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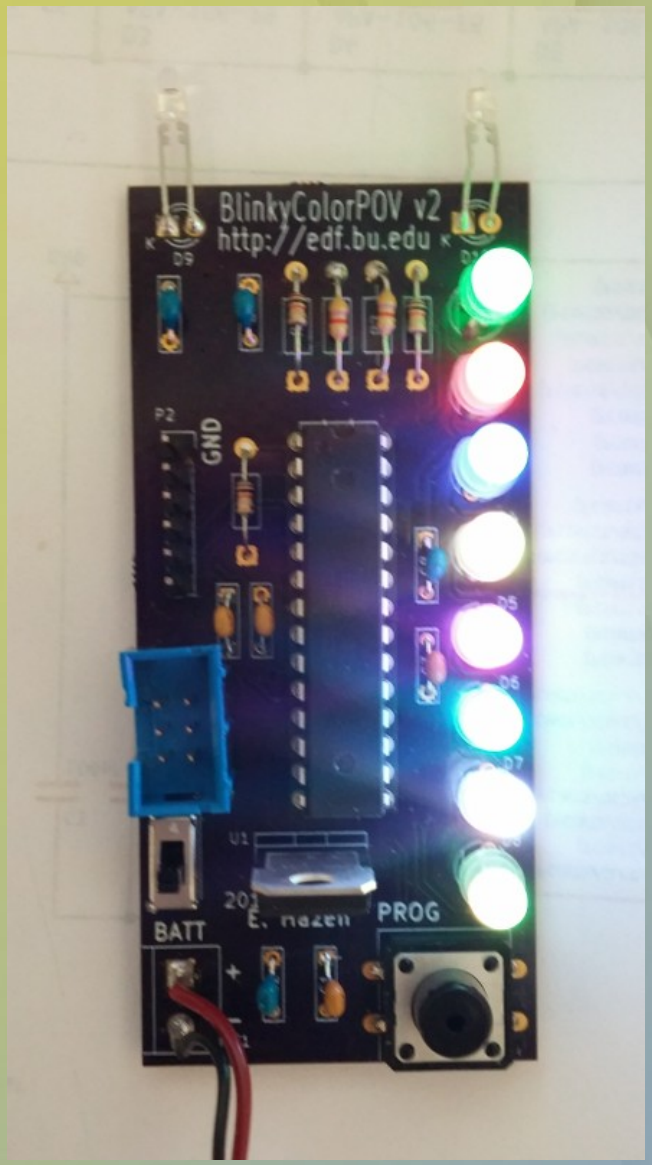
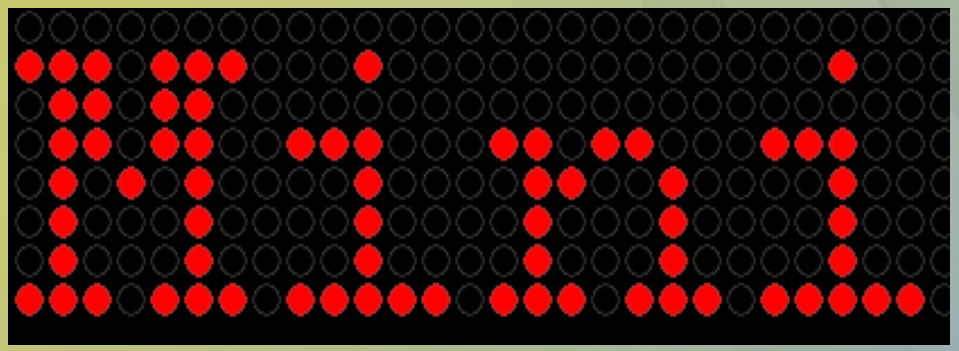


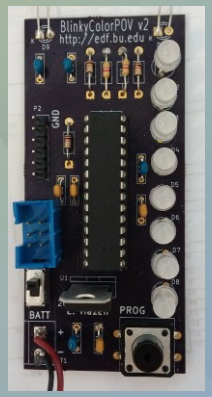
Welcome To Science Solstice 2016

At the Electronics Design Facility

What is it? A “BlinkyPOV”

POV means
“persistence of vision”





As you wave the MiniPOV, the LEDs blink out a message by turning on in a pattern.

Your eye sees the message because the image of the LEDs “persists” (stays) for a while in your eye

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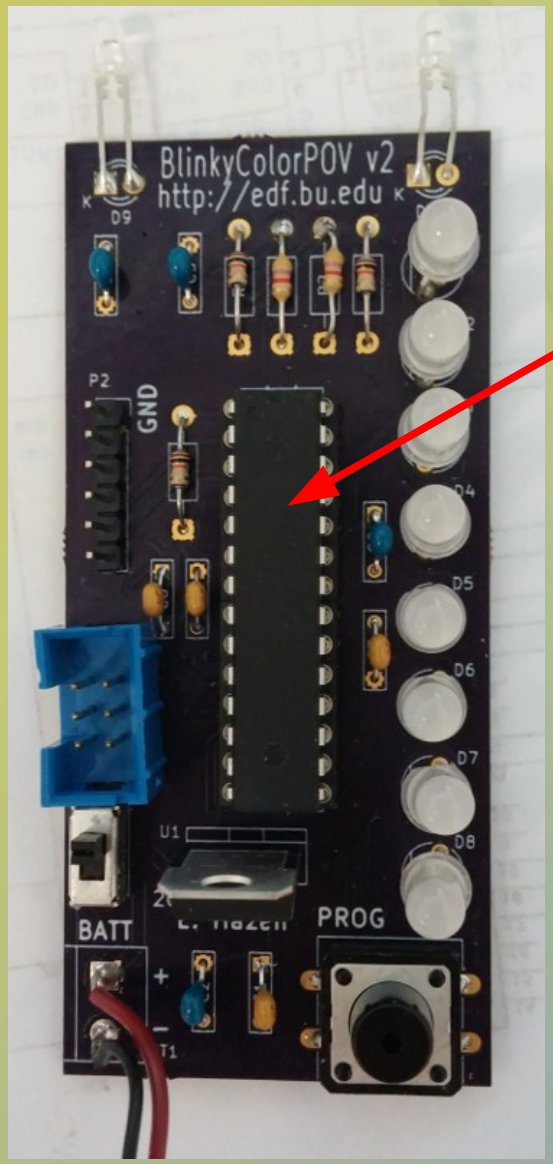
How does it work?



The black thing with all the legs is a tiny computer called a *microcontroller*

They are programmed in a language called C

They are used in lots of things around your house (microwave, stereo, TV...)

Other parts are needed too...

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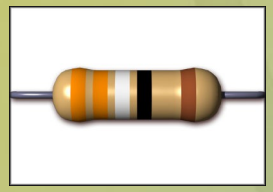
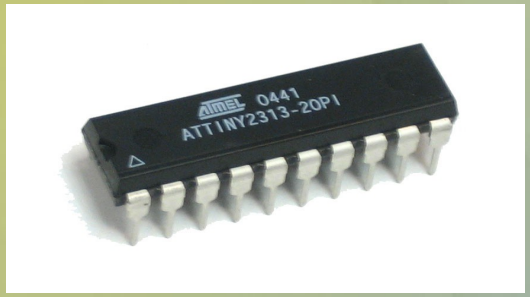
Parts, Parts, Parts!

LED (*light-emitting diode)*
Lights up in response to electric current

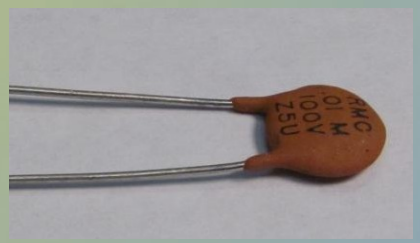


Resistor – limits the amount of electric current in a circuit



Microcontroller – tiny computer
Each leg (pin) can be controlled by a program in C

Switch – allows electricity to flow when pressed



Capacitor – stores electricity (like a battery, but for shorter times)

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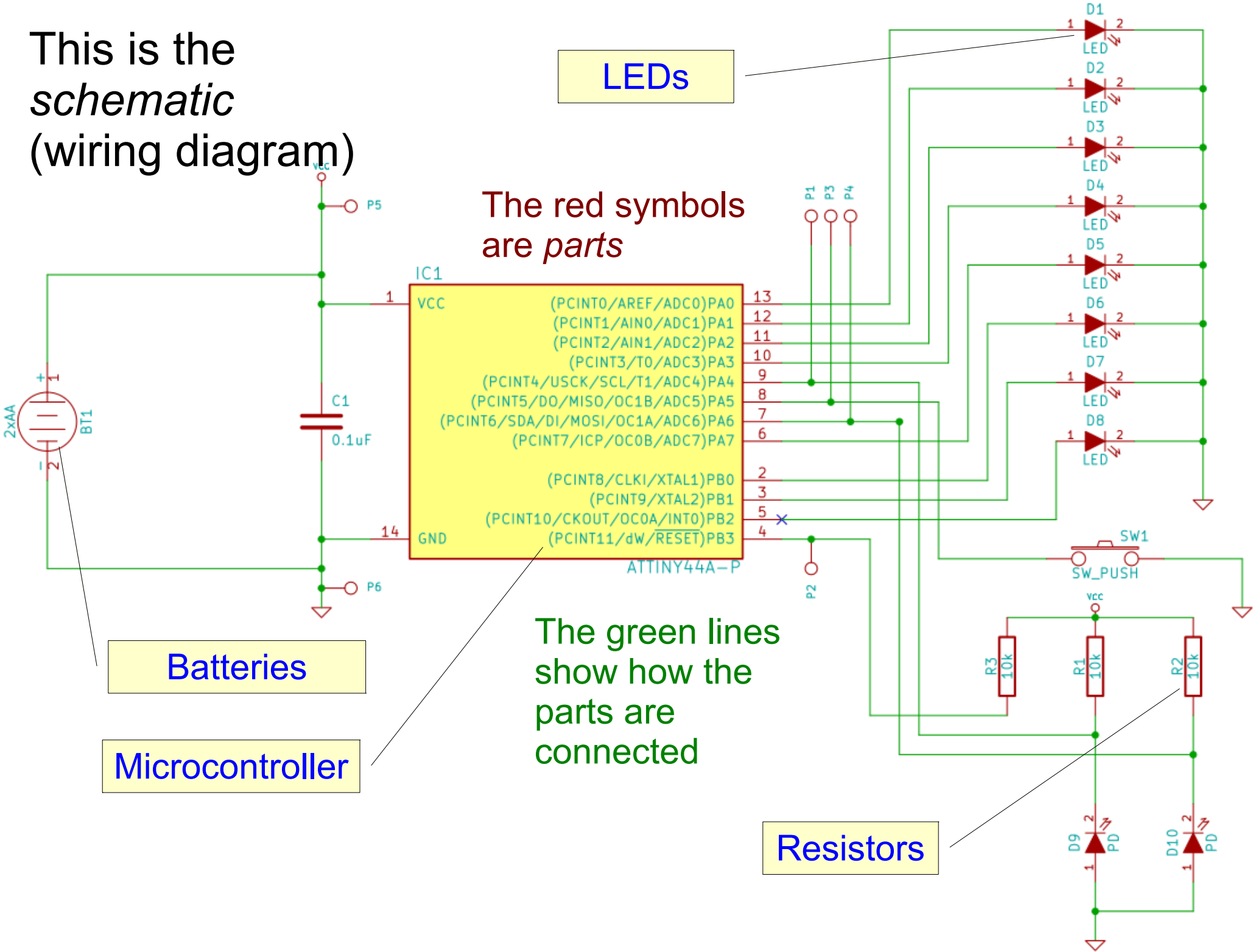
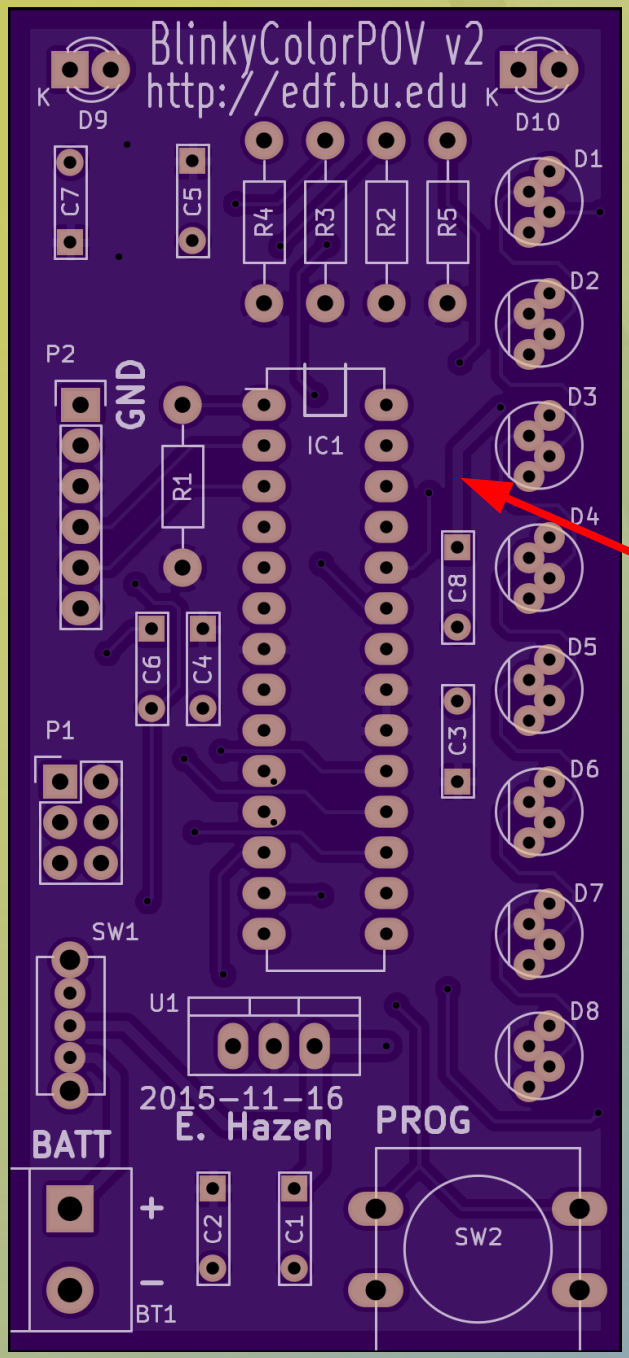
How Do We Design It?

- Draw a wiring diagram (*schematic*)
- Draw a layout
- Send the design to a company to make the *printed circuit board*
- Solder in the parts (you get to do this!)
- Program it (you get to do this too)
- Test it

This is the *schematic* (wiring diagram)





Everything is soldered into a *printed circuit board*

The squiggly lines are printed in copper on the board like wires ... they connect together the parts to make an electric circuit

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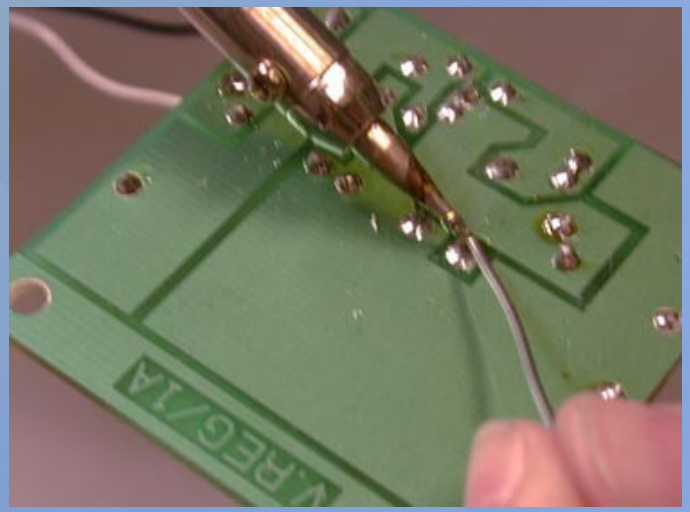
Soldering

- *Soldering* is the joining of metal objects together. A filler metal ("solder") is melted and flowed into the joint.
- Soldering was practiced in ancient Egypt at least 7000 years ago
- Soldering is used to attach electronic components to a board, and also for jewelery and other applications



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Soldering Safety

- The iron gets hot!
  Don't burn yourself. Careful not to splash solder
- Solder is made of lead, which is poisonous
  Wash your hands when you are done; don't eat or drink while soldering
- Snipped component leads fly at high speeds
  Close your eyes or cover board with your hands