eSewing Worksheet

Welcome to eSewing! By the end of this workshop, you should have a project you've designed, made, and sewed a small electric circuit into.

How to start:

First, **decide what you want to make**. A badge? A wristband? Your favourite animal? Feel free to use the examples for inspiration!

Once you've decided, **design your project on paper**. Make sure to consider where your LED light and battery holder will go, and make sure you use a material that can be sewed through (like felt or foam).

[photo: LED light]
[photo: battery holder]

You might want to think about hiding the battery, or making sure you will be able to sew to the pins of the LED once it is in your project.

When the design is done, get materials and **make the basic pieces** of your project! Hot glue, PVA glue, or regular thread can be used to attach pieces together. Please ask for help if you want to use the hot glue guns.

Once you feel ready to **start on the electronics**, ask a helper and they will explain which components (pieces of the circuit) you'll need.

How do I make a circuit?

Once you've asked a helper for materials, you will probably have: a small battery, a battery holder, an LED light, a sewing needle, and conductive thread.

[labelled photo]

Using the conductive thread, sew to one of the positive and one of the negative holes on the battery. It's important that you don't create a connection between the two sides, to ensure the circuit has go through the LED. To attach to the positive and negative, simply tie a knot using the conductive thread. It may be helpful to sew through the holes a few times, to create a loop of thread.

Then, figure out which way your LED light needs to be attached to the battery. It is recommended to do this before sewing it in place. If the long pin of the LED (the

negative) is connected by conductive thread to the negative (-) side of the battery holder, and the positive is connected to the short pin, then your LED should light up.

Your circuit should look like this:
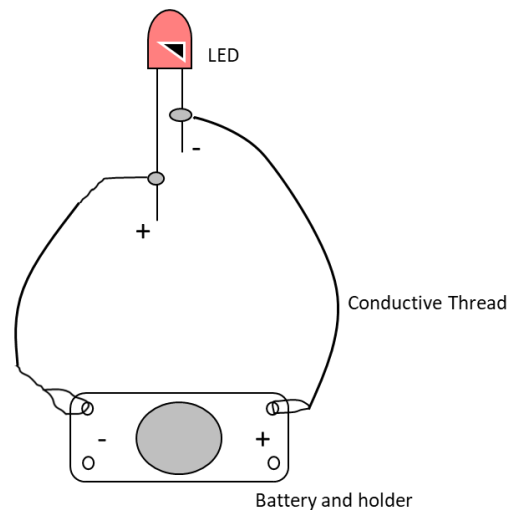
After this, the lose threads can be sewed in place. When putting the pins of the LED through a material, make two separate holes with a needle first to prevent the legs from touching.

Help! My circuit doesn't work!
Check:

- That the long (-) pin of the LED is securely connected to the positive (+) side of the battery. If the pins look the same, try switching the thread or looking for a 'flag' inside the LED, as shown on the diagram. The negative side will have this flag.
- That there are no 'short circuits' – where the thread or pins are connected too early and the current can avoid going through the LED.
- The battery is securely 'shiny'/'+' side up in the battery holder.
  Tip: Using gently closed scissors is the best way to remove a battery from it's holder.

Feel free to ask a helper if your project doesn't work!

Extensions:

For a more challenging project, you could try and make a circuit with:

- A switch, to turn the light on and off

- More than one light, either in series (on the same circuit), or by creating another circuit from the same battery.

What is….

An LED: an LED (short for 'light emitting diode') is a circuit component which lights up when a current is passed through it the right way. It's a type of light, which is commonly used in cars, house lights, and even on the International Space Station!

Conductive thread:

Conductive thread is made of special materials, so that it can conduct current the same way a wire can. Because it conducts electricity, you can use it to sew together components like lights into a working circuit.

A circuit:

An electric circuit is like a path that electrons can move through, meaning that electricity can flow from one end to another when it is given a voltage from a battery.

You can think of a circuit like a postman's route, dropping off letters to houses before returning back to the beginning of the route, before repeating the loop again the next day.

Please ask workshop leaders for help with using the hot glue gun, and do not allow young children to handle sewing needles unattended.