

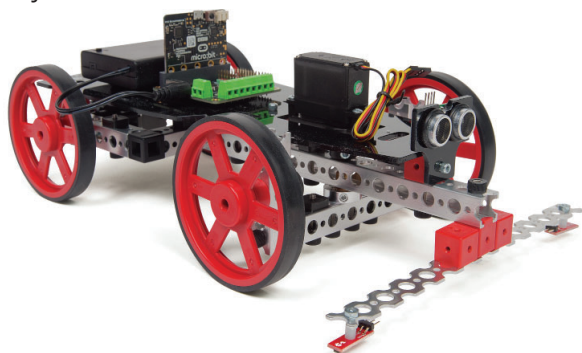
TEN80 AV/EV CHALLENGE

The Storyline & Challenge

Students assemble, wire, and program autonomous electric vehicles to complete a series of challenges that mirror those of partially and fully-automated cars on our roads today. Beyond STEM skills, students practice 21st century competencies such as research, collaboration, and effective communication.

Technology

The AV / EV is a 1/10th scale chassis that students assemble from Tetrax® Prime components, then automate by installing and programming electronics, sensors and a micro:bit. The micro:bit is a Microsoft microcontroller that can be easily programmed in Makecode from any device with a web browser. Beginners can start with drag-and-drop block programming. Advanced users can program it using the Python or Java text editors.



Standards

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.

Curriculum Overview

Each AV/EV kit comes with a full set of materials, teacher's guide, and student guide. Curriculum includes:

- Web training and support
- Introduction to AV / EV technology in today's society, and as a driving force of innovation
- "GIP": Good Investigation Practices
- Mechanical assembly instructions and electrical wiring guides
- Lessons and challenges:
 - Hello world (introduction to micro:bit)
 - Remote control (communications)
 - Distance and Speed
 - Direction (and serial data)
 - Obstacle avoidance
 - Stay in your lane (lane departure assist)
 - Navigate the Neighborhood
- Enterprise & Innovation units motivate students to manage their time and resources, to market themselves and their ideas, and be effective team members and leaders.

Competition Overview (Optional)

Ten80 AV Challenge teams can compete in locally-run competitions, are invited to compete in Face-to-Face (F2F) Competitions hosted by Ten80, and (optional add-on) in the online Points Race. Teams that lead in the Points Race leaders and place at F2F competitions are invited to the Ten80 Nationals hosted each April.

Get Involved

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Option to Collaborate
& Compete



Published and Organized By



AV/EV COMPETITIONS: COLLABORATE, CREATE, COMPETE

Ten80 teams can collaborate and compete in 1-2 day Face-to-Face (F2F) Competitions and in an online Points Race that runs from October to May each year.

Online Points Race (Optional)

No Travel Required! Student teams use an online dashboard to get feedback from remote STEM mentors and to earn points. Points categories are aligned to the Ten80 STEM Challenges curriculum so educators can use the site to stay up to date on student work.

Points Race entries are submitted between October 1st and the first week in May. A leader board celebrates team achievements and points leaders are invited to the Ten80 Nationals throughout the season. The ultimate Points Race winners are honored with custom-designed trophies shipped to their school or meeting place.

An additional fee is required. See the order form for details.

Face-to-Face (F2F) Competitions (Optional)

Whether in-person or remote, Face-to-Face (F2F) events combine the excitement of head-to-head competition with the innovative energy of a STEM Fair.

All registered Ten80 teams can compete in **locally-organized events** and in **Ten80 Regional competitions** organized by the Ten80 Education.

Teams earn invitations to the **Ten80 STEM Challenge Nationals** by leading in the online Ten80 Points Race or placing in sanctioned Ten80 Challenge events. The Ten80 Nationals event is hosted in April each year. Location varies (Past locations have include Miami, Charlotte Motor Speedway, Texas A&M).

AV/EV Competition Categories

F2F categories include:

- Road-Ready Challenges:
 - Drive the Distance
 - Direction
 - Obstacle Avoidance
 - Stay-in-Your-Lane
 - Parallel Parking
- Data-Driven Design Project
- Enterprise
 - Project Planning
 - Pitches & Presentations
 - Graphic Design, Team Identity and Vehicle Design

Online Points Race categories include F2F categories and more. For example, teams earn points for user interface design, for media exposure and specialization projects like 3D CAD designs.

