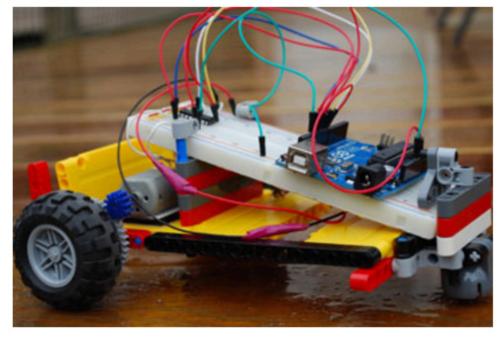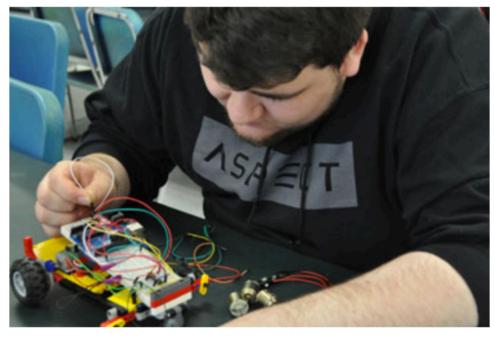## West Islip News

Arduino Roadster Project Lets High Schoolers Use Tech to Solve Problems

High school students in Ron Weber's electricity/electronics class worked to address a wide array of challenges in programming an Arduino microcontroller to drive an electric Lego roadster, which familiarized the students with electronics theory, code programming, problem solving and troubleshooting.

Working on the Arduino roadster project required the students to be able to construct their vehicle from Legos, wire an Arduino microcontroller with an H-Bridge integrated circuit to control the rotation of the electric motors, and create the programming code that directs the Arduino's control of the roadster.

Each step of the process had its own set of problems that needed to be solved. When building the roadster with Legos, considerations like gear ratios, weight distribution and length of the roadster were critical design constraints. The students also had to determine the revolutions per minute of the electric motors and the positioning of the custom circuitry, and follow schematic diagrams to precisely fabricate the electrical circuits necessary to control and propel the roadster.

Learning to program the Arduino – a very small special purpose computer with electronic input/output channels built into it – was the heart of the project. The Arduino has the ability to receive information from the input channels and to control motors and other peripherals connected to the output channels. When complete, the dragster is able to sense and react to the world around it. The Arduino's Integrated Development Environment made it easy to write code and upload it to the board. The students had to systematically create and structure the code into function modules that address individual actions of the roadster.

"The Arduino roadster provided our students with a real-life engineering experience," said Brian Taylor, the district's director of science and engineering technology. "The students drew upon many different technical understandings to accomplish one specific goal – making the roadster move."

"This type of activity has far-reaching implications on the experience of our students," said Weber. "Learning to use technology to solve problems is paramount to every student's educational experience."