Welcome to
National Robotics Competition 2023

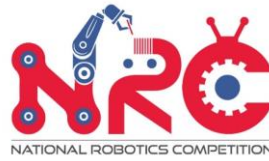## NRC Regular Category
Lower Primary: 7-9 years old | Upper Primary: 10-12 years old
Secondary: 13-16 years old | Tertiary: 16-19 years old

NRC Open Category
Primary: 8-12 years old | Secondary: 13-16 years old | Tertiary: 16-19 years old

AI Maker Series
Primary: 8-12 years old | Secondary: 13-16 years old

NRC Pre-School
5-6 years old

ARTec Robotics (Pre-School) *NEW*
4-6 years old

CoderZ Coding Challenge (Online)
Primary: 8-12 years old | Secondary: 13-16 years old

NRC RoboCup Singapore CoSpace Coding Challenge *NEW*
Primary: 8-12 years old | Secondary: 13-16 years old | Tertiary: 16-19 years old

Held live on-site at Science Centre Singapore from 21 August to 9 September 2023
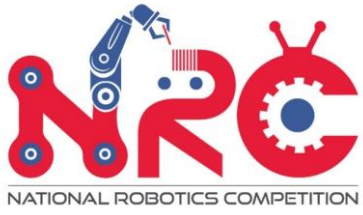
Agenda for the Webinar

- **Introduction to the NRC Open Category**

- **Introduction to theme**

- **Scoring**

- **Important Dates**

Introduction to
NRC Open Category

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NRC Open Category 2023

Finals

- Present your **robotic solution** based on the chosen solution to the Judges

- Teams will be provided a booth (2m x 2m x 2m) with 3 vertical display panels and a table

- 10 mins of presentation + 5 mins of Q&A

- Teams are encouraged to showcase a prototype of their robotic solution
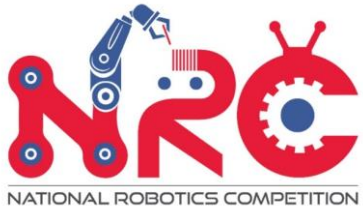
Video submission

- Upload a 90s video onto social media to promote your robotic solution (**by 18 Aug 2023, 1700hrs**)

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DUCK LEARNING opportunities in education

Ministry of Education SINGAPORE

GLOBAL ROBOTICS GAMES

SP Singapore Polytechnic

RoboCup SINGAPORE

WOW Learning

NRC Open Category 2023

General rules

- **Teams**
  - 2 to 3 team members per team

- **Age groups**
  - Primary: 8 to 12 years old (born in 2011-2015)
  - Secondary: 13 to 16 years old (born in 2007 to 2010)
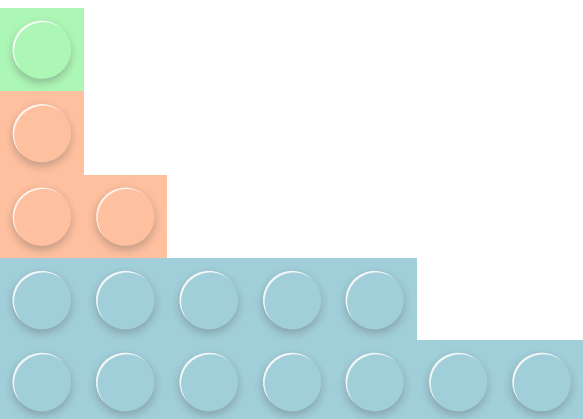 - Tertiary: 16 to 19 years old (born in 2004 to 2006)

Introduction to Theme

NRC Open Category 2023 Theme

Project Mission:

Develop a robotic solution to address UN Sustainable Development Goal: Zero Hunger

Through:

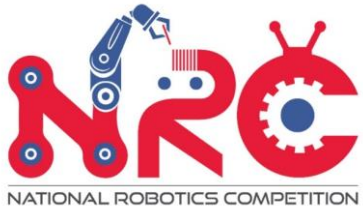- Increase food production and food yield

- Reduce food loss and waste

NRC Open Category 2023 Theme

Increase Food Production and Food Yield

Plants and vegetations can become stressed or die when environmental conditions fluctuate drastically. Some examples of the environmental conditions are pH of soil, amount of water and nutrients the plant or vegetation receive. Robots can help to monitor and maintain these environment conditions at the optimal conditions for the plants and vegetation to thrive in.

Teams can develop robotic solutions that can work together with humans safely to increase food production and food yield.

Note: Robotic solution that are clearly not within the theme will receive a score of 0.
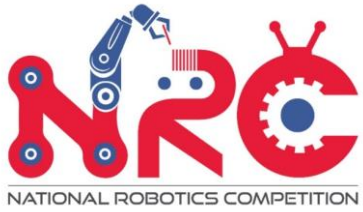
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NRC Open Category 2023 Theme

Reduce Food Loss and Waste

Food is lost or wasted along the food supply chain. For example. Food could be damaged or turn bad when it is being transported from the farms to the stores. A robot that can improve the efficiency of the transport system or storage of the food can reduce the amount of food that is being lost or wated along the food supply chain.

Teams can develop robotic solutions that can improve processes in the food supply chain.

Note: Robotic solution that are clearly not within the theme will receive a score of 0.

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Scoring

Judging for Presentations

- Page 11 of Open Category Challenge booklet

- 10 mins to present

- 5 mins for Q&A

- Championship Award

- Best Booth Design Award

- Most Popular Video Award

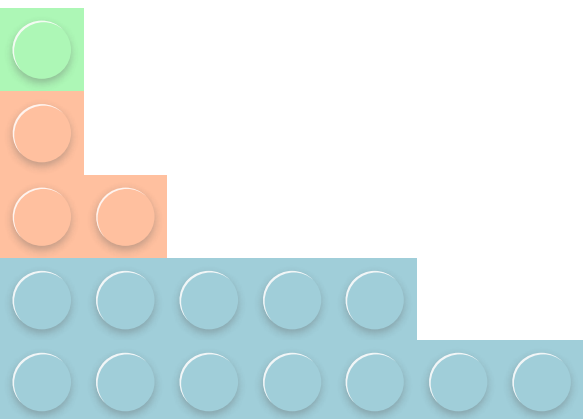| Category	Criteria	Points
1. Project (Total Points: 50)	1. **Creativity** – The project is original, innovative and demonstrates creative thinking.	10
	2. **Quality of Solution** – The project is well-thought out and is a good and is an effective solution to the problem. Prototype development and next step of the project is elaborated clearly.	15
	3. **Limitations** – able to identify limitations in their design and possible solutions to overcome these limitations	10
	4. **Research and Entrepreneurship** – Research shows elements of entrepreneurship such as, target customer group, cost structure, revenue stream, key resources, and partners.	15
2. Programming (Total Points: 30)	1. **Automation** – The project uses appropriate inputs from sensors to run specific routines and clearly demonstrates automation in the completing of the tasks.	10
	2. **Good Logic** – The programming options used are relevant, work reliably and efficiently.	10
	3. **Readable and understandable** – Codes are easy to follow e.g variables are well named, good use of comments	10
3. Engineering Design (Total Points: 40)	1. **Technical Understanding** – Team members are able to produce clear, precise, and convincing explanations about each step of the mechanical and programming process.	10
	2. **Engineering Concepts** – The project shows evidence and good use of engineering concepts and team members are able to explain the concepts and need for use.	10
	3. **Mechanical Efficiency and structural stability** – Parts and energy have been used efficiently - evidence of proper use of mechanical concepts / principles (gears/pulleys/levers/wheels & axles) The project (robots and structures) are strong, sturdy and the demonstration can be run repeatedly - parts don't detach - little need for repairs.	15
	4. **Aesthetics** – The mechanical elements have aesthetic appeal, there is evidence that the team went out of their way to make the project look as professional as possible.	5
4. Presentation (Total Points 25)	1. **Successful Demonstration** – A demo of the capabilities was completed, there is a sense that it could reliably be repeated, and that preparation and practice have taken place.	10
	2. **Communication & Reasoning Skills** – The team were able to present their project idea in an interesting way - how it works - why they chose it - why it has relevance. The team are able to easily answer questions about their project. They were also able to deal with any problems that arose during the presentation	10
	3. **Entertainment Value** – The project has a certain "WOW" factor - looks fun, captures the attention of passer by - makes you want to see it again or learn more about it.	5
5. Teamwork (Total Points: 15)	1. **Unified Learning Outcome** – There is evidence that team members have internalized knowledge and understanding of the subject matter pertaining to their project.	5
	2. **Inclusiveness** – The team are able to demonstrate that all members played an important role in the development, construction and presentation of their project.	5
	3. **Team Spirit** – The team display positive energy, good cohesiveness, value one another and are enthusiastic and excited about sharing their project with others.	5
6. Social Media Video (Total Points: 40)	1. **Originality** – Creative way of promoting their robot based on overall theme	40
	Maximum Points	200

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Important Dates

Important Dates

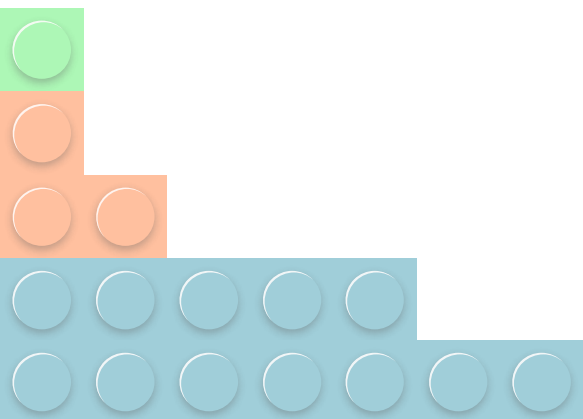|	Dates	Time	Remarks
Video link Submission	By 18 Aug 2023	5pm	Email video link to NRC@science.edu.sg
Onsite Competition	8th September 2023	9am – 5pm	Subjected to changes

Contact us/Updates/FAQ
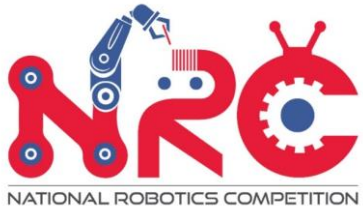
FAQ - Registration

1. Can I register for more than one category?

Is there a maximum no. of teams each school can register for?

Ans: **Yes, if the dates are not overlapped. There is no maximum no. of teams a school can register. can register.**

2. If we are registering as a private team, what do we put under school name?
Ans: **You can indicate as "independent" or "private".**

3. Can we pay the registration fee by e-invoice? Is there any other method of payment?
Ans: **We only accept credit card payment through our registration platform - Gevme.**

4. Can a coach/mentor be repeated for multiple teams?
Ans: **Yes.**

5. When is the latest cut off for registration?
Ans: **Registration opens from 24 Feb to 1st July 2023**
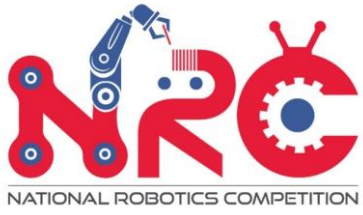
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FAQ -Others

1. Can I get tickets as a bystander to view the competition?

Ans: There is no need of bystander tickets to view the competition, walk-in is allowed. There will be a designated zone for the audience to sit and view the competition.

2. Is there any preparation class from Science Centre?

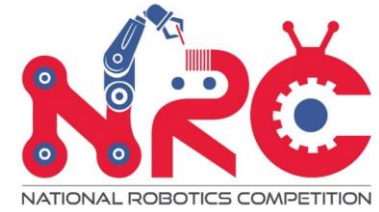**Ans:** There is no preparatory classes from SCS.

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Contact us/ Updates/ FAQ

Website

Social Media

Sign-up Link

Please send all questions to : NRC@science.edu.sg

Thank you!

Organiser:

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