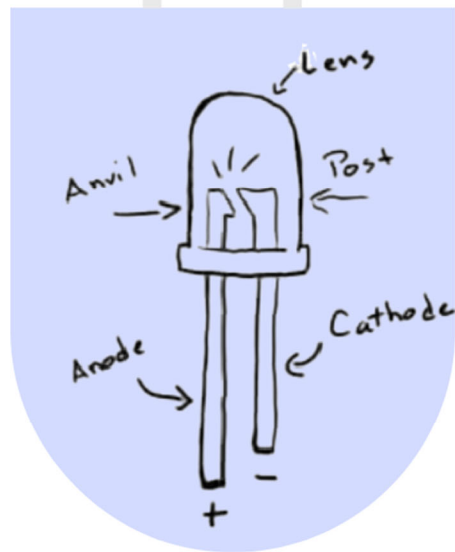


LED CARDS





K-STATE

Research and Extension

What's coming?

Step 1: Decorate

Step 2: Build a circuit

Step 3: Light it up!

Things to consider

- Make your connections secure
- Place the bulb so its not too close to the edge of the card stock.
- Pay close attention to the path of your circuit.
- Don't cross the copper tape.

Electric Symbols

positive +

negative -

battery | |

wire —

bulb ⊗

switch (closed) —○—○—

Materials

- Card stock
- Tape
- Copper Tape
- Button Battery
- LED light
- Art supplies
- Scissors
- Envelope

Vocabulary

- Anode - positive lead
- Cathode - negative lead
- Circuit - path followed by a flow of electric current
- Switch - a device that can break or close a circuit
- Short - an unintended path electricity flows through

STEP 1: DESIGN YOUR CARD

Draw a picture or design.
Decide where your light will go.



STEP 2: MAP THE CIRCUIT

- 1) Poke a small hole for the LED to go through.
- 2) Flip the card over so you can see the back.
- 3) Draw a + on one side of the LED hole. Draw a - on the other side of the LED hole.
- 4) Draw a Rectangle to plan the path of the Simple Circuit. Take the drawn line very close to the + and the - for one side of the rectangle. Draw a quarter sized circle on the opposite side of the rectangle.



STEP 3: RUN THE CONDUCTORS

1) Cut copper tape that is just a little bit longer than the newly drawn rectangle sides. The copper tape is critical for the success of the circuit. Copper is a conductor, and allows electricity to flow to the LED bulb.

2) Lay copper tape over the lines that were drawn. Do not stick down the copper tape on the negative side of the battery. Leave it flappy. Cut the copper tape to leave a gap at the LED hole and the battery site.



STEP 4: SECURE THE CONNECTIONS

1) Insert the LED into the card. Make certain the longer lead, the anode, is on the positive side and that the shorter lead, the cathode, is on the negative side. Bend the leads to line up with the copper tape on their correct side.

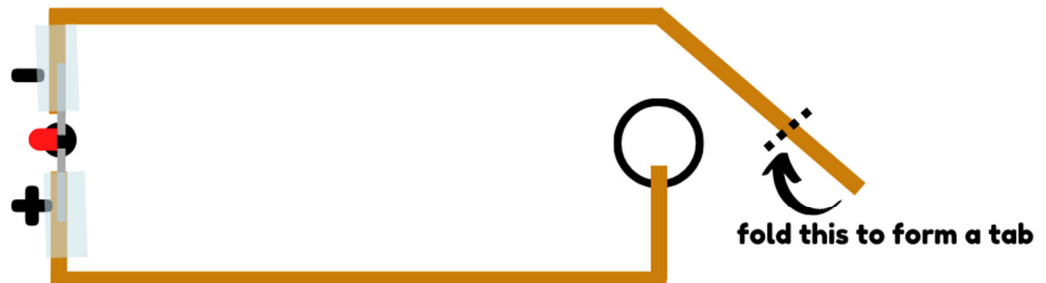
2) Secure the LED leads to the copper tape using scotch tape. Press firmly and make certain the tape fits tightly.



STEP 5: FORM THE SWITCH

1) Fold the end over on the flappy portion of copper tape so that the sticky sides stick together. Ensure that there is enough length for the flap to touch the center of the circle that is the battery placeholder.

2) Press the remainder of the tape that is still sticky down to the card stock.



STEP 6: POWER IT UP!

- 1) Using two glue dots, affix the positive side of the battery down to the card stock. The textured negative side should be facing up.
- 2) Lay the tab over the negative side. When connected, if everything is securely connected, the LED will light up.
- 3) If desired, cover the circuit with another sheet of card stock to hide it from view.
- 4) Congrats! The card is finished!



CHALLENGE YOURSELF!

What did you learn?

Current flows and follows a path called a _____.

There are two leads sticking out of the LED. The positive lead, or + side is called an _____. The negative lead, or - side, is called a _____.

Current flows and follows a path called a _____.

In a circuit, a _____ is used to open or close a circuit.

Electricity wants to take the fastest path to ground. If conductors shorten the path and allow the current to skip the LED and find a faster path to the ground, electricians call that a _____.

MAKE THE BEST BETTER.

Learn about series and parallel circuits

Use your new knowledge to make a light up poster

Make a quiz using this technique. Have the correct answer light up green and the incorrect answer light up red.