

teknikio

Fabtronic Sewing guidebook

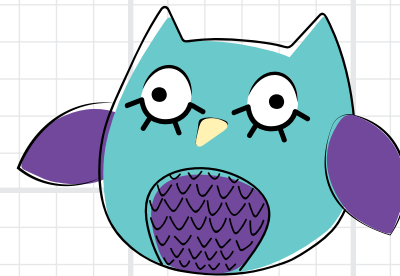


TABLE OF CONTENTS

3. MATERIALS
CHECKLIST

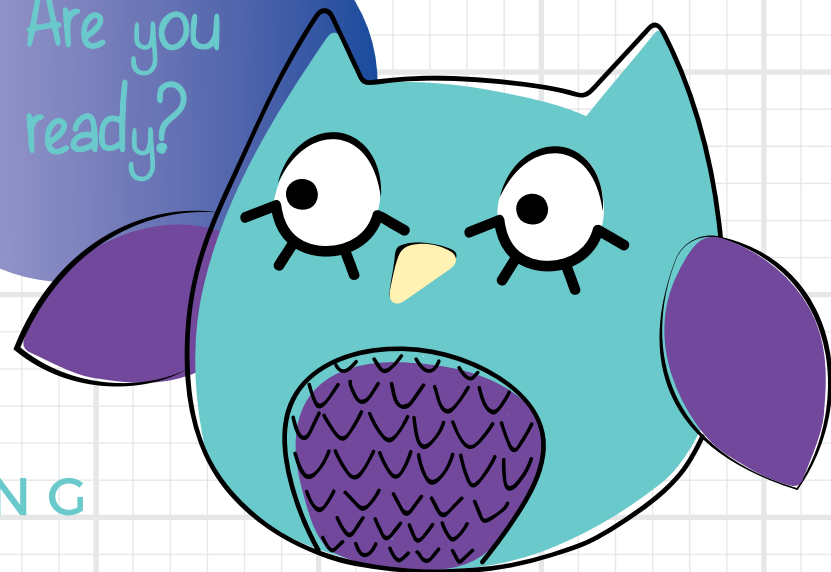
7. BASIC
SEWING

15. PROJECT
GUIDE

22. TROUBLESHOOTING

25. OWL
PATTERN

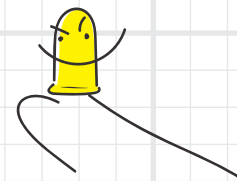
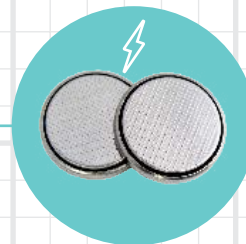
Are you
ready?



YOUR MATERIALS

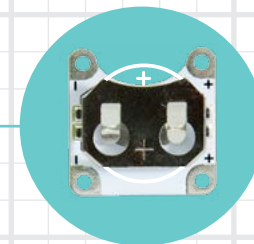
2x COINCELL BATTERIES

This small battery can provide power and fit in tight places. You can connect this to your circuit for power—just make sure that the positive side connects to the positive end and the negative side (or ground) connects to the negative end.



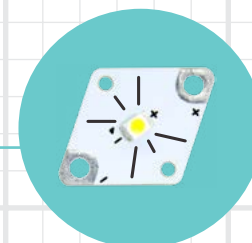
1x SEWABLE COINCELL BATTERY HOLDER

You also have a sewable battery holder in your kit, with conductive holes marked as positive and negative. When inserting your battery in the holder make sure the side with the “+” is facing up and the unmarked side (sometimes perforated) is facing down.



2x SEWABLE LEDs

The LEDs in your kit are smaller surface mount LEDs, so the positive and negative sides are marked next to the silver holes you will use to sew the LED on.



YOUR MATERIALS

1x CROSS STITCH CLOTH

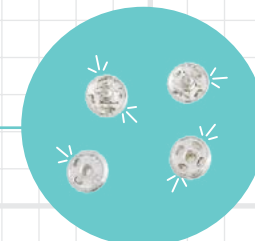
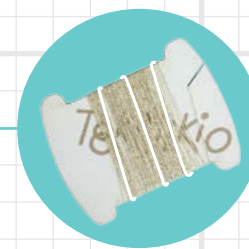
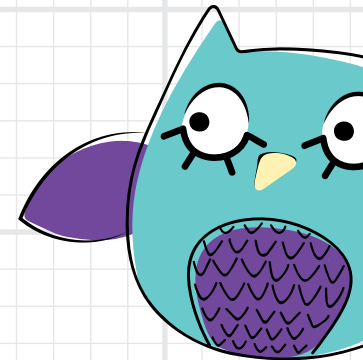
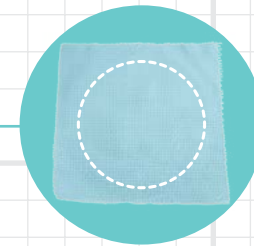
This is your prototyping canvas. The holes in the cloth help you sew the thick conductive thread through the cloth. You can draw and stitch your favorite fabric circuit design onto this cloth!

1x SPOOL OF CONDUCTIVE THREAD

This thread has silver strands which are conductive. The silver in the thread lets electrons pass through the thread and allows it to carry or transmit power and signals through a circuit. Steel is another metal commonly used to make conductive thread.

4x FABRIC SNAPS

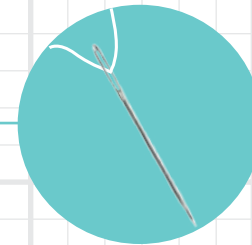
These can be used to hold pieces of fabric together like buttons, or you can sew them into circuit and use them as a switch!



YOUR MATERIALS

1x SEWING NEEDLE

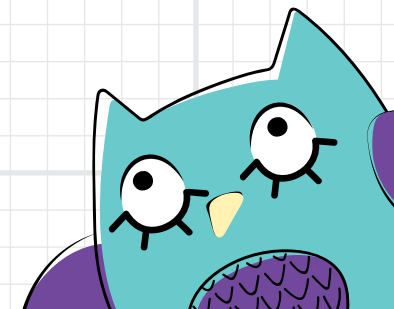
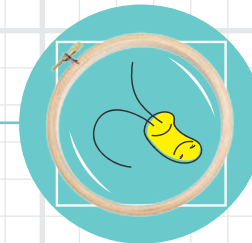
This is what you will use to sew your project together. Be careful, the needle has a sharp point!



1x EMBROIDERY HOOP

(Retail box version only)

This is a tool used to hold fabric in place. To use: unscrew the bolt so the rings come apart, then place your fabric flat in between them and tighten the bolt. We recommend you practice sewing with your hoop, and then take apart the project and sew the lights on a new piece, unless you are an experienced seamstress.



ADDITIONAL TOOLS AND MATERIALS

Here is a list of tools and supplies that complement your set.
We also encourage you to combine this set with other [Teknikio](#) sets.

MATERIALS AND TOOLS

Fabric and Thread
Cotton Stuffing
Sewing needle/machine
Scissors

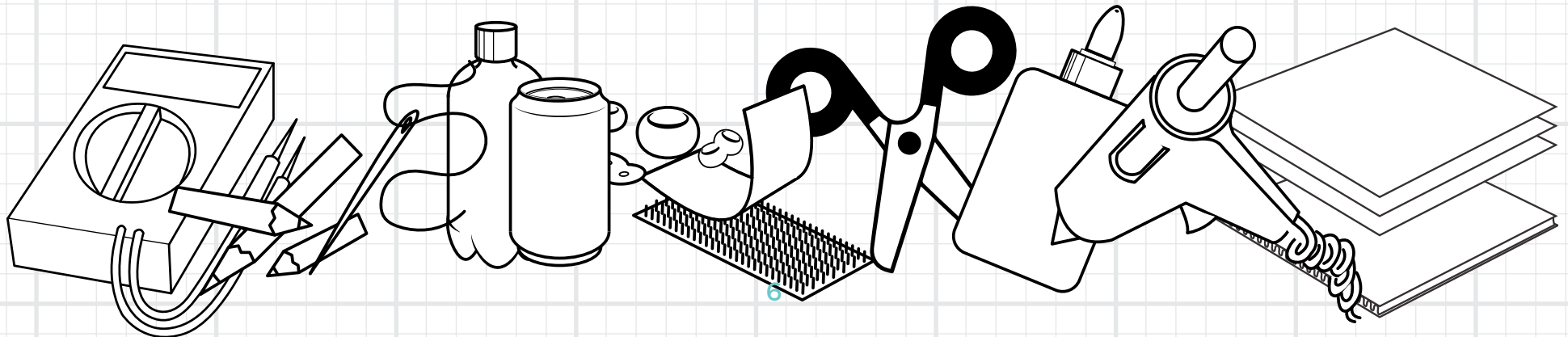
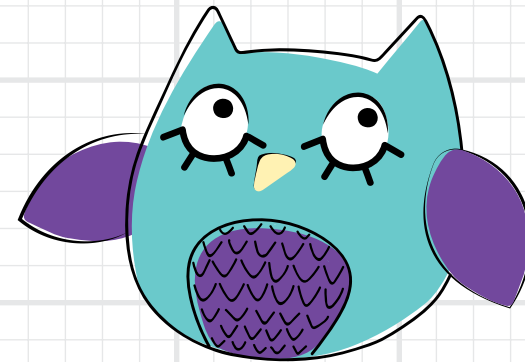
OPTIONAL MATERIALS

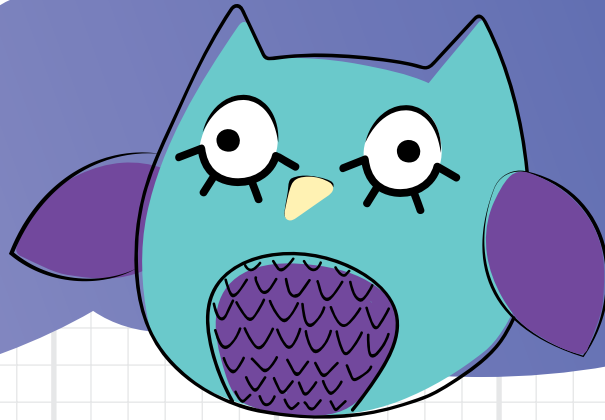
Velcro
Paper
Cardboard
Scrap metal and plastic
Beads and sequins

OPTIONAL TOOLS

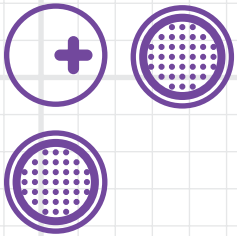
Wire cutters/strippers
Glue/hot glue
Multimeter

Ready to
learn?

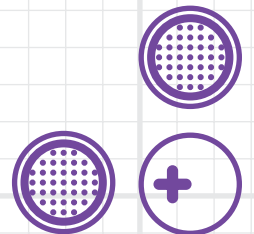




This guidebook teaches you how to sew light circuits into your own creations.

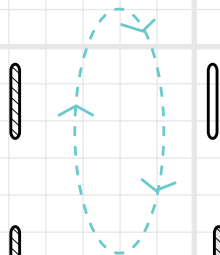
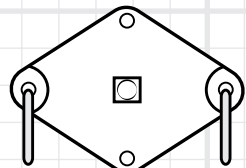


Basic Circuits



BASIC CIRCUITS

The next section will provide a review of basic electronics and how a circuit works.



flow of electricity

Things to remember:

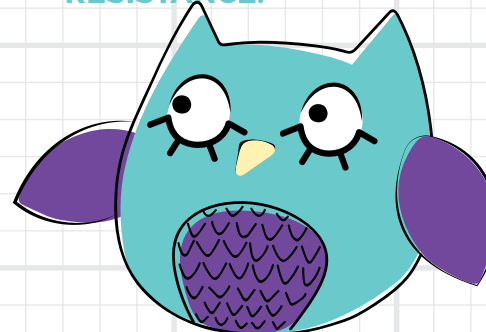
A CIRCUIT IS ALWAYS A LOOP.

ELECTRICITY FLOWS FROM POSITIVE TO NEGATIVE AROUND THE LOOP.

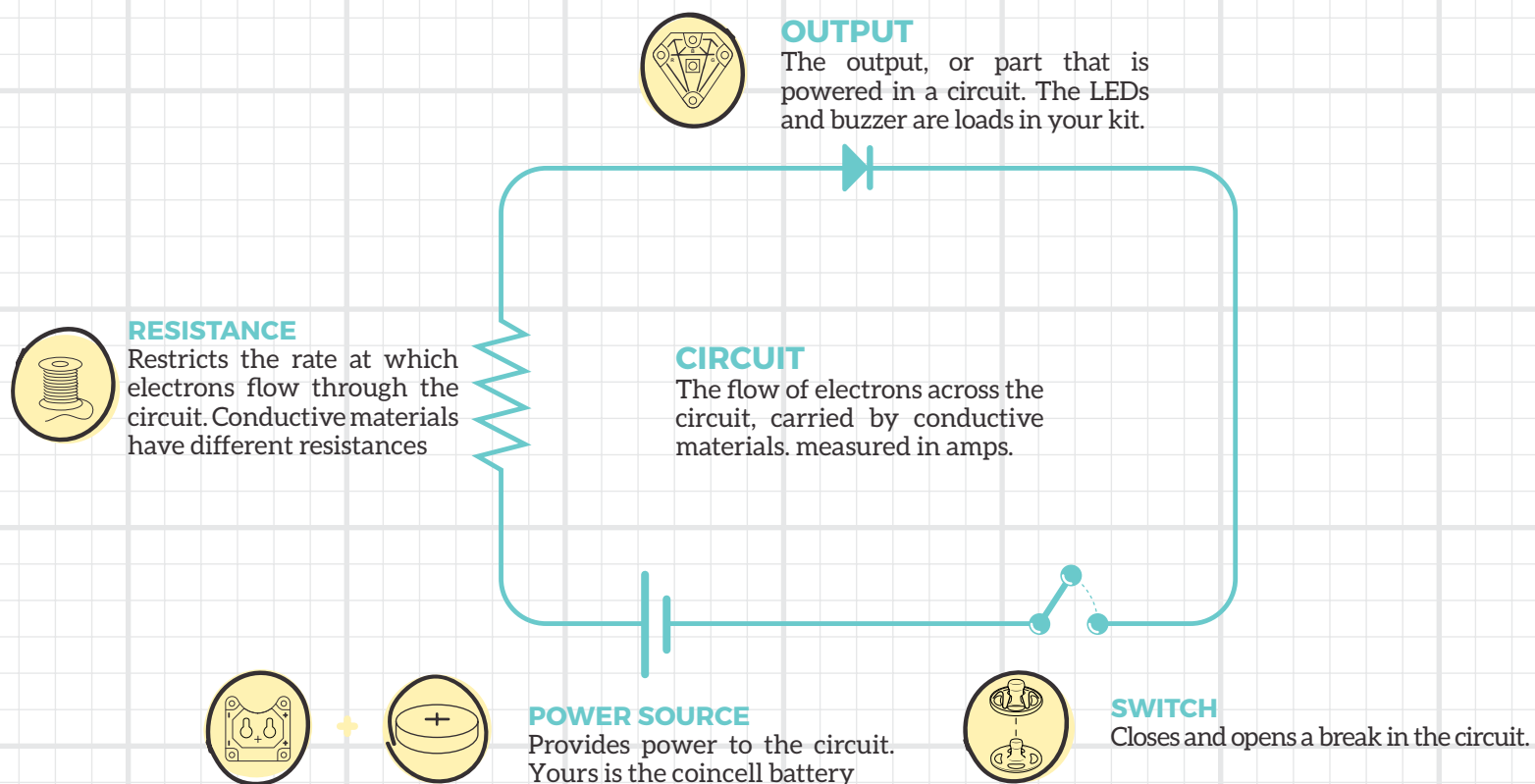
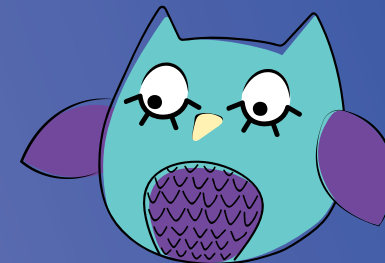
EVERYTHING IN THE CIRCUIT MUST BE ORIENTED IN THE SAME DIRECTION FOR THE CIRCUIT TO WORK.

ANYTIME A COMPONENT IS PUT INTO THE CIRCUIT BACKWARDS, IT CAUSES A BREAK IN THE CIRCUIT, MEANING IT BREAKS THE LOOP.

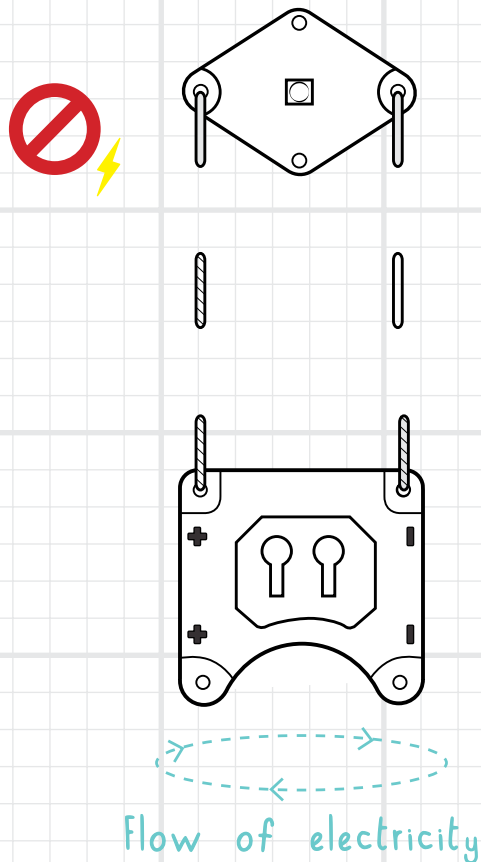
ELECTRICITY WILL ALWAYS TAKE THE PATH OF LEAST RESISTANCE.



CROSS-STITCH SWITCH



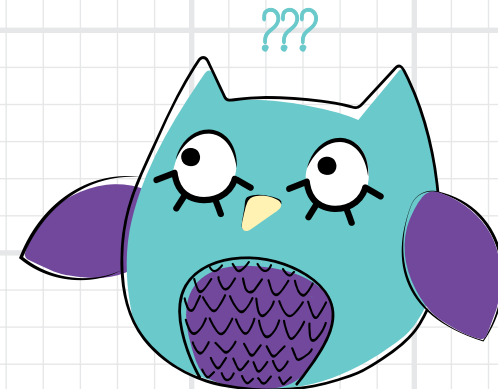
SHORT CIRCUITS

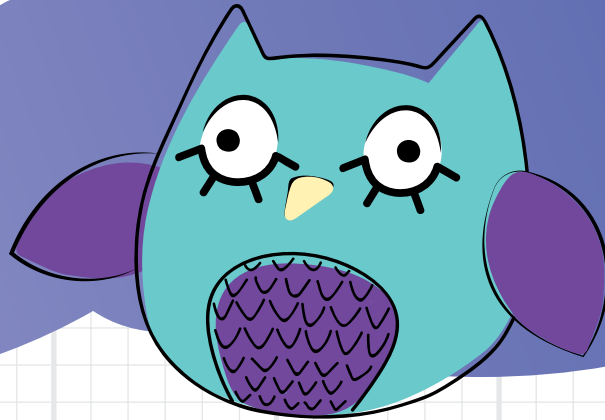


If you were to connect the circuit line in the diagram to the left, the current will flow through the shorter (yellow) path and skip the path that connects to the LED.

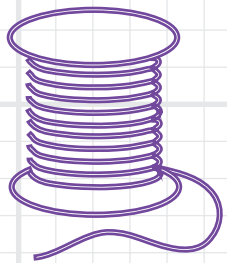
This will result in a **short circuit**—a short circuit is basically equivalent to connecting from the positive end of the power source to the negative, without putting anything in between.

This will drain or “burn out” your battery very quickly. You should always make sure there are no short circuits in your design.





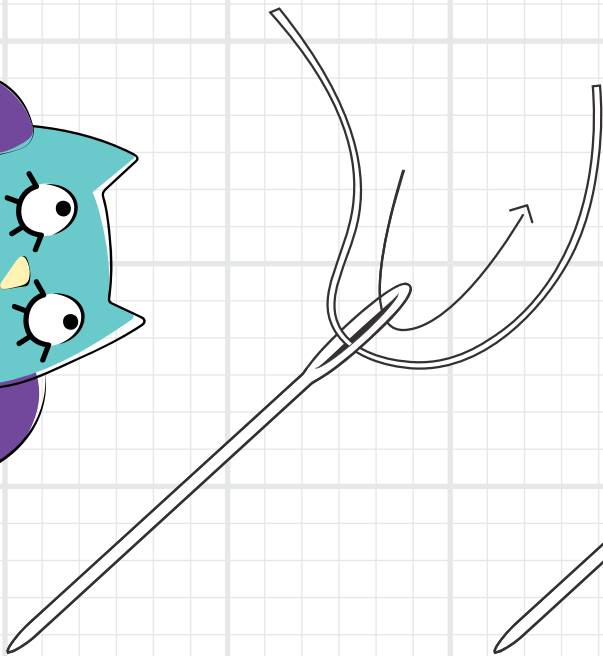
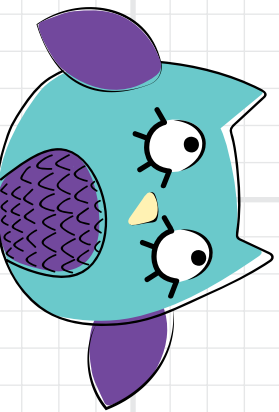
Basic



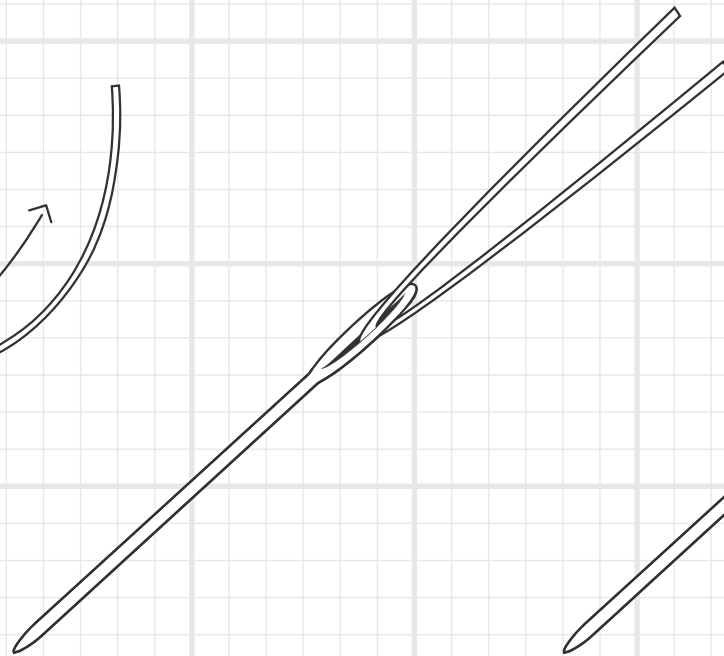
Sewing

HOW TO THREAD A NEEDLE

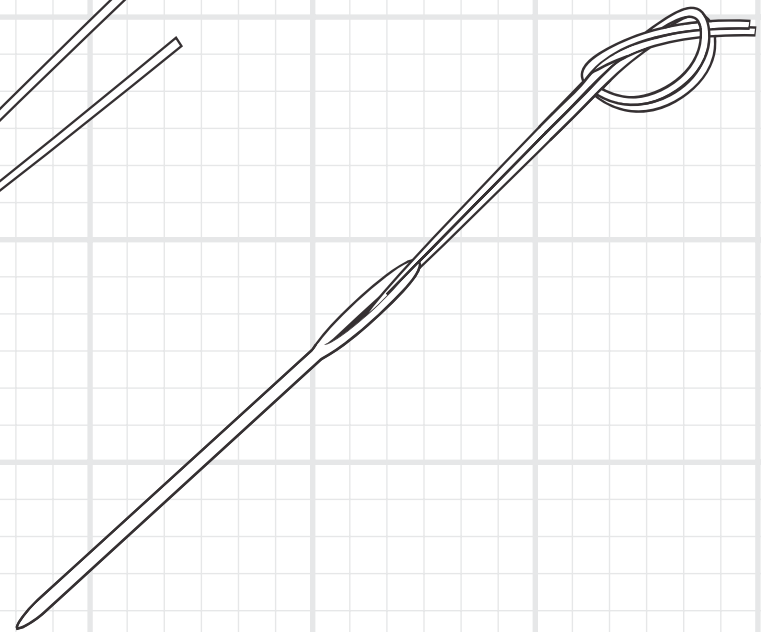
Cut some thread. Stick one end of your thread through the eye of the needle



Pull your thread until it is folded in half on the needle



Take the two ends of the thread and tie a knot



HOW TO SEW

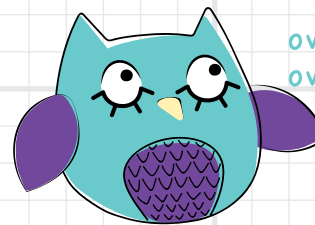
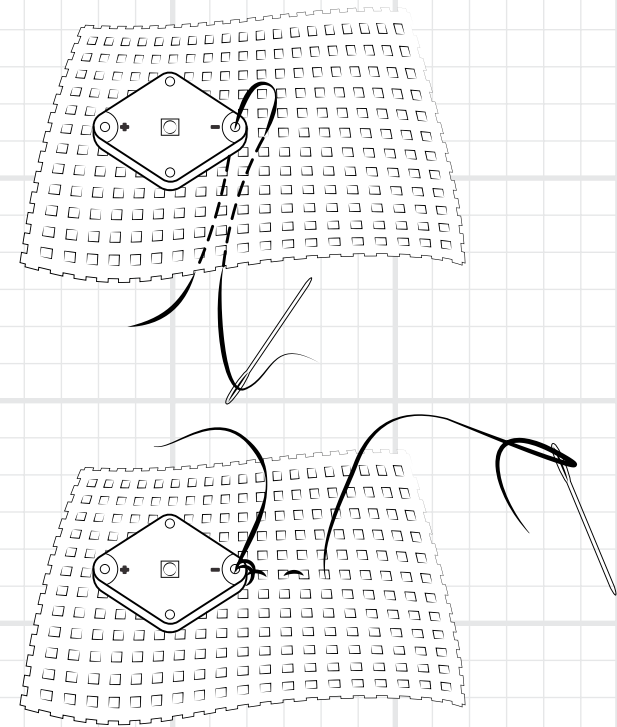
Take your **Cross Stitch Cloth**, your **threaded needle**, and a **Sewable LED**.

First, place the LED where you want to sew it onto the cloth.

Then, take your needle and thread and, starting from the back, push your needle through the cloth and the positive or negative pad of the LED.

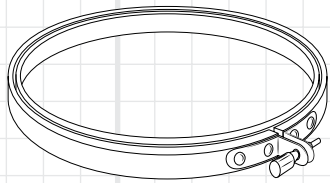
Loop the thread through the hole and cloth multiple times so the LED is secured tightly.

After looping a few times, push the needle down through the hole next to the LED. Push the needle up through the next hole and repeat up and down until you are done or reach the next thing you want to sew

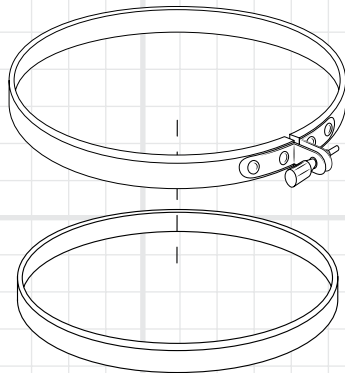


USING YOUR EMBROIDERY HOOP

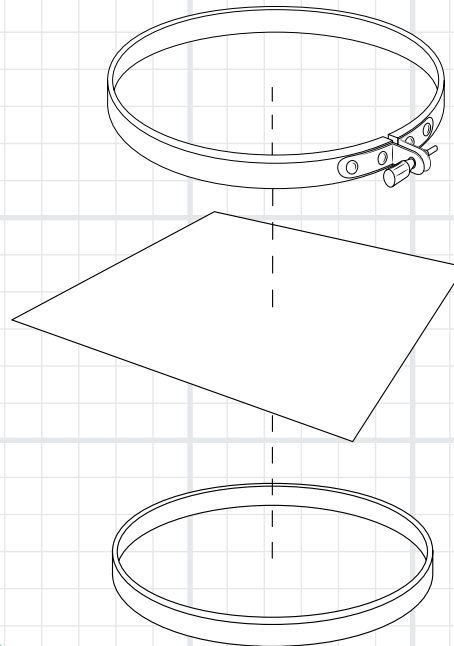
Take your embroidery hoop



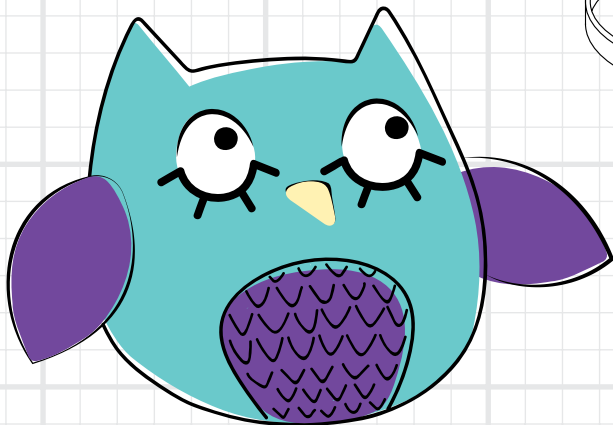
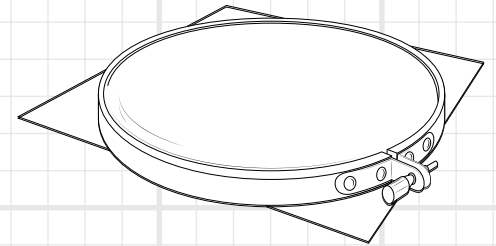
Loosen the screw and take the hoops apart



Place your fabric between the hoops



Put the hoops back together and tighten the screw



CROSS-STITCH CIRCUIT PRACTICE

1

There are 2 separate pieces of thread in this circuit:

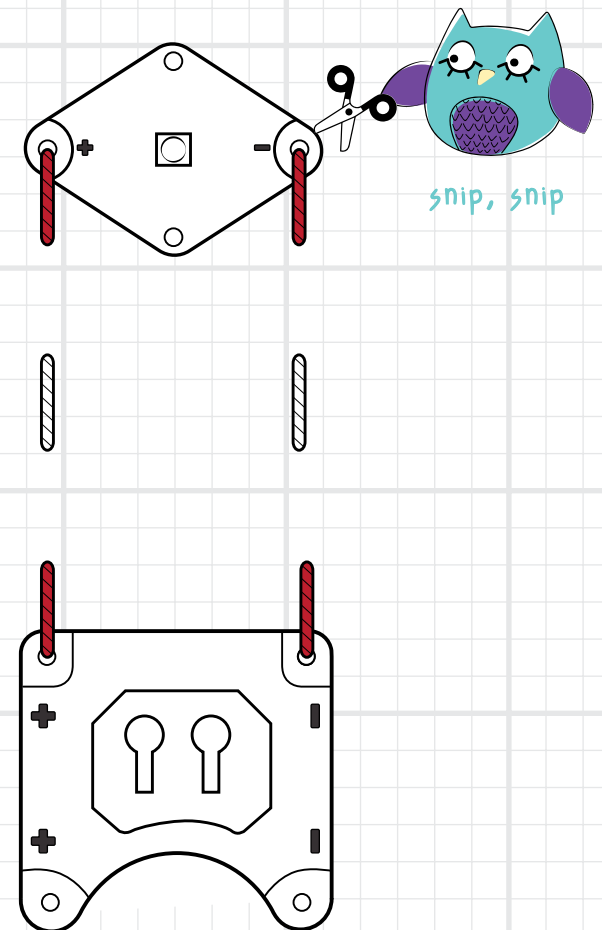
Sew one thread between the negative terminal of the battery and the negative side of the LED

2

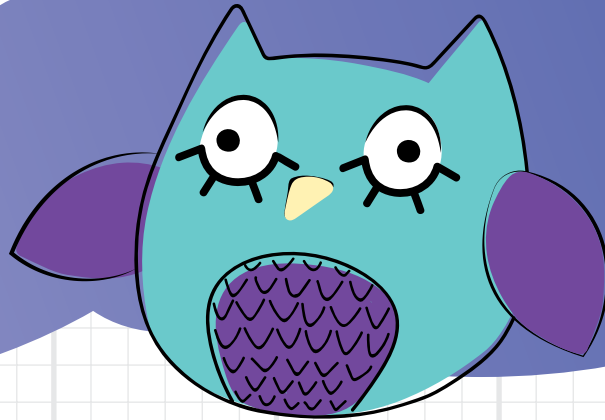
Sew the other thread between the positive side of the battery and the positive side of the LED. It should light up.

The red stitches indicate where the thread ends.

Once you get to a red stitch or a hole on the board, tie a knot, cut the thread, and start with a new piece. When you are sewing around a silver hole on the board, make sure to go around it a couple of times to make sure it is tight.



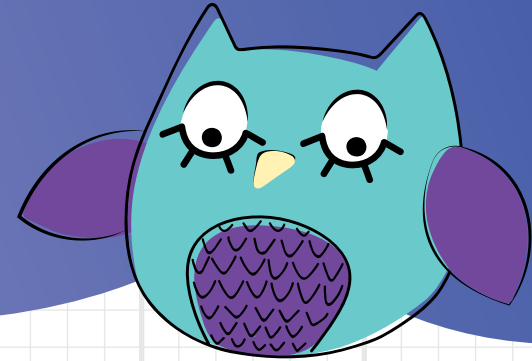
LIGHT UP
YOUR EYES



Owl project guide

Want to make something else? Find more ideas and tutorials @ www.teknikio.com/learn

SEWING YOUR OWL



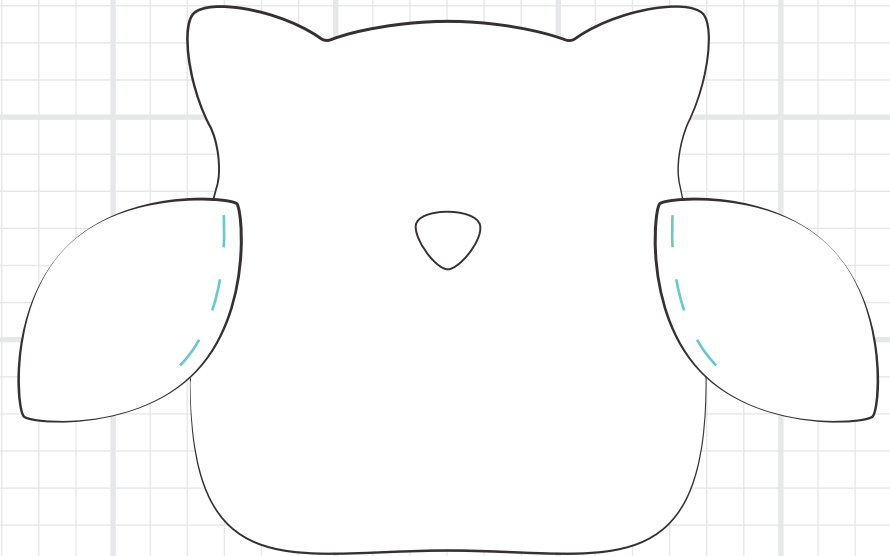
do not lose
any pieces!



Cut out the owl pattern from the back of this guide onto the fabric of your choice. Make sure you know what each piece is for!

Place the piece for the beak onto the front body piece and sew it on with non-conductive thread (Shown in blue).

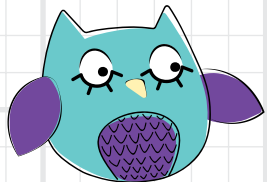
Sew the wings onto the body with non-conductive thread. So that it lays flat on the front of the owl's body and angles away from the body.



ATTACH THE EYES

2

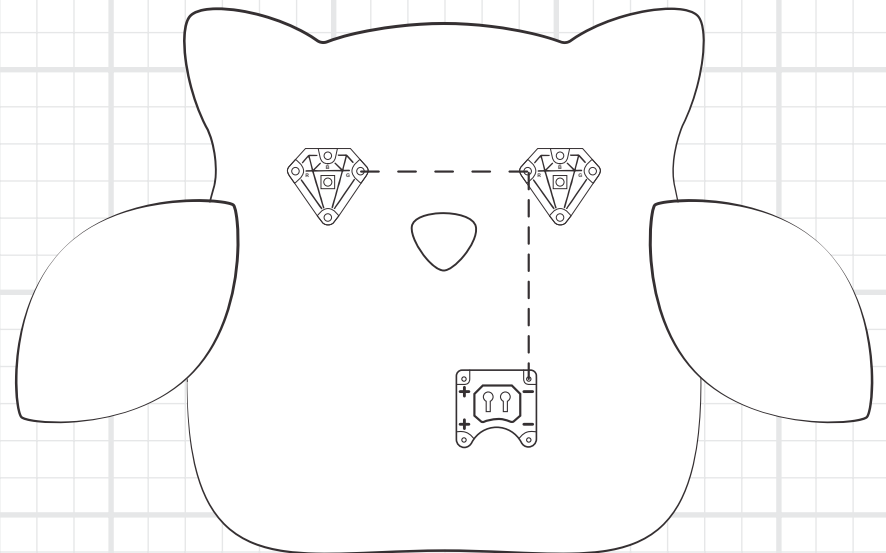
Now take the front body piece and place two **Sewable LED** lights where you want the eyes. Sew a connection between like you did during your practice between the negative pads on each board. Don't forget to loop around the eye pads a couple of times.



Always sew the positive side to another positive side and a negative side to another negative side. If you do not do this, your lights will not turn on!

3

Take your **Sewable Coincell Battery Holder** and place it as close to the center of the belly as you can. Starting from the negative pad of the second LED that you just attached, sew to the negative pad on the battery. Tie a knot and cut your thread.



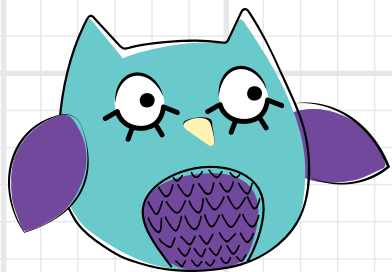
SEWING THE CIRCUIT

4

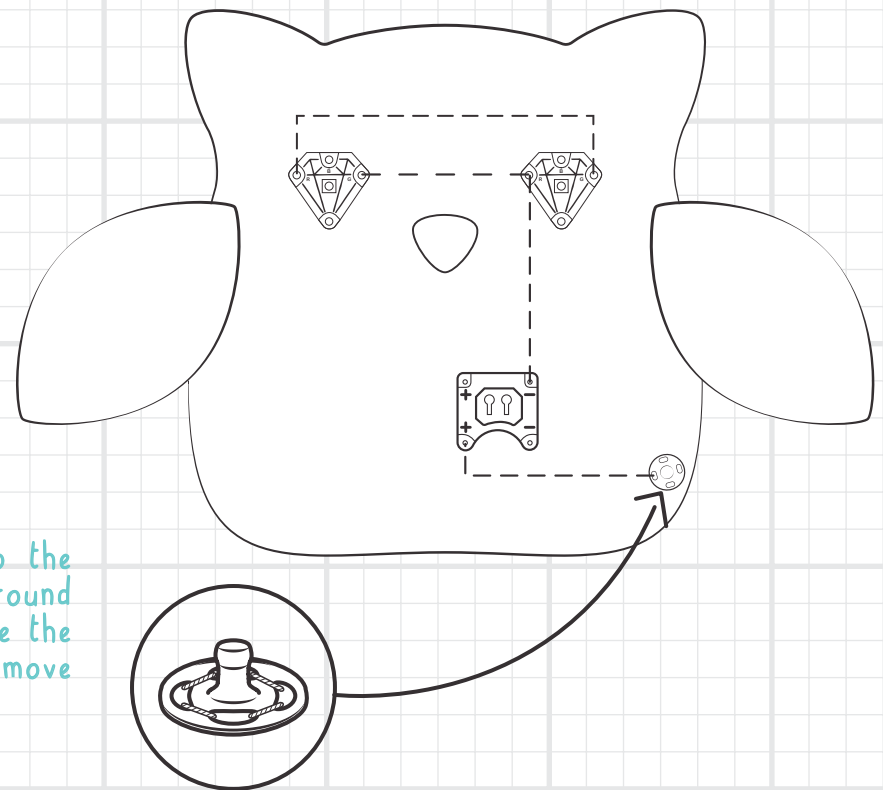
Re-thread your needle if you need. Now sew the two positive holes together on the eyes. Make sure not to touch the thread that connects the negatives to avoid a short circuit. Tie a knot and cut your thread.

5

Next, take the bottom side of one of the snaps and place it on the body below the battery holder to the right. Sew from the positive hole on the battery holder to the snap like in the diagram. Tie a knot and cut your thread.



To sew the snap onto the body, sew in and out around all four holes to secure the snap so it does not move around.



ADD THE BACK AND THE SNAPS

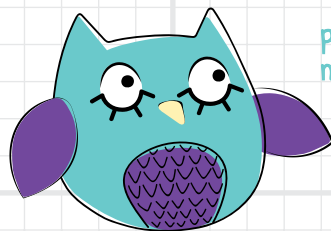
6

Working on the **underside of the wing**, sew the top side of the snap so that it matches up with the bottom snap when connected. Connect this snap with the positive pad on the right LED board. Tie a knot and cut your thread

7

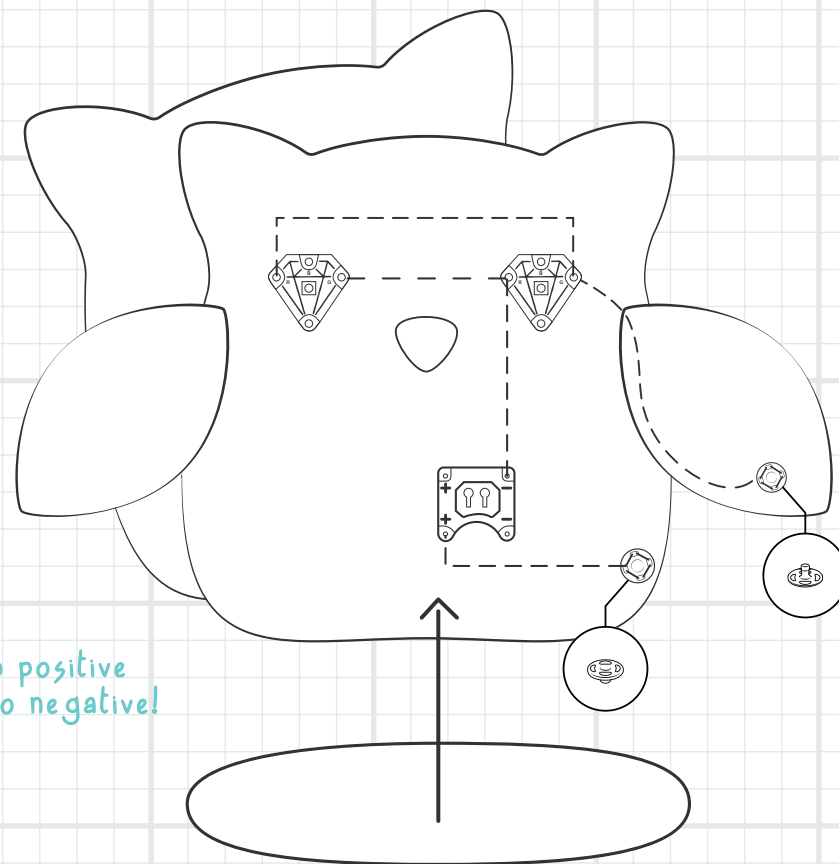
Now thread your needle with non-conductive thread. Take the belly panel and line it up with the bottom of the front panel. Sew the belly piece over the battery holder, leave a small opening on the top so that you can access the battery!

Take the back body panel and sew the bottom and sides back body piece to attach it to the front panel. They should line up nicely!



positive to positive
negative to negative!

20

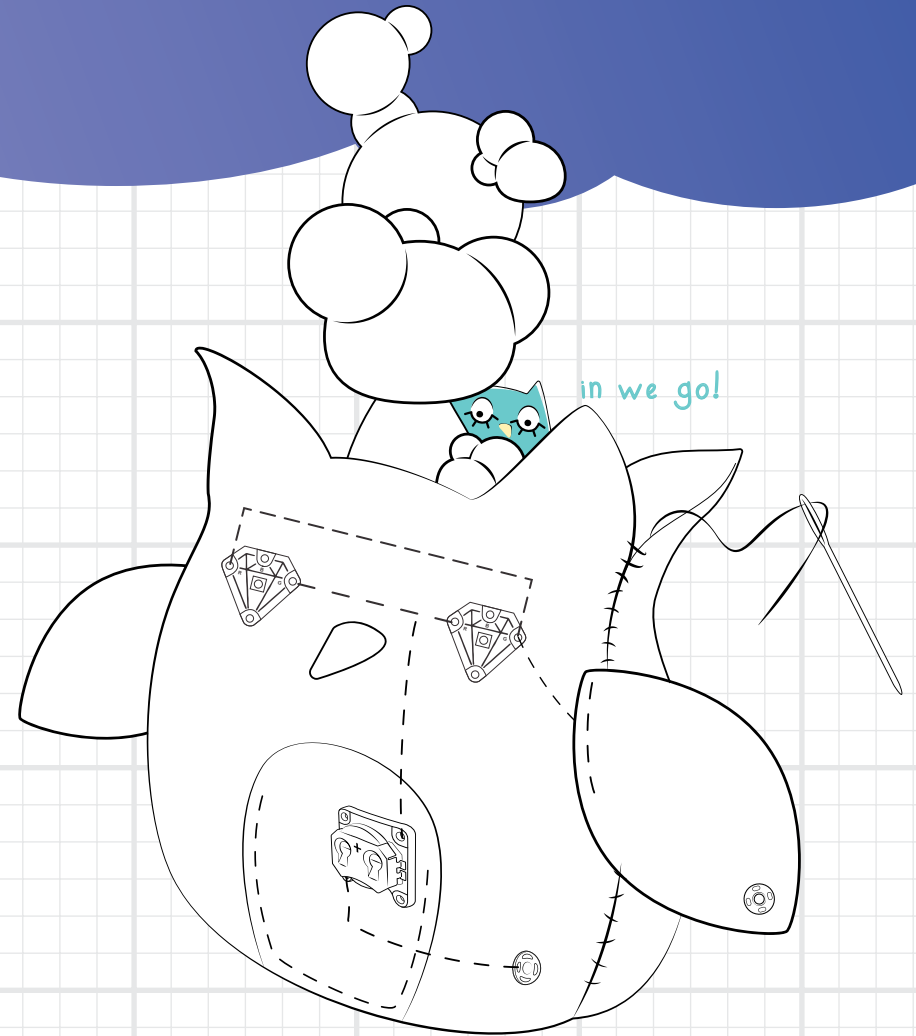


STUFF THE OWL!

8

After you sew the bottom and sides of the body together, stuff with your cotton stuffing until the owl is as soft or firm as you like.

After you have stuffed your owl, sew the top of his head shut with non-conductive thread so no stuffing spills out.

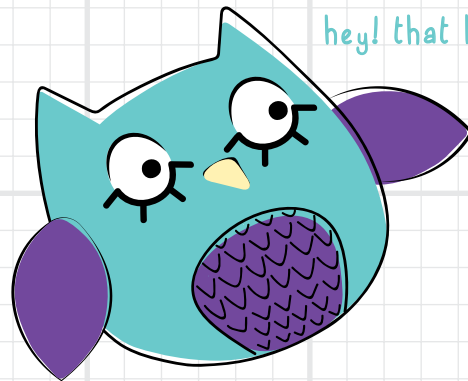


TEST YOUR OWL

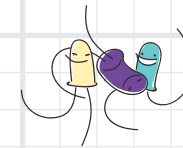
9

Your owl is all done! Now all you have to do is make sure it works! Insert the battery into the battery-holder so the positive side is up. Take the wing with the snap and connect it to the snap on the body. The eyes should light up. Replace the battery when necessary by reaching in the belly.

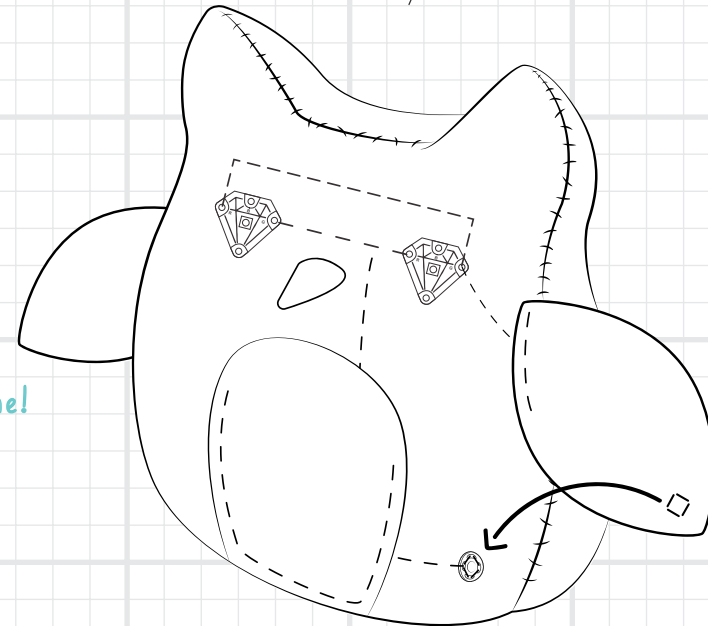
If they don't, refer to troubleshooting on page 21.



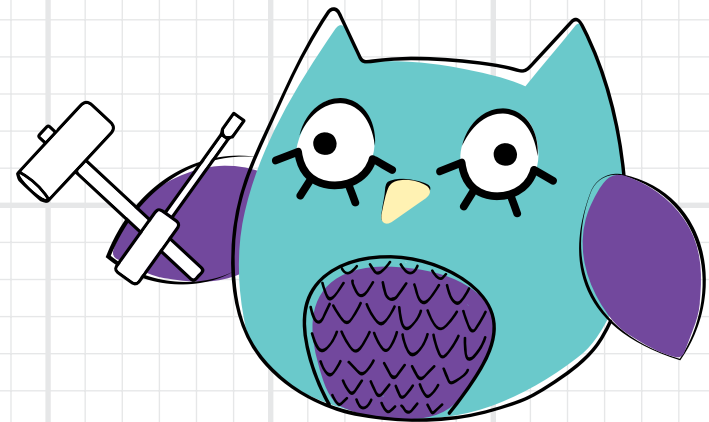
hey! that looks like me!



yay! new friends!

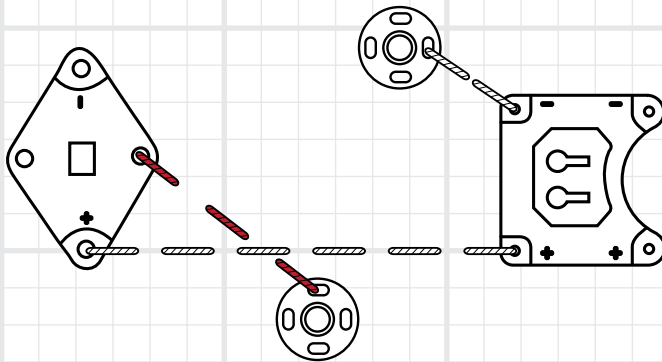


Troubleshooting



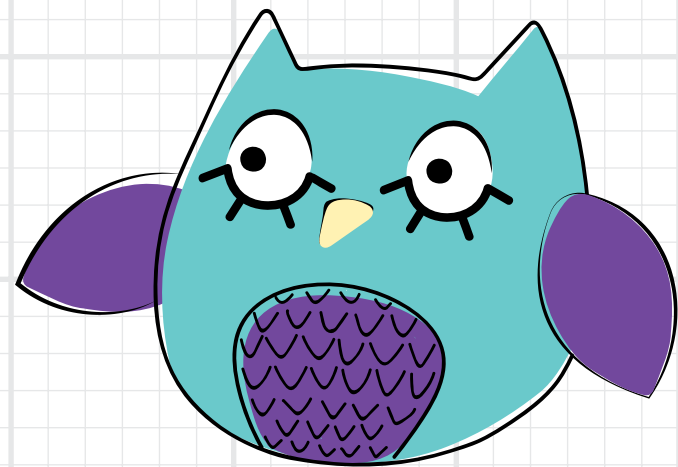
TROUBLESHOOTING

There are 2 common problems that can break the circuit. The first is that the positive and negative paths are crossing. Make sure none of your paths look like this:

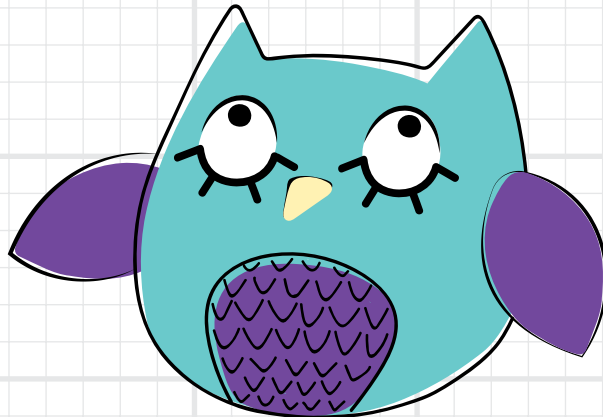


Then make sure none of the thread coming off the knots on the back of your circuit are touching.

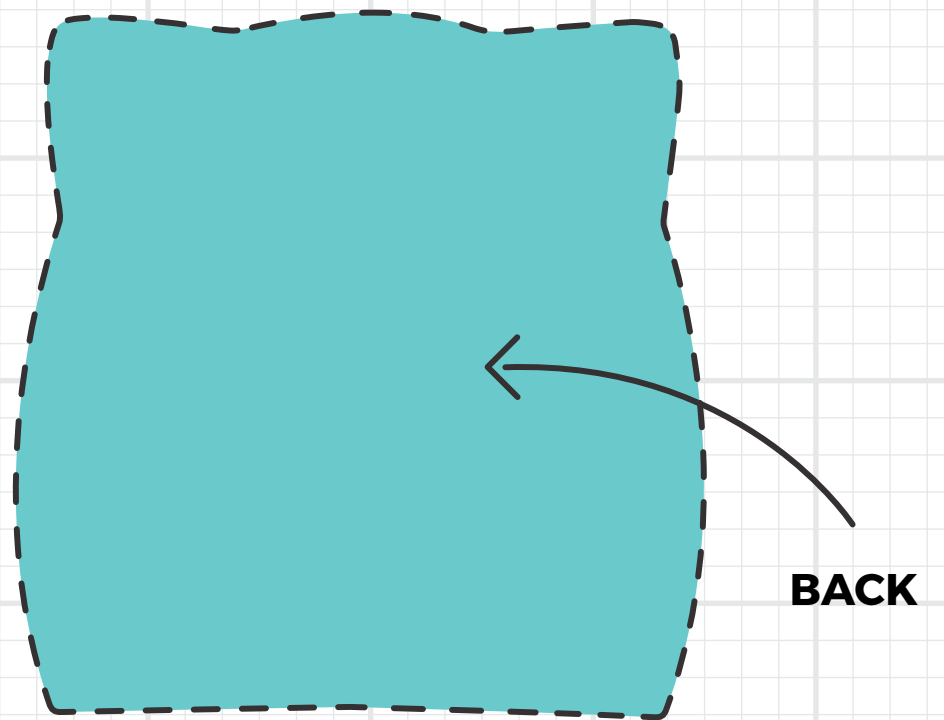
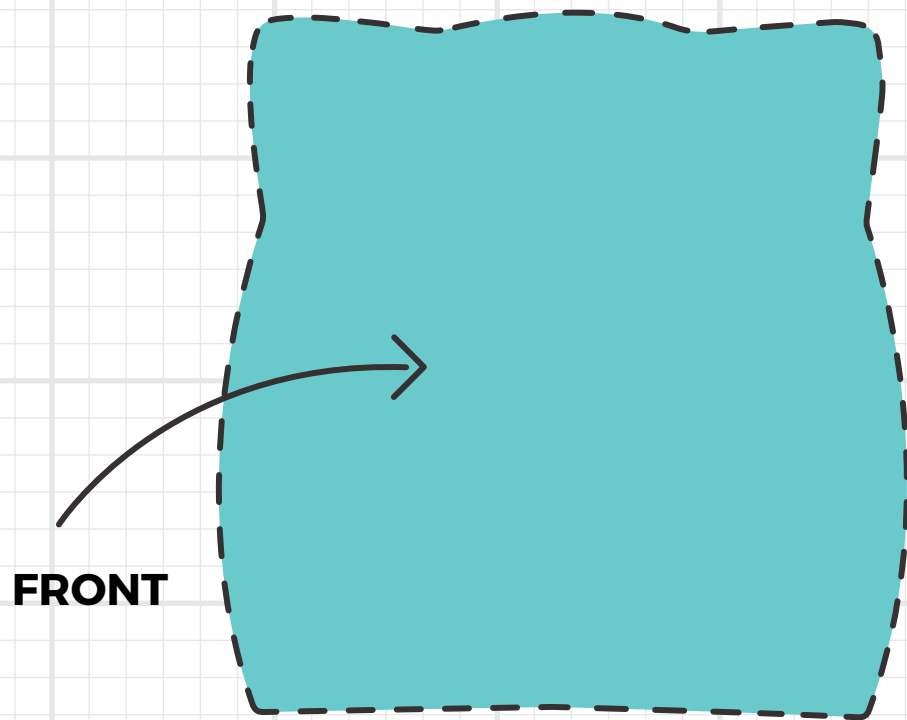
The second common problem is a bad connection. This can happen anywhere your thread is connecting to a board or snap. Make sure all of these connections are tight and that the thread is making good contact with the silver surface on the boards and/or with the snaps.



PATTERN



OWL PATTERN



OWL PATTERN

