

# Six Nations Polytechnic

## STEM/STEAM - Tech Wednesdays

### Feb 2018 – Class #1



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[https://en.wikipedia.org/wiki/Six\\_Nations\\_Polytechnic](https://en.wikipedia.org/wiki/Six_Nations_Polytechnic)



Lecture 1 - February 2018

# Creating Infrared Breaker aka Burglar Alarm



## Objective

- We building a Burglar Alarm using a Infrared Beam
- When the Beam is broken we will
- Change the ble Candle
  - Green OK,
  - Red = somebody broker the Beam – Alarm !!!

## How does it work?

Infrared  
Emitter  
(Clear LED)



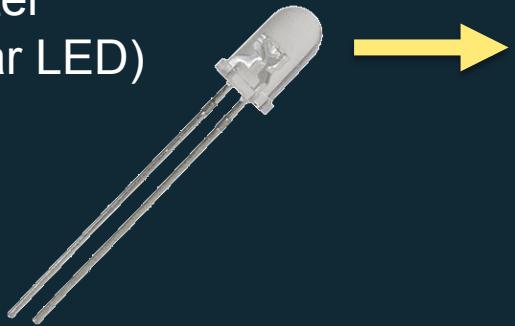
IR Receiver  
(Dark LED)



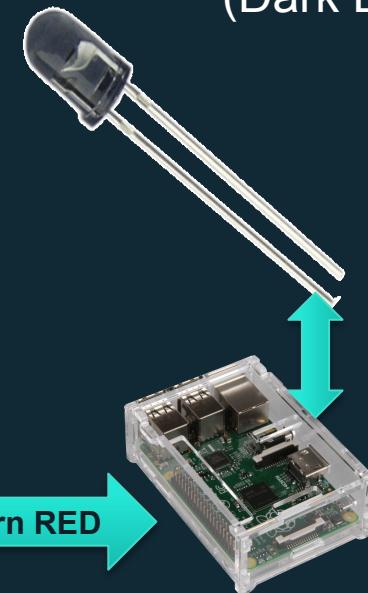
Invisible Infrared Beam

# How does it work?

Infrared  
Emitter  
(Clear LED)



IR Receiver  
(Dark LED)



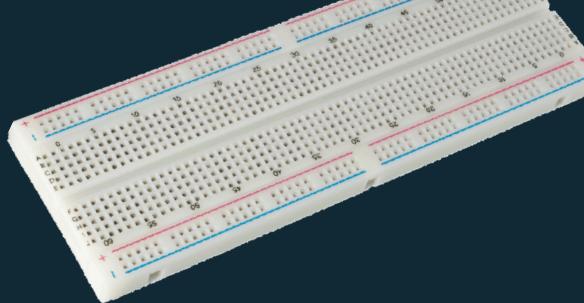
Turn RED

## The pieces

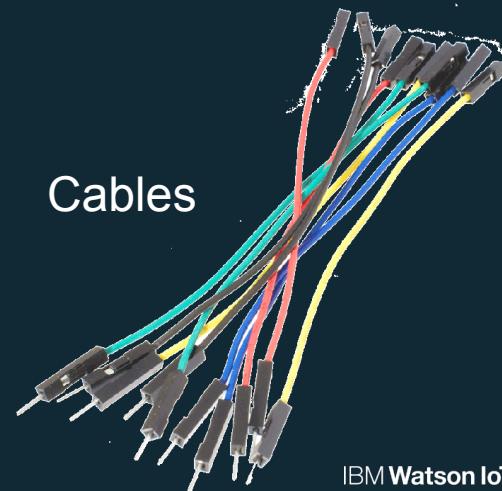
- Materials should be in your box

- Breadboard
- 3 Resistors (2x 330 Ohm 10KOhm)
- IR Emitter, Receiver
- 1 Red LED for Testing

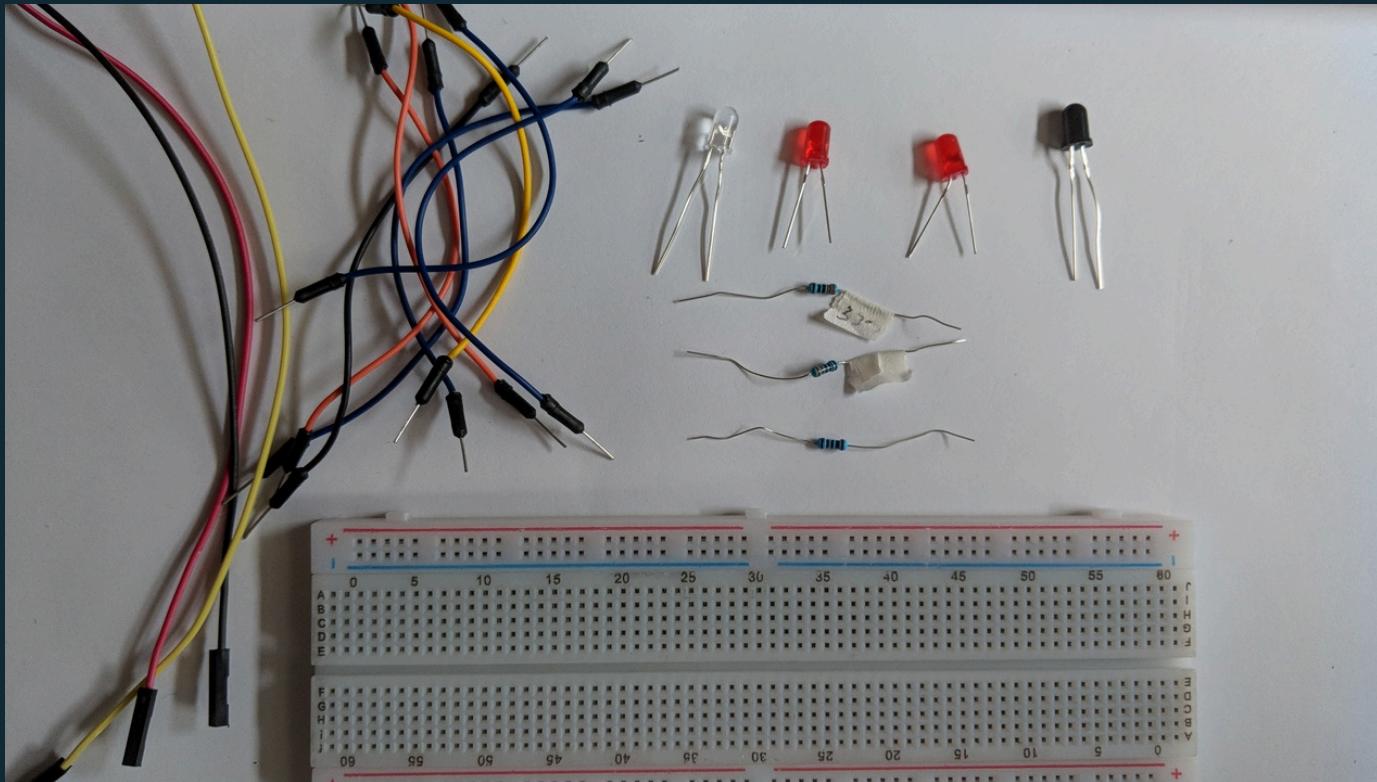
»



Cables

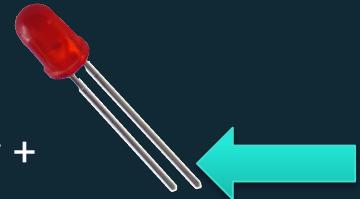


## Pieces we need – these should be in your PI Box

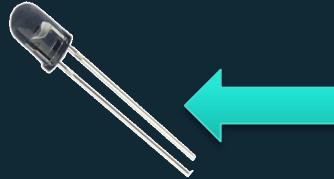


## Things to Remember!

- A Diode (LED) lets the electricity thru only in one way
- Use Red Cable for the + (Power) and Black or Blue for Ground/GND
- The LED's have a long and a short end ! Connect Long end with Power +

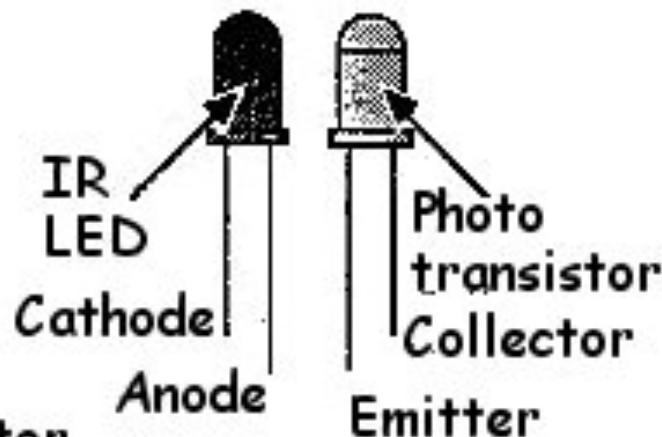
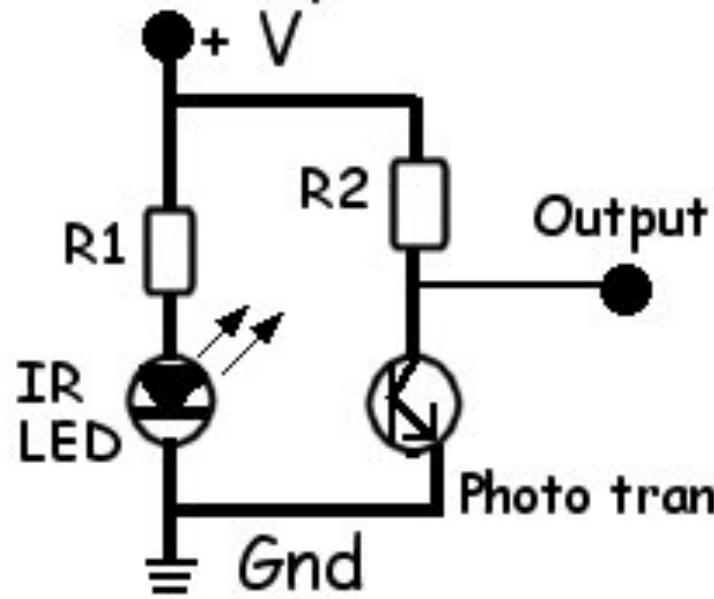


- For the IR Received we will use the short END
- Mark with tape so you know which is the 330Ohm Resistors and which is 10KOhm



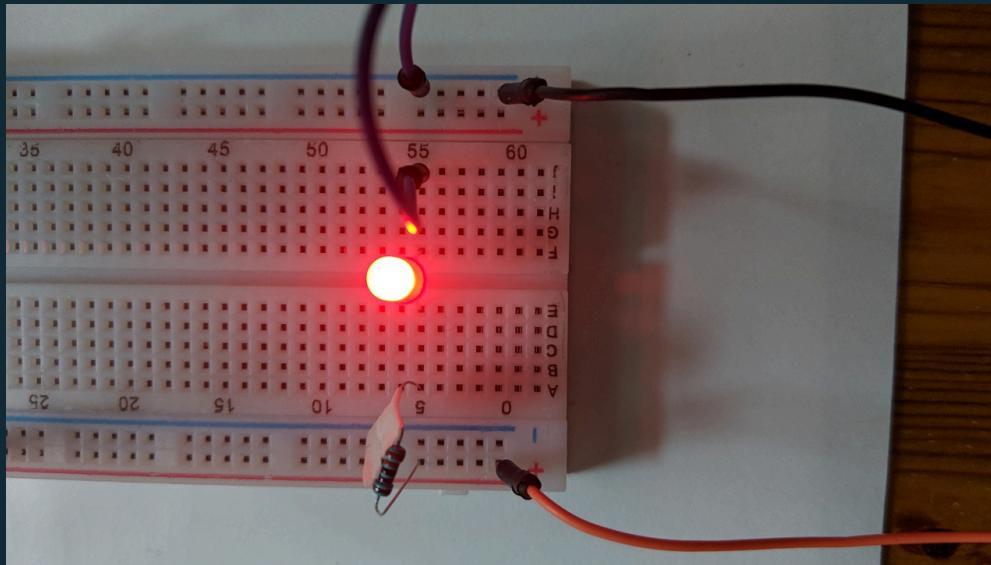
## Electrical Schema

Simple IR Emitter & Detector



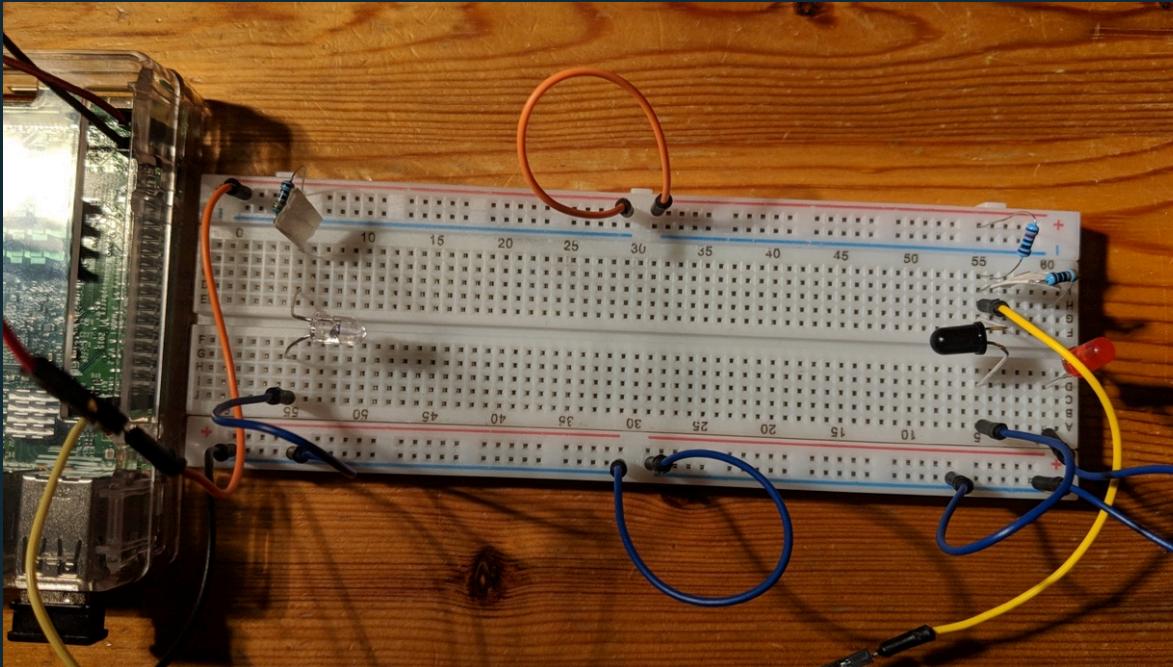
## Test setup

- We will start with just the RED led .



## The result

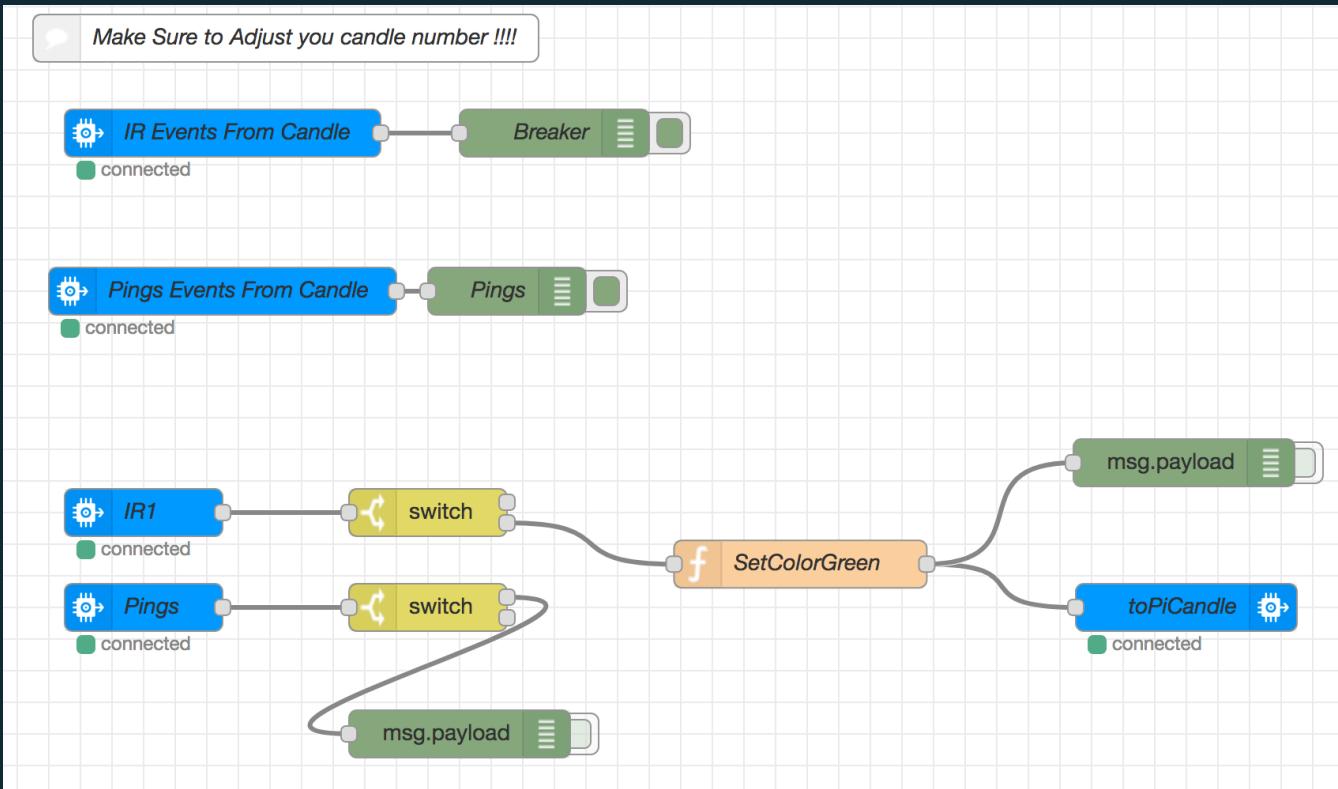
- We will show you the configuration in person
- Video on YouTube – mvk channel



## Step Two

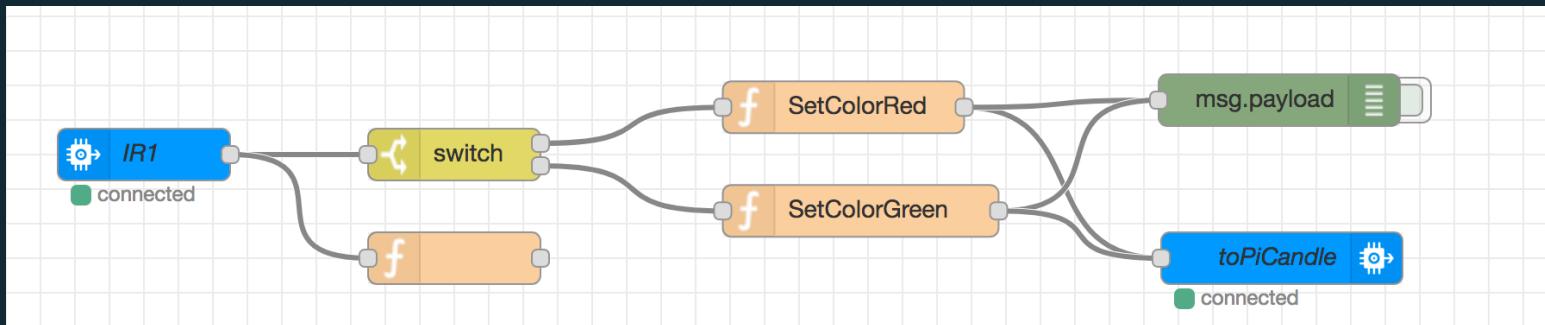
- Connect the output to the PI (yellow cable to the far left pin)
- Fire up your Node-RED in a browser
  - `http://snp???.mybluemix.net/red`
- Get the code from Github see bookmark on browser
  - <https://github.com/SixNationsPolytechnic>
    - Userid snpkid?? /Password
    - See 2018-01-BurglarAlam Folder
      - <https://github.com/SixNationsPolytechnic/2018-01-BurglarAlam/blob/master/BurglarAlarm.flow>
      - Make sure to view in raw mode
    - Remember CTRL-A, CTRL-C and CTRL-V
    - Import the Node-RED flow into Node-RED

# Once Imported you should see the following flow

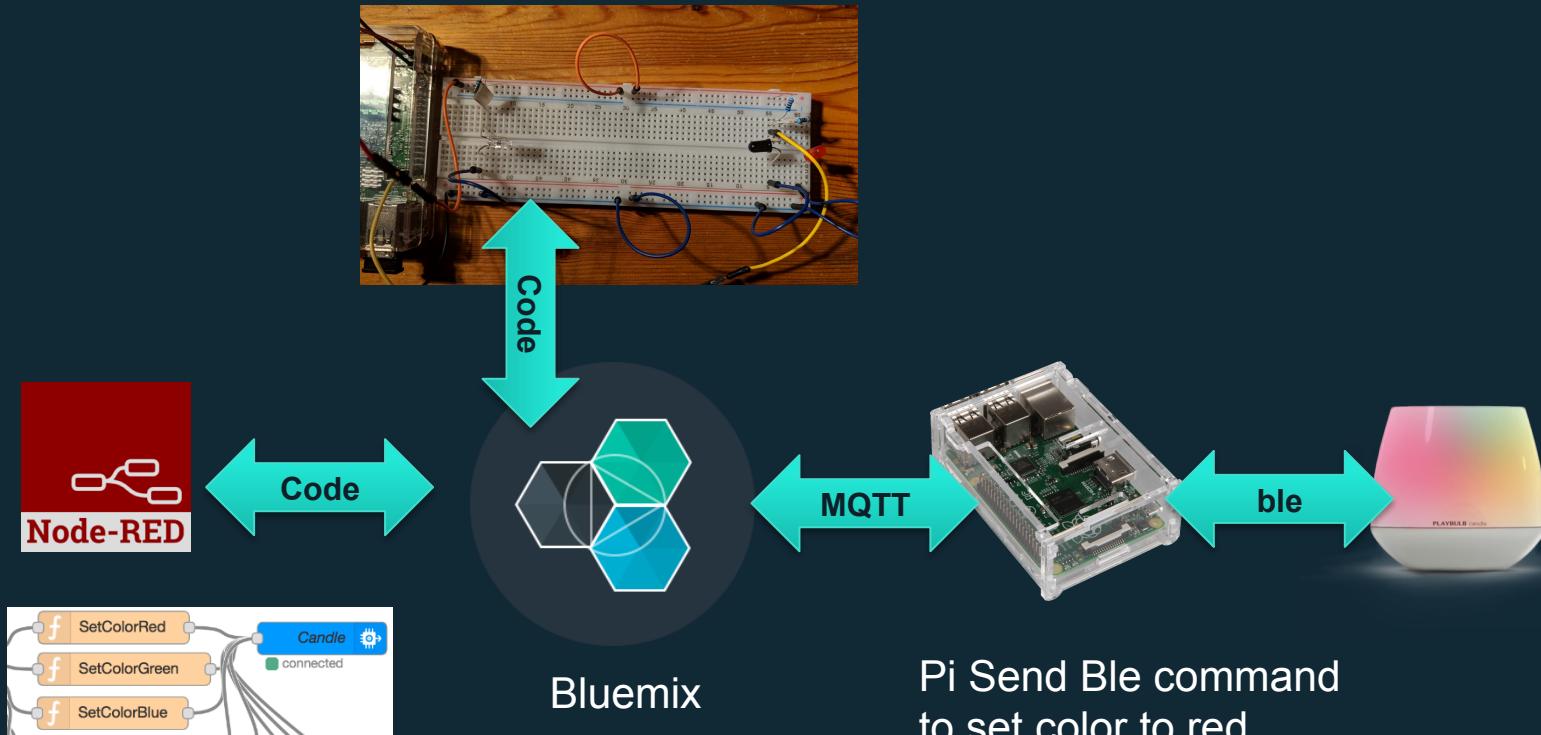


## Your Task Adjustments Flow.

- Adjust the Candle Number to your number
- Make sure you get Events/Message from the PI/Burglar Alarm
- **Add the command to set the Candle to RED when the IR Beam is broken**



# Setting the Light based on Events e.g when the Infra RED Beam is broken



## Last step

- Back up your code into your github folder use your name or group number
- Delete the Node-RED flow
- Disassemble the breadboard and put the pieces back into the box

## Reference

Node-Red Flow & Presenation for the class are at

<https://github.com/SixNationsPolytechnic/>

The IoT Code for the PI and Candle can be found here

<https://github.com/markusvankempen/playbulb>

Videos

<https://github.com/SixNationsPolytechnic/>





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# Burglar Alarm

Setting up the electronics

