STEM CHALLENGES

Each year, the MOST organizes and hosts four annual Design, Build, and Compete outreach competitions as well as the **CNY Science & Engineering Fair** (ISEF USNY09) for students in grades four through 12 in Central New York and surrounding counties. These events are held either virtually or in-person, depending on existing public health and safety guidelines.

The primary aim of these outreach programs is to provide students with engaging, hands-on learning experiences in **STEM** (Science, Technology, Engineering, and Math). By involving students in the purposeful design, construction, and testing of guided engineering projects, these programs seek to help improve student achievement, expose students to concepts and careers in the STEM fields, and foster skills in problem-solving, teamwork, and the engineering design process.

Central New York Steamboat Challenge

The CNY Steamboat Challenge is a design challenge in "pop-pop" or "putt-putt" boat engineering. Individually or in teams, students design and construct a miniature working steamboat powered by a single tea light candle. On competition day, students present their design to the judges and are scored in five categories (engineering knowledge, relevant STEM principles, teamwork, creativity, and aesthetic/design) as well as their boat's best race time in two attempts.

Students compete and awards are given in three categories: Category I (grades 4-6), Category II (grades 7-8) and Category III (grades 9-12).

Central New York Bridges: Build 'Em and Bust 'Em

The CNY Bridges: Build 'Em and Bust 'Em competition is a design challenge in bridge engineering (civil engineering). Teams of students design and construct truss bridges from balsawood and glue provided by the MOST, with the goal of having the highest efficiency rating (a ratio of the load a bridge can hold to the mass of the bridge). On competition day, teams watch as their bridge is inspected and 'busted' – weight-tested until it breaks!

Students compete and awards are given in three categories: Category I (grades 4-6), Category II (grades 7-8) and Category III (grades 9-12).

CNY Micron Robotics & Embedded Systems Challenge

The CNY Robotics & Embedded Systems Challenge is a computer engineering challenge for students in teams of two or more. Each year, a new real-world challenge presents an opportunity for students to creatively employ the engineering design process to solve problems using basic microcontrollers, sensors, switches, and more. On competition day, students will display and demonstrate their design solutions and are scored on their computer engineering knowledge as well as the effectiveness and creativity of their design.

Students compete and awards are given in two categories: Junior Level (Grades 4-8) and Senior Level (Grades 9-12). Challenges are adapted for each category.

Central New York Science and Engineering Fair (CNYSEF)

A staple of MOST outreach programming for more than 40 years, the CNYSEF is the regional affiliate to the International Science & Engineering Fair (ISEF). Individually or in small teams, students design a STEM project, conduct their experiment or construct their prototype, and prepare a report on their findings. On the day of the fair, students present their research to CNYSEF judges, explore the college fair, and take in a keynote address.

Students compete and awards (including cash prizes, scholarships, and qualification for advanced fairs, including ISEF) are given in two categories: Junior Category (grades 4-8) and Senior Category (grades 9-12).

Central New York Rocket Team Challenge

The CNY Rocket Team Challenge is an aerospace engineering challenge in model rocketry. In teams of four to eight, students construct and design their rockets using kits provided by the MOST. On challenge day, students present their design to the judges and are scored on their STEM knowledge and rocketry calculations as well as their rocket's performance when launched – including whether their on-board "Eggstronaut" survives the landing!

Students compete and awards are given in two categories: Junior Category (grades 4-8) and Senior Category (grades 9-12).
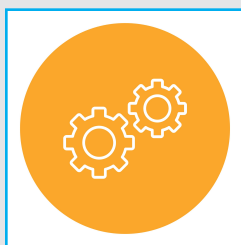
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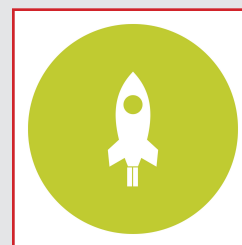- [ ] **CNY Steamboat Challenge** October 15, 2022
- [ ] **CNY Bridges Build'em & Bust'em** November 5, 2022
- [ ] **CNY Robotics & Embedded Systems** January 28, 2023
- [ ] **CNY Science & Engineering Fair** April 1, 2023
- [ ] **CNY Rocket Team Challenge** June 3, 2023

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