



World of the Blinky Flashy

Or: How to make All The Things Blink, Flash or otherwise make a Commotion

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All code can be found at:

<http://bit.ly/blinkyflashycode>

Us

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Plan

1. Hello & Intros
2. Basics
3. Some projects
 - e-textiles
 - paper circuitry
 - small circuits
4. Supplies & links

Basics (apply to all projects)

What you need

- Circuit tester (multimeter)
- Jumper wires
- Electrical tape
- CR2032 batteries (3V)
- Pliers (needlenose)
- Wire cutters or scissors

Basics (apply to all projects)

Things to know

- Polarity
 - It matters.
 - Components often (usually, even, but don't always) have a positive (cathode) & negative (anode).
 - Plus should connect to plus and negative to negative.
 - The cathode on battery, for instance, connects to the cathode of the LED)
- Don't cross the streams (don't let positive and negative circuit legs, or "traces", touch)
 - Best case: won't work
 - Worst case: ...

Worst case:



...fried components or fire

- to mitigate risk: test circuit using multimeter

the projects

Level	E-textile	Paper circuits	Small circuits
Easy-peasy	Hack your hoodie	Store bought card	LED throwie
Requires more thought	Hack your jean jacket	WIT dorm sign	Winter Pokeball
Tricksy	Changing lights hoodie	Fireplace card	Board for Red Hat design wall
Level-UP	Jellyfish costumes	Haunted House	Light-up, Steampunk Goggles

e-textiles

Using conductive thread to add lights and other electronics to fabric

Level	E-textile
Easy-peasy	Hack your hoodie (Conductive thread + switched battery pack)
Requires more thought	Hack your jean jacket (Conductive thread + switched battery pack, denim sewing + metal buttons)
Tricksy	Changing lights hoodie (gemma + textile sensor)
Level-UP	Jellyfish costumes (El wire + fairy lights + battery pack + mess'o'hot glue + staples)

What you need:

- Conductive thread
- Sewable LEDs (2 sizes: regular & sequin)
- Battery pack (switched or unswitched)

Things to know:

- Test before you trim
- Don't finish sewing on a board
- Scissors cut fabric just as easily as conductive thread
- Three loops around connection points
- Small, even stitches = better
- Different kinds of conductive thread (trade off: resistance v. ease of sewing)
- To wash:
 - Use clear nail polish or puffy paint to seal traces
 - Remove battery

paper circuits

Using copper tape to add lights and other electronics to paper

Level	Paper
Easy-peasy	Store bought card (integrated battery LED light also store bought)
Requires more thought	WIT hackathon sign (copper tape + standard LED + battery + switch) http://bit.ly/2b9qVqv
Tricksy	Fireplace card (paper slide switch + copper tape + battery + standard LED)
Level-UP	Haunted House (Silhouette + svg files + switched battery + copper tape + chibitronics flat LED lights)

What you need:

- Copper tape (like you use for stained glass)
- LEDs (two sizes: regular & sequin)
- Switch
- Battery pack (switched or unswitched)

Things to know:

- Copper tape is fussy.
 - Adhesive is not very conductive; have as much copper-to-copper contact as possible
 - Anything that slides to make a connection needs to be firmly attached for the connection to work
- Copper tape is also sharp. Very sharp.
- Copper tape oxidizes over time → for long-term use, consider wire

small circuits

Using wires, LEDs, Aruduinosaurs, and other components to add interactivity to things

Level	Small circuits
Easy-peasy	LED throwie (standard LED + battery)
Requires more thought	Winter Pokeball (fairy lights + coin cell)
Tricksy	Panel for Red Hat design wall (wire, LEDs, resistors, arduino, programming + mad collage skillz ;-)
Level-UP	Light--up, Steampunk Goggles

What you need:

- Wire
- LEDs
- Arduino
- Resistors
- Button
- Computer (to program Arduino)
- A breadboard is useful to prototype before making final connections

Things to know:

- For wire connections:
 - Twist wires together (good for more stationary projects),
 - Use wire nuts, or
 - Solder (for things that will get moved out that you want to last. Or if you're paranoid)

Supplier list

Supplier	Items	Used In
SparkFun	Conductive thread, Lilypad wearables, LED “sequins”, standard LEDS, battery holders, copper tape, button, Arduino	Hack your Hoodie, WIT Dorm Sign, Red Hat design wall panel
Adafruit	Conductive thread, FLORA & GEMMA microcontrollers + wearables, copper tape, NeoPixel Ring	Changing Lights Hoodie, Light-Up Steampunk Goggles
Amazing Magnets	Rare earth magnets	LED throwie
Amazon	Multimeter (most of the basics can be found here)	Pretty much everything
Chibitronics	Circuit Stickers	Halloween Paper House
Extreme Glow	Fairy Lights, Flat LEDs, EL Wire	Winter Pokeball, Jellyfish Costumes, Store Bought Card
Microtivity	Standard LEDs	Fireplace Card WIT Dorm Sign Design wall panel
Plug and Wear	Textile Sensors	Changing Lights Hoodie

Materials to make your life easier

- Puffy paint or nail polish (to seal traces on e-textiles)
- Bone folder
- All sorts of glue (glue dots, double-sided tape, tape runner, fast drying liquid glue, glue gun)
- Two pair of pliers are better than one
- Wire-stripping pliers - [these](#) rock

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