Unit 4: Data Logging

Content Area: **Technology**
Course(s): **Robotics**
Time Period: **November**
Length: **3 weeks**
Status: **Published**

Enduring Understandings

Big Idea: Break Down Problems and Build Up Solutions. Unit 4 of 5

- Technology evolves at an ever accelerating pace based on the needs/wants of society and is influenced by cultural, political, and environmental values and constraints
- Technological outcomes have the potential for anticipated and unanticipated positive and negative results
- Failure is an important and valuable part of the engineering process.
- Engineers work cooperatively in teams to accomplish a task.

Essential Questions

- How can system control be used in school, work, and home applications?
- How does technology extend human capabilities?
- What are the positive and negative consequences of technology?
- How do we evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem?

Content

Skills

- Develop a consciousness of what drives technology and its development
- Students will acquire skills about live and remote data logging, graph programming, and dataset calculation.
- Develop an appreciation of cultural inequities in the distribution and use of technology.
- Hone the ability to reason abstractly and quantitatively.

Vocabulary:

Color Sensor

Motion Sensor

Tilt Sensor

Switch

Loop Interrupt

cookie

Resources

Every student in every school should have the opportunity to learn computer science. Exposing the learner to multiple platforms for learning code facilitates a better understanding of the extensive resources available while creating a broad foundation of the basic concepts and principles behind computer science. The Robotics class will use the following platforms and resources:

(1) MAC Computers with OS X Yosemite version 10.10.5 with 8GB Memory

(2) Ideally, each pair of students will work together at one MAC computer, with one EV3 robot.

(3) Set up each workstation with: • LEGO® MINDSTORMS® Education EV3 Programming Software installed • Education version required*.

(4) EV3 Firmware V1.06H.bin or most current version

(5) Access to the Introduction to Programming LEGO® MINDSTORMS® EV3 curriculum software • This can be installed locally or on a local network server • This can be accessed remotely via internet, if our network infrastructure/firewall and policies allow*

(6) Two pairs of headphones with headphone splitters • One pair for each student to avoid using speakers, as multiple workstations in the same classroom will generate too much overlapping noise

(7) One 45544 LEGO® MINDSTORMS® Education Set per 2 students. Please NOTE: based on class size, additional Mindstorm Kits may need to be ordered.

(8) Additional LEGO® MINDSTORMS® parts may need to be ordered due to incomplete existing kits or loss.

Throughout this course the learners experience will be enhanced using the following:

- TED-Ed Originals; short, award-winning animated videos about ideas that spark the curiosity of learners everywhere.
- Ted Talks videos (Ted.com). TED Talks are influential videos from expert speakers on education, business, and computer science.

Standards

TECH.8.1.8.A.2	Create a document (e.g., newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.
TECH.8.2.8	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.8.A.2	Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.
TECH.8.2.8.C.1	Explain how different teams/groups can contribute to the overall design of a product.
TECH.8.2.8.D.1	Design and create a product that addresses a real world problem using a design process under specific constraints.
TECH.8.2.8.D.3	Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.
TECH.8.2.8.E.1	Identify ways computers are used that have had an impact across the range of human activity and within different careers where they are used.
TECH.8.2.8.E.2	Demonstrate an understanding of the relationship between hardware and software.
TECH.8.2.8.E.3	Develop an algorithm to solve an assigned problem using a specified set of commands and use peer review to critique the solution.