Cyber Security with Robotics and After School Cyber Clubs

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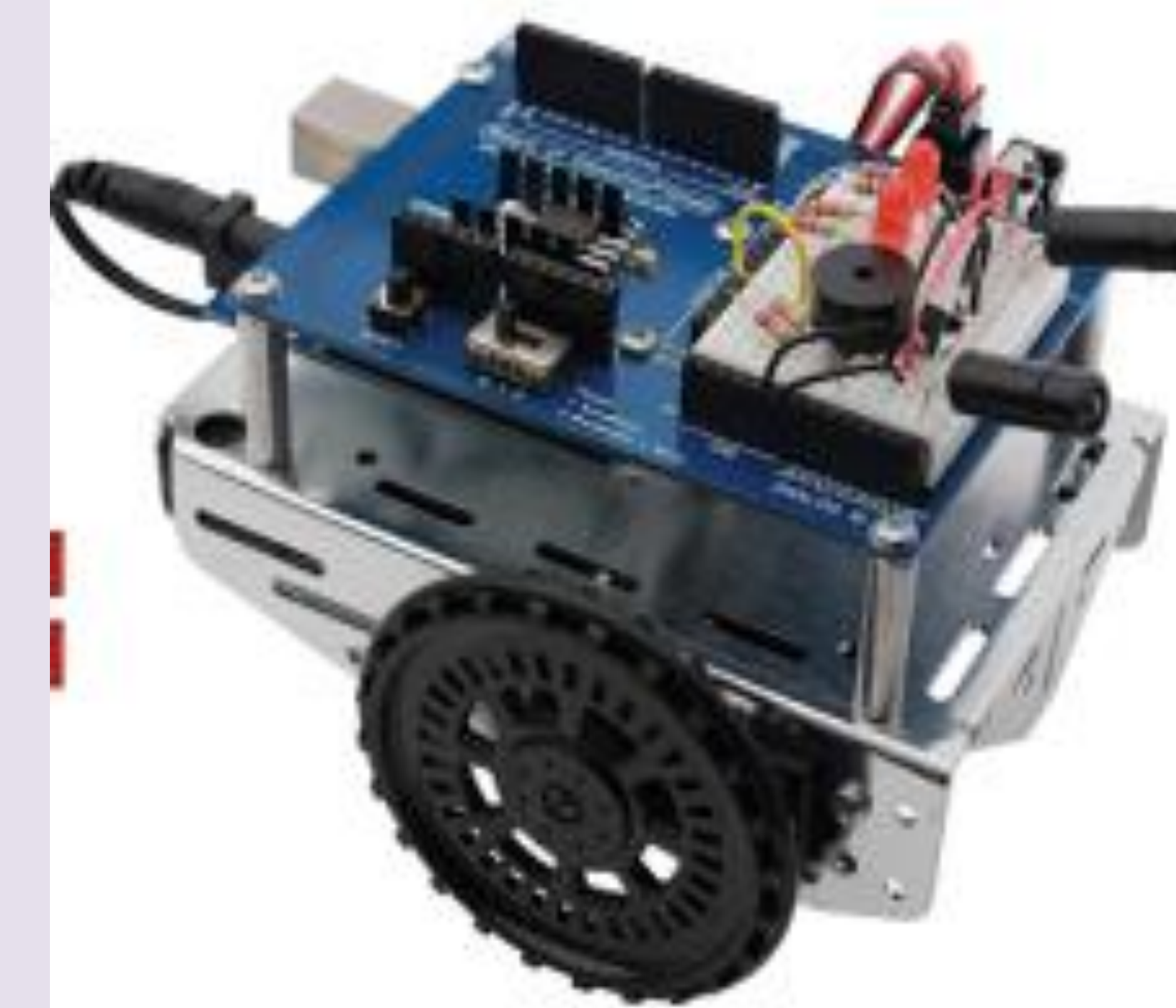
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Cyber Security with Robotics Course

Introduction: This course has been created by combining NICERC Cyber Literacy 1,2, Cyber Science curricula and the content learned during the Research Experience for Teachers (RET) Site at the University of Nevada Reno.

Course Description*: Cyber Security with Robotics is an innovative, project-driven course that integrates science, technology, engineering, and mathematics (STEM) disciplines with liberal arts.. The lessons in the course are divided into five main units: *Electricity, Robotics & Programming Basics, Foundations of Computer Science, Networking and Security, and Ethics and Social Issues.*

Unit 1: Electricity

Fritzing is an open-source CAD software for electronics circuit design.
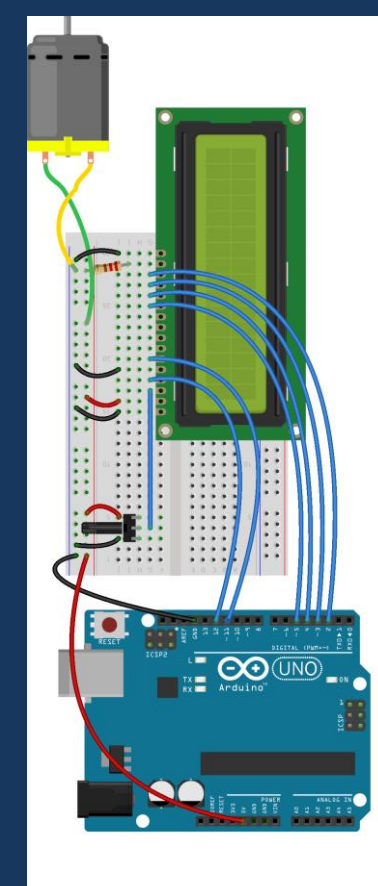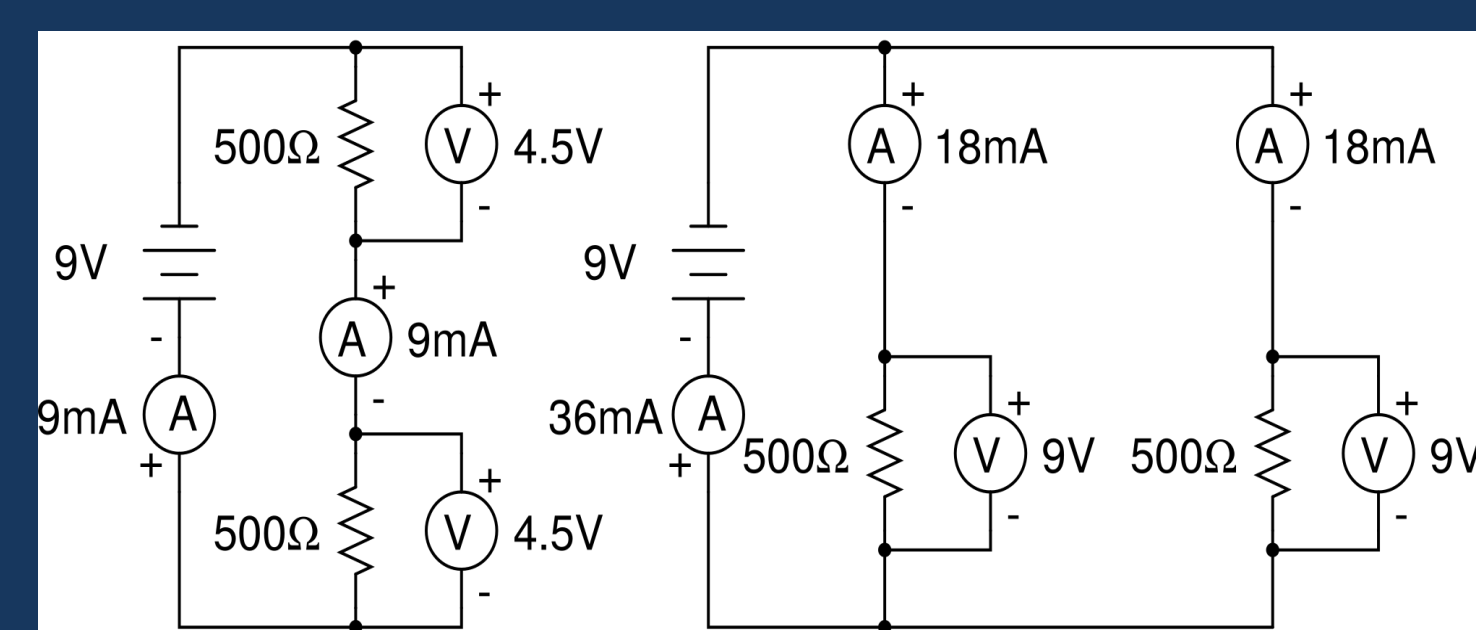
Unit 2: Robotics & *Programming Basics*

Students assemble their robots to perform various functions through the implementation of sensors and application of their programming Knowledge.

Foundations of Computer Science

Boolean Logic	Searching, Sorting & Selecting
Flowcharts	Recursion
Algorithms	Probability
Data Structures	Permutations & Combinations

Networking and Security

Networking and Security unit showcases the structure of networks as well as the vulnerabilities. The need for security is heavily emphasized through man-in-the-middle attacks, cryptography, and steganography.

Ethics and Social Issues

This unit explores the historical, ethical, and societal impacts of cyber. Students are challenged with deeper thinking through interpreting articles, writing essays, and participating in debates.

Standards

After School Clubs

The competition puts teams of high school and middle school students in the position of newly hired IT professionals tasked with managing the network of a small company.

FIRST Tech Challenge teams are challenged to design, build, program, and operate robots to compete in a head-to-head challenge in an alliance format.

CyberStart: a suite of challenges, tools, and games designed to introduce young people to the field of cyber security.

Sources: www.nicerc.org, www.sans.org, www.firstinspires.org