

Arduino Activity

Author: Ben Smith bensmith@rowlandhall.org

Grades: 6-8

Goal: *Learn how to make a basic circuit and make a light blink.*

Duration of lesson: 1 hour+

Objectives:

Use code to program a microcontroller. Basic circuits.

Lesson

Introduction

Ever wonder how toys make noises and blink lights when you push buttons?

Microcontrollers and circuits are used in all sorts of everyday objects. From remote controlled cars to robots and drones. Streetlights use sensors to determine when the sun goes down, the volume knob on a car stereo adjusts resistance through a microcontroller. They are everywhere!

Activity

I would suggest pre-building the circuits - given time restraints at this stage.

In groups of 4, students can make a simple circuit -

- Wire from GND pin in Arduino to a breadboard negative (black) strip
- Wire from neagtive (black) strip to board.
- 330 ohm resistor (controls current).
- LED light negative to positive.
- Wire from board to positive (red) strip
- Wire to 5Vpin in Arduino.

Introduce the Arduino IDE - Basic coding:

- Introduce basic Arduino code:
 - 2 required elements

- void setup() { setup code runs once }
 - void loop() {program code loops}
 - Other important code for this project:
 - pinMode(pin# , OUTPUT/INPUT);
 - digitalWrite(led, HIGH/LOW);
 - delay(time_ms);
- Show have kids load code from IDE - no need to write it all.

More details on the activity

This activity allows students to troubleshoot their code and circuits. There are a lot of extensions to work on: THIS SHOULD BE THE “MEAT” OF THE CLASS TIME.

- Circuit extensions:
 - More than one light
 - Buzzer?
 - Servo?
- Code extensions
 - change timing
 - heartbeat?
 - what is fastest you can blink?
 - different times for different lights?
 - random times?

I would suggest having two students pair program on a computer, and the other two pair on the circuit boards. I have found this can be done in 1 hour with proper setup. It is a great 2 hour class with more time to explore.

Check the following web sites for great explanations:

[Getting Started with Arduino pdf](#)

[Intro to arduino - book](#)

[Presentation](#) - look at the first 24 slides.

Closure

Have students share what they have learned - come up with future projects and ideas. Maybe share video of “Super Awesome Sylvia Arduino” on Youtube.