In-House Challenge General Rules 2025

WORLD ROBOT OLYMPIAD™

WRO®

SOUTH AFRICA

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1. Introduction

Robotics is a wonderful platform for learning 21st century skills. Solving robotic challenges encourages innovation and develops creativity and problem-solving skills in students. Because robotics crosses multiple curricular subjects, students must learn and apply their knowledge of science, technology, engineering, math, and computer programming.

The most rewarding part of designing robots is that students have fun. They work together as a team, discovering their own solutions. Coaches guide them along the way, then step back to allow them their own victories and losses. Students thrive in this supportive and immersive environment, and learning occurs as naturally as breathing air.

At the end of the day, at the end of a fair competition, students can say they did their best, they learned, and they had fun.

There is no international component for the In-House challenge.
The In-House challenge is run by coaches in their own capacity.
Score submission takes place between the 1st and 31st of October

2. What is the In-House Challenge?

The In-House Challenge is a set of three (3) different challenges with different levels of difficulty. The challenges may be attempted in any order, teams and coaches are encouraged to attempt more than one challenge. Coaches run their own In-House events for their teams and record the scores for the score submission during October. Coaches may run and record the challenges at any time during the year before the end of October. All challenges should be run following this general rule document as well as the rule documents for each challenge level. The purpose of the In-House challenge is to make robotics accessible to as many young roboticists as possible. For this reason, it is run by the coaches in their own environments during or before the challenge week. The primary goal is to challenge young roboticists to do their best and score what they are happy with and to plant and nurture a passion for robotics. To assist in achieving this goal if coaches feel the challenges are too difficult for their teams, they may simplify the challenge and still submit their teams scores to the WRO SA system to receive achievement certificates.

The In-House Challenge may be used as a tool to gauge the abilities of team members and provide coaches with an idea as to how their teams will fair in other WRO SA categories. The In-House challenge is not about winning, it is about challenging yourself to do the best that you can and to leave the challenge with a smile and appreciation of your own robotics ability.

Important to note: Challenge level one (1) is easy enough that teams using WeDo 2.0 or Spike Essential Robots can achieve full points.

2.1 How the challenge works.

Attempting the In-House Challenge can be broken down into 4 phases.

Phase 1: Selection/Setup Phase

The In-House challenge contains three (3) different challenge levels. The coach or teams choose which challenge level or levels they would like to attempt. Teams are encouraged to attempt more than one challenge level. The game elements for the challenge should then be built the game rules read and understood and the school/club/company should be registered on the WRO SA registration system during the registration period.

Phase 2: Building and Practice

Teams prepare and practice for the challenge by designing, building, programming, and testing their robot on the game mat. Teams should be confident in their robot design and have learnt how to program and control the robots' motors and sensors.

Phase 3: Scoring/Proving

Coaches allocate a maximum of 3 hours for teams to be officially scored for the challenge. Teams must use the robot they designed and during the 3 hours they must reprogram their robot to score as many points as possible on the game mat during the allocated time. This means teams must start a new program from a blank page, they must use their knowledge gained from practice to program their robot and showcase their design and programming ability. A surprise rule may be introduced to challenge the teams even further and provide teams with a chance to score extra/bonus points. The coach during this time should not assist the teams with

any programming but should assist if hardware issues occur. Teams attempt the challenge and their highest score must recorded.

Phase 4: Score Submission and Awards

Final team scores must be submitted to WRO SA through the website during the score submission month. Scores will be checked, and certificates generated. Coaches will receive their team's digital achievement certificates once all checks have been completed. Certificates are awarded for each level teams attempted these are banded bronze, silver, gold or diamond. Teams may receive a secret special certificate if they have met the secret conditions for achieving it.

3. Challenge Requirements

3.1 Team/Club Requirements

3.1.1 The In-House challenge is open to any club, school, organisation or individual that wishes to attempt the challenge.

3.1.2 The In-House Challenge is open to team members from ages 6 years to 19 years. There are no specific age groups for the challenge levels.

3.1.3 The In-House Challenge should comprise of teams of minimum 2 participants to a maximum of 3 participants. You may still enter a single participant, but it is suggested by WRO SA that teams comprise of 2-3 team members.

3.1.4 Coaches run the In-House Challenge in their own environment following this general rule document as well as the rule documents for each challenge level.

3.1.5 Coaches must have registered their school/club with WRO SA before the close of registration and paid the entry fee to submit scores and receive team certificates.

3.2 Challenge Hardware Requirements

3.2.1 The In-House challenge uses the Robo Mission Junior Game Mat (Mars Exploration) and the 45811 LEGO Elements box these can be purchased from Hands on Technologies the official LEGO Education distributer for South Africa (https://www.handsontech.co.za/).

3.2.2 The dimensions of a WRO mat in an age group are 2362 mm x 1143 mm.

3.2.3 The internal dimensions or a game table should be 2362 mm x 1143 mm (like the game mat) or max. + / - 5mm in each dimension.

3.2.4 The height of the borders is 70 +- 20mm.

3.2.5 All black lines are at least 20mm.

3.2.6 The game mat is printed on PVC roll up material.

3.2.7 Teams do not have to use an official WRO SA competition table.

3.3 Hardware Relating to the Robot

3.3.1 The In-House Challenge is open to any robotics platform and software and is **NOT EXCLUSIVE** to LEGO devices. Any device and software may be used to participate in the challenge.

3.3.2 Teams should design their robot to score as many points as possible and should be allowed to make physical alterations to their robotic solution.

3.3.3 There are no restrictions on the type or number of sensors or motors used for a team's robotics solution. Coaches may decide to implement their own restrictions.
3.3.4 Teams can arrive with their prebuilt robot ready to commence programming when "Start" is announced.
3.3.5 The robot size is restricted to the size of the "Starting Area" (white area surrounded by a darker colour line) on the game mat, 250mm x 250mm. Once the robot leaves the start area it may unfold.
3.3.6 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.

3.4 Software

3.4.1 The In-House Challenge is open to any robotics platform and software and is NOT EXCLUSIVE to LEGO devices. Any device and software may be used to participate in the challenge.
3.4.2 The In-House challenge is open to any programming software.
3.4.3 If necessary, teams may remote control their robot to attempt/complete the In-House challenge. However, WRO SA recommends teams attempt an autonomous or hard coded solution before going this route.

3.5 Challenge Week/Score Submission

3.5.1 Coaches must register their school/club/company with WRO SA before the close of registration 30th of September 2025 to receive WRO SA certificates for team members with successful score submissions.
3.5.2 Coaches must submit all team scores before the closing of the scoring system at midnight the 31st of October. No late scores will be accepted.
3.5.3 Teams must reprogram their robot during the allocated challenge time (3 hours) to complete the Challenge levels and upload their scores to the WRO SA website during the challenge week.
3.5.4 Teams may attempt any In-House Challenge level and are encouraged to attempt more than one challenge level.
3.5.5 No video submission or score sheet submission is required to receive team certificates.

3.6 Challenge and Rule Variations

The In-House Challenge is designed to encourage and inspire teams to continue on their robotics journey. For this reason, the following variations are allowed and should be implemented by coaches where they see applicable.

3.6.1 Coaches may alter/change any part of the challenge to make the challenge easier or more difficult for their teams.
3.6.2 Coaches may choose to omit parts of the challenge to assist their teams in building their confidence in themselves and their own ability.
3.6.3 The maximum score allowed for the base of the In-House challenge is 300 points. The inclusion of the surprise rule may see the score increase above 300 points. This will not change the certificate banding for Bronze, Silver, Gold, or Diamond.

3.7 Registration & Payments

3.7.1 Coaches must register their school/club/company with WRO SA before the close of registration 30th of September 2025 to receive WRO SA certificates for team members with successful score submissions.

3.7.2 Payment for the In-House challenge must be made **before** the final score submission date 31st October 2025 if teams are to receive certificates. No certificates will be generated after this closing date if payments have not been received.

3.7.3 For any issues regarding registration or payments please email wro@handsontech.co.za

4. Challenge Scoring

Teams should be given a maximum of 3 hours for each challenge level. During this time teams must program their robot and log scores. Teams are allowed 4 scoring opportunities. The process for scoring should be as below:

Step 1: Teams must inform the judge when they want to be scored.

Step 2: The game elements must be set up in their starting positions the same for all teams participating. 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.

Step 3: The team waits for the judges signal to start the scoring run. When the robot has stopped moving, or the team has indicated that the run has ended the scoring can begin.

Step 5: Score the run based on the final resting positions of the game elements **NOT** while the robot is in motion.

Step 6: Record the team's score on their score sheet. NB: A score may only be record if the teams score is higher than their previous scoring run. For example, on the first scoring run team A scored 50 points, on the second scoring run team A scored 30 points the second scoring run should not be recorded.

Once the 3 hour time limit is up the teams highest scoring run should be recorded for submission to the WRO SA website in October in order to receive achievement certificates.

5. Prohibited Matters, Fairness & Ethics

5.1 Prohibited matters

5.1.1 Destruction of competition courts/tables, materials or robots of other teams.

5.1.2 Use of dangerous items or behaviours that may create or cause interference with the competition.

5.1.3 Inappropriate words and/or behaviour toward other team members, other teams, audience, judges or staff.

5.1.4 Any other situation which judges might consider as interference or violation of the spirit of the competition.

5.2. Fairness

5.2.1 All teams should be given the same challenge layout and randomization.

5.2.2 All teams should be treated fairly and no team should be prioritised above another.

5.2.3 All teams should have the same amount of time to participate, practice and score.

5.2.4 If a challenge is simplified it must be simplified for all teams.

5.2.5 All teams must be scored in the same manner when the robot has finished moving and without any bias.

5.3 Ethics

5.3.1 Coaches should not assist teams with programming or building of robots, all work should be that of the team.

5.3.2 Coaches should encourage participation, celebrate success, and encourage teams in times of failure.

5.3.3 Coaches should be non-biased while judging teams.

5.3.4 Encourage teams to do their best and score as many points as possible within the teams limit.