



National Robotics Competition 2006

Organisers



Co-organiser



National Partner for World Robot Olympiad (WRO)



BUILDING NOW THE SKILLS FOR THE FUTURE

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Official Battery



National Robotics Competition 2006

VISION

To provide a powerful learning platform to enable students to cope with skills that are essential for success in the 21st century.

MISSION

To strengthen important problem-solving and social skills that are critical for success in further studies and future careers. These skills include:

- a) Problem solving
- b) Creative thinking
- c) Interpersonal communication
- d) Collaborative teamwork skills

OBJECTIVES

1. To help students build a solid foundation in maths, science, technology, design and ICT through hands-on experience or investigation.
2. To train students to work together to solve challenging problems in a spirit of creative collaboration.
3. To enable students to develop systematic thinking as they plan and implement programs and at the same time, improve logical thinking skills through the programming of robots.
4. To enhance student's creativity in problem solving and raise their awareness to the many possible ways of arriving at the desired results.
5. To promote competition in robotics amongst Malaysian school students as a healthy indulgence.

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National Robotics Competition 2006

Zone and Preliminary Competition : Schedule

01 April 2006	Registration Opens
30 May 2006	Registration Closes
16 May until 15 June 2006	Briefings on the Zone Competitions

Regional Schedule

1. ZONE A (Perlis, Kedah)
Month: 12 June 2006
Venue: Dewan SMK Batu 5, Jalan Jeniang, Kedah
2. ZONE B (Selangor)
Month: 19 -20 July 2006
Venue: Kuala Selangor, Selangor. (During State Carnival Science & Technology)
3. ZONE C (Kuala Lumpur)
Month: 20 – 21 June 2006
Venue: Kuala Lumpur
4. ZONE D (Melaka, Johor)
Month: 04 July 2006
Venue: Pontian, Johor
5. ZONE E (Pahang, Terengganu, Kelantan)
Month: 26 June 2006
Venue: PSPN Kota Bahru, Kelantan
6. ZONE F (Sabah, W.P. Labuan)

Mini Zone 1

Month: 29 July 2006
Venue: W.P. Labuan

Mini Zone 2

Month: 31 July 2006
Venue: Kota Kinabalu

Mini Zone 3

Month: 02 August 2006
Venue: Lahad Datu (Sandakan & Tawau)

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Zone and Preliminary Competition : Schedule

7. ZONE G (Sarawak)

Mini Zone 1

Month: 24 July 2006

Venue: Kuching

Mini Zone 2

Month: 25 July 2006

Venue: Sibu

Mini Zone 3

Month: 27 July 2006

Venue: Miri

8. ZONE H (Perak)

Month: 30 – 31 May 2006

Venue: Dewan SM Teknik Slim River (During State Carnival Science & Technology)

9. ZONE I (Negeri Sembilan)

Month: 11 July 2006

Venue: Dewan Sekolah Dato Abdul Razak, Seremban

10. ZONE J (Pulau Pinang)

Month: 15 June 2006

Venue: Dewan SM Teknik Seberang Perai, P.Pinang

Final Competition : Schedule

Date: 22 - 24 August 2006

Venue: Dewan S.M.K Tunku Ampuan Durah, Seremban, Negeri Sembilan.

** The organisers reserve the right to make changes to the NRC 2006 programme and dates.*

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RULES AND REGULATIONS

General Guidelines

1. This competition is open to all students in schools(MoE) up to the age of 18.
2. Each team has to create an autonomous robot to participate in the events.
3. Each team comprises 2 to 3 students and one teacher.
4. An official competition kit for both the categories consists of:
 - a. 1 × 9794 LMFS Team Challenge Set
 - b. 1 × ROBOLAB Software
 - c. 1 × Additional Gear Reduction Motor
 - d. 1 × Light Sensor or Angle Sensor (optional)
5. The competition kit or construction materials, particularly of the winning teams, will be randomly checked at the end of the competition.
6. Participating teams must prepare one A4 page presentation in English. In case of a tie, the teams involved would be required to make a presentation to the judges.

Competition Format

1. Category and events

Category	Ages (Years)	Event
Primary School	Up to 12	Tug of War**
Secondary School	13 – 18	Robot Adventure

2. Format

Category	Event	Format
Primary	Tug of War**	Round Robin (Best of three)
Secondary	Robot Adventure	Time-trial (Best of two tries)

** Events and format for the Final Competition may be different from the above. Information will be provided to the finalists at a later date.*

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Definitions

1. "Playing Field" is defined as the white flat and level floor for the robots to run on. All playing fields will have an overall dimension of not exceeding 1,110mm × 2,370mm.
2. "Track line" is defined as the black line of 25mm (width) that is laid down on the playing fields. Unless specifically stated otherwise, robots must be calibrated to recognise and follow the track line. The calibration can be done during the trial period.
3. "Match" is defined as a particular competing duration of the robot, either in time-trial format or elimination format, which results in a score being awarded to the robot.
4. "Round" is defined as a collection of matches competed under the same specific playing fields and rules that are scheduled to provide equal, fair and competitive chance for all the robots entering the competition.
5. "Tournament" is defined as a collection of all rounds under the same playing fields and rules.
6. "Operator" is defined as a student member of the team designated to start and stop the robot in a match.
7. "Match Area" is defined as the area around each playing field condoned off from spectators, non-competing teams and non-operators of competing teams of a particular match.
8. "Objections to Judging"- Teams are expected to obey the judge's rule to maintain an orderly and friendly competition. In the event of a "must" objection, teams must submit a documented objection to their mentor. The mentor must then submit it to the NRC Advisory Committee or Head Judge to settle the dispute within the shortest possible time.
9. "Robots" - The Robots designed for NRC Regular Category must be autonomous robots. Teams are given 1 to 2 hours before each round to build and test their robots. During Round 1, robots must be built from scratch. Thus, pre-built robots are not allowed in the competition area. For subsequent rounds, teams may modify the robots they built during Round 1. Once the competition starts, team members are not allowed to touch their robot again.

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General Rules

1. The referees have the ultimate authority during the National Robotics Competition. Their decisions are final. Referees will not review recorded replays after the match is over.
2. Participants must prepare their own competition kit such as notebook computer and 9794 LMFS.
3. If a referee disqualifies a team, the disqualified robot must be turned off immediately and will not score any points for that match.
4. A team may not gain advantage or win a match by breaking rules, even by accident.
5. Deliberately damaging the playing field will result in an immediate disqualification.
6. Deliberately damaging the opponent's robot will result in an immediate disqualification.
7. Team members and the mentor / teacher must not intervene or interfere with the operation of the robot of their own team or that of the opponents, physically or remotely. Interference will result in an immediate disqualification.
8. Altering the specification(s) of the playing field or robot components (e.g., the motor) will result in an immediate disqualification.
9. Standard batteries will be provided during the tournament. The robot can only operate with the provided batteries. The use of non-standard power supply will result in an immediate disqualification.
10. Only the operator of the competing team is allowed into the match area during the match.
11. A robot is declared "miss-track" when all of its wheels are on the same side of the track line. Miss-tracking will result in the immediate termination of the match for that robot concerned (but not necessarily its opponent).
12. A robot is declared "miss-colour" when it fails to do specific task associated with a colour patch. Miss-colouring will result in the immediate termination of the match for the robot concerned (but not necessarily its opponent).
13. The dimension of the robot must not exceed 250mm × 250mm × 250mm, including installed batteries, at rest. During the competition, the robot may change its own dimensions without any human intervention.
14. All robots must be submitted to the central repository before the beginning of each round. The team is prohibited from modifying its robot before the particular round is completed. However, batteries may be changed at the beginning of each round.
15. In the event of a conflict in the translation of the rules, the English version is considered the correct and final version.
16. Complaints, if any, must be brought up when the competition is running. Complaints after the competition will not be entertained.
17. It is not allowed to modify any part from the LMFS 9794 kit and the Robolab software such as motor, RCX, sensor and Firmware. If the judge detects any changes on the LMFS 9794 kit, the team will be disqualified automatically.
18. Only the participants and the organisers are allowed in the quarantine area when the quarantine time starts.
19. The operator can only run the robot at the signal of the judge.

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AWARDS STRUCTURE

Preliminary Competition (Zone Competition)

1. Primary School Category

Event – Tug of War

Winner GOLD: Trophy and RM500 cash

Winner SILVER: Trophy and RM300 cash

Winner BRONZE: Trophy and RM200 cash

2. Secondary School Category

Event – Robot Adventure

Winner GOLD: Trophy and RM500 cash

Winner SILVER: Trophy and RM300 cash

Winner BRONZE: Trophy and RM200 cash

Medals will be awarded to all members of the winning teams and certificates of participation will be awarded to all participants.

Final Competition

1. Primary School Category

Event – To be Advised

Winner GOLD: LEGO® Trophy, RM1000 cash, 1 set 9794 LMFS Team Challenge Set (RM1550) and WRO participation.

Winner SILVER: LEGO® Trophy, RM500 cash, 1 set 9684 eLab Renewable Energy Set (RM1150) and WRO participation.

Winner BRONZE: LEGO® Trophy, RM300 cash, 1 set 2009645 Simple & Powered Mechanisms Set (RM680) and WRO participation.

2. Secondary School Category

Event – To be Advised

Winner GOLD: LEGO® Trophy, RM1000 cash, 1 set 9794 LMFS Team Challenge Set (RM1550) and WRO participation.

Winner SILVER: LEGO® Trophy, RM500 cash, 1 set 9684 eLab Renewable Energy Set (RM1150) and WRO participation.

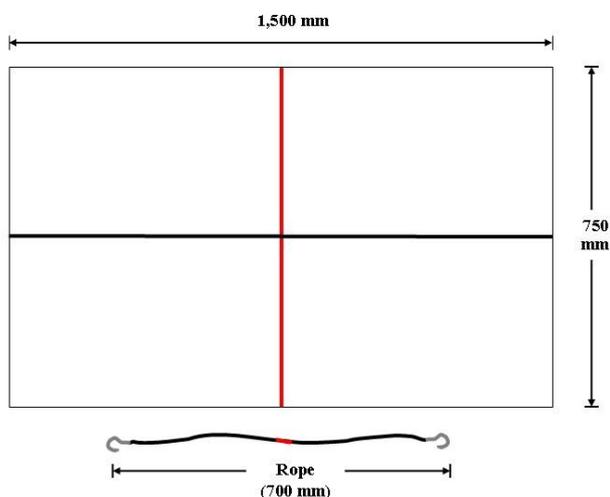
Winner BRONZE: LEGO® Trophy, RM300 cash, 1 set 2009645 Simple & Powered Mechanisms Set (RM680) and WRO participation.

Medals will be awarded to all members of the winning teams and certificates of participation will be awarded to all participants.

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PRELIMINARY COMPETITION: PRIMARY CATEGORY

Strength –Tug of War



Objective

The robot has to pull the rope, and thus its opponent, onto its side while tracking the straight line.

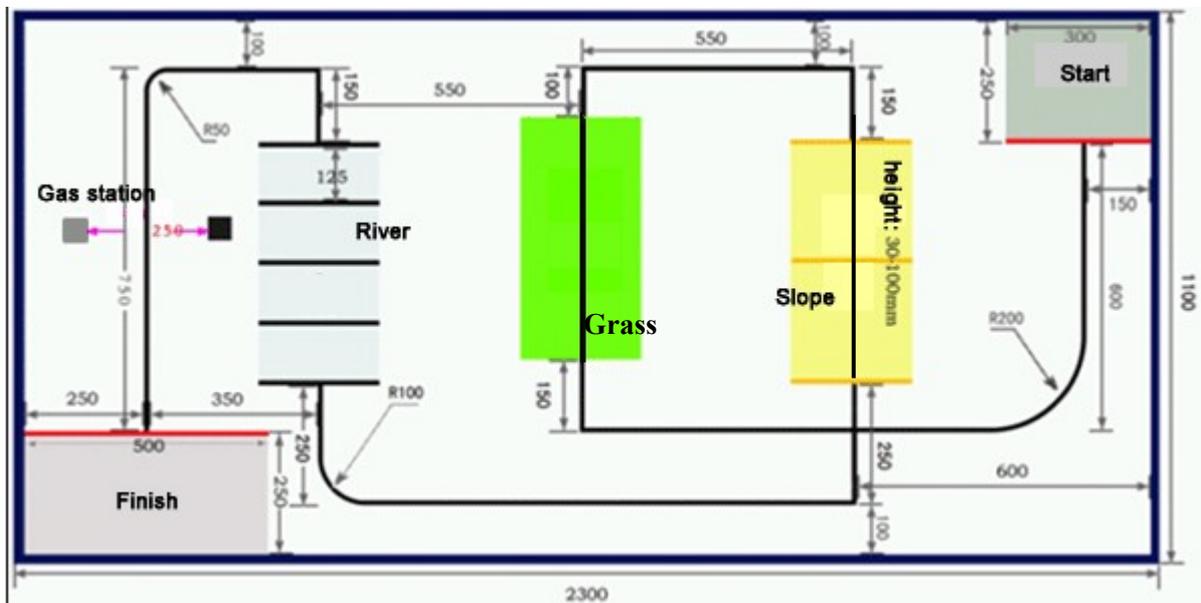
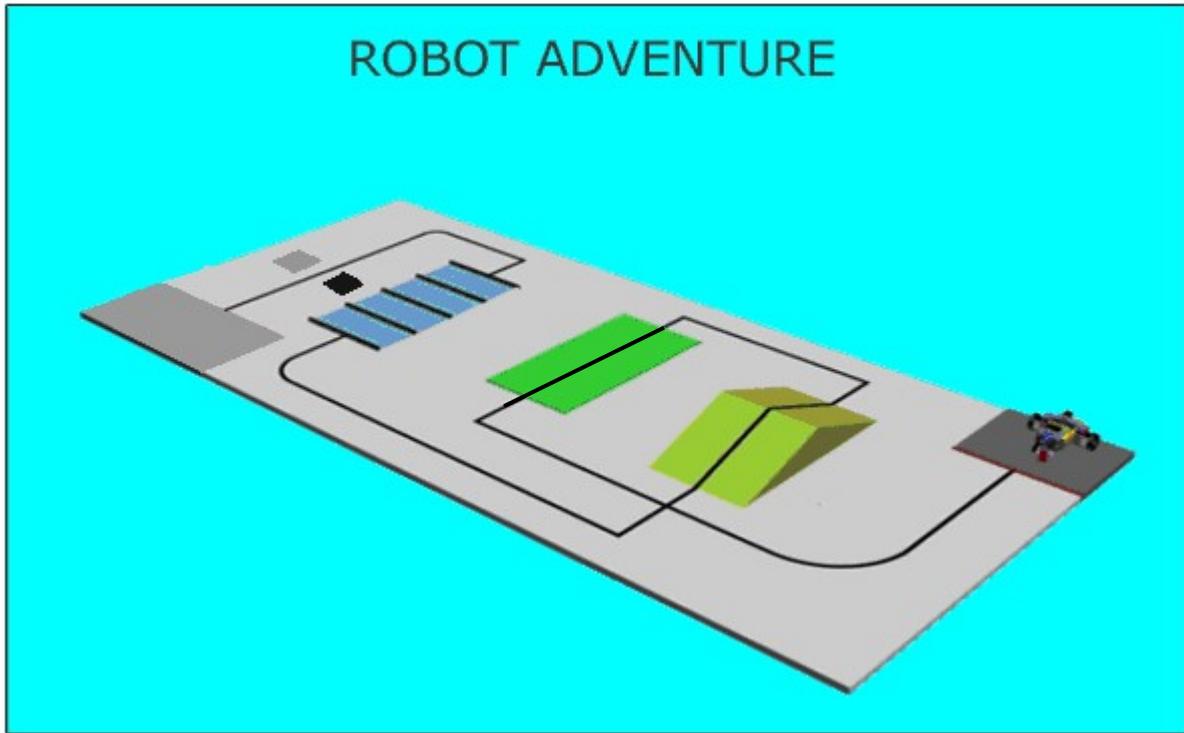
Game Rules

1. The playing field dimensions are 1,500mm × 750mm.
2. The playing field consists of:
 - a. One marker at the exact centre of the rope.
 - b. One straight line of 1,500mm in length.
3. The robot must have an attachment point to be hooked up with the rope.
4. The match begins by attaching the ropes to the robots with the marker exactly at the centre point of the straight line.
5. When the referee signals the start of the match, the robots must pull at the rope while simultaneously tracking the line.
6. The robot that miss-tracks will immediately lose the match.
7. The match lasts 120 seconds. The robot that pulls the marker to its side, wins.

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PRELIMINARY COMPETITION: SECONDARY CATEGORY

Robot Adventure



Specifications:

Slope: Base 500mm, Width 250mm, Height 30mm-100mm, Upslope (Down Slope), Length 250mm



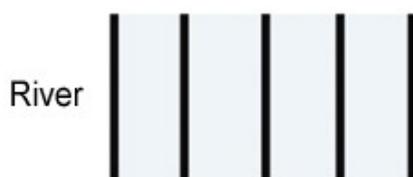
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Grass: Length 500mm, Width 250mm, material (TBD)



River: Is made up of 5 parallel black lines. Each line is 255mm long, 15mm wide

and with a height of 12mm. They are made of 4 2 by 8 stud black LEGO bricks. The distance between each line is 125mm.



Gas Station: Is made up of a 30mm in diameter cylinder. The distance between the coloured blocks are 250mm.



Game Rules

1. The Robot Adventure field is 2300-2370mm long, 1100-1150mm wide and the base of the field is white. There will be black lines on the field with a width of 25mm. (For details see photo.)
2. The field will mainly consist of slopes, grass field, rivers and gas station.
3. There will be tracks on the field. The tracks can be straight, arched, right-angle corners, crosses, etc.
4. The field shown is for illustration purposes only. The actual field will be provided on the competition day.

Game Objective

1. Design a robot, start from the starting position and within 2 minutes, the robot follows a designated track/line and crosses all the obstacles and finishes the mission.
2. Within the starting position, any part of the robot cannot cross the Starter's box limits.
3. Robots must signal their light 2 times when passing the gas station.
4. During the competition, the game is considered incomplete should all the 4 wheels of the robot are on either side of the track.

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5. Once the judge signals an incomplete game, team members should stop their robot immediately.

Scoring

1. If mission is completed (passes all the obstacles) within 2 minutes, the robot which completes the mission in the shortest time is the winner.
2. If the robots fail to complete the mission, the scores awarded will be based on the obstacles passed:
 - a. 25pts – Pass Slope: 25 points
 - b. 25pts – Pass Grass: 25 points
 - c. 25pts – Pass River: 25 points
 - d. 25pts – Finish: 25 points

** The scores must be completed in sequential order, which means no scores will be given to Pass Grass unless the Pass Slope is completed.*

3. **If the mission is completed (the robot passes all the obstacles) exceeding 2 minutes, the excess time used will be subtracted from the final point score at the rate of 1 points per second but not exceeding 20 points in total.** For example, if your time is 135 seconds, then 15 points will be subtracted from your total score, if your time is 150 seconds, then only 20 points will be subtracted from your total score.