IDE SERIES

2024 SINGAPORE

COMPETITION MANUAL

Updated: 30 Jan 2024

Event Organiser:

NULLSPACE®

vm EDUCATION

INTRODUCTION TO IDE SERIES

Introduction

IDE (Innovation, Design and Engineering) Series is a national technology and engineering competition event. The aim of the competition is to challenge students on problem solving across domains such as electronics, programming, and mechanical design.

IDE 2024 will be held in-person for most categories.

The spirit of the IDE Series is enabling our youths to apply the skills they have to solve problems, and in IDE Series competitions, this is executed through the element of a surprise mission or previously unseen challenge, which will be revealed only on the competition day. For IDE2024, there are 12 competition events in the series, namely:

1. IDE Robotics (Open) – **New!**
2. IDE Robotics
3. IDE Sprint
4. IDE Maker
5. IDE Sumobot
6. IDE VEX 123 – **New!**
7. IDE VEX GO – **New!**
8. IDE VEX IQ – **New!**
9. IDE VEX VRC – **New!**
10. IDE Code Builder (Scratch 3.0)
11. IDE Code Hacker (Python 3.8)
12. IDE Challenge

IDE Code Builder and Code Hacker preliminaries will be held **in-person** this year. Finalists will be invited to the competition venue. Prizes for these categories will also be presented in-person.

IDE Series is open to Singapore schools, international schools (both local and foreign), and public teams.

OVERVIEW OF COMPETITION EVENT (Part 1)

	IDE Robotics (Open)	IDE Robotics	IDE Sprint	IDE Sumobot
Competition Area	Mechanical design and computer programming	LEGO® mechanical design and computer programming	LEGO® mechanical design and computer programming	LEGO® mechanical design
Competition Date	20-21 May 2024 (Onsite)			
Target	Robotics and Infocomm Clubs			
Platform	Open Platforms ^ (Eg. mBot, Maqueen, Arduino)	LEGO® Mindstorms EV3 / SPIKE Prime		
Primary (Age 9-12)	✓	✓	✓	✓
Secondary (Age 13-16)	✓	✓	✓	✓
Tertiary (>16)	-	-	-	-
Team	Team (1-3 pax)			
Registration Fee	$75/team (before 15 Mar 2024) $95/team (before 15 Apr 2024)			
Additional Fee	$100 for Robotics Playfield (Optional) $30 for LEGO Brick Props (Optional)		$100 for Sprint Playfield (Optional) $30 for LEGO Brick props (Optional)	N/A

* 10% discount per team registration for schools registering for the first time.

^ Arduino, BBC micro:bit, mBot, Maqueen and other microcontroller platforms are allowed for IDE Robotics (Open).

OVERVIEW OF COMPETITION EVENT (Part 2)

	IDE Maker	IDE Challenge	IDE Code Builder	IDE Code Hacker
Competition Area	Innovation, design thinking, electronics and programming	Innovation, design thinking, fabrication	Block-based Programming	Text-based Programming
Competition Date	8-10 May 2024 (Online Prelim) 20-21 May 2024 (Onsite Finals)	20-21 May 2024 (Onsite)	Preliminary Round to be held on 6-7 May 2024 (Onsite Prelim) Competition Finals to be held on 20-21 May 2024 (Onsite Finals)	
Target	Design & Technology, Robotics and Infocomm Clubs		Robotics/Infocomm Clubs, ALP students, Computing students.	
Platform	Open Platforms ^	N/A	Scratch 3.0	Python 3.8
Primary (Age 9-12)	✓	-	✓	-
Secondary (Age 13-16)	✓	✓	✓	✓
Tertiary (>16)	-	-	-	✓
Team	Team (1-3 pax)	Team (1-3 pax)	Individual	Individual
Registration Fee	$75/team (before 15 Mar 2024) $95/team (before 15 Apr 2024)		$35/participant (before 15 Mar 2024) $40/participant (before 15 Apr 2024)	
Additional Fee	N/A	N/A	N/A	N/A

* 10% discount per team registration for schools registering for the first time.
^ Both Arduino, BBC micro:bit, and other microcontroller platforms are allowed for IDE Maker.

OVERVIEW OF COMPETITION EVENT (Part 3)

	IDE VEX 123	IDE VEX GO	IDE VEX IQ	IDE VEX VRC
Competition Area	VEX mechanical design and computer programming			
Competition Date	20 May 2024 (Onsite)		20 May 2024 (Onsite - Primary) 21 May 2024 (Onsite - Secondary)	21 May 2024 (Onsite)
Target	Robotics and Infocomm Clubs			
Platform	VEX 123	VEX GO	VEX IQ	VRC
Preschool (Age 5-6)	✓	-	-	-
Lower Primary (Age 7-9)	✓	✓	-	-
Upper Primary (Age 10-12)	-	-	✓	-
Secondary (Age 13-15)	-	-	✓	✓
Open (Any age)	-	-	-	✓
Team	Team (2-5 pax)	Team (2-3 pax)		Team (4-5 pax)
Registration Fee	$75/team (before 15 Mar 2024) $95/team (before 15 Apr 2024)			
Additional Fee	$100 (Waived for 1st 10 sign-ups)	$150	$350	More details to be announced

* 10% discount per team registration for schools registering for the first time.

IDE Robotics

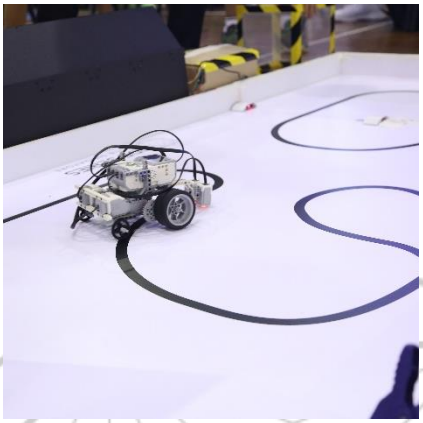
IDE Robotics involves building and programming robots of LEGO® Robotics platform to achieve objectives that are revealed only on competition day. **Part of the competition objectives will be revealed ahead of time** so that students can make adequate preparations, but some of the objectives will only be revealed on competition day. Students will have 4 hours to make practice runs for their robots before making their competition robot runs.

There no platform restrictions for IDE Robotics (Open) category.

IDE Maker

IDE Maker is a competition for students aged 9-12 and 13-16. Teams are allowed to use **any microcontroller platforms** to design and program a project prototype based on the competition theme for the year. **There will be a preliminary judging round held via Zoom** for students to present and showcase their working prototypes. Selected teams will be invited to the finals at the competition venue where they will demonstrate their prototype to a panel of judges when they visit their booth.

IDE Sprint



IDE Sprint is a fast-paced robot racing competition using the LEGO® Robotics platform. Teams will have 3 trial runs to perform calibration and to adjust their programs to create the fastest line tracing robot. Teams will not just be challenged to have their robot make the fastest run, but some strategy is involved in the route that is taken to achieve the highest possible score in the shortest possible time.

IDE Code Builder & Code Hacker

IDE Code Builder is based on Scratch 3.0, and will be available for Primary and Secondary teams, while IDE Code Hacker is based on Python >=3.8, and is available for Secondary and Tertiary teams. Students will code based on a series of computing-based questions, and teams will be awarded points for each working code that is submitted. **This year, a preliminary round will be held onsite prior to the competition date, finalists will be invited to compete at the competition venue.**

IDE Sumobot

IDE Sumobot is a competition involving two robots which compete to push each other off the playfield. Teams may engage in a variety of building and programming strategies to seek, engage, dodge, outwit, or otherwise overpower their opponents.

IDE Challenge

IDE Challenge is a hands-on competition with one or more engineering challenges. On the actual day of competition, teams will need to construct the most effective design under limited time using the materials provided to them.

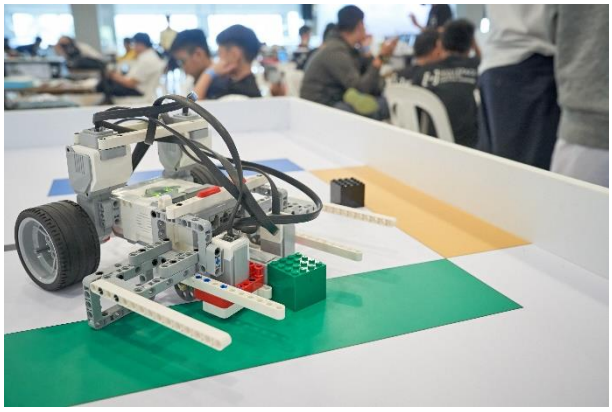
This year there will be an additional surprise challenge announced on the competition day.

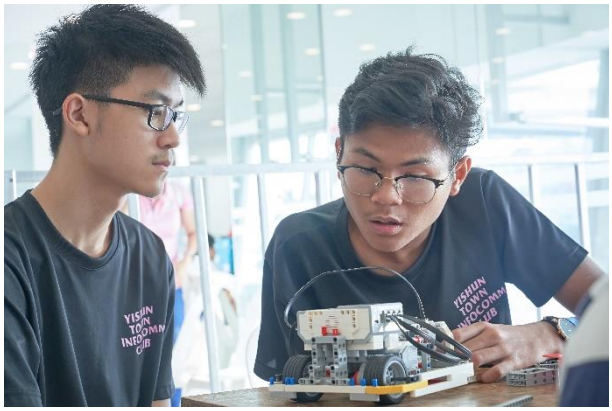
IDE ROBOTICS

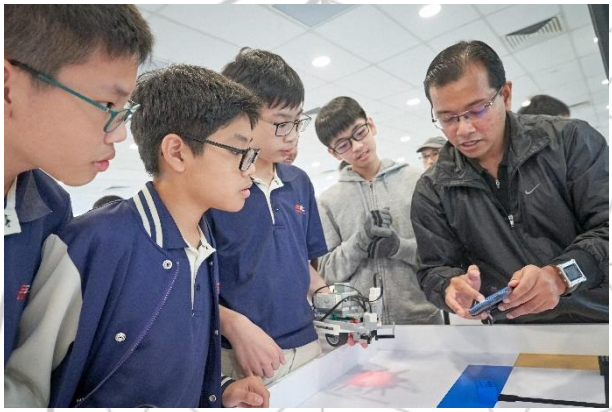
IDE Robotics will be held live at our competition venue. This year, there will be 2 categories available depending on choice of robotics platform: **IDE Robotics** and **IDE Robotics (Open)**.

Scope of Competition

The competition mission consists of several scoring elements and tasks wrapped around a central theme. **IDE Robotics will be limited in using the LEGO® Mindstorms EV3 or LEGO® Education SPIKE Prime robotics platform, IDE Robotics (Open) has no robotics platform limitations**. Students are to use their imagination and creativity to devise the most efficient strategy to deliver the mission objectives and maximize their results. Each category will be divided into 2 sub-categories, namely Primary and Secondary with missions of different levels of difficulty.

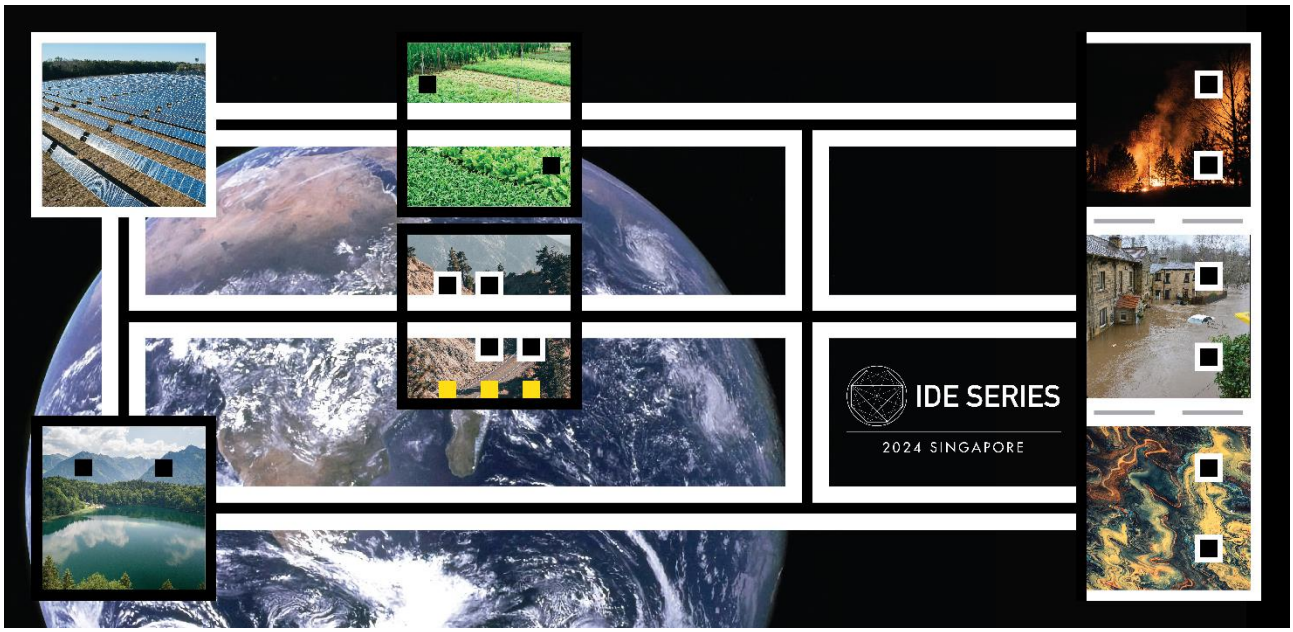






Mission for 2024

Partial mission objectives will be revealed in the IDE Robotics 2024 competition manual. It will be available for download by 13 Feb. The printable playfield is also available for download on our website. The full mission objectives will be announced on the competition day. The playfield dimensions are 236.2cm x 114.3cm.



Download printable playfield and competition manual from ideseries.org/ide2024

Teams are allowed to bring along a **pre-built** robot as well as a half-completed program for the competition day.

Format:

- 4 Hours of Programming and Testing time
- 2 Final Robot Runs, max time of 2 min each. Score will be counted as of the 2 min mark if the robot were to exceed 2 min of runtime. Best score and time of the 2 runs will be used for ranking.

Skills required for IDE Robotics:

- Line following (single/double light sensor)
- Building of robot attachments (Cube collection and/or dispensing device)
- Colour Scanning (Secondary Category)

Equipment Required:

- Robotics set with
    - Light sensors and/or colour sensors
    - 2-4 Motors for IDE Robotics, not limited in IDE Robotics (Open)
- Laptop for programming (with power adaptor)
    - For MOE schools do log in to school laptop in school. There is no SSOE network at competition venue.
- Each team is to bring 1 power extension cord with at least 2m length.

** Note that teams are expected to ensure that they have sufficient battery (laptop and robots) or to bring their own chargers. Chargers will not be provided.*

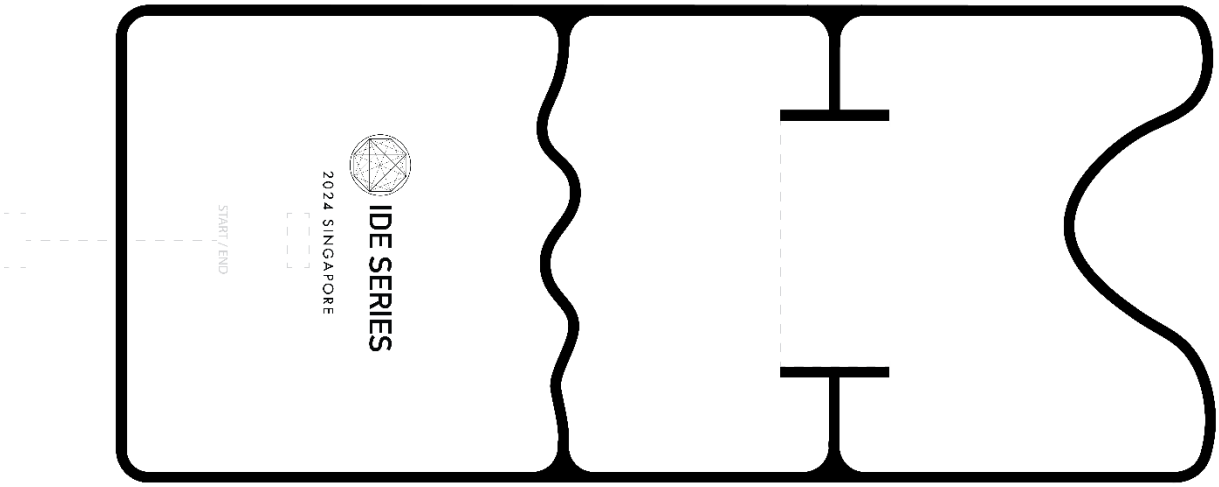
IDE SPRINT

Scope of Competition

IDE Sprint is a fast-paced robot racing competition using the LEGO® Robotics platform. Teams have 3 trial runs on the competition day to calibrate and adjust their programs to create the fastest robot that follows the line.

Primary and Secondary teams will compete within their own categories.

Playfield Mission



Download printable playfield and competition manual from ideseries.org/ide2024

Surprise Rule
The playfield mat will remain mostly the same except for the big, dotted rectangular area. This area will feature lines that will be different on the actual competition playfield, and this will only be revealed on the actual competition day.

Format:

- Each team will have 3 trial runs of 2 min each before the competition.
- 2 Final Robot Runs, max time of 2 min each. If the robot makes a failed run, the maximum time of 2 min will be awarded.

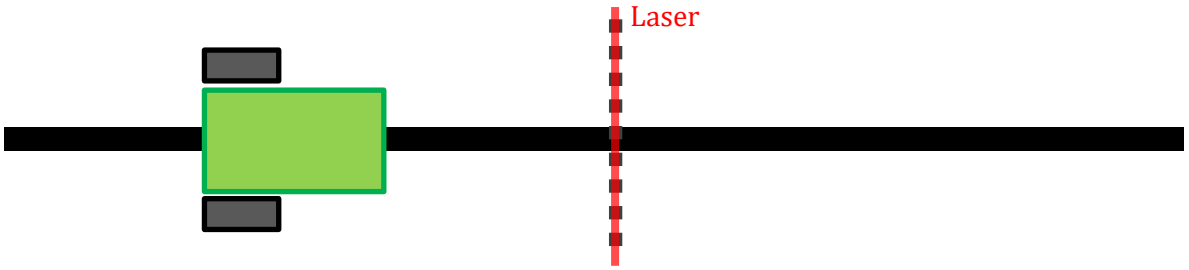
Equipment Required:

- Robotics set with
  - Light sensors and/or colour sensors
  - 2-4 Motors
- Laptop for programming (with power adaptor)
  - For MOE schools do log in to school laptop in school. There is no SSOE network at competition venue.
- Each team is to bring 1 power extension cord with at least 2m length.

** Note that teams are expected to ensure that they have sufficient battery (laptop and robots) or to bring their own chargers. Chargers will not be provided.*

How the competition will be conducted

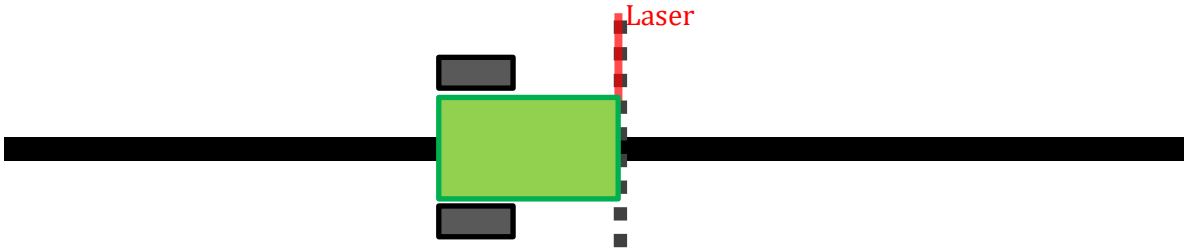
Time in the IDE Sprint competition will be done using a laser timer. Robot Operators must start the robot from a distance behind the start line to avoid prematurely activating the timer.



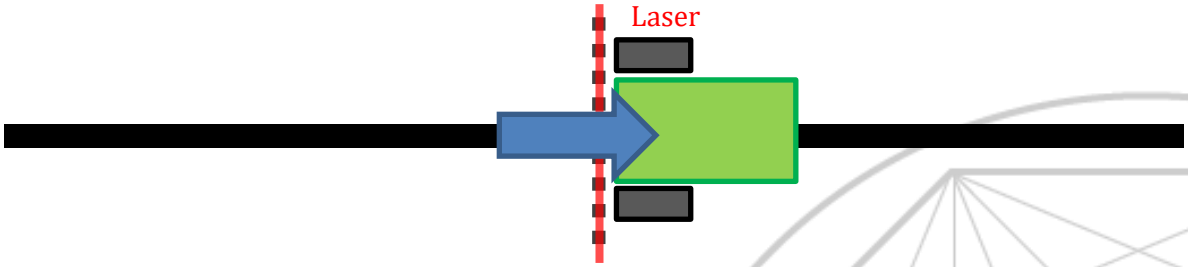
Robot Operator starts the robot a distance behind start line

Start line

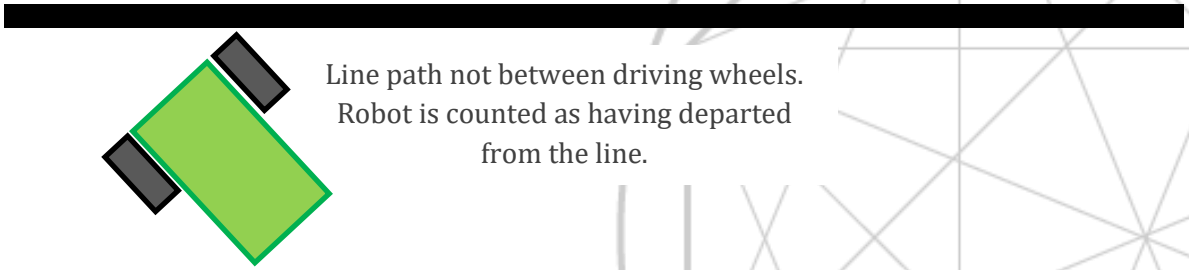
The timer will automatically start when the front of the robot crosses the Start/End line and blocks the laser beam.



Thereafter, robots have a maximum of **10 seconds to cross/exit the start line**. Failure to do so will result in a failed run, where the maximum time of 2 minutes will be awarded for the team's run, and no points will be awarded for this run. The timer will stop automatically when the robot comes back and crosses the laser in the same direction. **Note that the robot must cross the laser in this direction only. Reversing or U-turning to cross the laser will result in a failed run.**



If the robot should stray/depart from the line, this run will be regarded as a failed run. The robot is counted as having strayed if the line is not between both driving (or motorised) wheels.

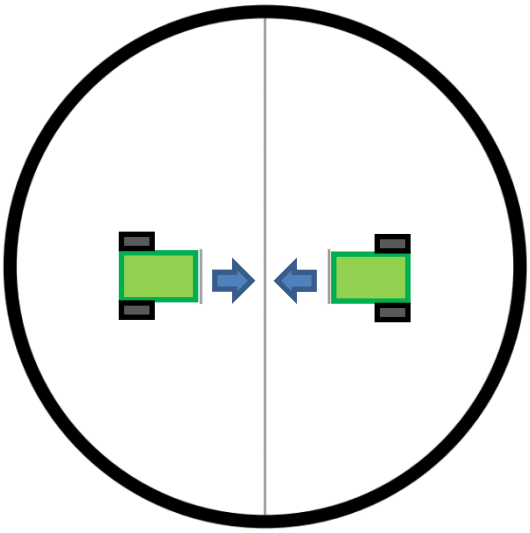


Line path not between driving wheels. Robot is counted as having departed from the line.

IDE SUMOBOT

Scope of Competition

IDE Sumobot is a robot combat competition where robots will compete to push each other off the playfield. Contestants will start 10cm away from the middle line. The first contestant to push the other off the raised wooden circle playfield will be considered the winner.



Scoring

Winning teams will be awarded 2 points, draw 1 point, and losing teams will be 0. In the event where robots fail to touch each other at all during the 30s duration, it will be counted as a loss for both teams. Robots are expected to seek out and engage the opponent.

Win	2
Draw	1
Lose	0

In the event where there is no knockout within 30s, the judge award a victory based on which robot managed to push further into the opponent's territory. Alternatively, the judge may also decide to award a draw.

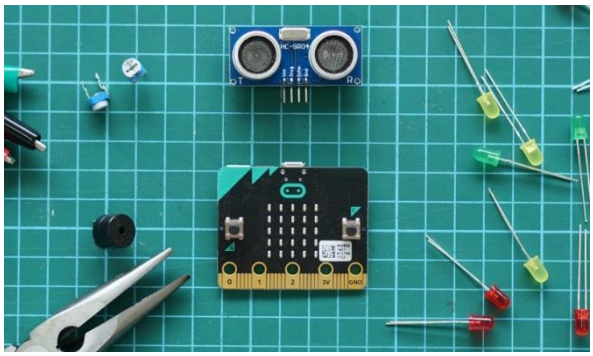
Robot Design

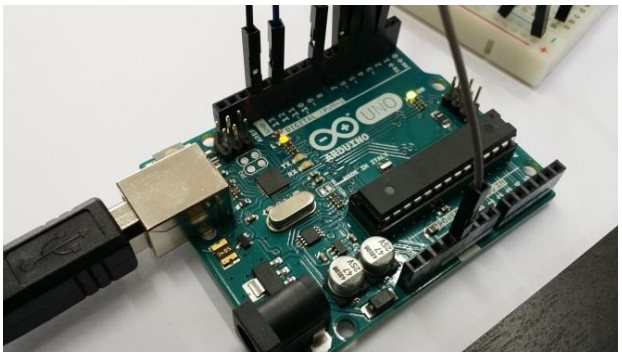
Contestants may build their robots with mechanisms to grapple, flip, push, or overpower their opponents. Any robot attachment that is likely to cause unnecessary damage to the opponent's robots may not be used in this competition.

Sensors may be used to detect the opponent or parts of the playfield, and additional motors may be used. Equipment used must follow the specifications as spelled out in the Competition Rules (Pg. 19-20). No unauthorised equipment/materials may be used.

Robots must adhere strictly to the size requirements as specified in Competition Rules, and robots must also weigh in under 1kg.

IDE MAKER





Scope of Competition

IDE Maker is a competition aimed at encouraging a new generation of makers to solve problems through technology. Students will be graded based on the novelty, usefulness and effectiveness of their implemented solutions.

Challenge Theme for 2024

IDE is partnering with World Robot Olympiad (WRO) Singapore for this year's competition theme: "**Earth Allies**".

In 2024 teams will learn more about how we humans affect nature and how nature and natural events can affect us. How can your project solution help us live in harmony with nature? Can your project solution help us live in places where nature is dangerous or harsh, and can they assist us in living a more environmentally friendly lifestyle?

Note:

- Participation in IDE Maker 2024 is not required for participation in WRO Singapore 2024.
- Participation in IDE Maker 2024 will have no direct contribution to your scores at WRO Singapore 2024.

Platforms you can use:

- Arduino
- micro:bit
- Any other appropriate microcontroller system

Students may use a combination of these platforms to build their prototypes and are encouraged to fabricate parts of their prototype on their own using Wood/Acrylic/Metal/Recycled Materials/Cardboard/3d printing.

Project Documentation (3 May 2024)

Teams are required to submit a project documentation by sending it to sg@ideseries.org by **3 May 2024, 12pm**. Teams can download the project documentation template from https://ideseries.org/ide2024.

Preliminary Round (6-7 May 2024)

Teams are to design and prototype a device as a solution to the challenge theme. This prototype need not be fully functional, but it must be sufficiently functional to demonstrate a proof-of-concept. This year, teams will present their project during an online preliminary round (**6-7 May 2024**) through Zoom with their working prototype. Shortlisted finalist teams will be invited to the competition event day to set up their booths for final presentation.

Competition Finals (20-21 May 2024)

Shortlisted finalist teams will set up their project booths during the competition day. Each team is allocated 7 minutes to present their project to the judges, plus 3 minutes of Q&A, during which they will be expected to perform a live show-and-tell demonstration of their prototype. Teams may use a combination of a slide show and posters or other presentation aids.

Judging Rubrics

Teams will be assessed based on the following criteria:

1. Novelty & Innovation
2. Design and Aesthetics
3. Usefulness & Impact Factor
4. Cost Effectiveness
5. Presentation
6. Relevance to Theme
7. Quality of Implementation
8. Popular Vote

Rubric 1 to 7 will be based on scoring by the judging panel, while Rubric 8 will be determined by popular vote based on public voting on the competition event day. Primary and Secondary teams will be judged within their own categories.

IDE CODE BUILDER

Scope of Competition

IDE Code Builder is a coding competition aimed at testing participants' ability to plan and execute programs. Questions may revolve around physical/visual manipulation of sprites via program, or they may involve manipulation and operations on data variables. Scratch 3.0 is the platform for this competition event.

Competition Format

Participants will compete as individuals for both preliminaries and finals, **both will be held onsite**. They will be given 90-minutes to complete as many questions as they can. These questions will be ranked Easy, Medium and Hard. Each question will have points awarded based on their difficulty. Note that points will only be awarded based on the program's output and not based on the efficiency or logic of the algorithm.

Participants are not expected to complete all the questions, and we would hence encourage them to be tactical about choosing or prioritising questions to complete. Programs will be submitted for scoring; finalists will be invited to the finals at the competition venue.

Students are expected to bring their own computer devices that must be able to accept USB drives for distributing competition files and for submission.

No internet connections are allowed during preliminaries and finals. Students have to install Scratch 3.0 app that allows offline use.

Skills Required

Participants are required to be very familiar with the standard programming proficiencies:

- When Green Flag clicked/When (key) pressed
- If/Else
- Forever/Repeat until/Repeat (x)
- Wait (x) seconds/Wait Until
- Variables

Participants may also need to be familiar with the following to answer some of the questions:

- String manipulation (showing text using the 'Say' block, or storing/joining text)
- Lists (making, adding and editing lists)
- Pen extension
- Sprite coordinate system
- Moving (x) steps and turning (x) degrees
- Sensing if sprite has touched various entities
- Using/deleting clones of sprites
- Ask user for input blocks

Note that we only allow a teacher to assist if participant is facing difficulties with computer operation. It is advisable for participants to be familiar with the computer system to be used for the competition.

Sample Questions

Sample Question 1:
Make a program that asks the user for the base and the height of a triangle, and then the program should calculate the area of the triangle.

Sample Question 2:
Make a program with a computer sprite (Design your own or use an preloaded sprite from Scratch app).
At the start of the program, set the password to be abc123.
Using the computer sprite, ask for a password and wait. If the user keys in the correct password, have the computer sprite say 'Welcome!' Otherwise, say 'Access Denied'.

Sample Question 3:
Add a Basketball Sprite to your program. Make a bouncing ball program such that the ball drops from the top of the screen (Y=150).

- Each time the ball touches the bottom edge of the screen it should bounce back up.
- When the ball bounces, it should bounce back to only half the height of its previous maximum height.
- This should repeat forever.

Sample Question 4:
Using the Pen-Down function, write a program where the Cat sprite moves and draws a shape based on a randomly generated number between 1 - 9. The random number will determine the number of sides the shape has (eg. 3 = Triangle, 4 = Square, 5 = Pentagon, etc.).

IDE CODE HACKER

Scope of Competition

IDE Code Hacker is a coding competition that tests participants on their problem solving and computational thinking using Python. Participants will be required to write code to solve a computational task presented in a question. This competition event will require Python >=3.8.

Competition Format

Participants will compete as individuals for both preliminaries and finals, **both will be held onsite**. They will be given 90-minutes to complete as many questions as they can. Points allocated for each question will be clearly stated. The questions will be grouped into Easy, Medium and Hard, each question having its own points based on difficulty. Participants are not expected to complete all the questions and are advised to be tactical in choosing questions.

Students are expected to bring their own computer devices that must be able to accept USB drives for distributing competition files and for submission.

No internet connections are allowed during qualification and finals. Students have to install and use Python IDLE, with Python version >= 3.8 for offline use.

Scoring

Participants will be awarded points based on their final output and not based on efficiency and complexity of their program. **No points will be awarded in the event that the output is incorrect.** Points will only be awarded if their output matches that of multiple test cases.

Skills Required

Participants are required to be very familiar with the standard programming proficiencies:

- Input and Output
- If/Else, and Loops
- Arithmetic and Logical Operators
- Random module
- String processing and formatting
- Functions and Recursion
- File Input/Output

Submission Details

Participants will be required to submit all their work by the 90-minute mark of the competition. Submission will be collected through an USB drive. **Any submission after this point will not be accepted.**

Participants are expected to be sufficiently orientated to the computer system they will use for the competition, as well as using Python IDLE.

Sample Question 1:
Write a program that is able to find prime numbers. First, it will ask the user to input a number. Then, it will find the corresponding prime number (i.e. 2 being the first, 3 being the second… etc.) and it will print this prime number.

Sample Question 2:
Write a program that creates 10 random numbers between 1 – 100. Thereafter, it will print the 5 numbers on the screen. Next, the program will automatically sort the numbers from low to high, and then print the 10 numbers on the screen.

One way in which you can perform the sorting is as follows:
Taking a random set of numbers: [1, 91, 59, 86, 26, 36, 8, 21, 70, 52]

Step 1: Check if the first digit is larger than the second digit. If so, swap them. If not, leave them in place.
Step 2: Check the second digit against the third, third against fourth, and so on until all digits are checked.
Step 3: Repeat the above for all digits again until no more digits get swapped. Then, this means that the list is completely sorted.

```
unsorted list:
[75, 3, 25, 31, 18, 88, 51, 35, 97, 35]
sorted list:
[3, 18, 25, 31, 35, 35, 51, 75, 88, 97]
>
```

Sample Question 3:
Write a program that asks the user for a UserID and password.

- At the start of the program, there should be 3 UserIDs and 3 passwords.
- If the user enters a UserID and its corresponding password correctly, the program will ask the user if they want to change their password.
- If the user indicates to change password, the program will prompt for a new password
- Then, program will prompt the user to re-enter the new password. If both the new password and re-entered password are correct, the program will change the password for the user.

IDE CHALLENGE

Scope of Competition

The competition challenge is open ended with varied scoring elements and fields wrapped around a central theme. Much of the challenge itself will depend on the students' ingenuity, experience in design and construction, and familiarity with tools and materials rather than textbook knowledge.

Challenge for 2024: Fastest, Higher, Furthest

This year's competition is made up of three challenges. Students will have 2 hours of problem solving and construction time to tackle 3 separate construction challenges in total.

Fastest	Higher	Furthest
Teams will work together to solve a surprise electronic challenge. **No programming knowledge is required.** Construction materials will be "unlocked" for teams who complete this challenge.[1]	Build the tallest possible tower. The tower must be able to support a weight which will be provided by the organisers. The height will be measured from the floor to the bottom of the weight.	Build a bridge that is able to span the furthest between two tables. The bridge must only be supported on both ends by the tables. It must be wide enough and stable for a pullback toy car to be released across the bridge. The distance will be measured between the tables.

[1]Teams will be given a time limit for the surprise challenge. Construction materials will be unlocked for **all teams** regardless of completion after the time limit is up.

The above is the challenge in brief for IDE Challenge 2024. The preparation work may consist of planned designs or mock-ups, however the device must be constructed on competition day using materials provided.

Teams are not allowed to bring along any pre-made prototypes/devices or extra materials to the competition. **Teams must use only provided materials** and the entirety of their devices must be constructed during competition time itself. Teams may, however, bring idea sketches, or their own specialised non-electric tools such as scissors or ruler. **Penknives are not allowed.**

IDE VEX

To be Announced

COMPETITION RULES

Rules and Regulations

General:

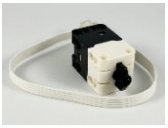
1. During the competition, all teams must look after their own personal property, team construction and materials.
2. Any member(s) of the competition who is/are caught in the act of sabotage, theft or mischief, whether to cause harm to other participating teams or not, will be dealt with by the competition organisers and may subject the team to disqualification.
3. No external help is to be rendered in this competition. This includes receiving direction, contribution, construction of any kind from any party or person not belonging to the team. Failure to comply with this rule will be dealt seriously and may subject the team to disqualification.
4. All decisions by the competition officials and organising parties are final.

IDE Robotics (Open)

1. Teams are expected to bring their own robots that can be constructed from any robot kits. No sharing of robots between teams allowed.
2. Robots must have a single 2-state physical switch or button that is not obstructed from view to the judges that is used to start and stop the robot during a competition run.
3. Batteries used must be reasonably safe and robot construction should take into account of potential short circuits.
4. Robots using laser components are restricted only to Class 1 lasers. Proof of laser class needs to be submitted for verification.
5. The size of the robot will be strictly limited to 25cm x 25cm x 25cm at the starting area. All extensions beyond the size limit must be deployed autonomously.
6. Teams have allocated time to program and test their robots on the competition day. Following which, during the competition runs, no further modifications may be made.
7. Robots are to be completely autonomous and finish the mission without interference from any external influence nor any wireless communication.
8. LEGO® controllers are also allowed here, with no restrictions on number of sensors and motors – multiplexes are also allowed.

IDE Robotics, IDE Sprint & IDE Sumobot

1. Teams are expected to bring their own LEGO® Mindstorms EV3 or Robot Inventor or SPIKE Prime Sets, batteries and laptops. No sharing of robots between teams allowed.
2. Each robot is only allowed to use one controller (either Mindstorms EV3 or Robot Inventor or SPIKE Prime). However, the number of motors and sensors is not restricted. No multiplexing of motor or sensor ports allowed.
3. List of Approved Sensors and Motors (Table 1) – HiTechnic sensors are **not allowed**

EV3 Large Motor	EV3 Light/Color Sensor	EV3 Touch Sensor	EV3 Ultrasonic Sensor	EV3 Gyro Sensor
EV3 Medium Motor	 Force Sensor	Large Motor	Medium Motor	Color Sensor
Distance Sensor				

4. Only LEGO® branded equipment may be used for the robot.
5. **Use of LEGO® Powered Up electric motors are allowed.**
6. Before each competition run, an inspector will check the robots for any non-LEGO® or non-approved parts/accessories. Team may face possible disqualification or point deduction if the parts cannot be removed.
7. The size of the robot will be strictly limited to 25cm x 25cm x 25cm at the starting area. All extensions beyond the size limit must be deployed autonomously.
8. Teams have allocated time to program and test their robots on the competition day. Following which, during the competition runs, no further modifications may be made.
9. Robots are to be completely autonomous and finish the mission without interference from any external influence.
10. Robots used here are not allowed to be used again for IDE Robotics (Open).

IDE Maker

1. Hardware:
    a. Any Arduino board model (e.g. Uno, Mega 2560, Leonardo, Mini, Nano etc.) and custom Arduino boards (e.g. Maker UNO)
    b. BBC micro:bit
    c. Any other suitable microcontroller platform
2. Programming: No limitation on software or programming language.
3. Additional shields, add-on hardware components are allowed.
4. Teams are to prepare their own presentation materials for the presentation on competition day.
5. Project prototype must be physically demonstrated to judges during the presentation time.

IDE Code Builder & IDE Code Hacker

1. Students are to keep their screens shared throughout the competition.
2. No external help is to be rendered in this competition. This includes receiving direction and contribution of any kind from any party or person not belonging to the team. Failure to comply with this rule will be dealt seriously and may subject the team to disqualification.
3. All decisions by the competition officials and organising parties are final.

School and Team Eligibility

Preschool Category (For VEX)

- Age 5 to 6 years (in 2024)
- IDE VEX 123

Lower Primary Category (For VEX)

- Age 7 to 9 years (in 2024)
- IDE VEX 123, IDE VEX GO

Upper Primary Category (For VEX)

- Age 10 to 12 years (in 2024)
- IDE VEX IQ

Open Category (For VEX)

- No age restrictions
- IDE VEX VRC

Primary Category

- Age 9 to 12 years (in 2024)
- IDE Robotics, IDE Robotics (Open), IDE Maker, IDE Sprint, IDE Sumobot, IDE Code Builder

Secondary Category

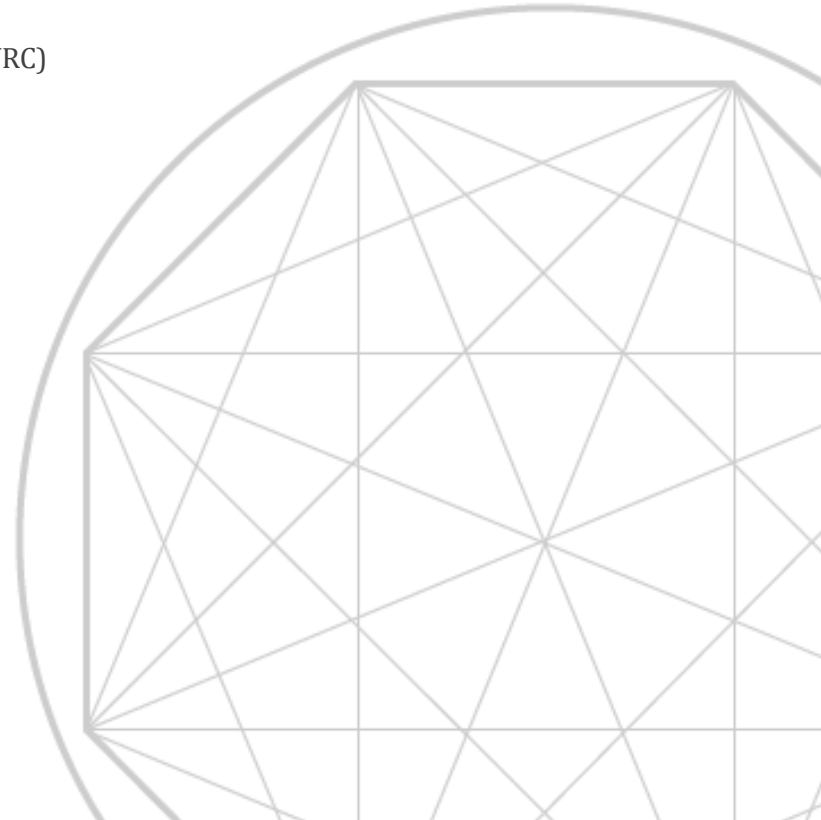
- Age 13 to 16 years (in 2024)
- IDE Robotics, IDE Robotics (Open), IDE Maker, IDE Sprint, IDE Sumobot, IDE Code Builder, IDE Code Hacker, IDE Challenge, IDE VEX IQ, IDE VEX VRC

Tertiary Category

- Age 16 to 19 years (in 2024)
- IDE Code Hacker

Team Registration (for team-based categories)

- Up to 3 students
- Up to 5 students (IDE VEX 123, IDE VEX VRC)



IMPORTANT DATES

Early Bird Registration deadline	15 Mar 2024, 11.59pm
Registration Deadline	15 April 2024, 11.59pm
IDE Maker Project Documentation Submission	3 May 2024, 12.00pm
IDE Maker Preliminaries	8-10 May 2024, on **Zoom**, timing TBC
IDE Code Builder Preliminaries	6 May 2024 (Primary Category)
IDE Code Hacker Preliminaries	6 May 2024 (Tertiary Category)
IDE Code Builder Preliminaries **IDE Code Hacker Preliminaries**	7 May 2024 (Secondary Category)
IDE Robotics **IDE Robotics (Open)** **IDE Sprint** **IDE Sumobot** **IDE Challenge** **IDE Maker Finals** **IDE Code Hacker Finals** **IDE Code Builder Finals** **IDE VEX IQ**	20 May 2024 (Primary Category) 21 May 2024 (Secondary, Tertiary Category)
Prize Presentation	20 May 2024 (Primary Category) 21 May 2024 (Secondary Category)

AWARDS

All award categories are not mutually exclusive. For example: A team may be awarded both the "Design Award" and "Judges Special Mention Award" for the IDE Maker Competition. Prizes are subjected to adjustment by the organisers and will be updated on the competition website.

IDE Maker, IDE Challenge Awards

Awards	Prizes
Championship Award	First to Third: Competition Trophy, Medals
Innovation Award	Competition Trophy & Medals
Design Award	Competition Trophy & Medals
Engineering Award	Competition Trophy & Medals
Judges' Special Mention Award	Certificates

IDE Robotics, IDE Robotics (Open), IDE Sprint, IDE Sumobot, IDE VEX 123, IDE VEX GO, IDE VEX IQ, IDE VEX VRC Awards

Awards	Prizes
Championship Award	First to Third: Competition Trophy, Medals
Fourth to Tenth Position:	Ranking Certificates

**IDE Robotics awards will be further subdivided into (MOE/International) schools category and private team category.*

IDE Code Builder, IDE Code Hacker Awards

Awards	Prizes
Championship Award	First to Third: Competition Trophy, Medals
Other Finalists	Ranking Certificates

**The organisers may, at their discretion, modify the category of awards, and/or the award itself.*

REGISTRATION

Registration for IDE2024 closes on 15 April 2024.

Please take note of the following registration rules:

1. The organizers reserve the right to reject any teams that do not fulfil the registration criteria.
2. Special invoicing arrangements may be made using our registration form.
3. No changes to the registration form will be allowed after 15 April 2024.

Additional Optional bundle purchases

1. Laminated Certificate of Participation: $5
2. IDE Robotics Playfield: $100
3. IDE Robotics Playfield LEGO props: $30
4. IDE Sprint Playfield: $100
5. LEGO Education SPIKE Prime
    a. SPIKE Prime Core Set: $971.56
    b. SPIKE Prime Expansion Set: $284.40
    c. SPIKE Prime Colour Sensor: $71.56
    d. SPIKE Prime Medium Motor: $119.27
    e. SPIKE Prime Large Motor: $128.44

To register for this competition, please visit our website at: http://www.ideseries.org/ide2024

Contacts

For competition enquiries, contact: sg@ideseries.org