

University of Northern Iowa

UNI ScholarWorks

Summer Undergraduate Research Program
(SURP)

2020 Summer Undergraduate Research
Program (SURP)

Jul 31st, 1:00 PM - 3:30 PM

Developing Arduino Coding Curriculum

Tyler Brown

University of Northern Iowa

Riley Buchette

University of Northern Iowa

See next page for additional authors

Follow this and additional works at: <https://scholarworks.uni.edu/surp>



Part of the [Electrical and Electronics Commons](#), [Engineering Physics Commons](#), and the [Science and Mathematics Education Commons](#)

Let us know how access to this document benefits you

Recommended Citation

Brown, Tyler; Buchette, Riley; and Kidd, Timothy, "Developing Arduino Coding Curriculum" (2020). *Summer Undergraduate Research Program (SURP)*. 7.

<https://scholarworks.uni.edu/surp/2020/all/7>

This Open Access Presentation is brought to you for free and open access by the Student Work at UNI ScholarWorks. It has been accepted for inclusion in Summer Undergraduate Research Program (SURP) by an authorized administrator of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

Author

Tyler Brown, Riley Bucheitte, and Timothy Kidd

Developing a STEM Arduino Coding Course

Student: Tyler Brown

Advising Professor: Timothy Kidd

Cooperating Teacher: Riley Bucheitt



Objectives

- Develop course content developed from online manuals
 - We use the parallax BOE online manual and the ARDX online manual
 - Modular courses. Can be outfitted for a quarter long course or a semester long course
- Learn the effectiveness of the developed curriculum in teaching students basic coding and electronics.
 - Using student results on pre and post tests

ARDX
experimentation kit for arduino



LEARN.PARALLAX.COM

Results - The Tests

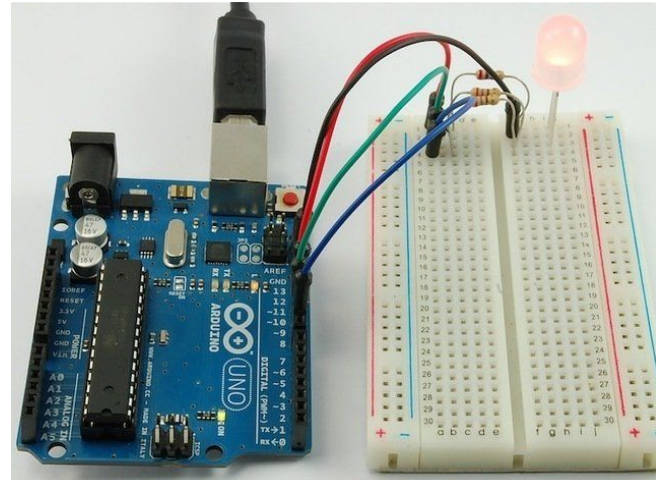
We have 2 separate tests, one for using the coding program and the other for using the electronic components that are seen within the course.

Below is an example for the

1. What is the purpose of a resistor?- Understand
 - a. Reduce electrical current
 - b. Increase electrical current
 - c. Stop electrical current
 - d. Produce electrical current
 - e. None of these

Results - The Course Units

- We have developed 8 units with a 2 week final project
 - First unit is from the Parallax BOE manual and the rest uses the ARDX manual
 - Some chapters in the ARDX manual are skipped
- These unit range from talking to the Serial Monitor within the program itself, as well as exporting code to an arduino microcontroller.



Conclusion - Moving Forward

- Cooperating teacher will teach this course for this next school year
 - He will administer the pre and post tests to gain a measure of much of an impact this class has on student knowledge
 - He will also be recording his impressions of what is happening in his class throughout the course - This will include tweaks that he believes would be appropriate to improve the class
- Analyzing data we get from the pre and post tests
- Looking at student feedback for what they would want to see during the course

Thank You!

Thank you to the physics department for giving me the opportunity to participate in this research.

Thank you to Professor Kidd for being an excellent guide and mentor on this project

Thank you to Riley Bucheitt for all suggestions and teaching this course