Science is LiT

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Summary

RET gave educators an opportunity to explore Photolithography and the fabrication of chips on a silicon wafer.

RET introduced participants to the Internet of things (IoT). Graduate Assistants guided participants to fabricate heavy metal sensors.

Heavy metal sensors were tested to detect lead then educators used open-source network devices to code in C programming language

Lesson Plan

Day 1

- Draw a picture of scientist
- Survey career interests in STEM
- Problem solve to get LED on
- Survey how quickly problems were solved

Day 2

- Research Arduino projects that interest each student
- Differentiate between advanced / beginning Arduino projects

Day 3

- Allow students to code for personal problem solving interests or upload codes from *Arduino.org*
- Gallery walk of student projects
- Survey career interests in Engineering

Lesson Learned and Assumptions

Internet of Things: Interoperability of devices and the physical world

Open Source Networking: MSP430 and Raspberry Pi

C-Language: Programming MSP430 and Raspberry Pi to solve a problem

Implementation Strategy

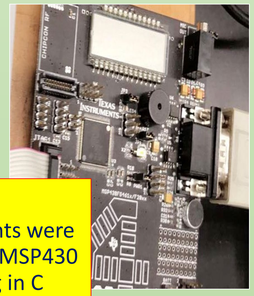
Arduino UNO
Breadboard
Wires
LED Light
Resistors
Cable

OCPS Standard:
SC.7.N.1.1 - Defining a problem, planning out a scientific investigation collecting data, analyzing data, and defending conclusions.

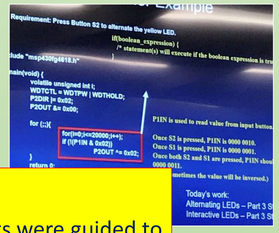
OCPS Standard
SC.7.N.1.2 - Differentiating between replication from repetition

Inquiry Based Learning for The Nature of Science

Research Activities

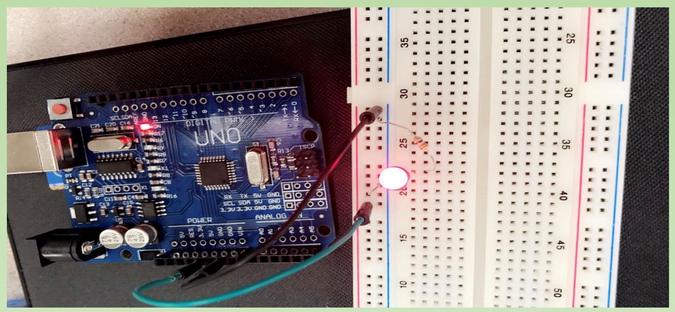


RET participants were introduced to MSP430 and coding in C language to get an LED light on



Participants were guided to then code for specific tasks like turn on multiple lights and create a calculator

Participants were each given a Raspberry Pi for their personal use and first had to format in HTML to create a website then project on Raspberry Pi



Acknowledgments

RET Site: COMET Program, College of Engineering and Computer Science, University of Central Florida. This content was developed under National Science Foundation grant EEC-1611019.

References

Ferdoush, S., & Li, X. (2014). Wireless Sensor Network System Design Using Raspberry Pi and Arduino for Environmental Monitoring Applications. *Procedia Computer Science*, *34*(The 9th International Conference on Future Networks and Communications (FNC'14)/The 11th International Conference on Mobile Systems and Pervasive Computing (MobiSPC'14)/Affiliated Workshops), 103-110. doi:10.1016/j.procs.2014.07.059