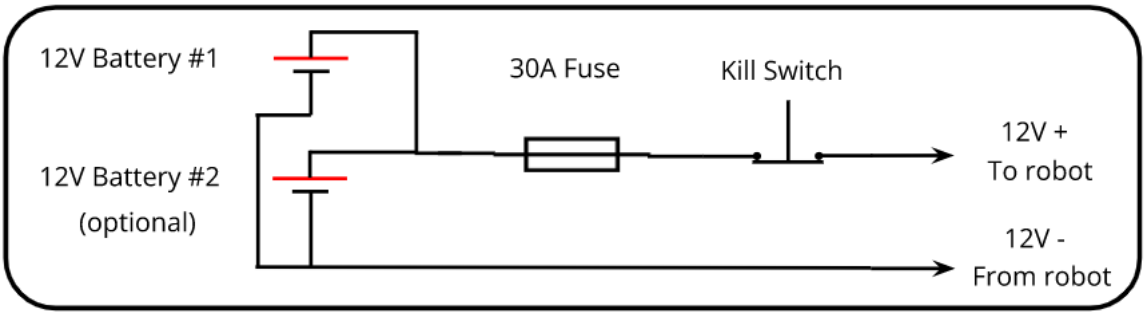
For safety reasons, the robot must have an easily identifiable and accessible ON/OFF red kill switch. The kill switch must be connected to the circuit such that it kills the robot's 12V circuit when the switch is pushed down, not pulled. The kill switch that must be used on all robots is the NPB22-J, or a switch deemed equivalent by CRC Robotics. If any other switches of the same type are used on the robot, they cannot be red.

2.3.4. Fuse

All robots must have a 30A fuse (single usage or reusable) between the 12V batteries and the kill switch. The total 12V battery output must be limited to 30A.

2.3.5. Safety Specification

The power circuit must, at a minimum, adhere to the following safety schematic:



2.3.6. Power Motors

Only the following power motors can be used as part of the power circuit, with any or no gearbox attached:

Motor Type	Part Number
Banebot Motor	RS-555 with any gearbox
goBilda Motor	Modern Robotics/MATRIX 12VDC Motor **Legal replacement:** RobotZone 12VDC Motor for heavy-duty planetary gearbox
Car Power Seat Motor	Princess Auto SKU: 9102179

2.3.7. Power Motor Count

The maximum number of power motors allowed on the robot is 8, with a maximum of 4 power motors of the same type and gearbox combination. In all cases, the maximum number of motors of the same type, regardless of the coupled gearbox, is 6.

2.3.8. Power Motor Modifications

Any modification to the electrical components of the power motors is prohibited. Modifications may only be made to the mechanical components of the power motors, if desired. Therefore, the gearbox can be changed or removed completely.

2.3.9. Power Servos

Servos powered by the 12V power circuit are prohibited.

2.3.10. Power Motor Controller

Power motors may be controlled with relays, interrupts, switches and/or any motor controllers, such as the Victor SPX, as long as they are rated for the appropriate current.

2.3.11. Capacitors

The addition of capacitors to the 12V power circuit of the robot is permitted. The role of these capacitors is to reduce the magnetic field emitted by the motors. However, no electrolytic capacitors are permitted for this task. The capacitor may not be used to accumulate charge. If the capacitor is polarised (if it contains only one direction for connection), it is considered illegal.

2.3.12. Wiring

The use of an adequate wire gauge is mandatory in the power section of the robot (12V) in order to pass the technical certification. We provide these two tables as guidelines.

Current (A) at 12V	Wire gauge
0 - 1	20
1 - 5	18
5 - 10	16
10 - 20	14
20 - 30	12

Robot circuit component	Current (A)
Battery/Fuse/Killswitch	30
Distribution panel	30
From Battery to Victor SPX	30
From Victor SPX to Motor	30
Other (12V LEDS, 12V Speakers, 12V cooling fans, etc.)	See manufacturer's recommendations

2.4. Pneumatics

There are many dangers to working with high-pressure systems. Thus, the following regulations are put in place to emulate the same safety standards present with the power circuit.

2.4.1. Kill Switch

If the robot uses any pneumatics, it must have an easily identifiable and accessible ON/OFF manual pneumatic exhaust valve (kill switch). All actuators/valves must be at the ambient pressure when turned to OFF.

2.4.2. Maximum Pressure

The pneumatic system of the robot must be divided into two parts. Their maximal pressures are the following:

A. Tank section: 90 psi
B. Low-pressure section (actuators/valves): 55 psi

2.4.3. Pneumatic System Protection

In a similar fashion to the fuse in an electrical circuit, the pneumatic system must be equipped with an overflow valve that can be controlled to release any pressure greater than 90 psi.

2.4.4. Altered Pneumatic Parts

All pneumatic pieces (actuators, valves, cylinders, tanks, switches, etc.) must be unchanged from their original state, as purchased new. No altered parts will be accepted. All serial numbers must be visible for certification.

2.4.5. Actuator/Cylinder Control

Each actuator/cylinder must be controlled by no more than one valve.

2.4.6. Valve Control

All the valves must be controlled by the controller. It is permitted to add relays or power modules to the low-voltage or power-electrical circuit to control the valves if they are still controlled by the controller. The pneumatic system and its controls cannot pose a risk of injury or damage if the controller or valves were to run out of electricity or air, including when any of the 2 kill switches are activated in the event of an emergency.

2.4.7. Maximum Input and Tube Diameters

The valves must have a maximal input hole of 1/8" (3mm). The tubes between valves and their actuators/cylinders must have a maximal diameter of 3/16" (5 mm).

2.4.8. Manometers

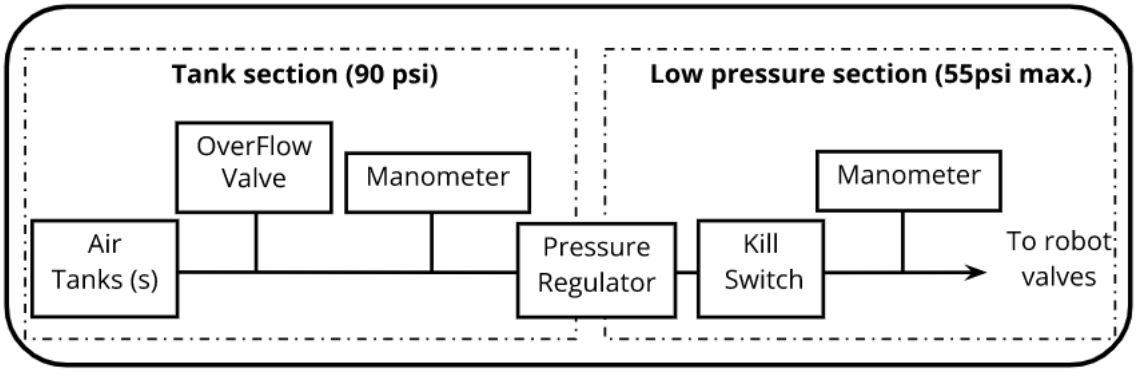
A manometer must be installed in both low-pressure and air tank sections.

2.4.9. Series/Parallel Plugging

Plugging several tanks in series or in parallel is allowed if their pressure does not exceed 90 psi.

2.4.10. Safety Specification Scheme

The pneumatic system must, at a minimum, adhere to the following safety schematic:



2.5. Alternative Power and Energy Systems

2.5.1. Gravitational Energy

There is no restriction with regard to using gravity.

2.5.2. Single Decompression Springs

A spring that, after having started the heat in a compressed or stretched state, releases its energy during the heat, but cannot return to its original state without human intervention, will be deemed illegal.

2.5.3. Proper Spring Usage

If spring systems are used, they must be in relaxed states, or compressed or stretched by the same batteries and motors used during the heat, before the heat begins. Spring systems that function through oscillation are also allowed, given they conform to the above rules.

Spring-loaded mechanisms that release their energy all at once, like a catapult, must not present any pinch points or crushing hazards in the trajectory of the released moving robot part or parts. Such springs cannot be armed while the robot is being transported on and off the playing field to avoid injuries.

2.5.4. Fans

Fans can only be used to cool down motors or electrical components that can potentially overheat.

2.5.5. Lights

Lights can be used on robots, but they must draw their energy from the 12V power circuit. Blinding lights or other components deemed distracting or disruptive by the certification judge or the referees on the playing field must be disconnected.

2.5.6. Lasers

The use of lasers of any type is prohibited.

2.5.7. Other Electrical Sources

The only electrical power sources allowed are the ones stated in Sections 2.2 and 2.3.

2.6. Dimensions

2.6.1. Initial Size Limits

Robot dimensions are limited to an initial dimension limit of [...] (length x width x height) at the beginning of each heat.

2.6.2. Extension Constraints

After the heat begins, robots can extend their dimensions up to [...] (length x width x height). Robots need to be able to reduce their size back to meet the initial size limits by themselves.

2.6.3. Moving Parts

Moving robot parts are allowed if they do not extend beyond the allowed dimensions and height limit at the beginning of and during a heat.

2.6.4. Robot Parts

A "robot part" is defined as the following: *All things that touch the robot at the beginning of the heat, except playing field elements and GPs.*

2.6.5. GP Handling

All parts of the robot that can be in contact with the GPs must be built without sharp corners or edges to avoid damaging them. Fasteners such as screws must not stick out in the path or potential path of a GP in a way that could damage them.

No mechanism or robot part can compress the GPs to a diameter of less than [...]. Mechanisms that launch the GPs must have a minimum of [...] width of contact with all GP sides with which it is in contact. When in doubt, contact CRC Robotics.

2.7. Certification

2.7.1. Safety Inspection

Robots will be required to pass a safety inspection (on-site, at the Competition) in order to be judged and have access to the playing field. During the certification, the electrical power circuit, and if present, the pneumatic circuit, will be inspected for their integrity. If parts are protected inside boxes, the boxes will need to be opened during certification. Should any part of the circuit be inaccessible, the robot will not be certified. Refer to the certification criteria at the end of this section.

2.7.2. Post-Certification Modifications

Teams may modify their robot between heats at their discretion. However, each electrical modification and each modification made to enlarge the robot's dimensions must be subsequently certified. Failure to recertify the robot will result in all points gained in subsequent heats to be void. When in doubt, recertifying a robot, even after minor modifications, is regarded as best practice.

2.7.3. Safety

Any robot deemed to be dangerous for any reason can be disqualified until the necessary safety measures are put into place.

2.8. Evaluation

2.8.1. The Evaluation Process

The evaluation of a team's robot includes two stages: the Preliminaries and the Finals.

The Preliminaries:

- All registered teams are divided into pools. The number of teams per pool is dependent on the number of registered teams.
- The judges of each pool evaluate and rank the teams' robots. Judges are participating mentors or qualified CRC volunteers. Judges are never assigned to pools containing their current or past teams.
- Each pool is evaluated by different judges. Judges of all pools follow the same judging criteria for each category.
- The top teams in each pool will qualify for the Finals. The number of qualifiers per pool is dependent on the number of registered teams.

The Finals:

- Finalists are the top teams from each pool in the Preliminaries.
- There are no pools in the Finals. All finalists are evaluated by the same judges.
- Judges evaluate and rank the finalists' work. Judges are field experts and did not judge in the Preliminaries. Judges in the Finals follow the same judging criteria used in the Preliminaries.
- Based on the ranking provided by the judges, the top three teams in each division will receive awards.

2.8.2. Evaluation Criteria

The evaluation criteria are divided into three levels: Standard, Developed and Advanced.

- The Standard level provides minimal criteria that should be satisfied. These criteria may target specific rules in the rulebook or requirements which are considered essential for acceptable work.
- The Developed level includes criteria which, when satisfied, demonstrate a commendable work quality.
- The Advanced level groups criteria which, when satisfied, set a team apart from the rest.

2.8.3. Schedule

The timeframes for the preliminary evaluations will be provided to the teams on the first day of the Competition. The teams that advance to the final round will be provided with their time frame after the preliminary round.

2.8.4. Presentations

The preliminary presentations will take place at the kiosk of each team. Final presentations will take place in a closed room at the host school.

2.8.5. Language

The presentation can be done in French and/or English.

2.8.6. Visual Support

Visual support is permitted. CRC Robotics does not guarantee the presence of electrical outlets for the presentation.

2.8.7. Structure

The presentations must abide by the following structure:

Length	Action
5 min	The team presents the robot (without the judges interrupting).
5 min	The judges ask their questions to the evaluated team.
5 min	The judges give feedback, rank teams, discuss and move toward the next team.

2.9. Evaluation Form for Robot Design

Topic	Level	Criterion
Design & Creativity	Standard	**Is the robot designed for the game?** The robot is designed to play this year's game and can adopt efficient game strategies.
	Developed	**Is the robot efficient?** The robot's intended mechanisms, components and programming use minimal resources for maximum output.
	Advanced	**Is the robot inventive?** The robot is designed with creative concepts, ingenious details and "out-of-the-box" thinking.
Presentation	Standard	**Did the team present and justify their approach to the design?** The team can intelligibly explain how it approached this year's game, highlighting their technical expertise, team size, and challenges.
	Developed	**Did the team explain their journey?** The team can clearly present and justify the evolution of their designs, technical drawings or prototypes in a professional and concise presentation.
	Advanced	**Did the team defend their decisions?** When faced with questions, the team can confidently explain and justify their decisions.

2.10. Evaluation Form for Robot Construction

Topic	Level	Criterion
Structure & Maintenance	Standard	**Is the robot efficiently built?** Appropriate materials are used in their proper context and the robot is robustly assembled. The robot has low mechanical tolerance and is well-calibrated. The robot is reliable/resilient and can withstand multiple heats without repair. The electrical and control systems are to standard, namely the convenience of the wire gauge used and the wire management.
	Developed	**Does the robot move as intended?** The robot's driving mechanism operates smoothly. The robot's ancillary systems are stable and make precise movements. Motors and mechanisms are appropriate for intended tasks.
	Advanced	**Is robot maintenance accessible and optimised?** All components can be easily accessed, maintained and replaced. The electrical system is protected and accessible. The robot parts can be swapped easily. Maintenance required on the robot is minimal.
Presentation	Standard	**Did the team present and justify their build process?** The team can describe and justify the build process and the choice and use of tools and machines required throughout the build.
	Developed	**Did the team highlight the efficiency of their build?** The team can justify the number and allocation of motors and choice of material and point out outstanding qualities and functions of their robot. The team can clearly present and justify the evolution of their build process, technical drawings or prototypes.
	Advanced	**Did the team defend their decisions?** When faced with questions, the team can confidently explain and justify their decisions.

2.11. Robot Certification Form

Team: _____

Component	Item	Certification		
		Acceptable	Unacceptable	Not Applicable
Electricity	Accessible Circuit			
	12V Batteries			
	Visible Master Kill Switch			
	30A Fuse or Equivalent			
	Battery Mounting			
	Wiring Gauge			
Motor count	Banebot Motor			
	GoBilda Motors			
	Black Car Seat Motors			
	5V Servos			
	Integrity of the Motors			
Electronics	Speed Controllers			
	Other Electronic Devices			
	Robot Controller Type			
Mechanical	GP-Handling			
	Spring-loaded mechanisms			
Pneumatics	Presence of Pneumatics			
	Visible Master Kill Switch			
	Pressure Valve			
	Number of Cylinders			
Robot	Dimension of the Robot			
	Visibility of CRC-provided ID			
	Robot Safety (electric circuit, exposed screw, sharp edge, dangerous mechanism, etc.)			

Notes: _____

_____

_____ _____

CRC Robotics Signature Team Signature

3. Kiosk

The kiosk component requires the organisation of an information kiosk and presentation of accomplishments to visitors and judges. This component gives each school an equal opportunity to showcase their school, their team and their robot while also developing presentation and artistic skills.

3.1. Installation and dismantling

3.1.1. Setup Safety

If any CRC Robotics official feels that there is a risk of accident either with the kiosk or with the construction methodology (e.g. unsafe ladder, tools, etc.), CRC Robotics will consult the team and stop the building process until a safe approach or correction can be agreed upon.

3.1.2. Competition Readiness

In an effort to have the best experience possible for all teams, kiosk elements must be painted and cut before teams arrive at the Competition. Minor tweaks will be permitted, but if major parts of the kiosk are being built on site, a penalty will be sanctioned.

3.1.3. Assembly Time Limit

The kiosk must be fully mounted and ready for judging within 6 hours of a team's scheduled arrival time sent by email to all teams in the days prior to the Competition.

3.1.4. Dismantling Time

Kiosks may not be dismantled until instructed to do so by the CRC Robotics Organizing Committee.

3.1.5. Dismantling

A team's kiosk area must be cleared and cleaned by 6:00 p.m. on the Saturday night of the Competition. No damage can be done to the area. Any team leaving any debris will be subject to a $200 fine as well as any cleaning costs incurred by the host school. Repeat offenders may be subject to further penalties.

3.2. Constraints for certification

Each kiosk will be required to pass a safety inspection at the end of their setup time limit in order to be judged. Refer to the certification form at the end of this section and the following points for details.

3.2.1. General

Identification: A clear and obvious identification of the team number and full school name must be properly displayed at the entrance of the kiosk.
Respect for Neighbour: The surrounding kiosk areas must be respected; otherwise, the team at fault will be penalised for any behaviour that has a negative impact on other kiosks (e.g. loud music, extending beyond the kiosk footprint, etc.).
Space Provided: A 12'4" (depth) by 12' (width) space is available to each team. The maximum height of the kiosk is 9'6".

3.2.2. Electrical Work Conformity

All electrical work within the kiosk must adhere to Québec's building safety standards. Wires must not be exposed (protected), need to be grounded, and anchored to avoid tripping or accidental disconnection.

3.2.3. Structural Integrity

The walls and internal structures of the kiosk must be adequately secured. All structures should be able to withstand reasonable pressure or force without risk of falling or collapse. It is not permitted to have any livable space on a second level due to safety concerns, including during set-up and dismantling time.

3.2.4. Safety Gear

Each kiosk must be equipped with at least one complete first aid kit (see First Aid Kit Requirements Certification Form), at least 3 pairs of safety glasses and at least 3 pairs of work gloves or mechanic's gloves. It is the responsibility of the participants and the adults in charge of each team to make sure proper safety gear is worn when necessary, both inside and outside the kiosk.

3.2.5. Access

There must be clear access for the robot and team members within the kiosk. The space must be easily manoeuvrable without hitting things or risk of injury, both for team members and the general public. Areas not accessible to the public must be clearly indicated. All spaces accessible to the public must consider the safety requirements for visitors of all ages.

3.3. Kiosk aesthetics and provisions

3.3.1. Material Provided

Items provided by CRC Robotics: 1 folding table (if desired), 2 school chairs (if desired) and 1 electrical outlet with 2 plugs (120V, 15A total).

3.3.2. Visual Appeal

Since kiosk spots are randomly assigned to teams, the outside walls of a kiosk will not be judged for reasons of equality. However, teams are encouraged to put an effort to make both the interior and exterior side of the walls of their kiosk visually appealing for the benefit of visitors and other participants.

3.3.3. Bilingualism

The information displayed and available in the interior or on the exterior of the kiosk must be entirely bilingual.

3.4. Evaluation

3.4.1. The Evaluation Process

The evaluation of a team's work includes two stages: the Preliminaries and the Finals.

The Preliminaries:

- All registered teams are divided into pools. The number of teams per pool is dependent on the number of registered teams.
- The judges of each pool evaluate and rank teams' work. Judges are participating mentors or qualified CRC volunteers. Judges are never assigned to pools containing their current or past teams.
- Each pool is evaluated by different judges. Judges of all pools follow the same judging criteria for each category.
- The top teams in each pool will qualify for the Finals. The number of qualifiers per pool is dependent on the number of registered teams.

The Finals:

- Finalists are the top teams from each pool in the Preliminaries.
- There are no pools in the Finals. All finalists are evaluated by the same judges.
- Judges evaluate and rank the finalists' work. Judges are field experts and did not judge in the Preliminaries. Judges in the Finals follow the same judging criteria used in the Preliminaries.
- Based on the ranking provided by the judges, the top three teams in each division will receive awards.

3.4.2. Evaluation Criteria

The evaluation criteria are divided into three levels: Standard, Developed and Advanced.

- The Standard level provides minimal criteria that should be satisfied. These criteria may target specific rules in the rulebook or requirements which are considered essential for acceptable work.
- The Developed level includes criteria which, when satisfied, demonstrate a commendable work quality.
- The Advanced level groups criteria which, if satisfied, set a team apart from the rest.

3.4.3. Multiple Teams per School

Kiosk spaces of teams from the same school will be placed beside each other. If the school decides to build one combined kiosk, judges will be informed to evaluate them separately, without considering the other space.

3.4.4. Language

Teams must ensure to always have at least 1 bilingual student speaker in the kiosk, giving presentations to and answering questions from the general public. However, the presentation for the evaluation can be conducted in the language of preference of the team.

3.4.5. Presentations

Preliminary and final presentations will take place in the kiosk of the evaluated team.

3.4.6. Schedule

There will not be a detailed schedule provided for the judging of the kiosks. Instead, time intervals will be provided during which the judges may visit the kiosks. This measure is necessary given the nature of this component of the Competition. However, a visual signal in the kiosk area will inform participants that the kiosk judging is in session.

3.4.7. Visual Support

Visual support is permitted.

3.4.8. Structure

The presentations must abide by the following structure:

Length	Action
5 min	The team presents the robot (without the judges interrupting).
5 min	The judges ask their questions to the evaluated team.
5 min	The judges give feedback, rank teams, discuss and move toward the next team.

3.5. Kiosk Evaluation Form

Topic	Level	Criterion
Construction	Standard	**Is the kiosk's layout optimal for a functional workspace?** The kiosk demonstrates a good understanding in creating a functional workspace (i.e. tool placement and organisation, functionality, etc.).
	Developed	**Is the kiosk engaging and reflective of the team's theme?** The kiosk is intriguing to the public. Students interact with the public in a respectful and friendly way.
	Advanced	**Does the kiosk surprise and amaze?** The kiosk has a "wow" factor. It creatively demonstrates excellence in detail and craftsmanship. The kiosk uses lights, screens, sounds, and props in such a way that it augments the visitor's experience.
Presentation	Standard	**Did the team engage the audience with their journey?** The team can clearly explain their inspiration and justify the process regarding the design and construction of the kiosk, considering their expertise, team size, challenges, and limitations.
	Developed	**Does the presentation add to the value of the kiosk?** The presentation of the kiosk is creative, engaging and related to the theme of the kiosk.
	Advanced	**Is the presentation an immersive experience?** The presentation generates connections facilitating the involvement of the audience as partners to the team.

3.6. Kiosk Certification Form

Team: _____ Time: _____

Component	Item	Certification	
		Acceptable	Unacceptable
General	Clear and obvious team identification		
	Respect neighbouring kiosks (sound, paint, etc.)		
	Space does not exceed 12’ x 12’4”		
Wiring	Protected		
	Grounded		
	Anchored		
Structural Integrity	Walls		
	Roof		
	Floor		
	No space on a second level		
	Proper fastening / anchoring (Accessories, equipment, shelves, objects, etc.)		
Safety	Necessary safety equipment		
	Safe tool storage		
	Manoeuvrability inside kiosk (Ability to move around without hitting things)		
	Safe public access (for all ages)		

Notes: _____

_____

_____ _____

CRC Robotics Signature Team Signature

3.6. Safety Equipment Checklist

The following list is designed according to CNESST Current Guidelines and is implemented with the goal of promoting best safety practices in all our schools. Though we cannot force its implementation during the work done over the season, we hope that its obligation at the competition will encourage teams to continue this practice in their own workshops.
At the competition, the following items with their respective quantities are mandatory at the moment of kiosk construction; **if there are items missing, no use of tools will be permitted inside the kiosk (for robot or otherwise).**

Item	Quantity Necessary	Sufficient	Insufficient
Fire Extinguisher	1		
Safety Glasses (With peripheral protection)	3 minimum		
Safety Gloves	3 pairs (ideally different sizes)		
Sterile Adhesive Bandages	25 (variety pack preferred)		
Sterile Gauze Pads 3”x3”	12		
Sterile Abdominal Pad 5”x9”	1		
Stretch Bandage 2”x 2 yards	1		
Sterile Compress Dressing with ties 4”x4”	2		
Triangular Bandage 40”x40”x56”	2		
Adhesive Tape	2.3m roll		
Antiseptic Wound Cleansing Towelettes	25		
Clean Examination Gloves (non-latex)	4 pairs		
Bandage scissors (blunt angled tip)	1 pair		
Splinter Tweezers (Fine tip)	1		
Hand Sanitizer OR Skin Cleansing Towelettes	6 uses		
Recommended by CNESST, but not necessary for CRC Robotics			
Topical antibiotic ointment	CPR Barrier Device	Eye Patch	
Instant Cold Compress	Practical Guide for First Aiders	Malleable Splint	