



THE CRC ROBOTICS  
JUNIOR COMPETITION

# RULEBOOK

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# MODUEL 2026

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A program of

**AEST  
EAST**

Version 1.0

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# General Rules

The CRC Junior Mø-Duel 2026 Competition will take place on February 20th, 2026 at St. Pius X Career Centre.

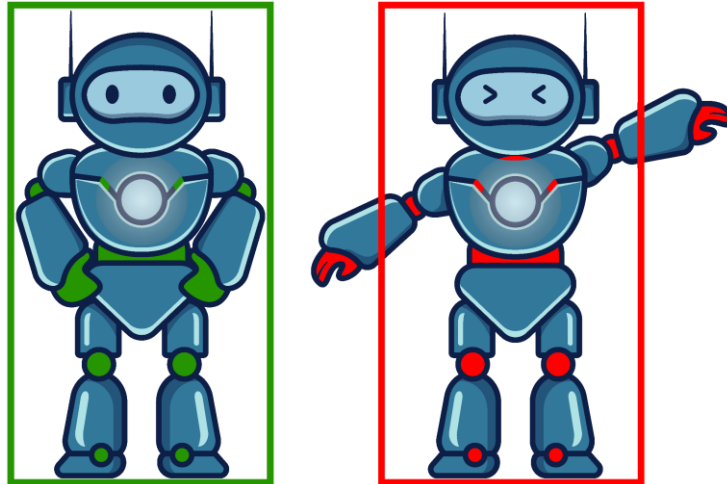
The Competition includes four (4) distinct components: three (3) different robot challenges and a kiosk presentation. Your overall ranking is determined by adding together your performances in all four (4) components.

- Your team, upon arrival, shall be assigned to one of four (4) challenge groups.
- Each challenge group shall rotate through the available challenges
- Rotations include a block of downtime to permit watching the Senior competition
- Rotations are based on a pre-determined schedule.
- Teams within the challenge group must queue to be permitted to attempt their assigned challenge.
- It is the team's responsibility to participate in the challenge assigned to them.
- An attempt timer of two minutes shall begin when teams are instructed to start their robot by a Game Official.
- There is no limit to the number of attempts a team may make within their assigned challenge.
- Only the best attempt in a challenge shall be used for the team's ranking.
- Teams must assign themselves to a kiosk evaluation slot, on arrival.
- Slots are attributed on a first come first serve basis.

*Additional details available within the information booklet.*

## Robot Constraints

- Robots shall be controlled by one of these LEGO® series **controllers**: Spike, EV3 or NXT.
- The robot must have a single button that will allow the robot to start moving. The buttons on the **controller** are permitted.
- The maximum voltage of a robot's **controller** is 10 Volts.
- **When fully extended**, your robot must fit in a 250 mm x 250 mm x 320 mm (height) box.



- When not queuing up or making an attempt, modifications to the build and programming of your robot are permitted.
- You may use the same robot, a modified one, or a completely different robot for each attempt.

# Challenge # 1 – Tractor Actor

## Goal

The main objective is to calculate the distance between the **wall** and the weighted **sled** while dragging it.

## Making an Attempt

**Start:** Your robot shall be placed in the starting square.

**Game Flow:** Your robot shall attach to and pull the weighted **sled**. Your robot must measure and display the distance in millimetres separating the **furthest forward portion of the sled's body** to the **back wall**.

**End:** The attempt shall end once your robot ceases movement, touches the **back wall** (behind the **ramp**), or once the attempt timer runs out.

## Playing Field

- The playing field consists of a flat track enclosed on three (3) sides by 305 mm high walls.
- A **ramp** extending the width of the field is placed on the field.
- Both inclines for the **ramp** are angled at 5°.
- The **sled** is placed in its own starting square.
- If utilised, an ultrasonic sensor may only face towards the challenge's lateral walls.
- The omission of certain measurements in the technical drawings of this challenge is purposeful.

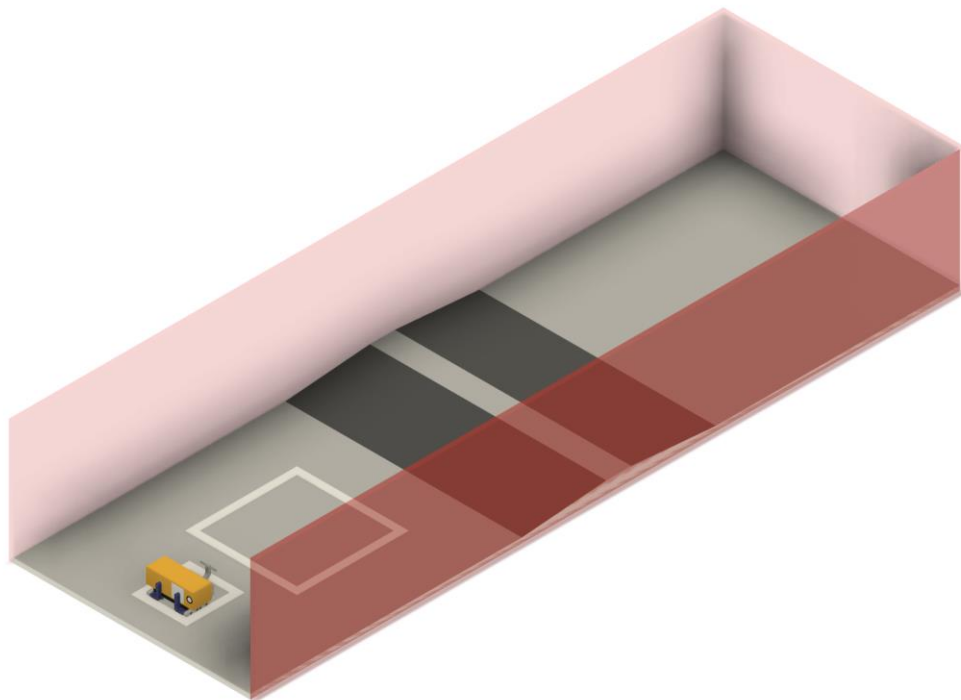
## Sled Specifications

- The **sled** shall be constructed from kit pieces as described in the technical documentation.
- During the challenge, the **sled** shall contain a full 200 ml standard Oasis or Compliments juice box without the straw and/or its wrapper attached.

## Scoring

Scoring shall be based on the most accurate overall distance measured ( $\pm 1\text{ mm}$ ) between **the furthest forward portion of the sled's body to the back wall**. Should two teams achieve the same final measurement in millimetres the team with the lightest robot ( $\pm 1\text{ g}$ ) shall be ranked higher in scoring.

## Field Example



# Challenge # 2 – Putt-in the Moon

## Goal

The main objective is to climb a tube and insert a golf ball into its upper end.

## Making an Attempt

**Start:** Your **robot** shall begin the **attempt** fully below the horizontal **starting line** with a preloaded **golf ball**.

**Gameplay:** Your **robot** shall remain attached to the **tube** throughout the entirety of the **attempt**. Your **robot** must insert a **golf ball** into the upper opening of the **tube**.

**End:** The **attempt** ends when your **robot** stops moving, detaches from the **tube**, inserts the **golf ball** into the **tube**, or when the **trial timer** runs out.

## Playing Field

- The **playing field** consists of a standard vertical ABS **tube**, 3 inches in diameter and 36 inches in height, mounted on a standard 3-inch toilet flange.
- A horizontal **starting line**, ¾ inches wide, is located 24 inches from the top end of the **tube**.

## Scoring

- The team whose **robot** inserts the **golf ball** into the **tube** the fastest (±1\_s) will achieve the highest ranking.
- Amongst the teams that did not insert the **golf ball** into the **tube**, the team whose robot ends the round at the highest elevation (±1\_cm) on the tube achieves the best ranking.
- Should two teams insert the golf ball at the same scored moment, or attain the same elevation, the team with the lighter of the two **robots** (±1\_g) shall be ranked higher.

## Field Example





# Challenge # 3 – Detour in Montreal

## Goal

The main objective is to retrieve a **cone** and bring it back to the **starting zone**.

## Making an Attempt

**Start:** Your **robot** must begin the attempt fully within the **starting zone**.

**Gameplay:** Your robot shall retrieve the **cone** located on the other side of the wall and bring it back to the **starting zone**.

**End:** The attempt ends when your robot stops moving, leaves the **playing field**, brings the **cone** back to the **starting zone**, or when the trial timer runs out.

## Playing Field

- The **playing field** consists of a black circular **arena** with a diameter of 1 meter.
- The arena has a white line, 19 mm wide, around its perimeter.
- A 300 mm high **wall** separates the **starting zone** and the **cone** and extends from the perimeter of the **arena** towards the center. The length of **wall** is not given.
- The **cone** is a standard orange and white ABS tube, 1 ½ inches in diameter and 75 mm in length.
- The center of the **cone** is located 100 mm from the **perimeter** of the **arena** and 100 mm from the **wall**.

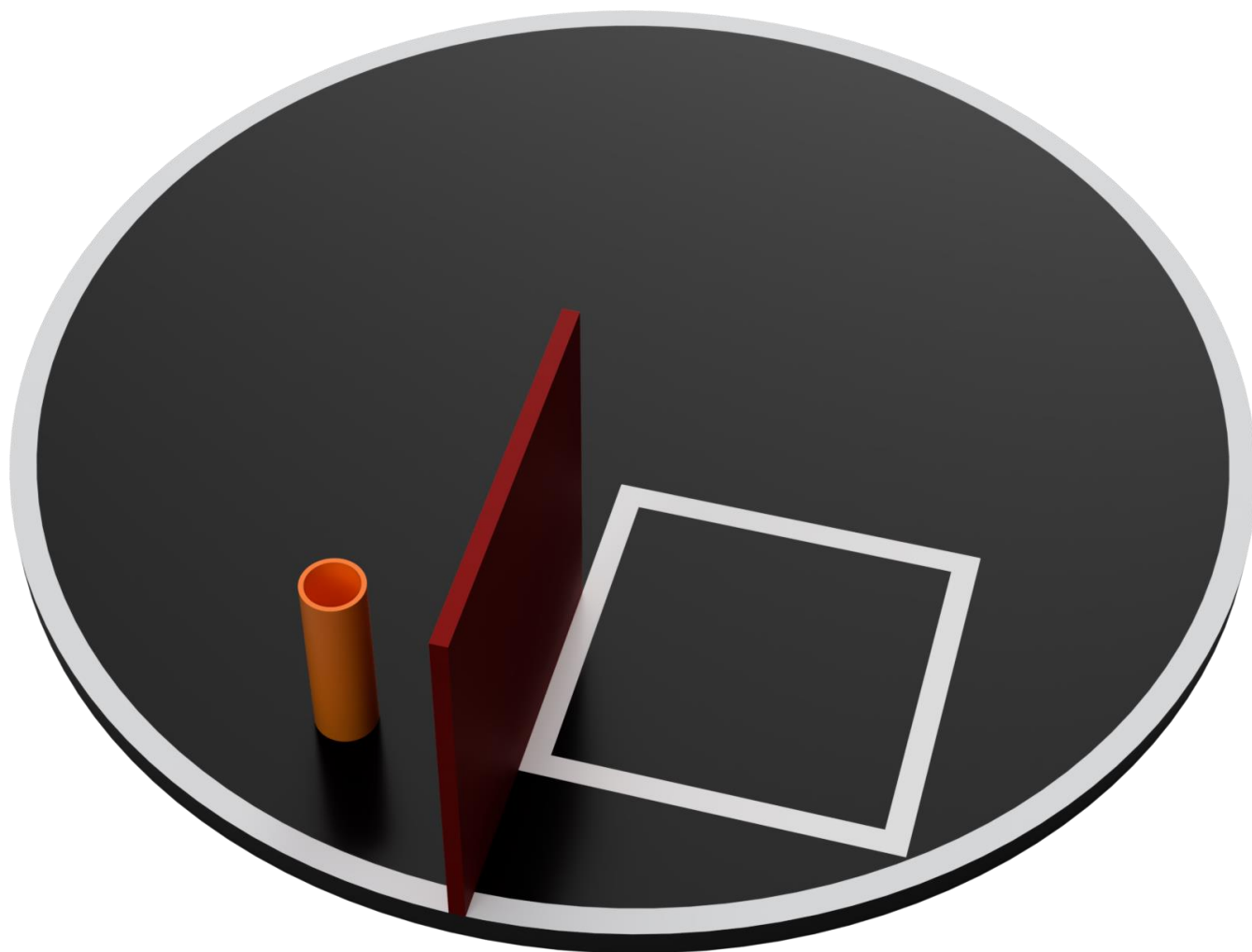
## Scoring

At the end of the attempt, the **remaining distance** the robot must travel is measured as follows:

- If the **robot** has moved the **cone**, the distance between the cone and the starting zone is **measured**. The measurement may be taken via the end of the **wall** if necessary.
- If the **robot** has not moved the **cone**, the distance between the **robot** and the **cone** is measured. Then the distance from the **cone** to the **starting zone** is added. The **measurement** may be taken via the end of the **wall** if necessary.

The team with the shortest **remaining distance** ( $\pm 1$  cm) to travel shall achieve the highest ranking. If several **robots** complete the task, the fastest **robot** ( $\pm 1$  s) will achieve the highest ranking.

## Field Example



# Kiosk

The Kiosk component requires the creation of a themed space and presentation to visitors and judges.

## Provided Material

- 1 folding table
- 2 chairs

## Constraints

- The presentation shall last no longer than 5 minutes.
- A 5-minute question period shall follow the presentation.
- All visual aids must be bilingual.
- Presentations may be in either language, however, students must be prepared for questions in either language.
- The kiosk must be identified with the school and team name.
- The presentation may be given by any number of students.
- The kiosk and the team must be respectful of neighbouring kiosks.
- The team must be ready to present in their selected time slot.
- No major modification shall be permitted on site.
- Any cleaning costs incurred by the host school due to non-respectful behaviour shall be invoiced to the offending team. Repeat offenders may be subject to further penalties.

## Kiosk Evaluation Form

| Kiosk Construction        |                                                                                                     |                                                                                                |                                                                                                           |                                                                                                                                           |          |
|---------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------|
|                           | Beginning<br>(1)                                                                                    | Developing<br>(2)                                                                              | Accomplished<br>(3)                                                                                       | Exemplary<br>(4-5)                                                                                                                        | Score /5 |
| <b>Layout</b>             | The layout is cluttered, confusing, and makes it difficult to navigate.                             | The layout is somewhat organized but lacks flow, making navigation awkward.                    | The layout is clean and well-organized, allowing for easy navigation.                                     | The layout is exceptionally clear, intuitive, and efficiently uses space, making it very easy to navigate.                                |          |
| <b>Visitor Engagement</b> | The kiosk fails to capture visitors' interest, with little to draw them in or hold their attention. | The kiosk captures some interest, but engagement is inconsistent or limited to a few visitors. | The kiosk effectively engages visitors, maintaining their interest with appealing content and activities. | The kiosk is highly engaging, capturing and holding visitors' attention with creative, interactive elements that encourage participation. |          |
| <b>Originality</b>        | The kiosk lacks creativity, using common or unoriginal ideas with minimal effort to stand out.      | The kiosk shows some originality, but the ideas or execution are fairly standard.              | The kiosk displays creativity in its approach, with some unique ideas or elements that enhance the theme. | The kiosk is highly original, incorporating unique, innovative elements that set it apart and make it memorable.                          |          |

| Presentation                 |                                                                                                              |                                                                                                                        |                                                                                                                    |                                                                                                                          |          |
|------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------|
|                              | Beginning<br>(1)                                                                                             | Developing<br>(2)                                                                                                      | Accomplished<br>(3)                                                                                                | Exemplary<br>(4-5)                                                                                                       | Score /5 |
| <b>Clarity</b>               | The presentation is unclear, with key concepts difficult to understand and explanations vague or confusing.  | The presentation communicates the basic ideas, but some parts are unclear or lack sufficient detail.                   | The presentation is clear and understandable, with minor areas that could be better explained.                     | The presentation is exceptionally clear, with all concepts well-articulated and easy to understand.                      |          |
| <b>Organization</b>          | The presentation is poorly organized, making it difficult to follow the flow of ideas.                       | The presentation has a general structure, but the flow of ideas is sometimes disjointed or lacks a smooth progression. | The presentation is well-organized, with a logical progression of ideas, though some transitions could be smoother | The presentation is extremely well-organized, with a logical and engaging flow of ideas that enhances understanding.     |          |
| <b>Response to questions</b> | Struggles to answer questions effectively, with responses lacking depth or relevance to the questions asked. | Answers questions with basic understanding, though responses may be incomplete or somewhat unclear.                    | Responds to questions with clear, thoughtful answers that demonstrate good understanding of the topic.             | Provides detailed, insightful answers to questions, demonstrating a deep understanding and ability to think on the spot. |          |