

## Make It at the Library 2015 – Workshop Homework Assignments

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**Revision Date:** 02/01/2015

### 1) Electrical components

- a) Make Skill-set: <http://makezine.com/2011/01/11/skill-set-understanding-electronic/>
  - i) LED
  - ii) Resistor
  - iii) Capacitor
  - iv) Transistor
  - v) Diode
  - vi) Integrated circuit
  - vii) Inductor
  - viii) Ohms Law
- b) Voltage and current explanation 1: <https://www.youtube.com/watch?v=IYZUXV-v71Y>
- c) Voltage and current explanation 2: <https://www.youtube.com/watch?v=zYS9kdS56l8>
- d) Does voltage or current kill you: <https://www.youtube.com/watch?v=9iKD7vuq-rY>
- e) AC and DC power: <https://www.youtube.com/watch?v=vN9aR2wKv0U>
- f) Sparkfun Voltage, Current, and Resistance: <https://learn.sparkfun.com/tutorials/voltage-current-resistance-and-ohms-law>
- g) Electronics and Sensors: <http://makezine.com/magazine/make-37/electronics-fundamentals-sensor-smorgasbord/>

### 2) Breadboarding

- a) What is breadboarding:  
<https://makezineblog.files.wordpress.com/2012/10/breadboardworkshop.pdf>
- b) Introduction to Breadboarding Part 1 of 2: <https://www.youtube.com/watch?v=oiqNaSPT17w>
- c) Introduction to Breadboarding Part 2 of 2: <https://www.youtube.com/watch?v=Mq9XMNsoAd8>
- d) Sparkfun How to use a breadboard: <https://learn.sparkfun.com/tutorials/how-to-use-a-breadboard>
- e) Collin's Lab: The real breadboard <https://www.youtube.com/watch?v=HrG98HJ3Z6w>

### 3) Reading Circuit Diagrams

- a) Skill Set: Reading circuit diagrams: <http://makezine.com/2011/01/25/reading-circuit-diagrams/>
- b) Collin's Lab: Schematics <http://makezine.com/2011/11/15/collins-lab-schematics/>

### 4) Sensors and Motors

# Make:

- a) Adafruit types of motors: <https://learn.adafruit.com/adafruit-motor-selection-guide/types-of-motors>
- b) Adafruit force sensor: <https://learn.adafruit.com/force-sensitive-resistor-fsr>
- c) Bareconductive touch sensor circuit: <http://www.bareconductive.com/make/making-a-touch-sensitive-circuit-with-electric-paint/>
- d) Bareconductive noise maker circuit: <http://www.bareconductive.com/make/building-a-555-noise-maker/>

## 5) Arduino

- a) Introduction to Arduino: <http://makezine.com/2012/06/18/an-introduction-to-the-arduino/>
- b) Adafruit Arduino Tutorials: <https://learn.adafruit.com/series/learn-arduino>
  - i) Lesson 0 - Getting started <https://learn.adafruit.com/adafruit-motor-selection-guide/types-of-motors>
  - ii) Lesson 1 – Blink LED: <https://learn.adafruit.com/adafruit-arduino-lesson-1-blink>
  - iii) Lesson 2 – RGB LED: <https://learn.adafruit.com/adafruit-arduino-lesson-3-rgb-leds>
  - iv) Lesson 6 – Digital Inputs: <https://learn.adafruit.com/adafruit-arduino-lesson-6-digital-inputs>
- c) (Video) Arduino Video 01 – Jeremy Blum: [https://www.youtube.com/watch?v=fCxA9\\_kg6s](https://www.youtube.com/watch?v=fCxA9_kg6s)
- d) (Video) Arduino Video 02 – Jeremy Blum: <https://www.youtube.com/watch?v=LCCGFSMOr4>
- e) Sound activated outlet: <http://makezine.com/projects/sound-activated-outlet/>
- f) Arduino plant monitor: <http://makezine.com/2014/05/02/monitor-the-health-vitality-of-your-home-garden-with-weekend-projects/>
- g) Arduino touch sensors: <https://www.youtube.com/watch?v=yI4EtBgMOxc>

## 6) Wearables and E-textiles

- a) Adafruit Gemma Introduction: <https://learn.adafruit.com/introducing-gemma/introduction>
- b) Adafruit wearable sensors: <https://learn.adafruit.com/flora-sensors>
- c) Adafruit Plush Game Controller: <https://learn.adafruit.com/plush-game-controller/overview>
- d) Arduino + temperature sensor: <http://makezine.com/projects/wearable-temperature-sensors-for-working-in-extreme-cold/>
- e) Illustrated guide to wearable electronics: <http://makezine.com/magazine/make-43/under-the-hoodie-a-quick-guide-to-wearables-components/>
- f) Adafruit Stitching circuits: <https://learn.adafruit.com/conductive-thread/stitching-around-circuit-boards>
- g) Adafruit Light Up Fish: <https://learn.adafruit.com/light-up-angler-fish-embroidery>
- h) Beatband sleeve: <http://makezine.com/projects/beatband-sleeve/>
- i) Beating heart headband: <https://www.youtube.com/watch?v=gbUViZi9aLo&feature=youtu.be&list=PLC3A0E18A403665FE>

## 7) Extra-credit

- a) Latest and greatest microcontrollers and boards: <http://makezine.com/magazine/make-43/a-smorgas-board-for-your-computing-pleasure/>
- b) Body boards – more wearable microcontrollers: <http://makezine.com/magazine/make-43/body-boards/>
- c) Adafruit Lipo batteries: <https://learn.adafruit.com/li-ion-and-lipoly-batteries>
- d) Adafruit Motors: <https://learn.adafruit.com/adafruit-motor-selection-guide/powering-your-motors>
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