NATIONAL CODE & ROBOTICS COMPETITION 2025

1. General information

National Code & Robotics Competition 2025

The National Code & Robotics Competition 2025, organised by The Lab, is a fun and exciting event designed to expose students to the world of coding and robotics. Open to the public for ages 5 to 14, this annual competition aims to ignite interest and innovation in Science, Technology, Engineering, and Mathematics (STEM).

Participants will tackle individual challenges, putting their knowledge and skills to the test in a dynamic and stimulating environment. This competition encourages students to think creatively, solve problems independently, and showcase their talent in coding and robotics.

1.2 Introduction to TLTC

Participants will face problem-based challenges that require solutions using coding and/or robotics. The competition consists of a qualifying round, semi-finals, and a final round, culminating in the crowning of the top 3 winners in each age group. This competition is a platform for students to showcase their creativity, problem-solving abilities, and technical skills in a dynamic and stimulating environment.

Students will focus on developing the following areas:

- Coding skills
- Robotics skills
- Computational Thinking (e.g., tinkering, debugging, collaboration, etc.)

1.3 Learning regardless of the result

The Lab strongly believes that the process of learning is more important than the result. The competition serves as a learning platform for students to experience competition and demonstrate their talent and interest in technology.

2. Age group and Coach definitions

2.2 Age Groups

The age groups are defined as of 31 December 2025

- Ages 5 - 6 years old: The Kinder category
- Ages 7 – 9 years old: The Junior category
- Ages 10 – 14 years old: The Coder category

Should a participant wish to join a category higher than what their age is supposed to be (i.e. 6 years old joining Junior), they will be allowed to do so.

However, an older participant will not be allowed to join a category for a younger age group (i.e. 11 years old joining Junior WILL NOT BE ALLOWED).

2.3 Coach Definition

In the Kinder category (ages 5–6 years old), each participant is allowed to have one parent or guardian act as a coach during the competition day. Coaches are there to facilitate learning and provide guidance when participants have questions or encounter problems. While coaches are not permitted to code or complete tasks during the actual competition challenge, they can assist by offering verbal support to their child.

This arrangement is specifically for the Kinder category due to the participants' young age and the likelihood that this may be their first competition experience. For participants aged 7–14 years old, no parent or guardian assistance is allowed.

3. Fair Competition

Participants are expected to uphold high standards of ethics throughout the competition. Every participant must compete fairly and show respect towards fellow competitors, judges, and competition organisers.

All solutions must be the original work of the participant. Using solutions that are not the participant's own work is strictly prohibited and will be considered plagiarism.

If there is suspicion of any violations, an investigation will be conducted. Penalties, including potential disqualification, may apply. Judges reserve the right to prevent the participant from advancing to the next stage of the competition, even if the submitted solution would have otherwise won.

4. Competition Format and Procedure

The competition for all age groups consists of three stages:

- Qualifying Round
- Semi-Finals
- Final Round

The Qualifying Round is open to all contestants, and the top 6 participants will advance to the Semi-Finals. From there, the top 3 participants will proceed to the Final Round, where the winners will be determined.

All three stages of the competition will take place on the same day in each category.

Category	**Date**
Kinder	21 September 2025
Junior	20 September 2025
Coder	21 September 2025

The location of the competition is at Tanglin Mall Atrium, 163 Tanglin Rd, Singapore 247933.

5. Competition Details

5.1 For Ages 5 - 6 years old: The Kinder category

The competition uses the Kubo robot.

Qualifying Round:

All Participants will face a total of three coding challenges in the qualifying round, where they must program Kubo to move from one random location to another. The goal is to complete each 3 tasks in the fastest average time within their group of six in each session. The top 6 participants overall will advance to the Semi-Finals.

Semi-Finals and Final Round:

From the Semi-Finals, the top 3 participants will proceed to the Final Round, where the winners will be determined. All three stages of the competition will take place on the same day, 21 September 2025.

Sample video:
https://www.youtube.com/watch?v=HwTV6O3H_0Y&list=PLb6GbZRcg07N3zUziu_Gw2WdPqYnB-a6R&index=2

5.2 Ages 7 – 9 years old: The Junior category

The competition uses the LEGO Education SPIKE Prime Core Set (45678) robot. There are two subcategories to The Junior category, namely The Junior Building and The Junior Coding category.

The Junior Building category:

Qualifying Round:

In this round, all participants (novice and expert) will face building challenges where they must construct three different robots. Participants will be given a specific amount of time to memorise the design of a robot and then a set amount of time to build it. The goal is to complete all three building tasks with the fastest average time within their group of six in each session.

If time runs out and no participant successfully completes the robot, the participant whose build is the closest to the desired robot will be declared the winner for that task. The top 6 participants overall will advance to the Semi-Finals.

Semi-Finals and Final Round:

In the Semi-Finals, the top 6 participants will compete for a place in the Final Round, where the top 3 participants will be determined and crowned as winners.

All three stages of the competition will take place on the same day, 20 September 2025.

The Junior Coding category:

Qualifying Round:

For the Junior Coding Category, participants will be using the **LEGO® Education SPIKE™ Legacy App (v. 2.0.10)**. Please download and install the application in advance using the following link:

https://education.lego.com/en-us/downloads/spike-legacy-app/software/

LEGO® Education SPIKE™ Legacy App v. 2.0.10

In this round, participants will be presented with 15 to 20 coding challenges using the LEGO Spike application. Each challenge will be displayed for 10 seconds. After the 10 seconds, participants will have up to 5 seconds to write their answer on a handheld whiteboard provided to them. The questions will be in either multiple-choice or fill-in-the-blank format. The top 6 participants overall will advance to the Semi-Finals.

- Novice participants will be assessed on logic, loops and conditionals using block-based programming.
- Expert participants will be additionally assessed on conditionals and variables using block-based programming.

Semi-Finals and Final Round:

In the Semi-Finals, the top 6 participants will compete for a place in the Final Round, where the top 3 participants will be determined and crowned as winners.

All three stages of the competition will take place on the same day, 20 September 2025.

5.3 Ages 10 – 14 years old: The Coder category

Participants will be assessed on their understanding of core programming concepts through a variety of formats, including block-based programming, language interpretation, logic puzzles, and abstract problem-solving. The competition is not tied to any specific coding platform, and challenges may draw from common programming environments such as Scratch, Python, and other similar platforms. Participants are expected to have a general understanding of coding concepts that apply across different platforms.

- **Novice** participants will be assessed on fundamental programming logic and reasoning. This includes understanding control flow structures (loops, conditionals) and applying structured logic to basic problem-solving in both visual and text-based coding.
- **Expert** participants will be assessed on more advanced logical reasoning and computational thinking. In addition to Novice-level concepts, they will demonstrate proficiency in variables, functions, multi-branch logic, and pattern analysis across both block-based and abstract formats.

Qualifying Round

Participants in the Qualifying Round will be grouped by category, and the round will be conducted in a **quiz format**, where both logic and accuracy are key. It will feature a series of coding-related challenges presented in various formats to assess a range of problem-solving skills.

Each challenge will be displayed for a limited time. During this period, participants must analyse the question and formulate their answer. Once time is up, no further changes will be allowed and they must present their responses for evaluation. Only complete and fully correct answers, as determined by the judge's discretion, will be awarded points.

Question Formats - Participants may encounter the following response formats, or a combination.

- **Multiple-Choice** – Choose the correct answer(s) from the provided options. Some questions may have more than one correct answer.
- **Fill-in-the-Blank** – Complete missing code elements, logic conditions, or values to achieve the intended outcome.
- **Short Answer** – Provide concise responses, such as the final output of a program or a logic-based explanation.

Challenge Types - Each question will be based on one or more of the following challenge types:

- **Output Prediction** – Analyse a given block-based code snippet, pseudocode, or logic sequence and determine the expected result.
- **Debugging** – Identify and correct logical or structural errors in a block-based code or logic flow.
- **Logic Puzzles & Pseudocode** – Solve visual or abstract problems that test computational thinking and reasoning using structured steps or pseudocode.

The goal is for participants to get as many points as possible within their session. In the event of a tie within a group, tied participants will proceed to answer tie-breaker questions until a winner is determined.

Semi-Final and Final Round

In the Semi-Finals, the top 6 participants from the Qualifying Round will compete for a place in the Finals, where the top 3 will be selected and crowned as winners.

Both the Semi-Final and Final Round have the same format as the Qualifiers, where participants will compete to answer coding challenges within a specific time frame.

Challenge Types - Participants in the Semi-Final and Final round will tackle coding challenges that may additionally include the following types:

- **Code Construction** – Participants will be given a scenario and a scrambled list of instructions. They must arrange these steps in the correct sequence to complete the task successfully. These challenges focus on logical thinking, flow control, and understanding of program structure

- **Code Reversal** – Participants will analyse and evaluate code snippets to determine which one correctly solves the given problem. These questions test understanding of program structure, logical flow, and intended outcomes.

The goal is for participants to get as many points as possible within the semi-final and final rounds. In the event of a tie within a round, tied participants will proceed to answer tie-breaker questions until a winner is determined.

All three stages of the competition—Qualifying Rounds, Semi-Finals, and Final Round—will take place on the same day, 21 September 2025.