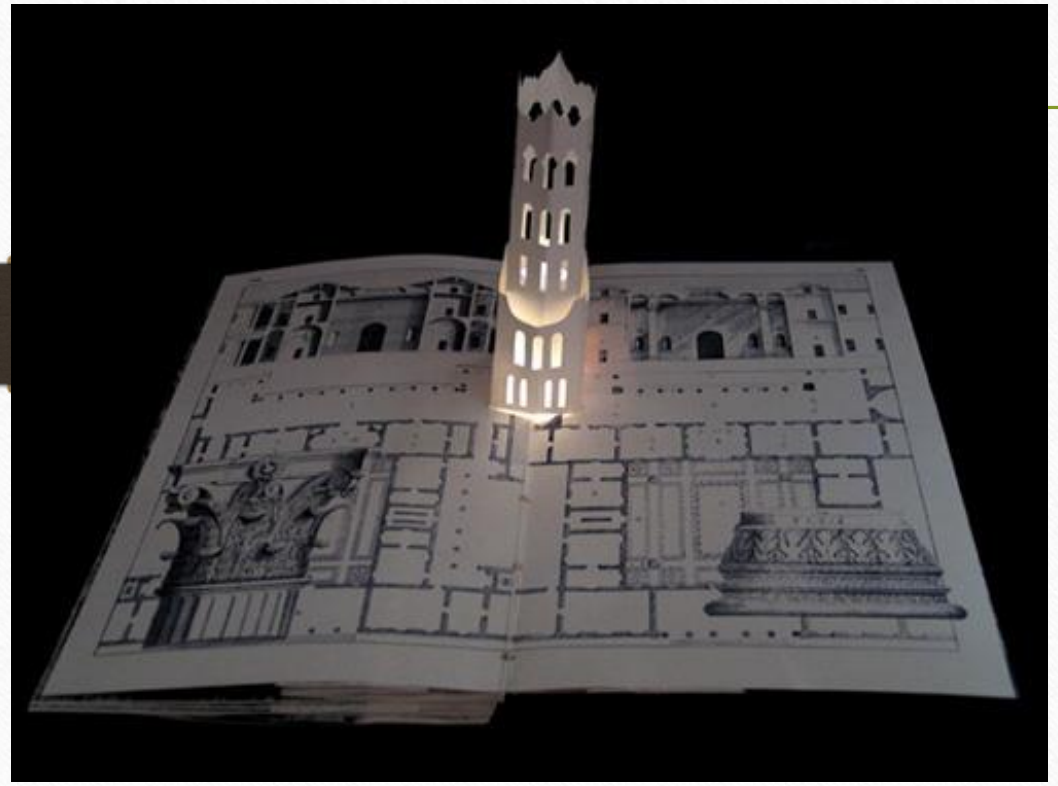
Electronics for Books

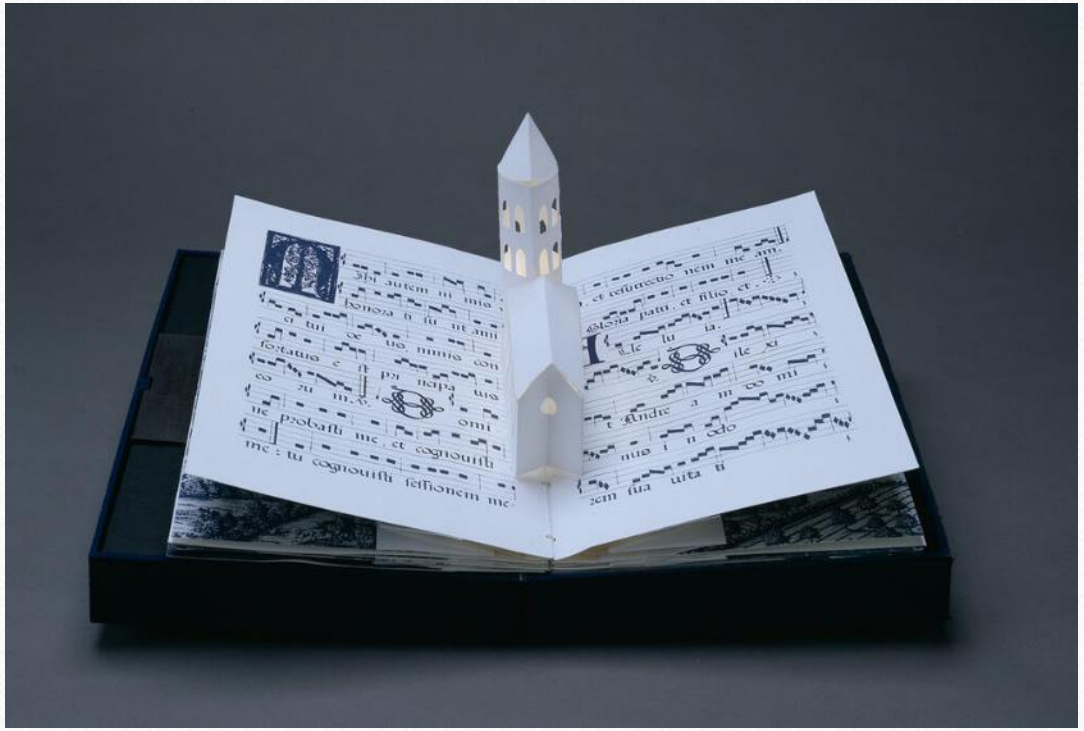
Adding Light and Sound to your Pages

We'll cover...

- Examples of Light and Sound
- Basic Electronics
- Adding the electronics to your book… simple solutions
- Resources

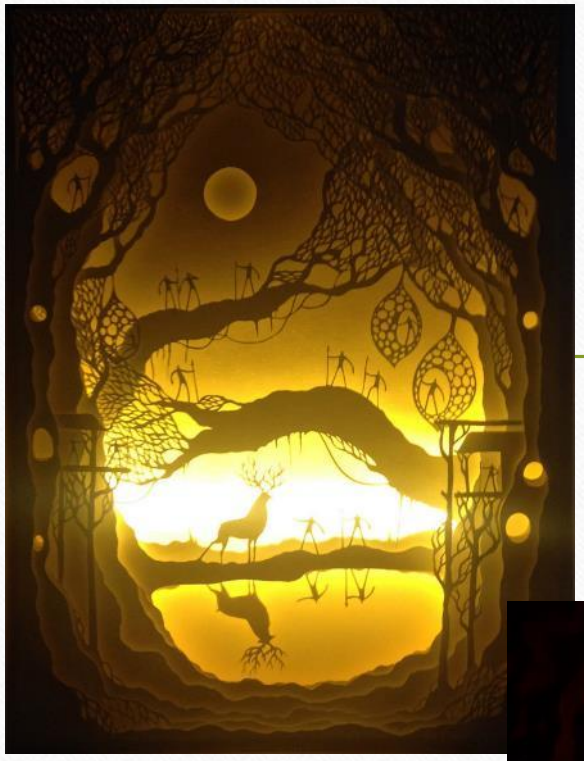
Carol Barton





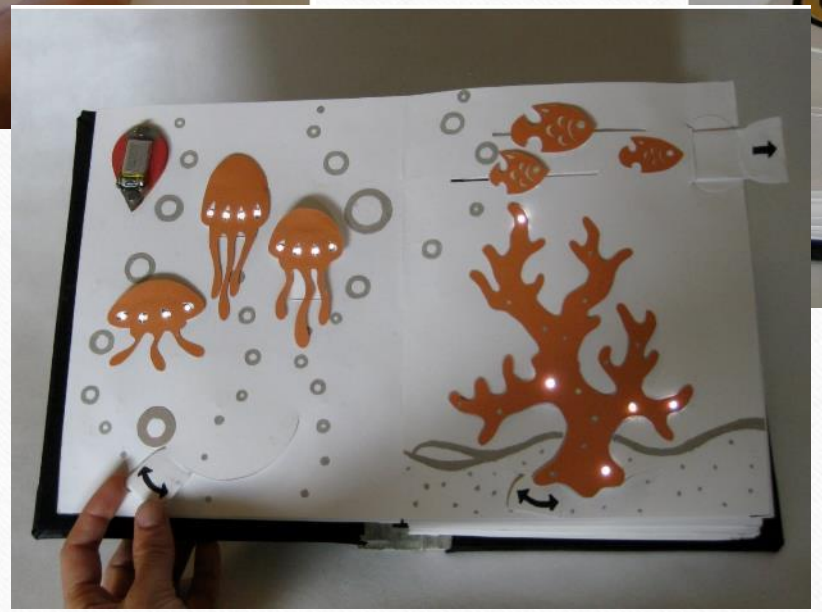
Shelby Arnold

Hari and Deepti

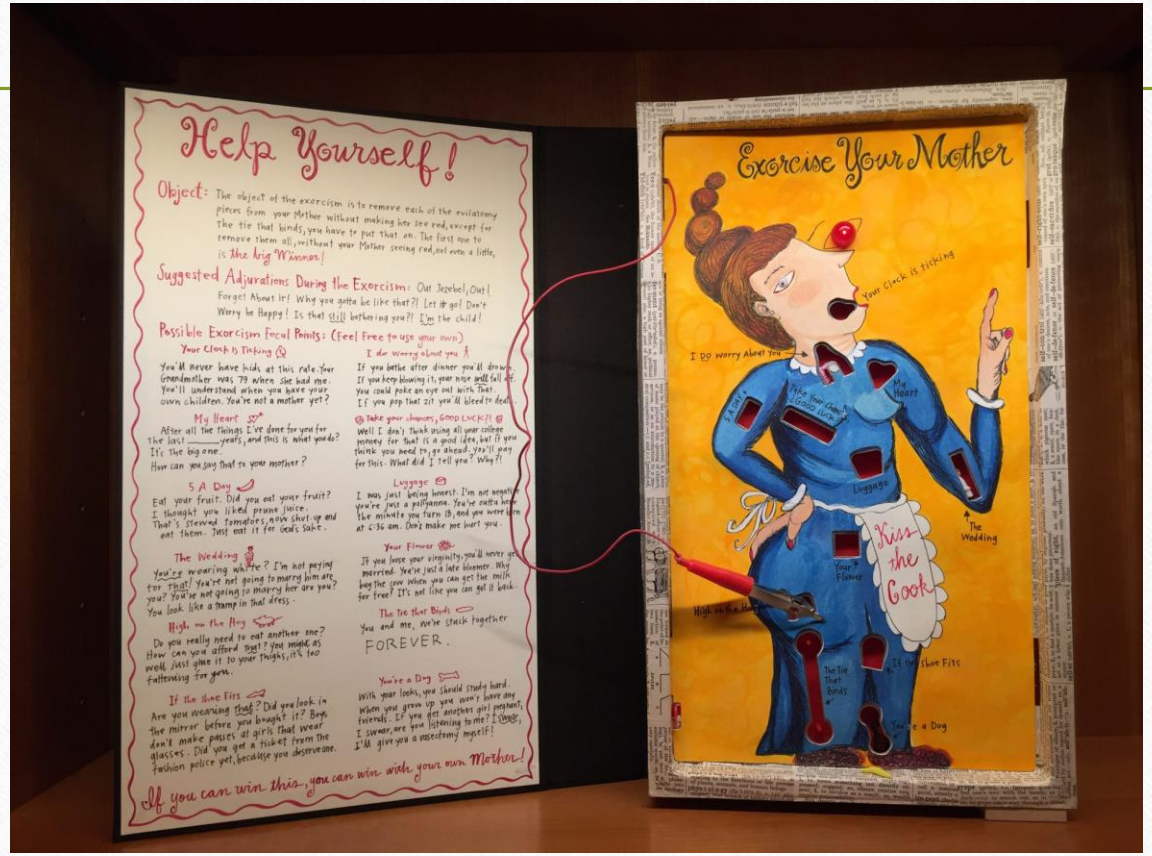


Matthew Reinhart
Star Wars

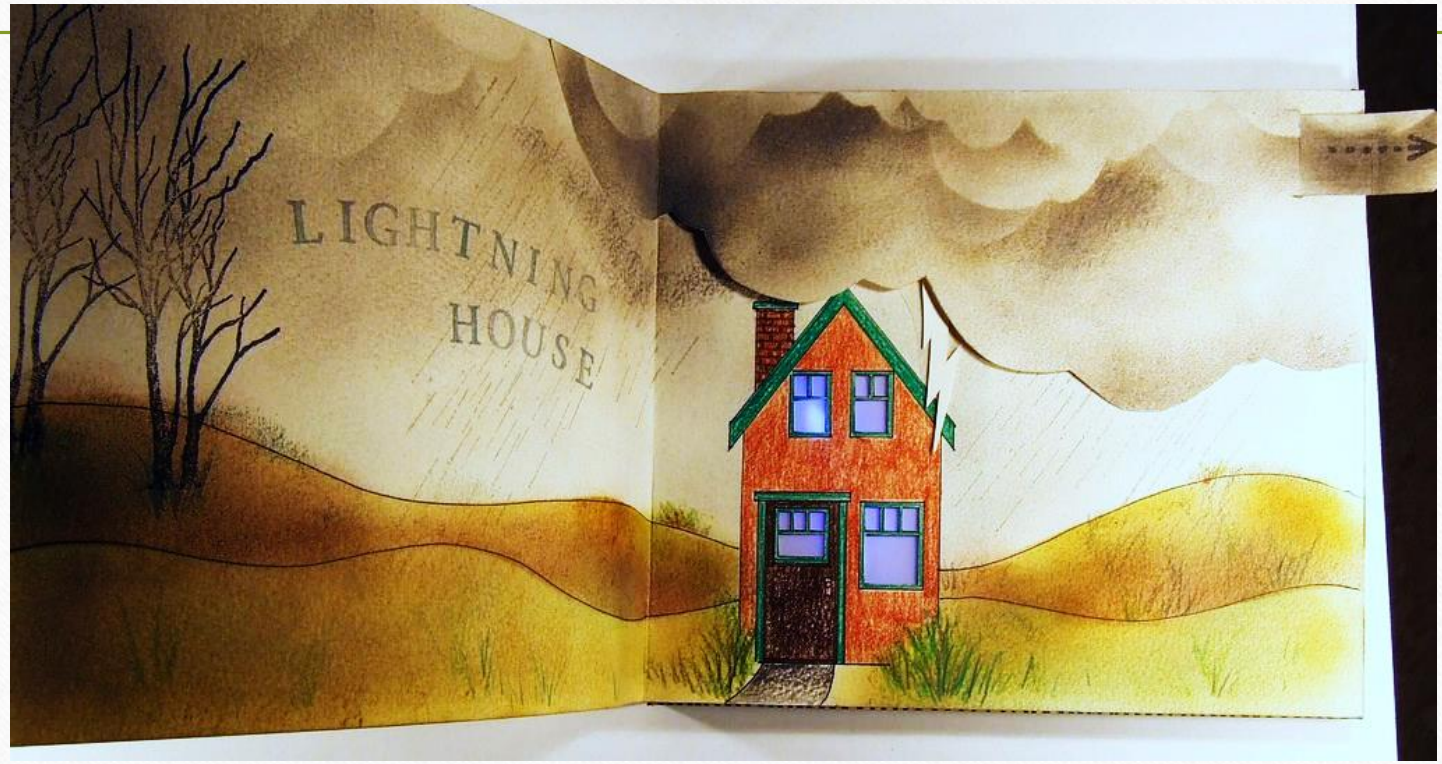
Jie Qi



Mare Blocker

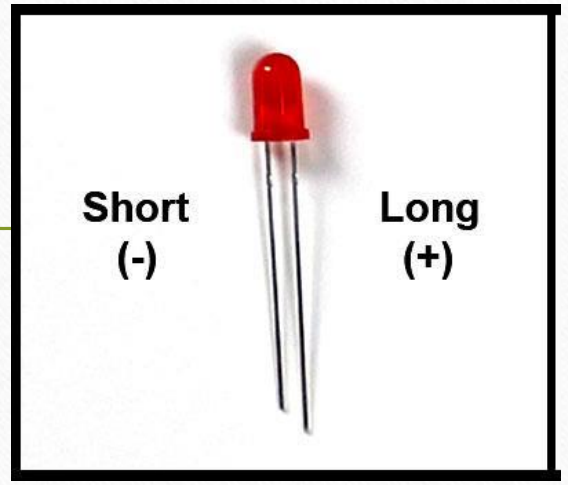


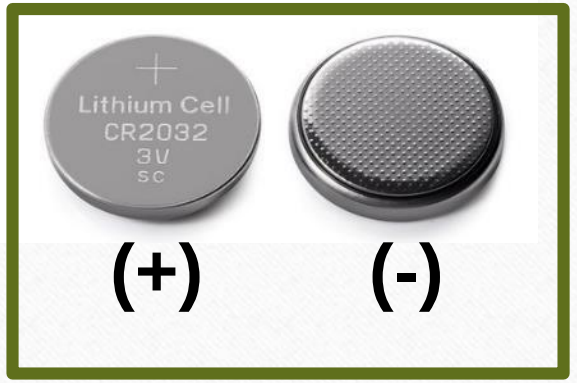
MJ Linford… Disaster Houses II



The basic concept

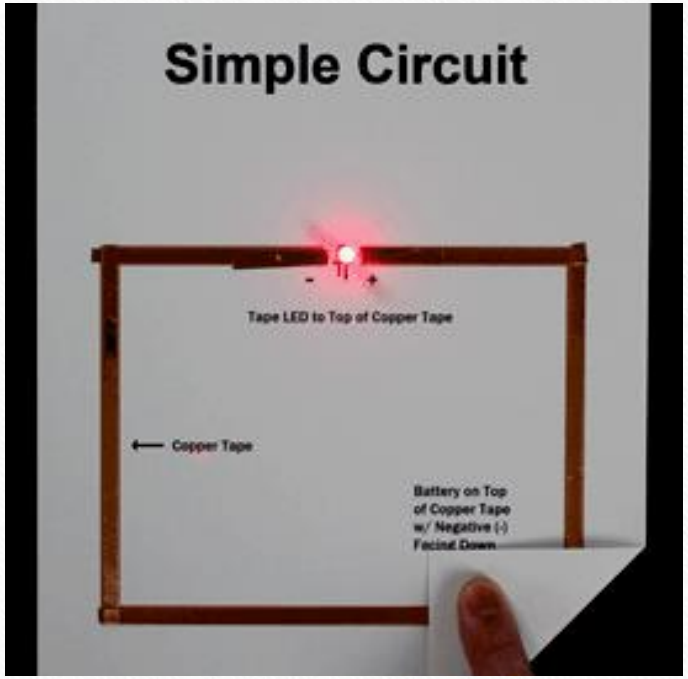
- LED and
- Coin cell battery

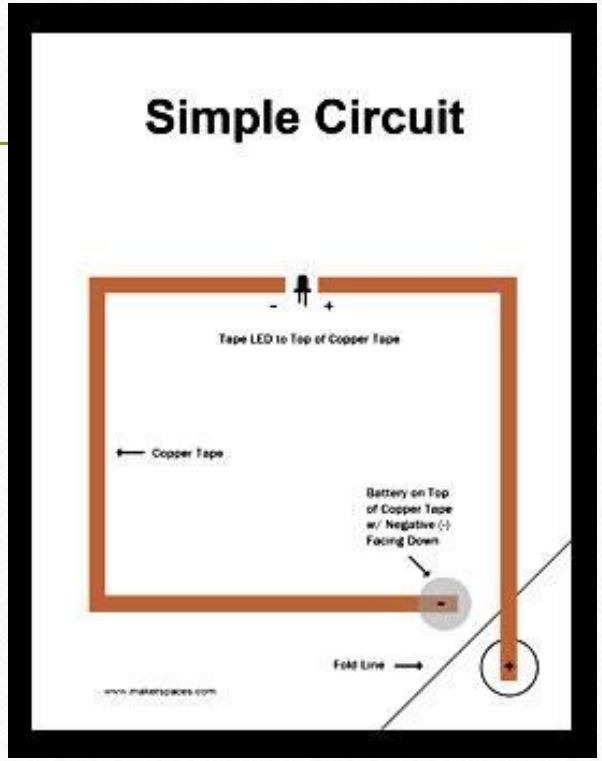




The basic concept: simple circuit

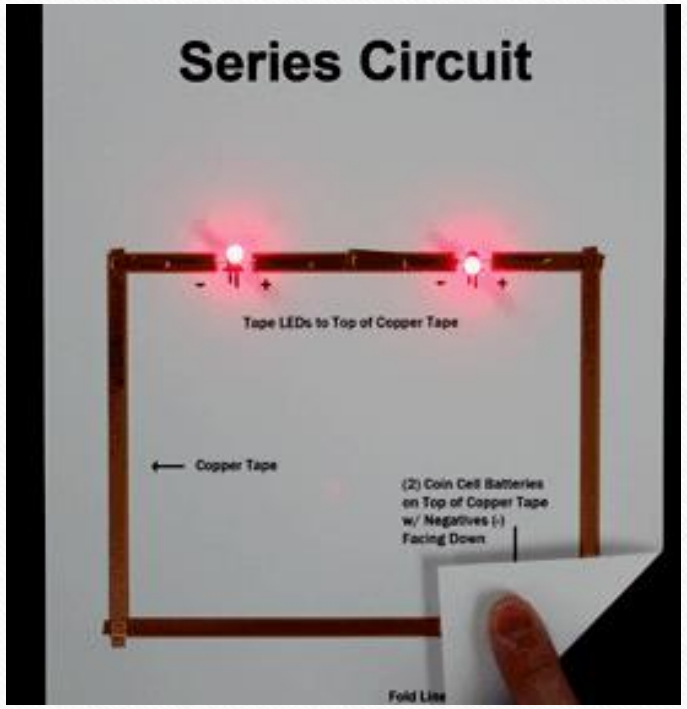
- Simple Circuit
- LED
- Coin cell battery
- Copper tape

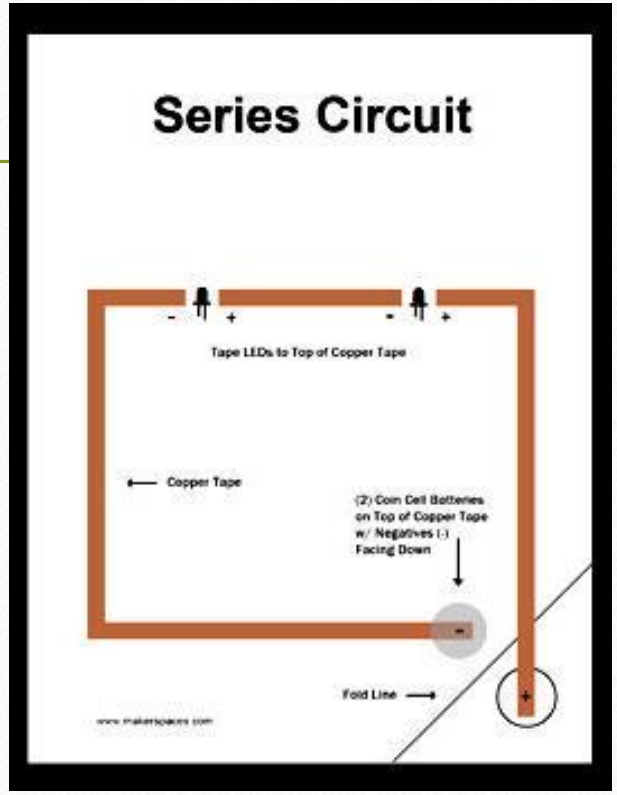




The basic concept: series circuit

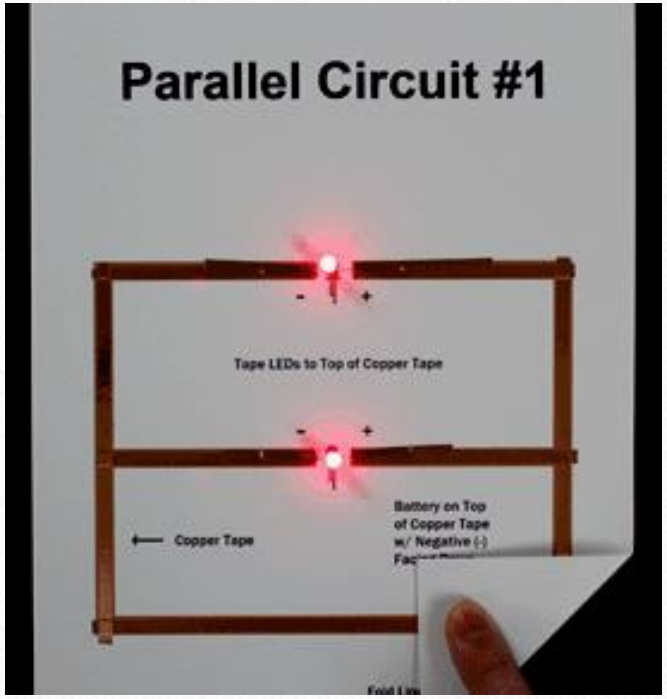
- Series Circuit
- 2 LEDs
- Coin Cell battery
- Copper tape

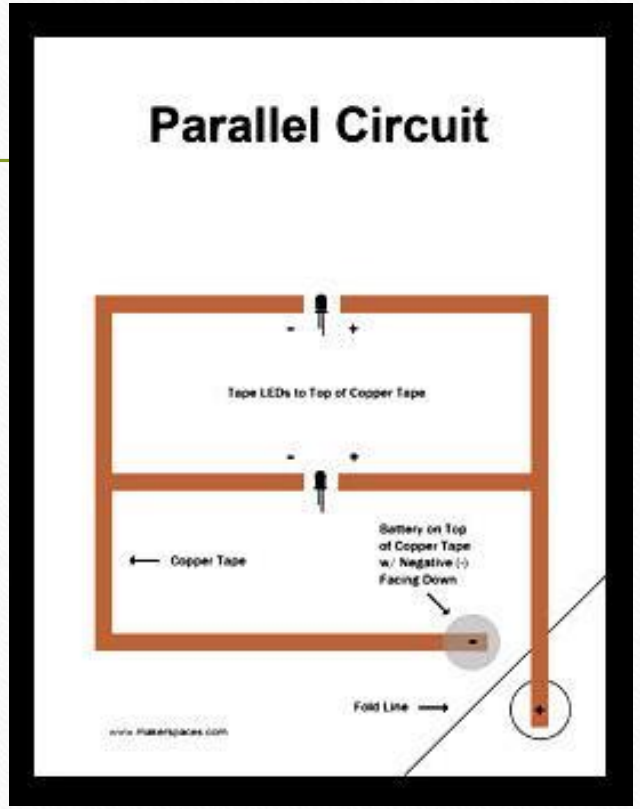




The basic concept: parallel circuit

- Parallel Circuit
- 2 LEDs
- Coin cell battery
- Copper tape





Supplies you will need

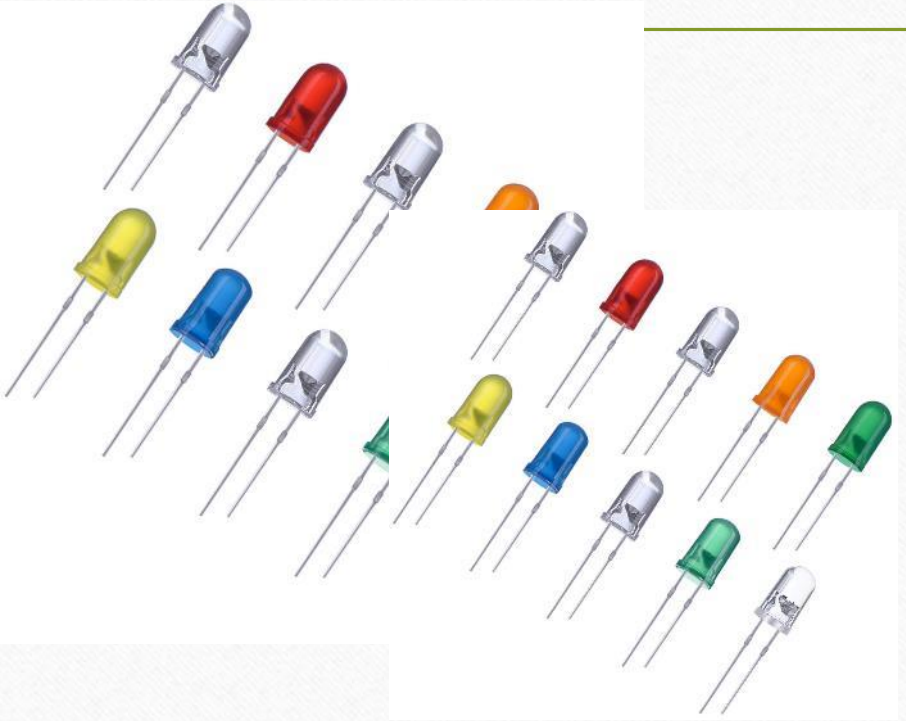
LEDS…Light Emitting Diodes's …

lots of choices

- 5 mm 3v
  - larger
  - harder to hide, rounded top
  - light comes out of top, not side
  - multiple colors, tri-colors

Light Emitting Diodes's ...

lots of choices



- 3 mm 3v
  - smaller
  - easier to hide, rounded top
  - light comes out of top, not side
  - multiple colors, tri-color

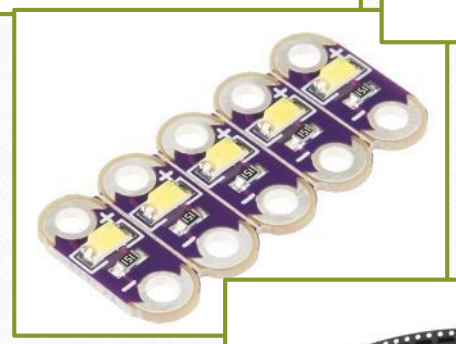
Light Emitting Diodes's ...

lots of choices

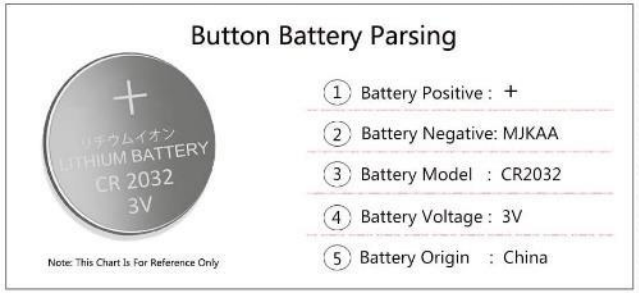
- 'flat' top LED's 3v
  - both sizes
  - shines upward
  - easier to hide
  - comes in multiple colors, tri-colors

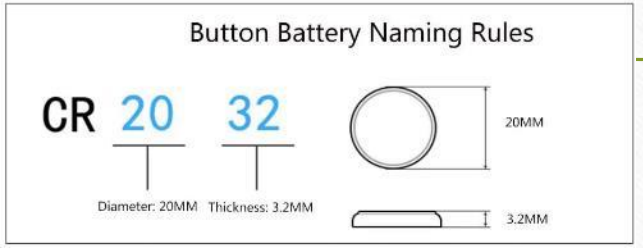
Light Emitting Diodes's ...

lots of choices



- Specialty LED's 3v
  - Chibitronics.com
    - electronics for paper crafters, kids
    - stick-on circuitry
- SparkFun Electronics
  - electronics for fiber arts and paper
- Arduino and Lilypad

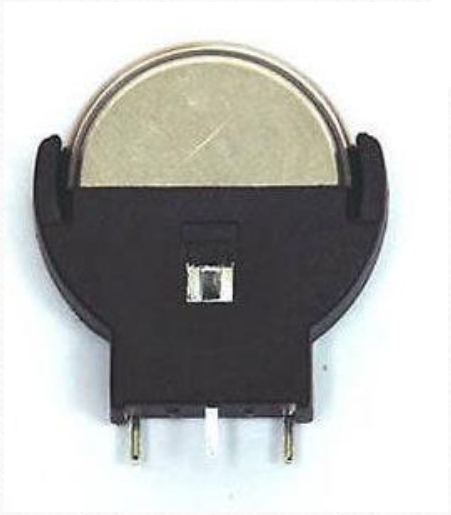




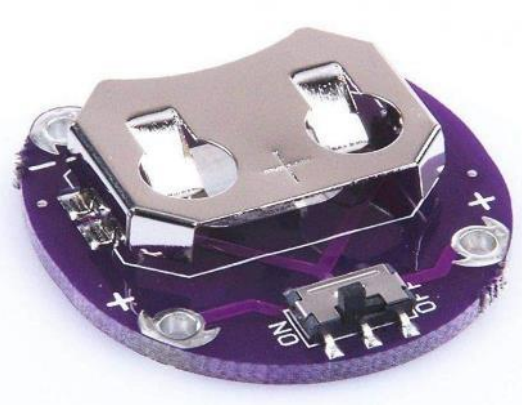
Batteries

- Coin cell batteries
  - CR2032
    - 3V 180 mAh
    - more juice', lasts longer
  - CR2025
    - 3V 150 mAh
    - thinner height profile

Traditional Battery Holders



Other Battery holders

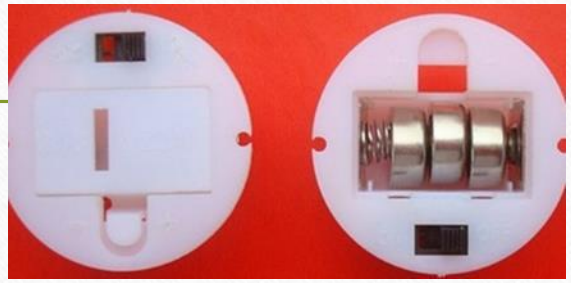


OPEN IT

ON/OFF SWITCH

Button Batteries

- LR41
  - 1.5V
  - need 2 for most LED's
  - Thick, harder to hide in book
  - kinda fiddly, imho
  - often used in sound modules

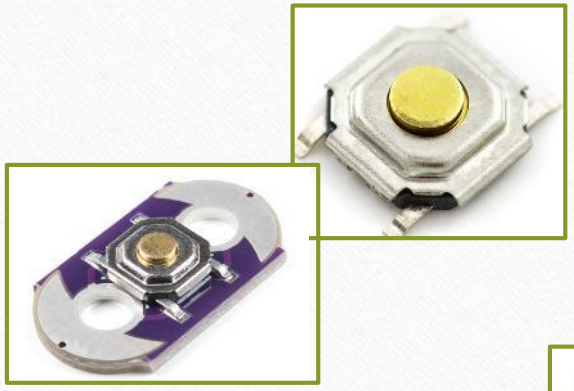


Making Connections

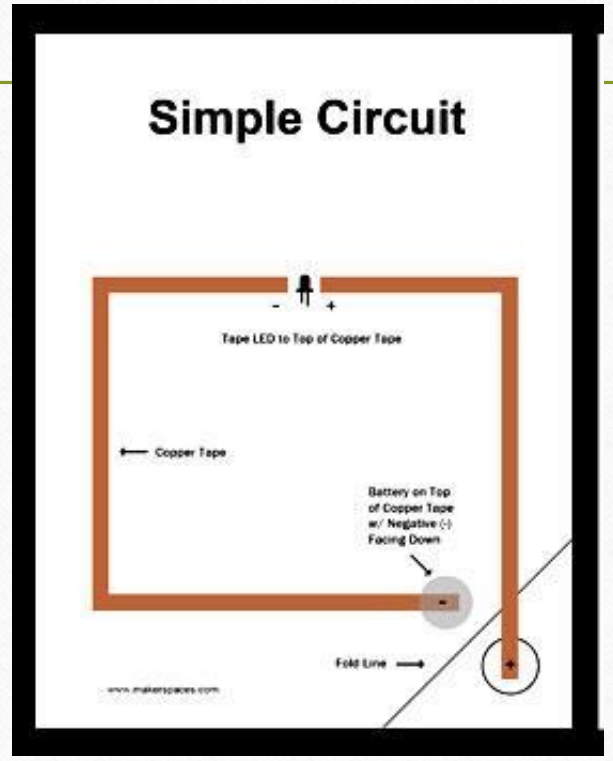
- Conductivity
  - copper foil
  - Steel thread
  - Coated wire
  - Brass sheeting
  - Circuit pens

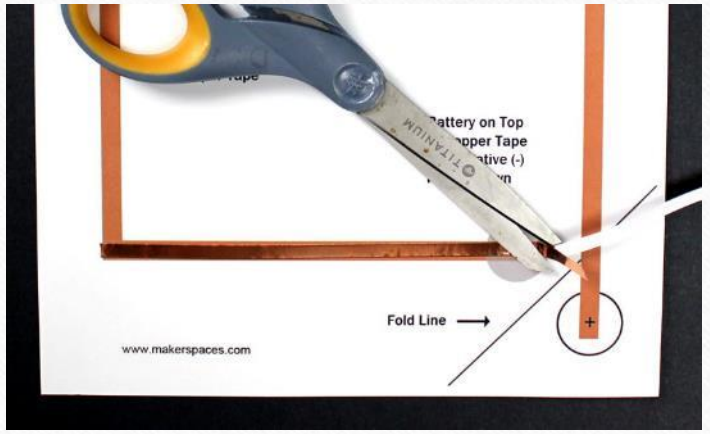
Switches

- Activate electronics
  - light
    - to activate when page is opened
    - to activate when action is taken
  - sound
    - to control activation of sound

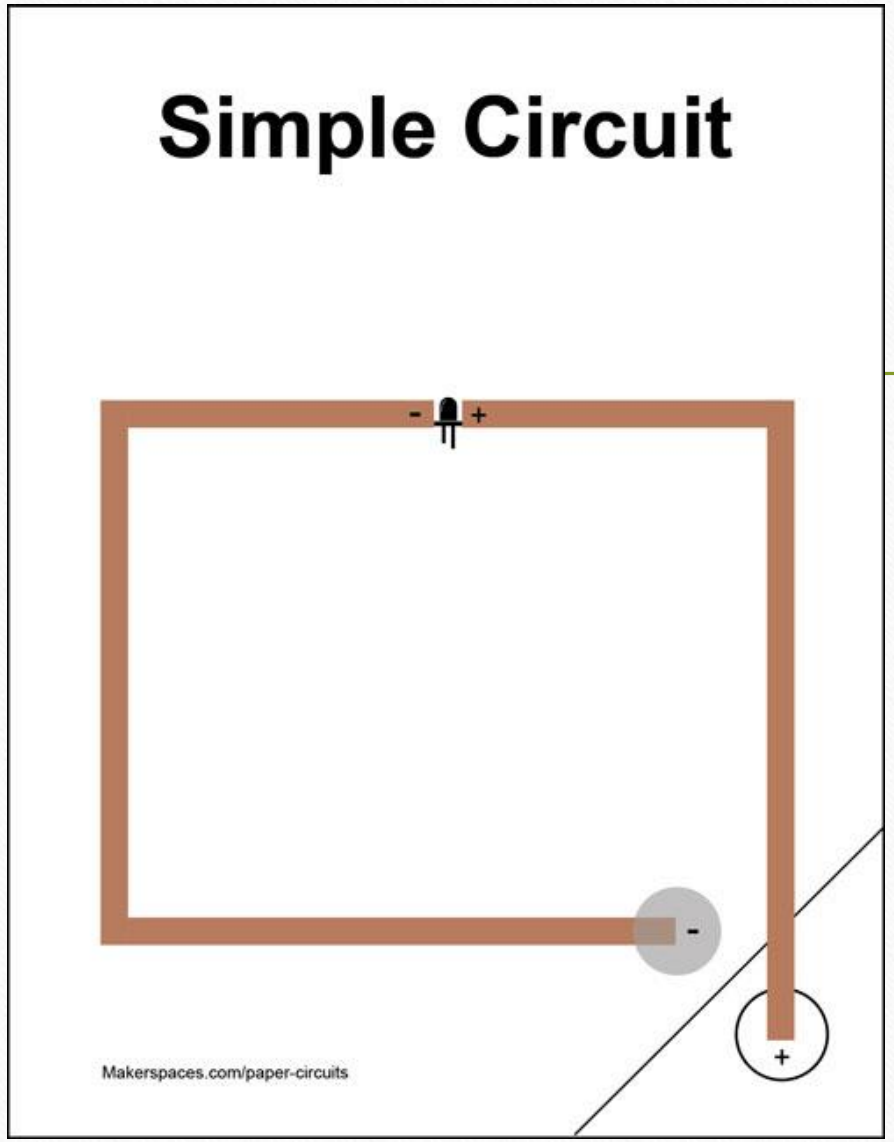


Making a simple circuit





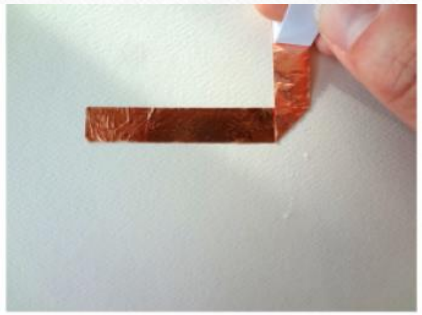
Making a Paper Circuit

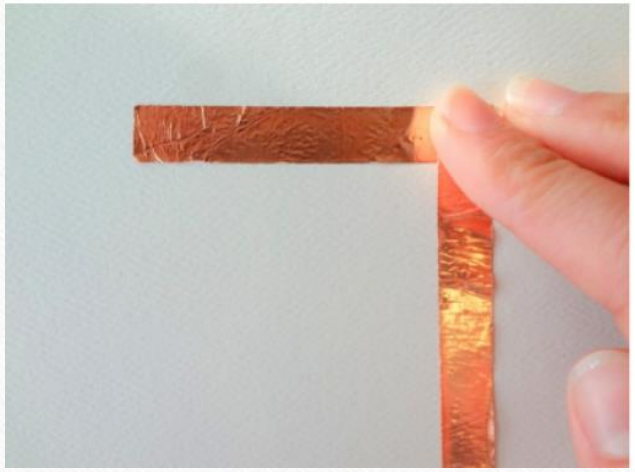
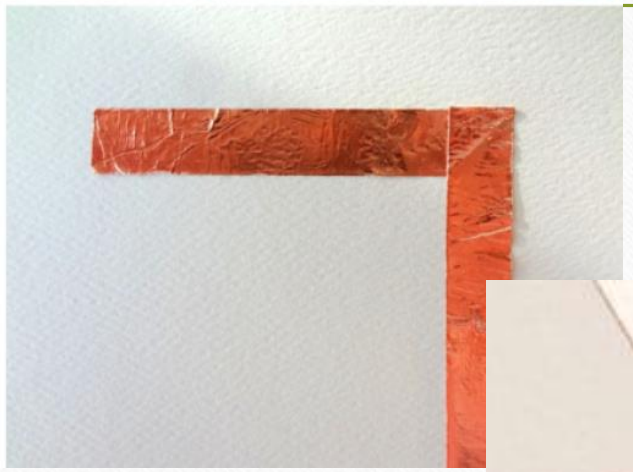
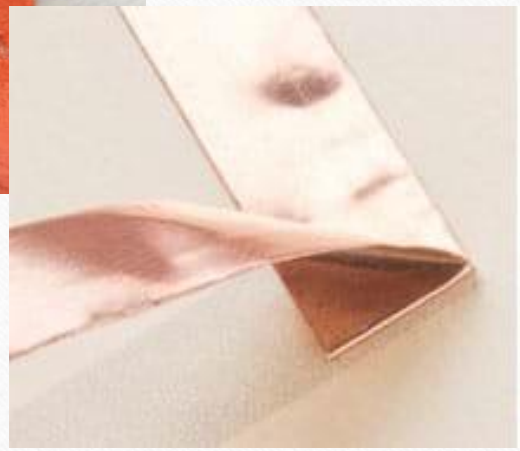
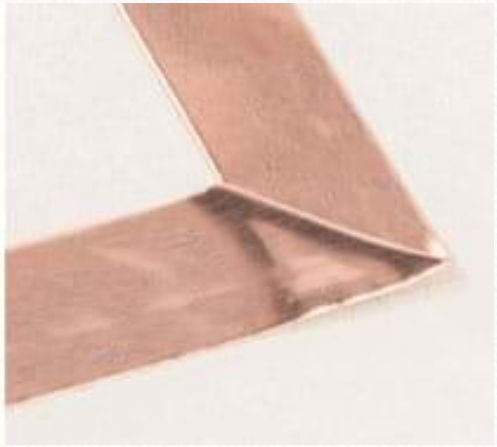


Use a template

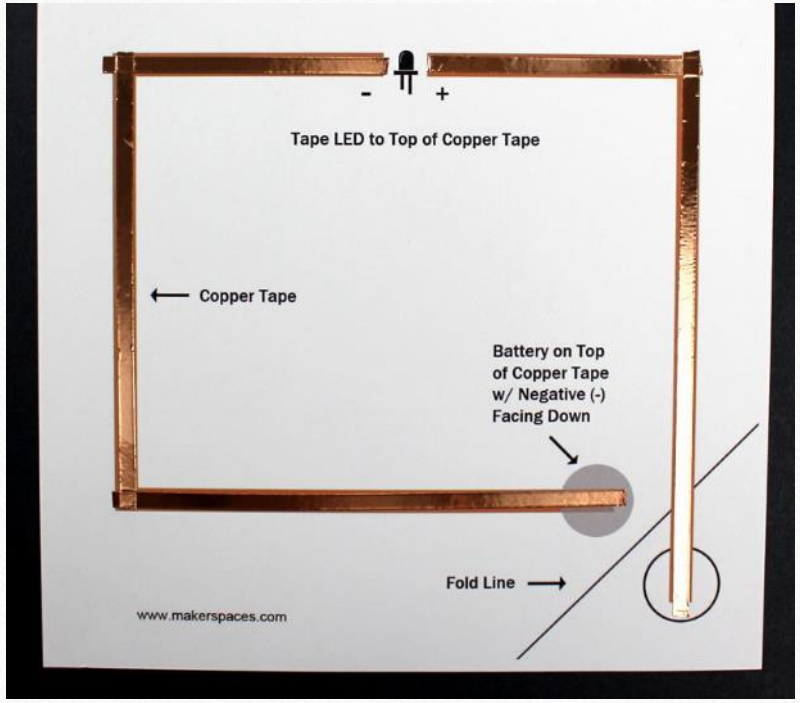
Download a template from MakerSpaces.com

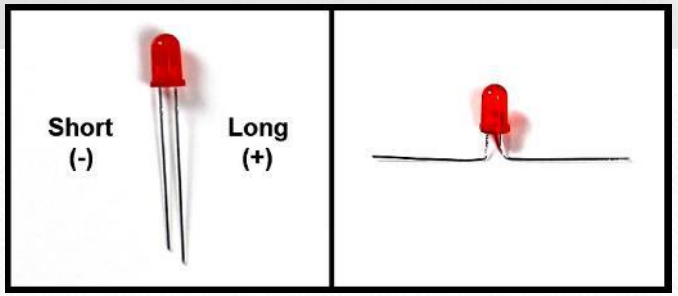
Making a copper foil corner

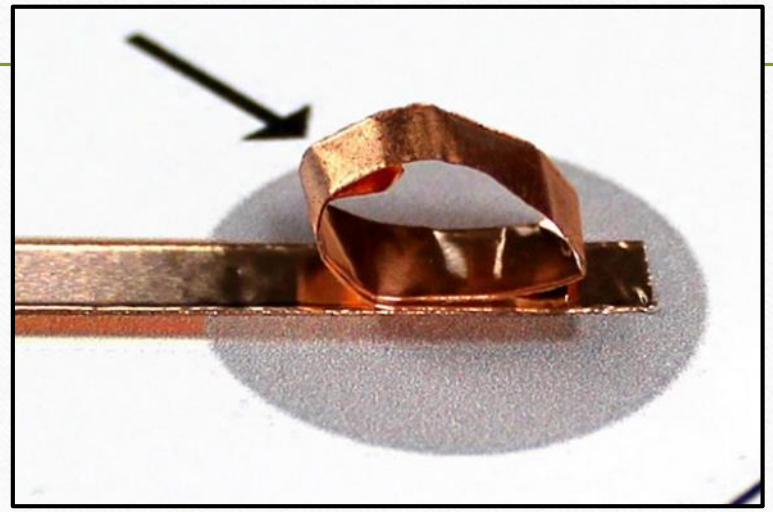





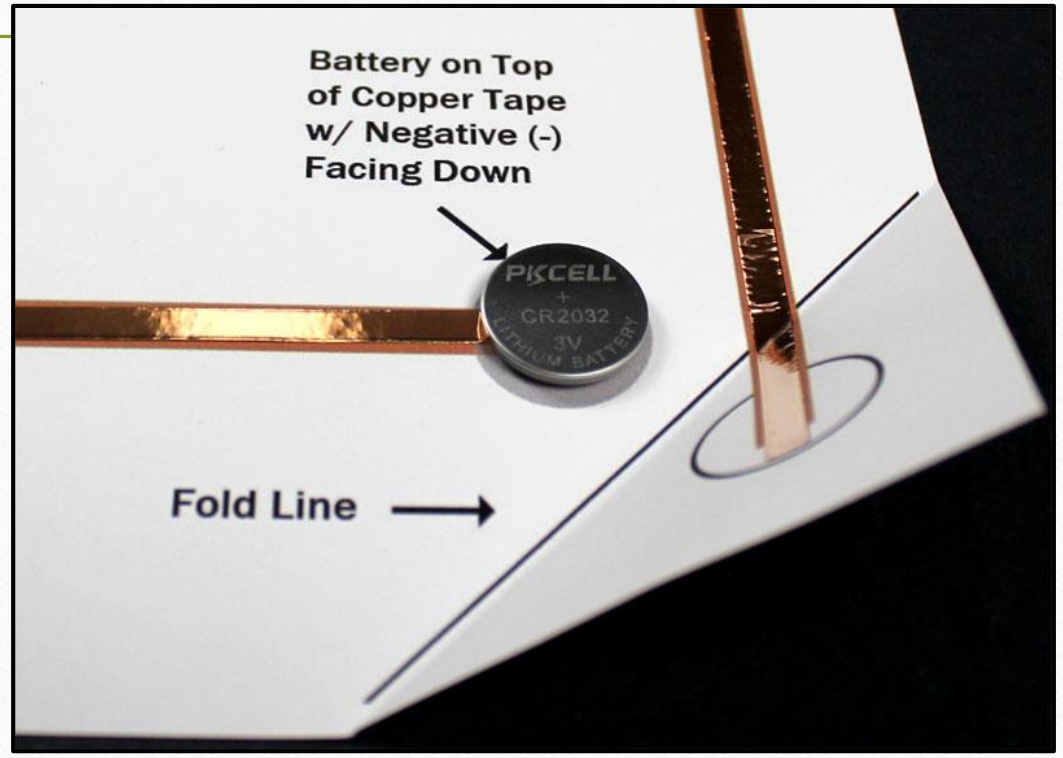
Making a simple circuit



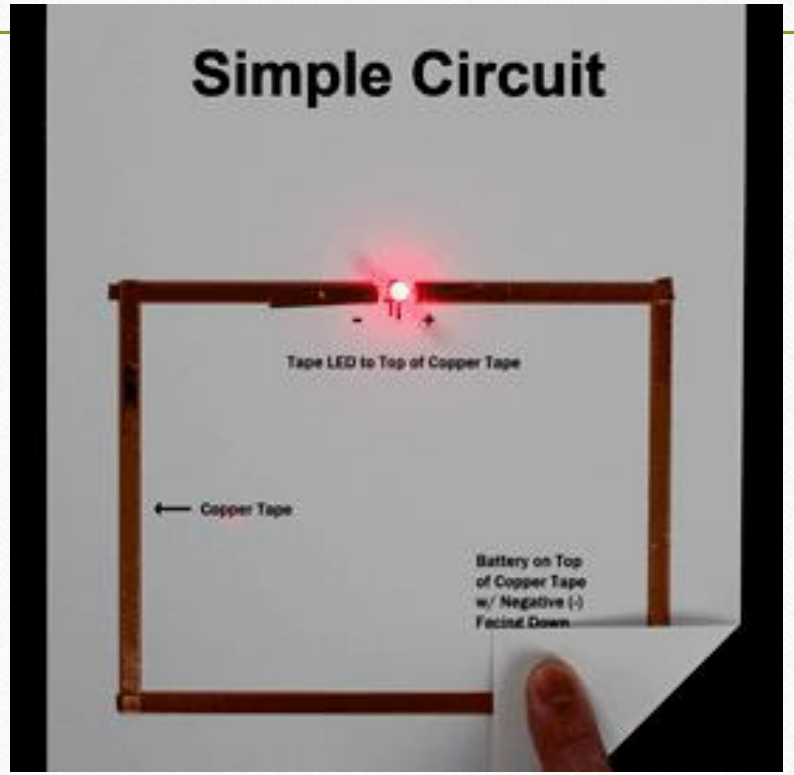


Making a simple circuit





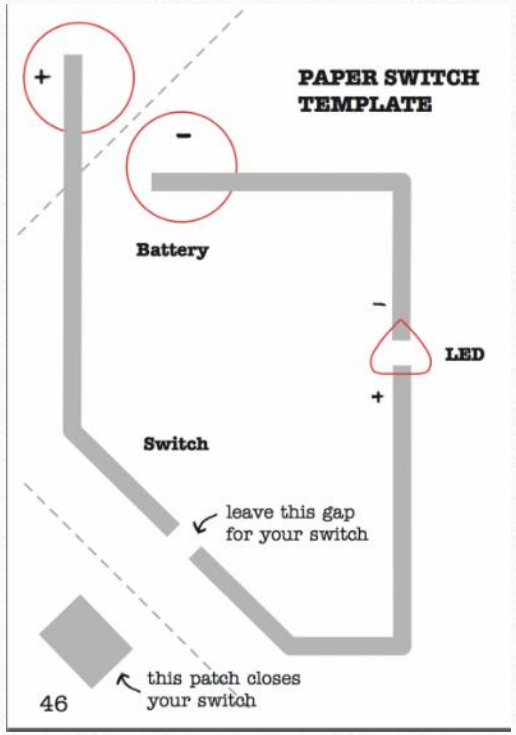
Making a simple circuit



- Now you have a simple circuit.
  - The 'switch' is you, pressing down on the corner of the paper to complete the connection.

Adding a switch

- Lilypad switch
- Chibitronic switch



Adding Sound to Your Artwork

My sound additions…

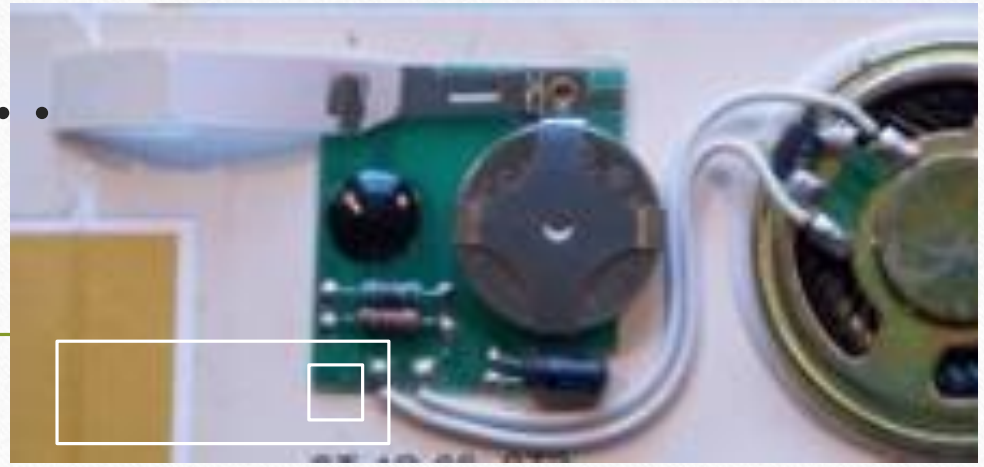
No Dog, No

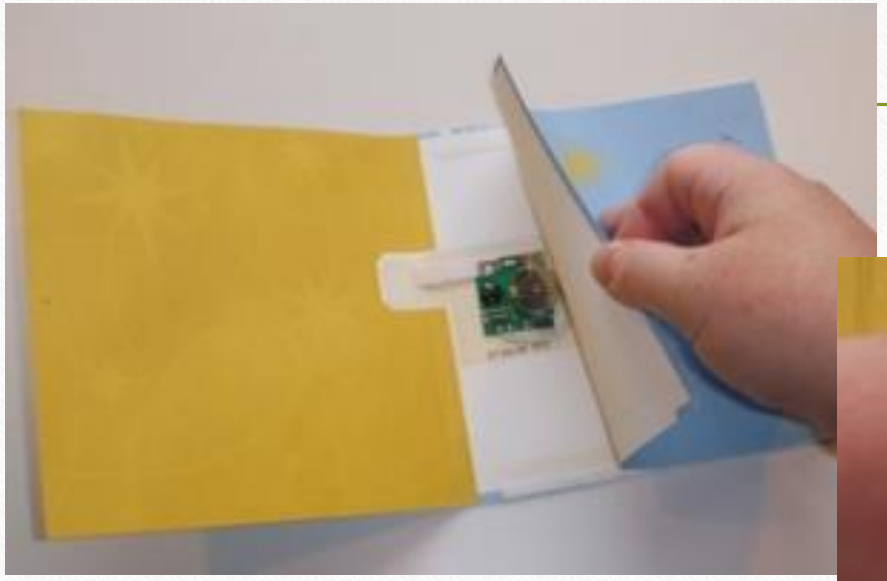
Tool Box

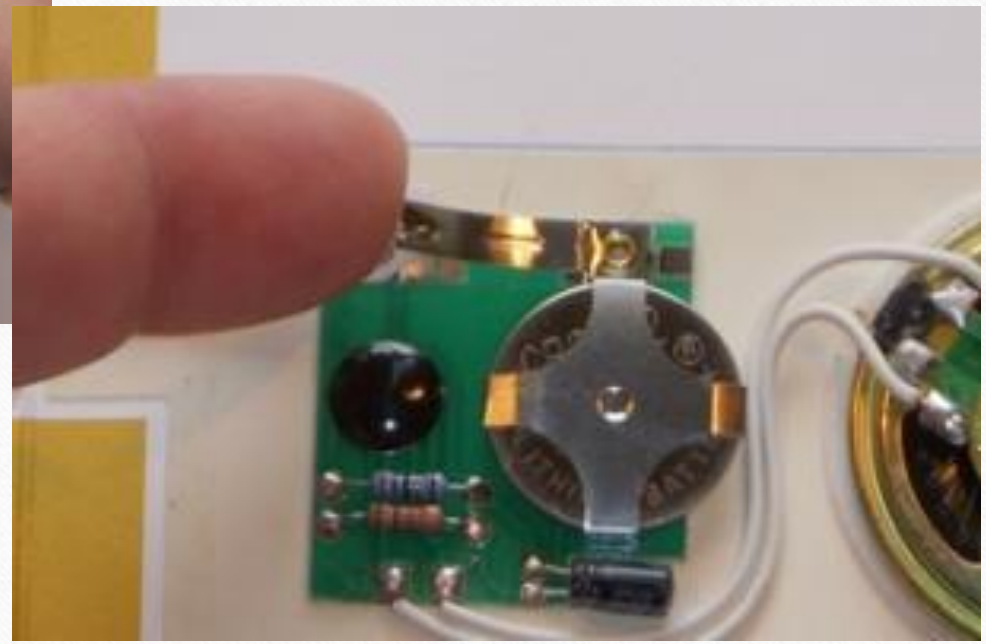
Adding sound

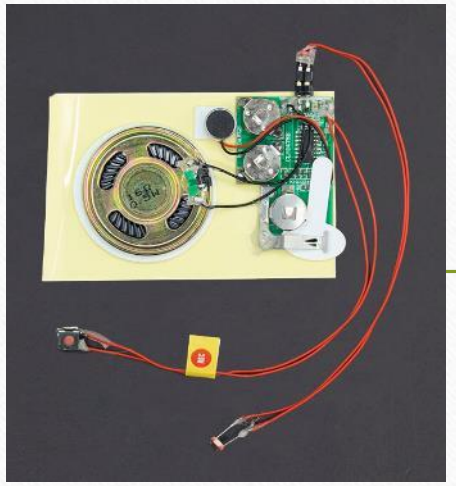
- Greeting cards
- Read-aloud books
- Talking picture frames

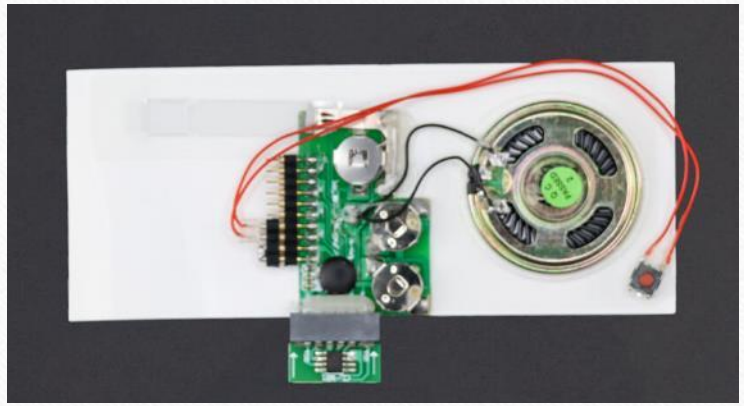
How sound cards work…









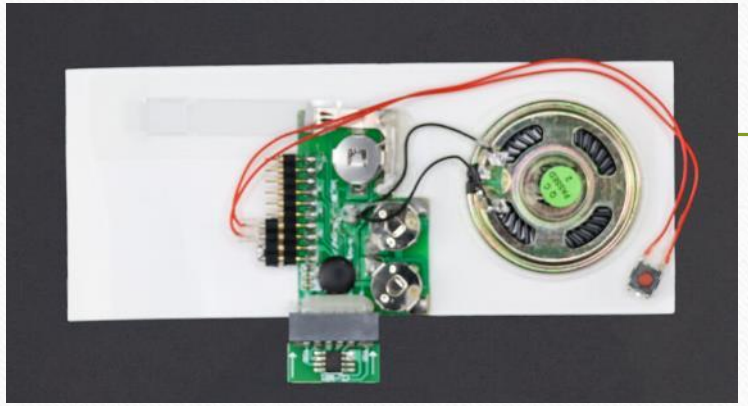


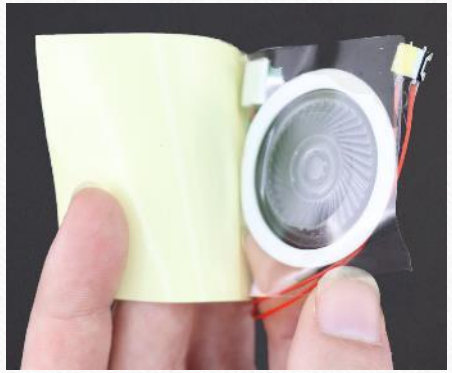
Big Dawgs Greetings

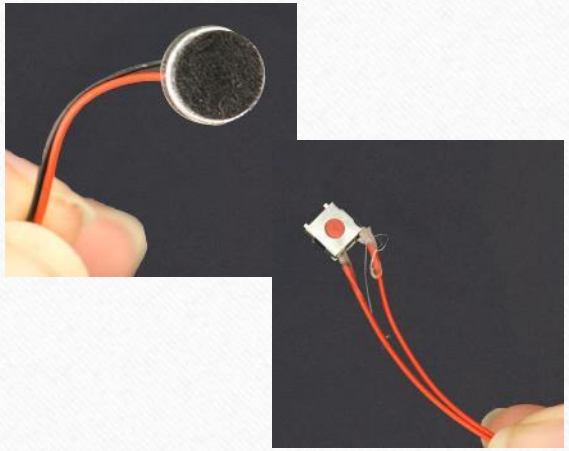
- User recorded sound modules
- Light activated sensors
- Tab activated sound

- bigdawgsgreetings.com

Big Dawgs Greetings







- User recorded sound modules
- various lengths of time...
  - 10 sec-200 sec
- Slider mechanisms
- Light activated sensors
- multiple sounds on one card
- bigdawgsgreetings.com

Resources

Sources:

- All Electronics: allelectronics.com batteries, LEDs, switches etc.
- Big Dawgs Greetings: Bigdawgsgreetings.com recordable sound cards
- The Battery supplier: thebatterysupplier.com inexpensive batteries
- Circuit Scribe: circuitscribe.com conductive ink pens, drones, etc
- Chibitronics: chibitronics.com paper-craft friendly LEDs, switches, controllers, and more.

Resources

Sources:

- Sparkfun electronics: sparkfun.com Lilypad electronics, fabric friendly components, programable color effects, etc.
- Digikey: digikey.com electronics, conductive adhesive copper tape, etc.
- Lessemf: Lessemf.com conductive fabrics
- Electric Mosaic: Electricmosaic.com Conductive supplies for paper, fabric, and LEGO projects

- Amazon: smile.amazon.com lots of everything above, at competitive prices, small vendors

Resources

- **Tutorials:**
  - instructables: instructables.com/circuits/
  - Jie Qi: technolojie.com
  - Maker Space: makerspaces.com

Making Amazing Books