



“SYSTEMS THINKING” THROUGH ROBOTICS

One Ultimate Challenge

Students integrate electrical, mechanical and computer systems, the three systems at the core of every robot, to meet a series of challenges that parallel autonomous vehicle (AV) operations.

AV Technologies

Robo Racecar challenges mirror those of driverless cars that may soon dominate our neighborhood streets and highways. **Rover** challenges are based on robots designed to explore remote areas of land, sea and space.

The Robo Racecar is a 1:16 scale car that students assemble (small hardware manipulation required) then automate using sensors and micro:bit processors. The Advanced Robo Racecar is an automated Student Racing Challenge car (1:10 scale RC car). Ten80 provides an add-on kit with basic instructions on how to install and program sensors using and Arduino microprocessor.

Rover teams are invited to compete in the NSL using any Rover that meets NSL specifications.

Standards

The Student AV Challenge is aligned to the Common Core State Standards for Mathematics & ELA, Next Generation Science Standards (NGSS) and Computer Science Teacher’s Association (CSTA) Level 3 standards.

Available Formats

- CLASS: Individual student accounts (available winter semester 2021)
- CLUB: Team accounts
- CAMP: 30 contact hours

Curriculum Overview

The Robo Racecar curriculum leads students through hands-on physical computing activities that address fundamental computational literacy concepts. Those lessons learned are applied to automate the RC car in stages, ultimately transferring decision-making from the human driver to the robot.

The Advanced Robo Racecar kit provides a how-to guide (not a full CompSci curriculum). It challenges students to extend their abilities to physically manipulate electronic components and solve problems through logical and systems-oriented thinking.

Though Rover teams can still compete in the NSL, Ten80’s Rover curriculum is no longer available.

Enterprise & Innovation units motivate students to manage their time and resources, to market themselves and to develop the 21st Century Skills required to turn ideas into realities.

Competition Overview (Optional)

Robo Racecar and Rover teams can compete in the AV Challenge series of the National STEM League (NSL) through Face-to-Face (F2F) Competitions and the Online Points Race. Points leaders and F2F competition winners are invited to the NSL Finals.

Get Involved

Ten80Education.com

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Option to Collaborate
& Compete in the NSL



Published and Organized By



ROBO RACECAR CHALLENGE

CLASS* vs. CLUB Options

In both CLASS and CLUB formats, video presentations direct students' physical activity and analysis using engineering logbooks. In a CLASS, educators assess students with a mix of online quizzes and rubric-based evaluation of documentation, results and physical products.

The CLASS format provides one login per student while the CLUB provides one login per team. Both provide two educator logins.

Materials Options

Each Robo Racecar station is designed to serve 2 - 3 students. Additional team members can participate through team roles that include user interface design, graphic design, web design, marketing, public relations, project management, research & development, fabrication, etc.

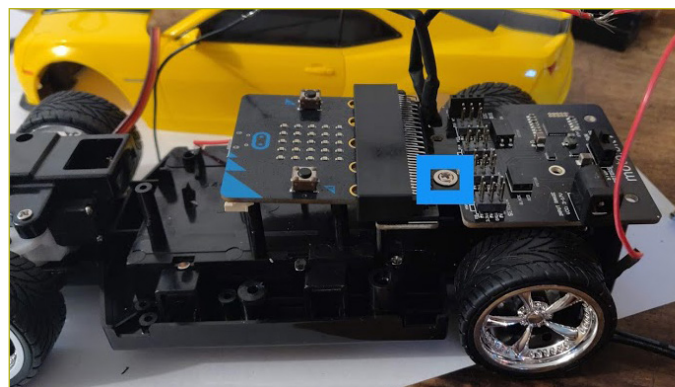
Few materials are consumable so the kit can be used repeatedly.

1, 2, 4 or 6-Robo Racecar Kit Contents

- 1, 2, 4 or 6 Booster Kits (contents shown below)
- Shared tools and battery charger(s)
- Student access to the SolidWorks® Student Edition
- Web consultation to help organize your program

1-Robo Racecar Booster Kit Contents

- 1 × Car kit
- 1 × Rechargeable batteries
- 2 × Micro:bit boards
- 1 × motor shield
- Multiple Sensors
- Set of Cables, wires, clips, headers
- Focus lesson set including breadboard, resistors, etc.
- Tool kit



Robo Racecar CLASS* & CLUB Startup Options

Should teams choose to participate in the National STEM League (NSL) the number of eligible teams is equal to the number of cars in their base kit. See the order forms for more details.

Class kits provide 1 curriculum login per student.

Robo Racecar CLASS Kit	Educator Licenses	Student Licenses	NSL Teams	Kit
Home	2	5	1	1-Station
Small	2	10	2	2-Stations
Medium	2	16	4	4-Stations
Full	2	24	6	6-Stations

Club kits provide 1 curriculum login per team.

CLUB Base Kit	Educator Licenses	Team Licenses	NSL Teams
1-Station	2	1	1
2-Stations	2	2	2
4-Stations	2	4	4
6-Stations	2	6	6

* Class format will be available for winter semester 2021.

ROBO RACECAR CAMP KIT

This camp-specific curriculum is organized into a 5-day format with 25-40 contact hours depending on your program organization.

The camp kit includes the same materials as the 6-Robo Racecar Base Kit described above. It is ideal for six teams of 3 - 4 students per team. The materials are NOT consumable and can be used to run multiple camps. After the first camp, only a per student license fee is required to maintain access to curriculum, resources and training.



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