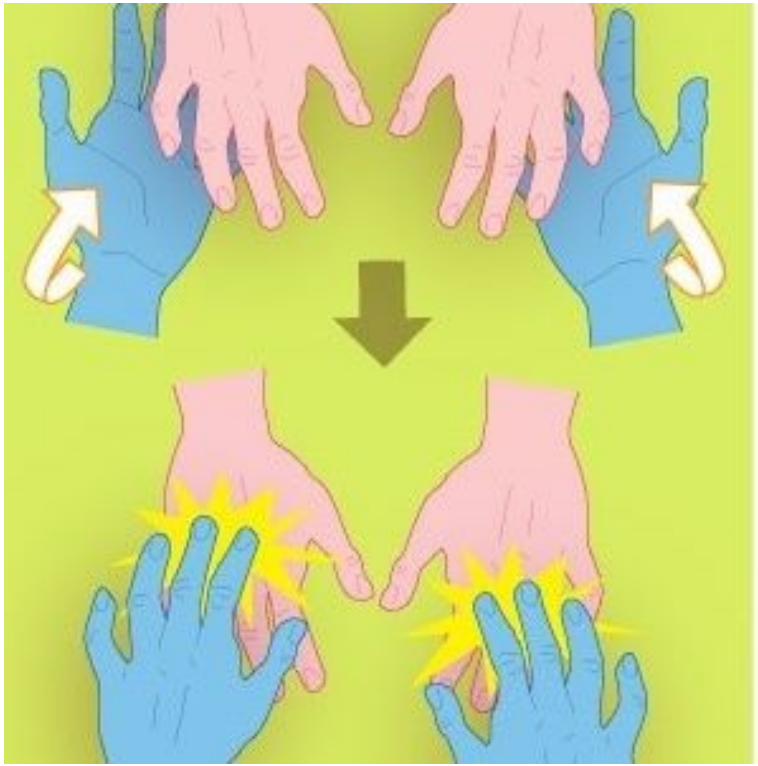
2018 NCSU
Glove Controller Workshop

Kaho Abe
NCSU
April 18th, 2018

Hand Clapping Game



Source: American Grandparents Association

What if these were functional?

Walmart.com

Etsy, GoFollowRabbits

Nintendo Power Glove (1989)

Peregrine Game Glove (2010)

Laser Tag

vice.com

Cosplay

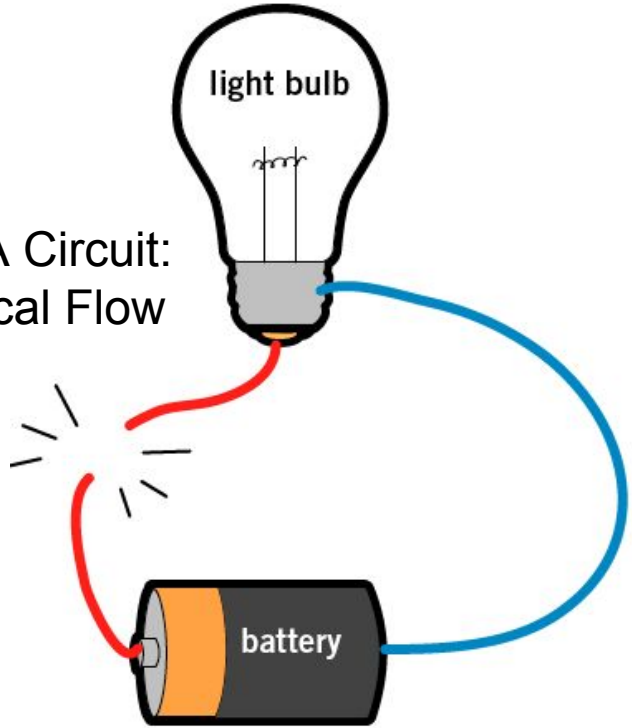
LARPing (Live Action Role Playing)

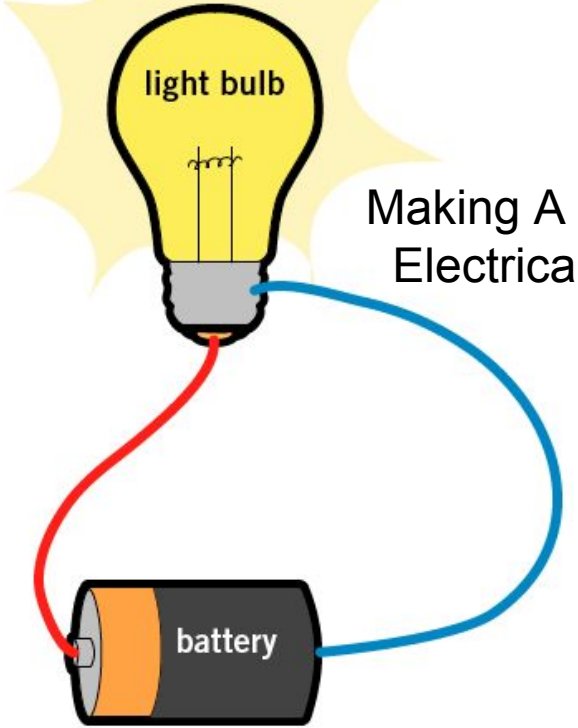
LARPING.org

Making & Breaking a Circuit

Making and Breaking a Electric Circuit

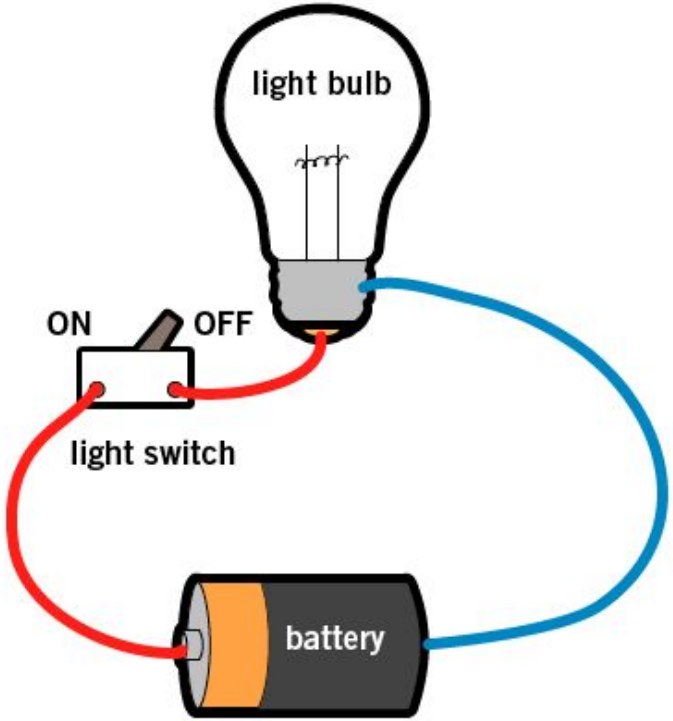
Breaking A Circuit:
No Electrical Flow

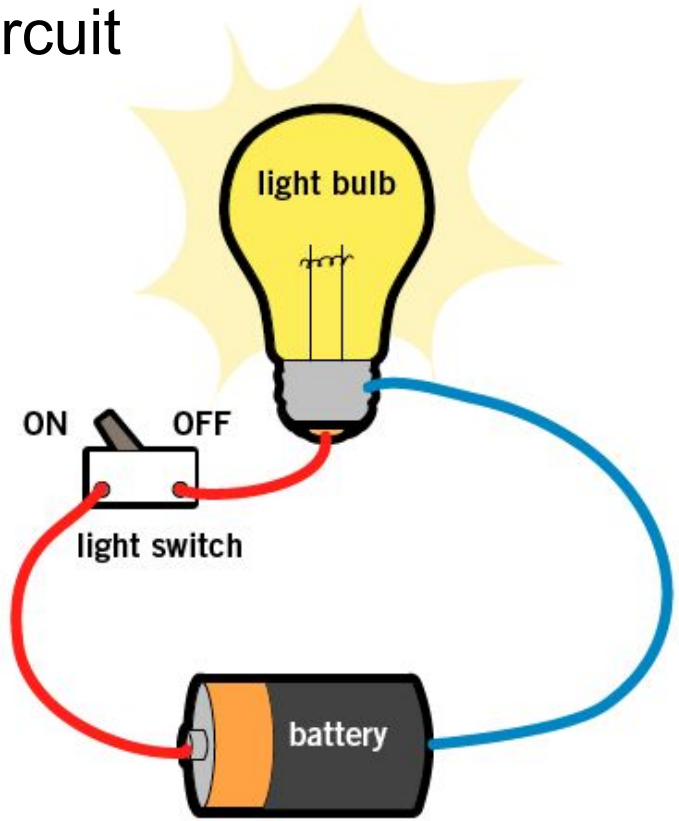




Making A Circuit:
Electrical Flow

Making and Breaking a Electric Circuit



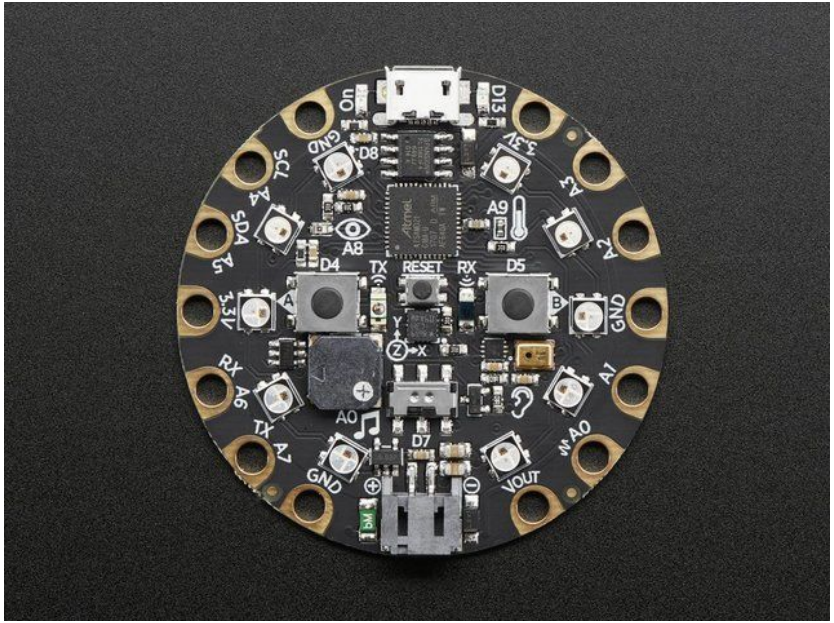


This concept exists all around us!

A keyboard and mouse is a bunch of switches!

Circuit Playground from Adafruit

- All-in-one board designed for those who want to learn about programming hardware
- Can be programmed using a variety of methods: block-based, Javascript, CircuitPython, Arduino
- Is open source
- Has many sensors and other features built in
- Can act as USB keyboard, mouse
- Great for wearables



More Information: https://learn.adafruit.com/adafruit-circuit-playground-express

Let’s make the gloves!

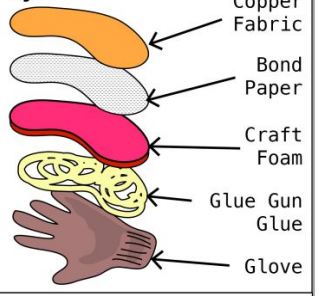
Playable Fashion Weekend Workshop: Glove Worksheet

with Kaho Abe & Ramsey Nasser
November 2013 at Eyebeam Art & Technology Center

Materials:
- Copper Fabric (LessEMF)
- Work Gloves (Home Depot)
- Bonding Paper (Amazon)
- Craft Foam (craft stores)
- Flora & USB cord
- 2 Alligator Clips

Tools:
- Glue gun
- Scissors
- an Iron
- Scrap cotton fabric

Layers:

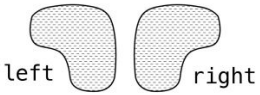


TEMPLATE FOR CONDUCTIVE PADS

Cutting:
- Cut 2 pieces of Color Foam
- Cut 2 pieces of Copper Fabric
- Cut 2 pieces of Bonding Paper

** For bonding paper, note smooth and rough sides. Must cut mirrored paid for right and left gloves.

Cut along dotted line



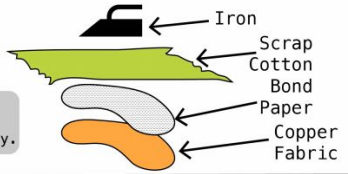
Note: make sure you print at full scale or the scale of the template will be changed.

Step 1:
Place bonding paper rough side down, on top of copper piece. Cover with scrap cotton fabric, and iron for 3 seconds. Make sure you cover all areas.

tip: use scrap cotton fabric when ironing to stop iron from getting destroyed with glue from bonding paper.

tip: don’t over use iron or glue will get all over the place.

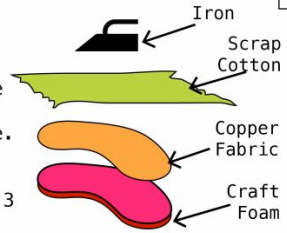
tip: steam should be turned off on iron to melt the glue properly.



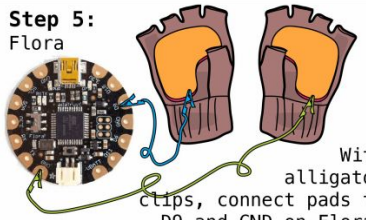
Step 2:
Wait til it’s cool to the touch. Carefully peel paper from glue. There should remain a adhesive layer on the copper piece.

Step 4:
Use glue gun to glue copper/foam piece down to glove, copper side up.

Step 3:
Place copper piece, adhesive side down, on top of foam piece. Cover with scrap cotton and iron for 3 seconds.

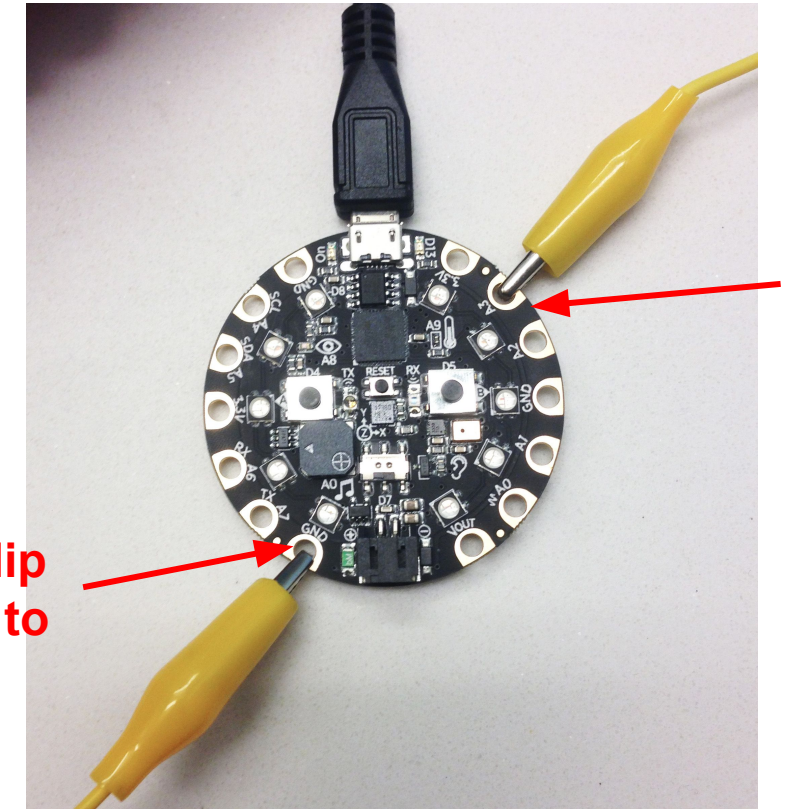


Step 5:
Flora



With alligator clips, connect pads to D9 and GND on Flora.

Step 5 on Worksheet



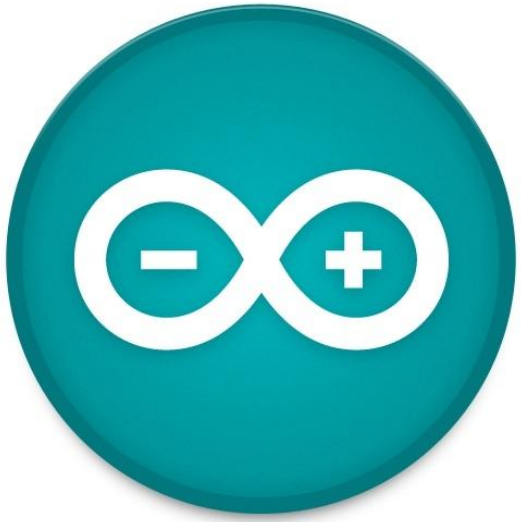
Connect alligator clip from A3 to the other glove.

Connect alligator clip from GND (Ground) to a glove.

Arduino Code

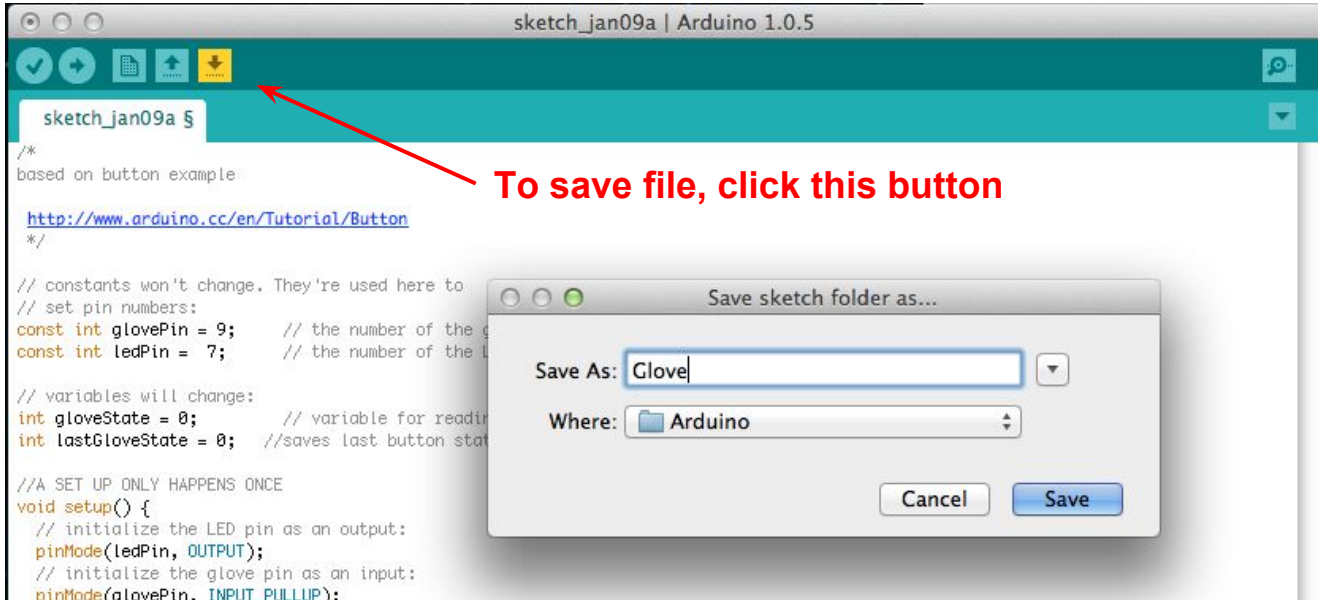
https://github.com/kahodesu/NCSU-2018-Workshop

https://bit.ly/2qGUtBT



Cut & Paste into Adafruit Arduino IDE

- Cut and paste code into Adafruit Arduino IDE window
- Save Arduino file with new name (whatever you want!)

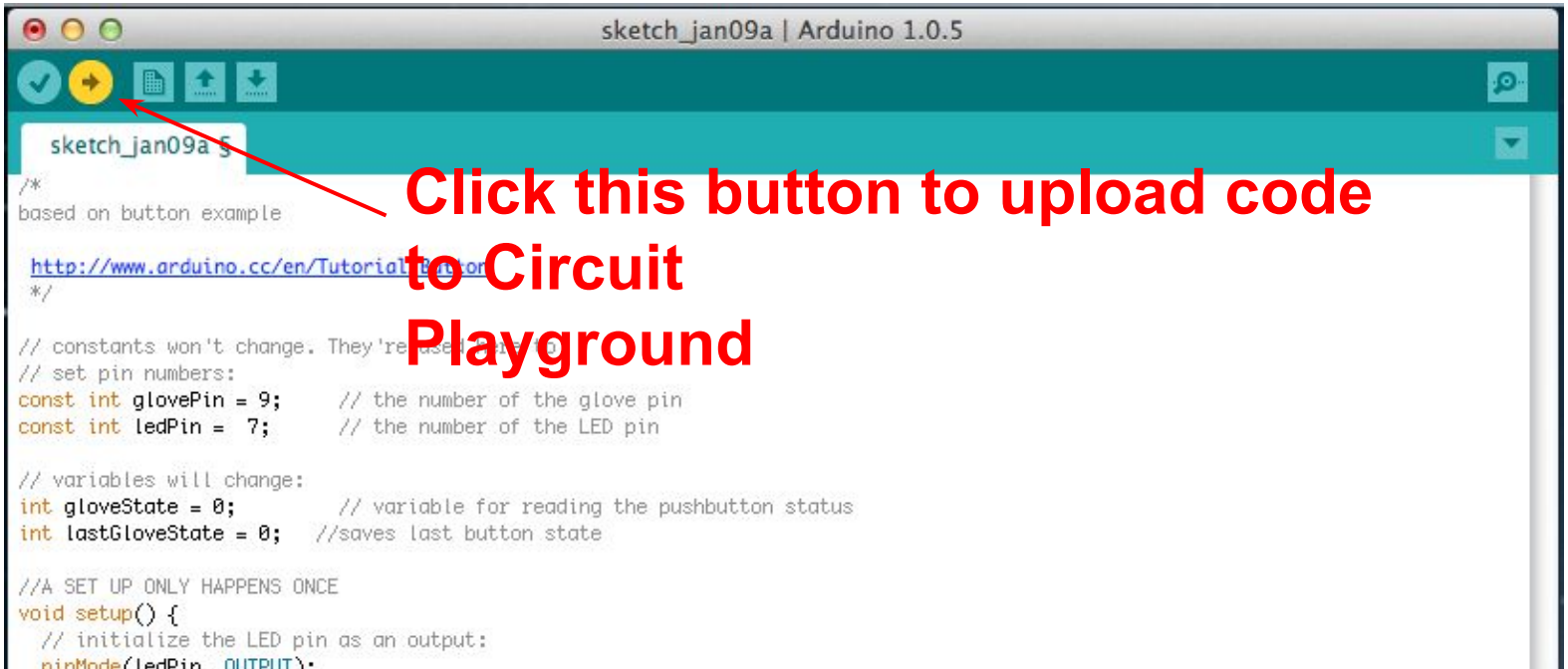


Set “Board” and “Port”

Make sure Tools>>Board>> Adafruit Circuit Playground Express

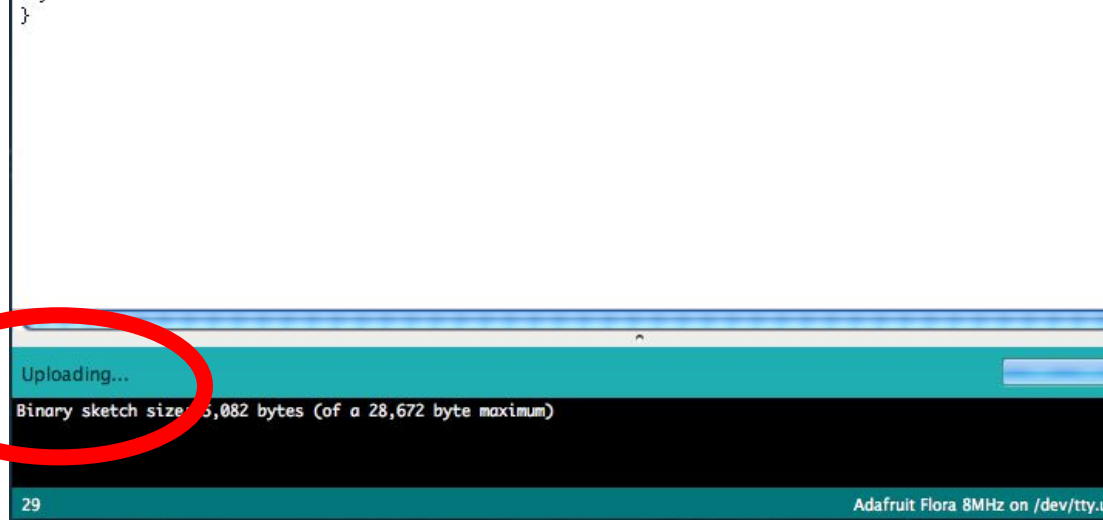
Tools>>Port>> USB port with Circuit Playground

Connect Circuit Playground to Computer via USB and Upload Code

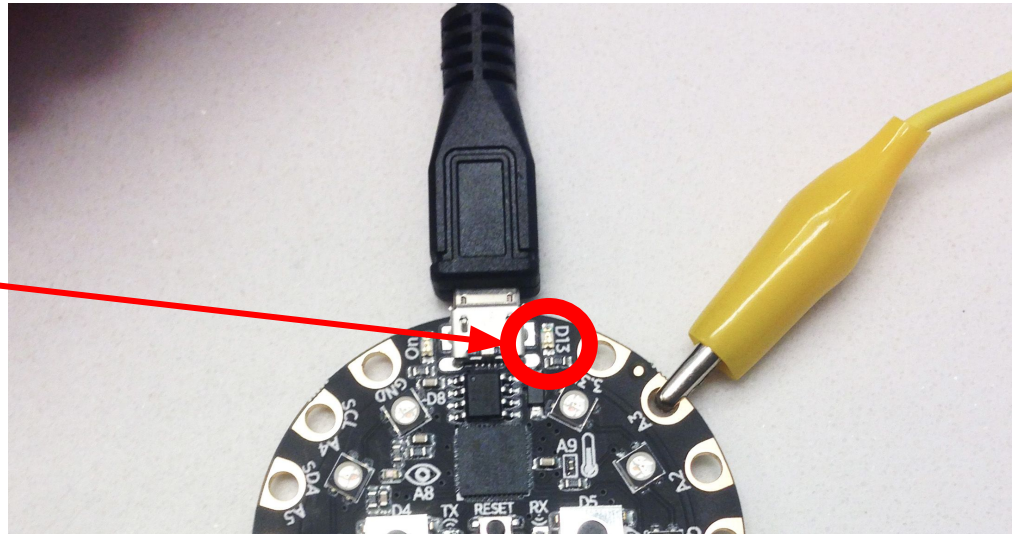


Uploading

You can check status at bottom left of IDE.



When you clap, RED LED should light up.



Review Code

variables

setup()

occurs once at start

loop()

occurs over and over again

Web Games Demo

Canabalt http://adamatomic.com/canabalt/

Flappy Bird http://flappybird.io/

Flowers Demo

- Change code so that instead of “space”, when gloves are clapped “A” is typed out.
- Go to http://kahoabe.net/flowers and clap!

Hand-to-hand examples:

Role of Technology

Tech as Facilitator

Tech as Judge

Tech for Feedback

Tech for Spectacle

What to do next?

Software:

P5.js https://p5js.org/

Processing https://processing.org/

Unity https://unity3d.com/

Maker Websites:

Instructables
https://www.instructables.com/

How to Get What You Want

http://www.kobakant.at/DIY/

Local Maker Spaces/Communities

Local Indepedent Game Dev Communities

Materials:

Adafruit https://www.adafruit.com/

Sparkfun https://www.sparkfun.com

lessEMF.com https://lessemf.com/

Thank you!

Website: http://kahoabe.net

Twitter: @kahodesu

Github: http://github.com/kahodesu