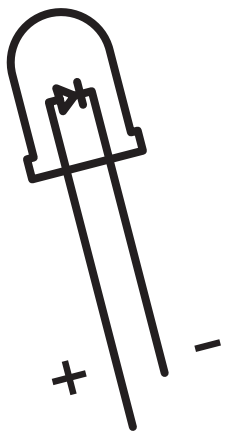
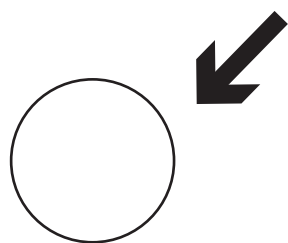


# Series Circuit

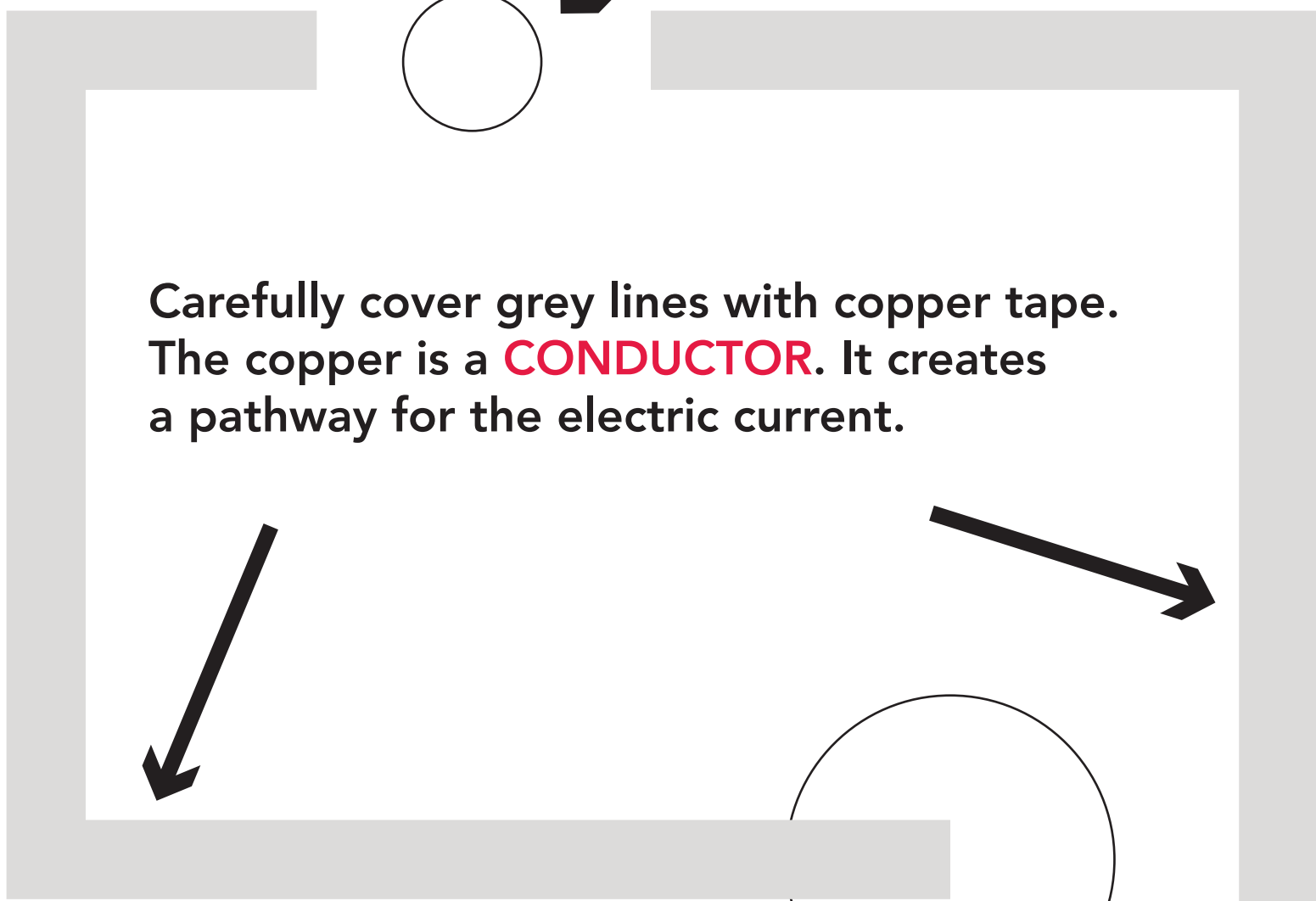
Create a continuous pathway that can carry an electric current to light up a tiny bulb.



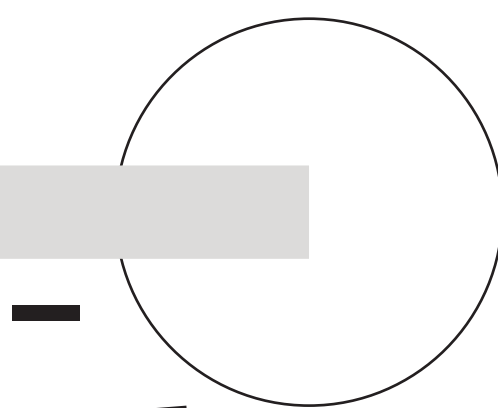
Place your LED here.  
This is the **LIGHT SOURCE**.  
Follow the directions on the next page to connect the LED.



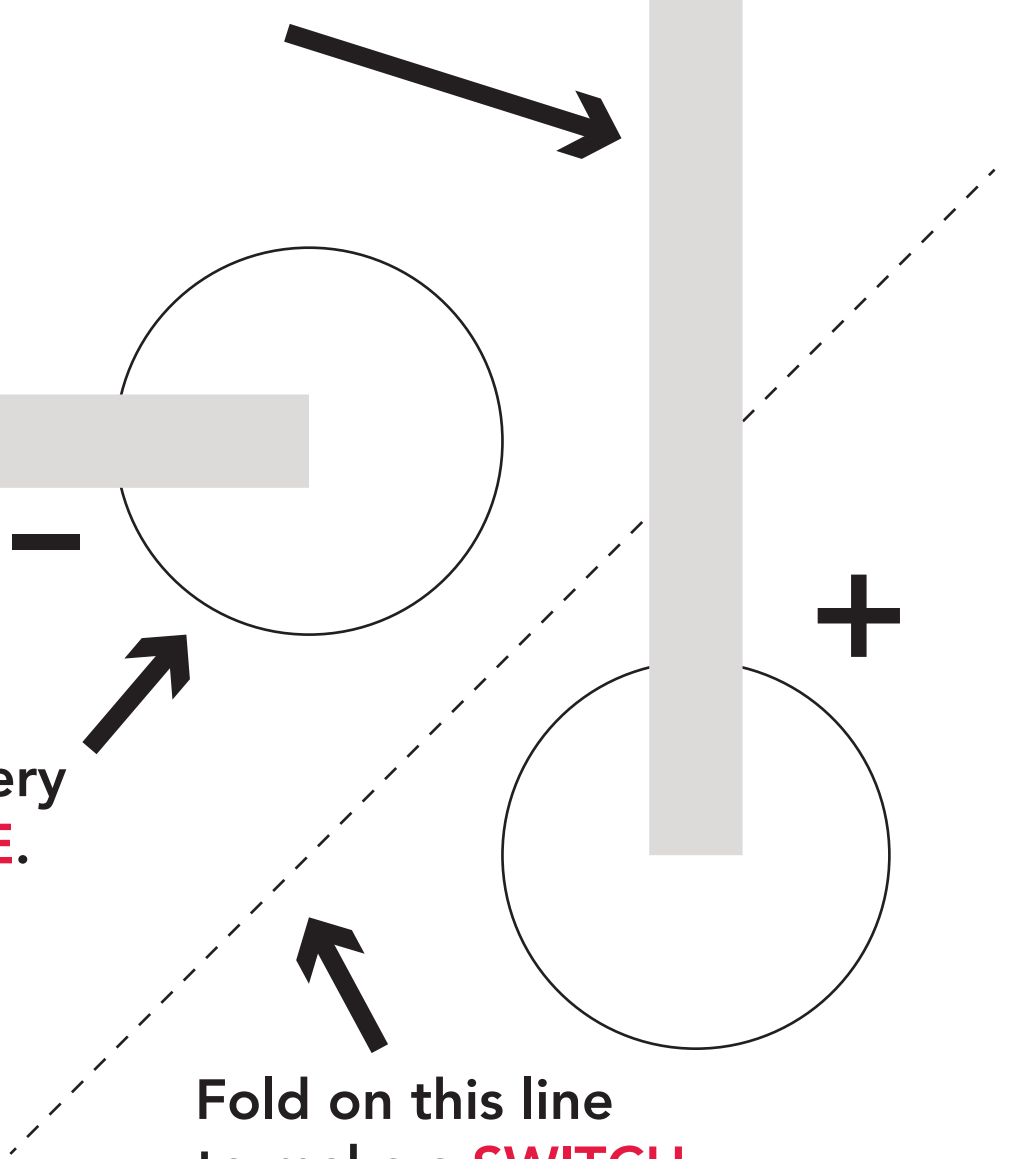
Carefully cover grey lines with copper tape.  
The copper is a **CONDUCTOR**. It creates a pathway for the electric current.



Place battery here  
with the negative side  
facing down. The battery  
is the **POWER SOURCE**.



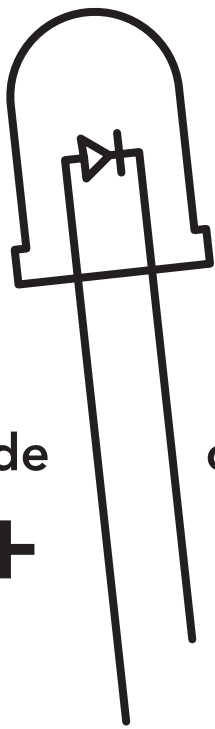
Fold on this line  
to make a **SWITCH**.  
The switch opens and  
closes the circuit.



# Attach the LED

(Light Emmitting Diode)

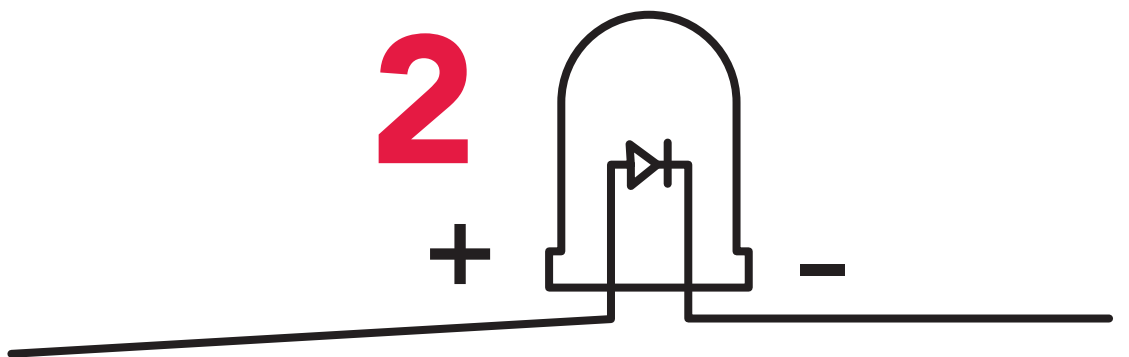
1



Look carefully to see which lead (wire) is long and which one is short. The long lead is **POSITIVE** and the short one is **NEGATIVE**.

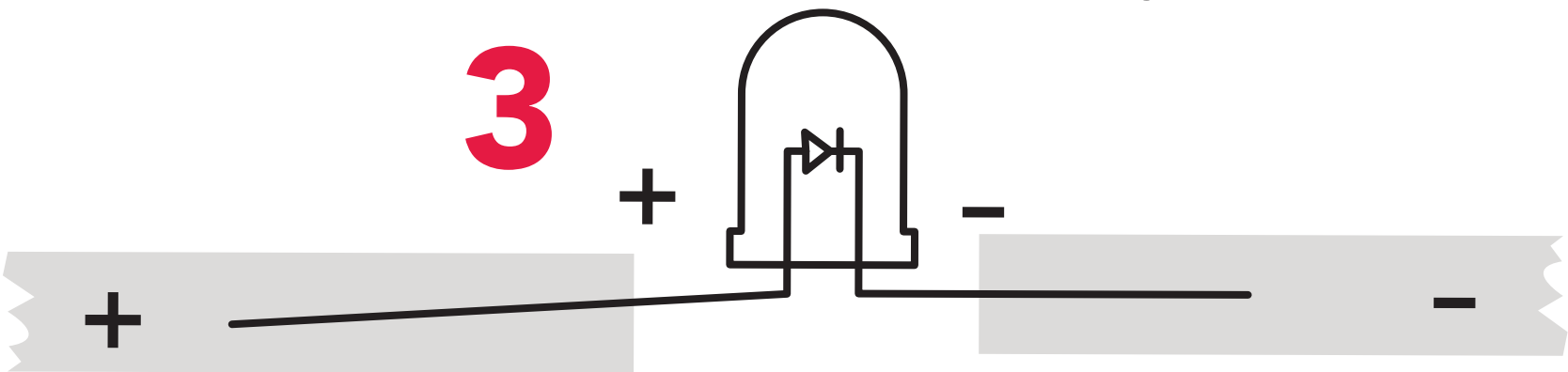
anode  
+  
cathode  
-

2



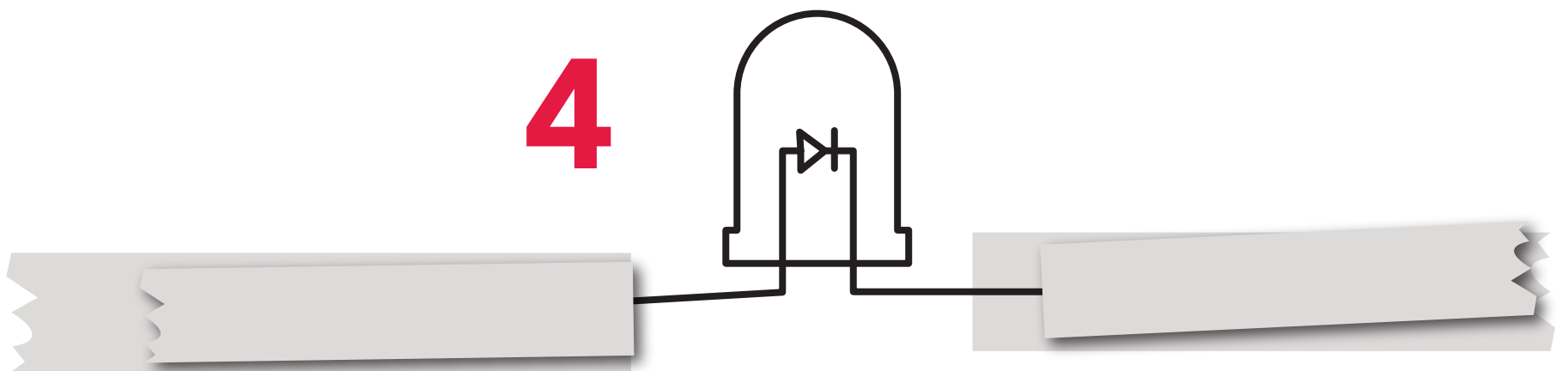
Gently bend the leads.

3



Place the LED onto the copper tape.  
Be sure to match positive with positive  
and negative with negative.

4



Now cover the ends of the leads  
with little pieces of copper tape.  
Press the tape down very well.

# WHAT CAN LIGHT UP?

lighthouse

car headlights

train

porch light

cell phone

stars

robot

lightbulb

camera flash

elevator buttons

## WHAT WOULD LOOK COOL WITH A LIGHT?

crazy eye

gold tooth

a good idea

diamond ring

campfire

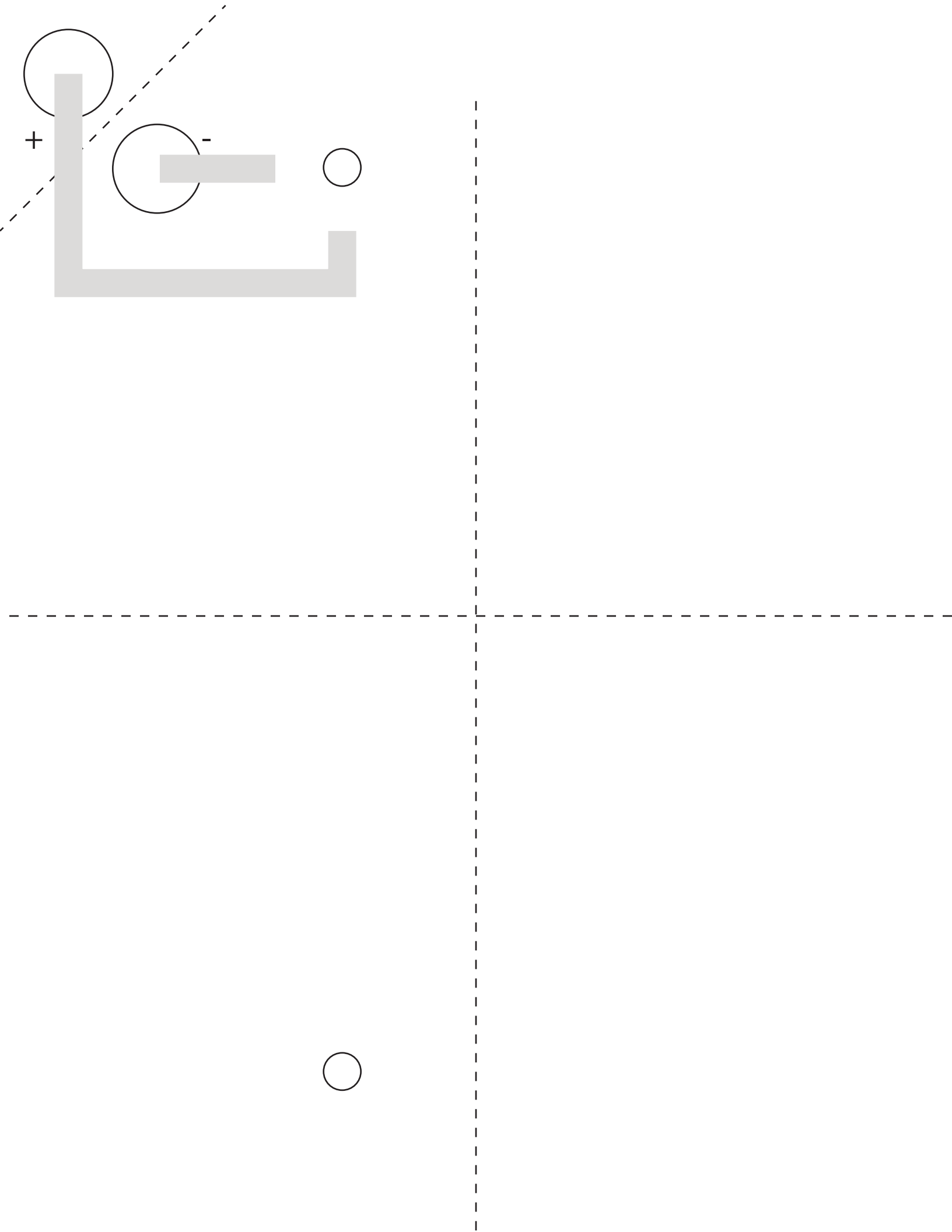
super hero

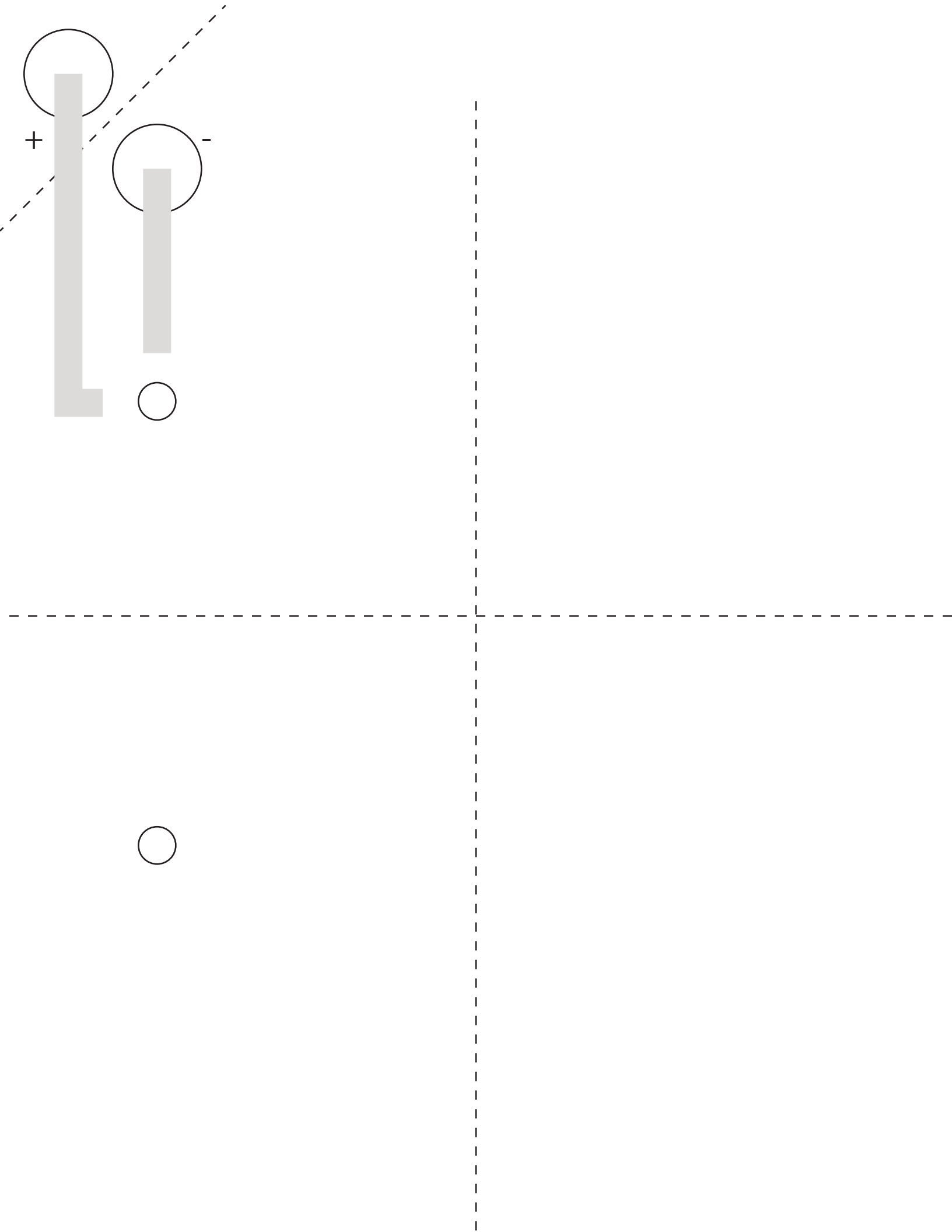
hurting finger

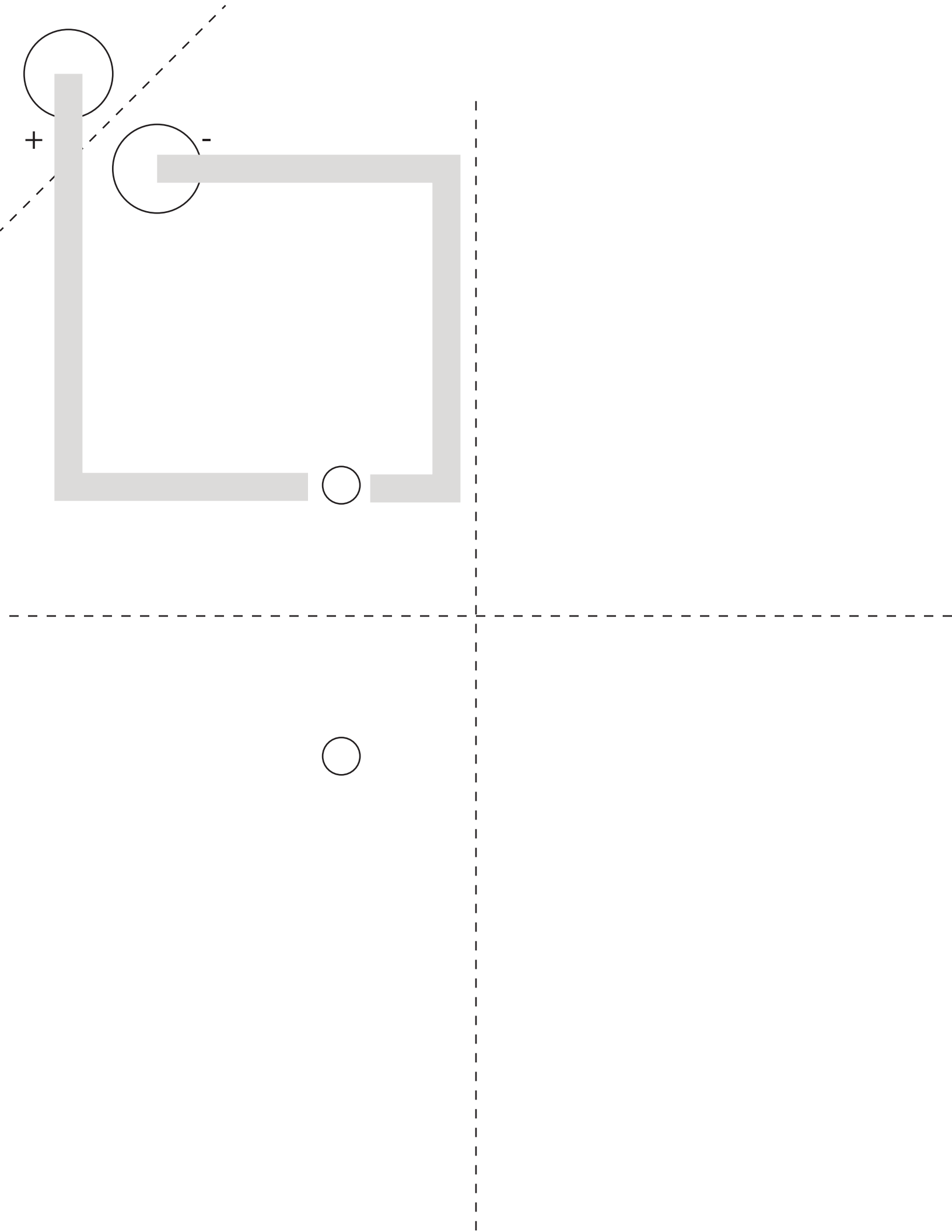
piece of candy

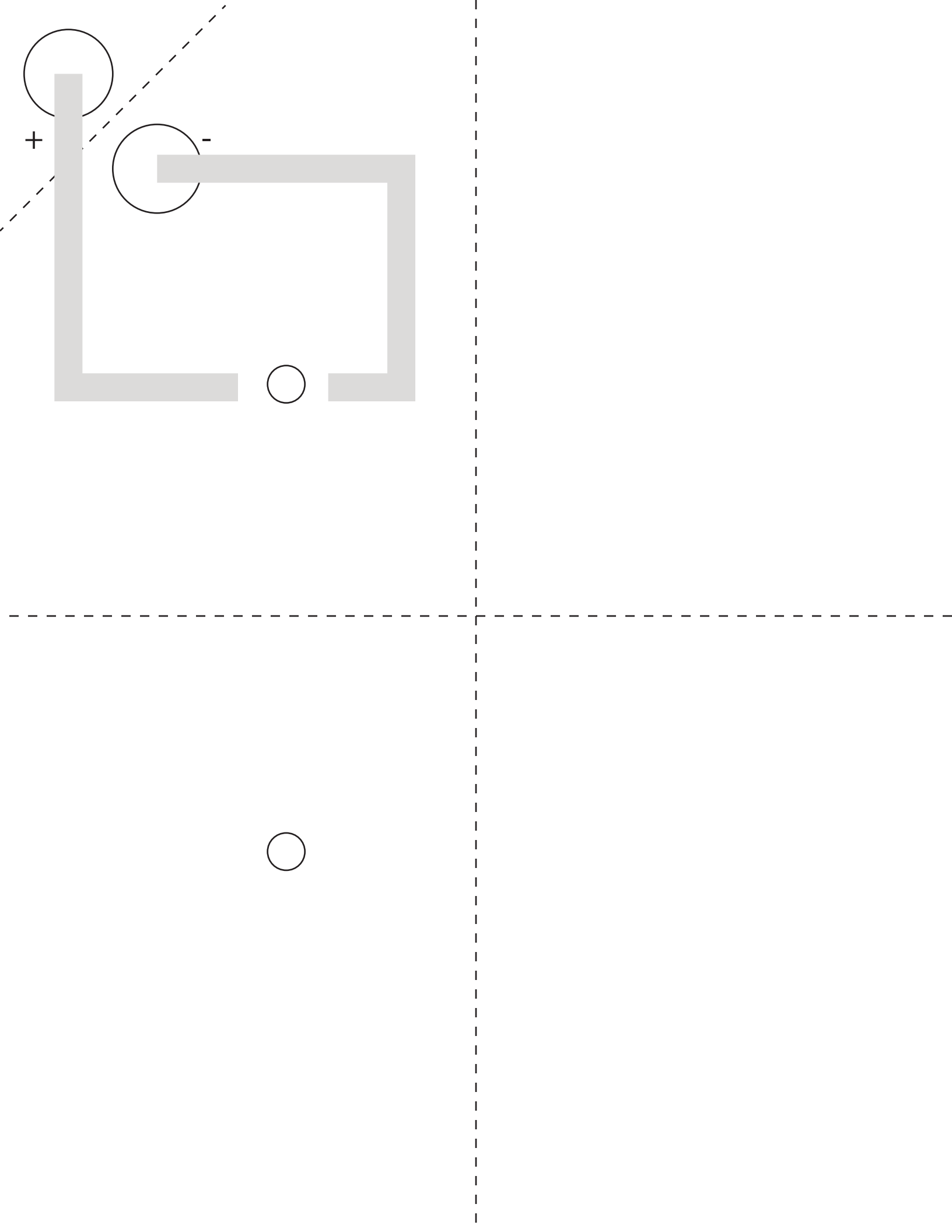
Rudolph's nose

## WHAT ELSE?









## Paper Circuits Materials List

<a href="#">Copper Tape (55 yds)</a> Conductive adhesive tape for making circuits	<a href="http://www.amazon.com/inch-yds-Copper-Foil-Tape/dp/B00CBPK0FW/ref=sr_1_3?ie=UTF8&amp;qid=1439156499&amp;sr=8-3&amp;keywords=copper+tape">http://www.amazon.com/inch-yds-Copper-Foil-Tape/dp/B00CBPK0FW/ref=sr_1_3?ie=UTF8&amp;qid=1439156499&amp;sr=8-3&amp;keywords=copper+tape</a>
Box of <a href="#">3V Coin Cell Batteries (100)</a> You need one battery per project	<a href="http://www.amazon.com/Maxell-CR2032-Lithium-Battery-Batteries/dp/B001RID9ZM/ref=sr_1_2?ie=UTF8&amp;qid=1432444678&amp;sr=8-2&amp;keywords=3V+coin+cell+battery">http://www.amazon.com/Maxell-CR2032-Lithium-Battery-Batteries/dp/B001RID9ZM/ref=sr_1_2?ie=UTF8&amp;qid=1432444678&amp;sr=8-2&amp;keywords=3V+coin+cell+battery</a>
<a href="#">Packs of Small Binder Clips (144)</a> To act as a switch--holding the battery in place	<a href="http://www.amazon.com/Universal-Small-Binder-Silver-10200VP/dp/B00B9GTBYA/ref=pd_sim_229_1?ie=UTF8&amp;refRID=1KPY9VKGBT7VTSXTVFK">http://www.amazon.com/Universal-Small-Binder-Silver-10200VP/dp/B00B9GTBYA/ref=pd_sim_229_1?ie=UTF8&amp;refRID=1KPY9VKGBT7VTSXTVFK</a>
<a href="#">White LEDs 5mm</a> Avoid using the colored bulbs because they can use different amounts of energy	<a href="http://www.amazon.com/Bluecell-White-Electronics-Ultra-Bright/dp/B005ONQ41W/ref=sr_1_2?s=hi&amp;ie=UTF8&amp;qid=1447344949&amp;sr=1-2&amp;keywords=5mm+white+LED">http://www.amazon.com/Bluecell-White-Electronics-Ultra-Bright/dp/B005ONQ41W/ref=sr_1_2?s=hi&amp;ie=UTF8&amp;qid=1447344949&amp;sr=1-2&amp;keywords=5mm+white+LED</a>
<a href="#">Sheet of Velostat</a> One piece will go a long way--use this to make the pressure sensitive fade switch	<a href="https://www.adafruit.com/products/1361">https://www.adafruit.com/products/1361</a>
<a href="#">Colorful Transparent Sheets</a> Totally optional--this is great to diffuse the light into different colors	<a href="http://www.amazon.com/Hygloss-Cello-Sheets-11-Inch-48-Pack/dp/B000K78HUI/ref=pd_sim_201_4?ie=UTF8&amp;refRID=1912NWQ9CYGA2SMW1HY1">http://www.amazon.com/Hygloss-Cello-Sheets-11-Inch-48-Pack/dp/B000K78HUI/ref=pd_sim_201_4?ie=UTF8&amp;refRID=1912NWQ9CYGA2SMW1HY1</a>
<a href="#">White Circuit Stickers</a> These are more expensive but easier to use--surface mount LED stickers. Choose these OR the bulb LEDs	<a href="http://store.chibitronics.com/collections/all/products/white-leds-megapack-30-stickers">http://store.chibitronics.com/collections/all/products/white-leds-megapack-30-stickers</a>