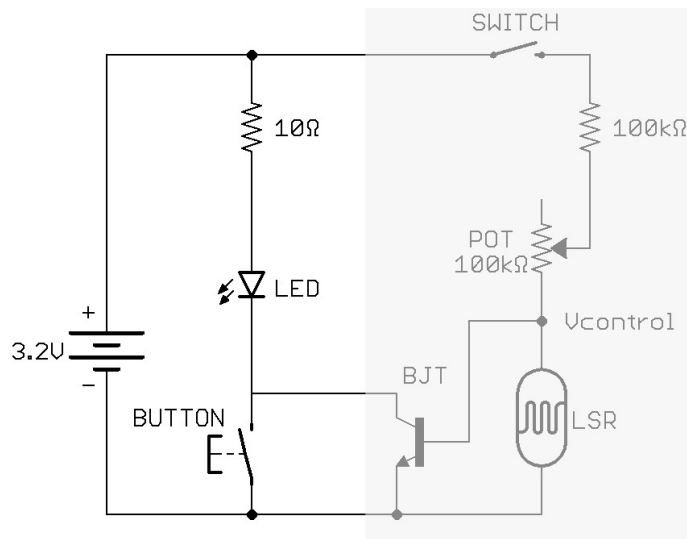# HIMALAYAN MAKERS GUILD
# Activity 12 – Soldering a Night-Light Circuit
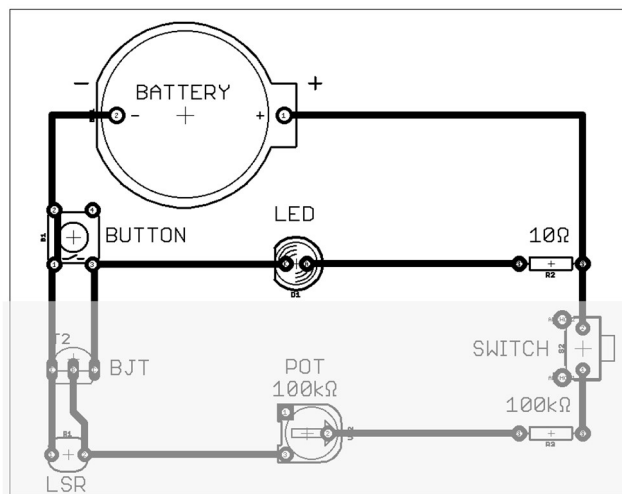
## Transferring the Night-Light to a Circuit Board

This is the Night-Light circuit diagram.

We can think of the nightlight as two parts:
1) **LED Light Circuit and Battery(left)**
2) **Control Circuit (right)**



Put onto a circuit board and rotated 90°, the night-light may look like this when looking at the top of the board.Can you see how the parts match the circuit diagram?

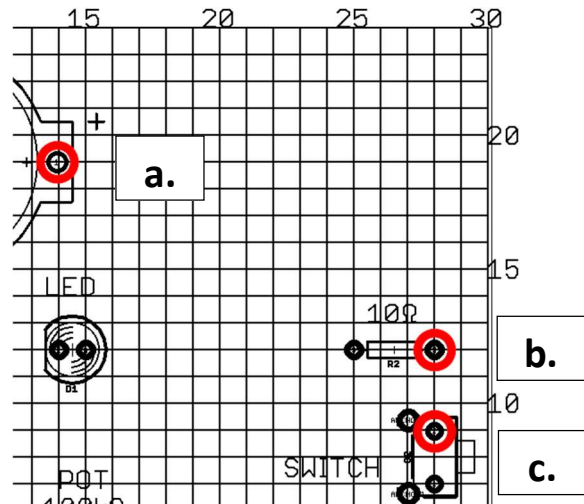We are going to focus on sodlering the **LED Circuit and Battery.**



## Part 1: Placing the Wires for the LED Circuit and Battery

Before soldering the parts into the circuit board, we will place the wires so they **wrap around** the holes where the **part pins** will come through the board. Then, when we put the part pin through the hole, we will be able to solder the pin together with the wire and metal plate of the board.
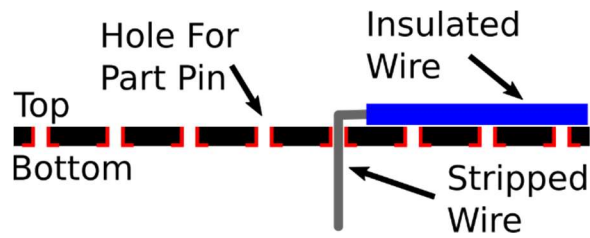
First, we will place the **battery + wire.**

This is a view of the top of the board. The grid shows where the holes are in the board.

1) Mark the holes where the…
    a. Battery + pin
    b. 10Ω resistor pin
    c. Switch pin
    …will come through the board using a marker or pen.

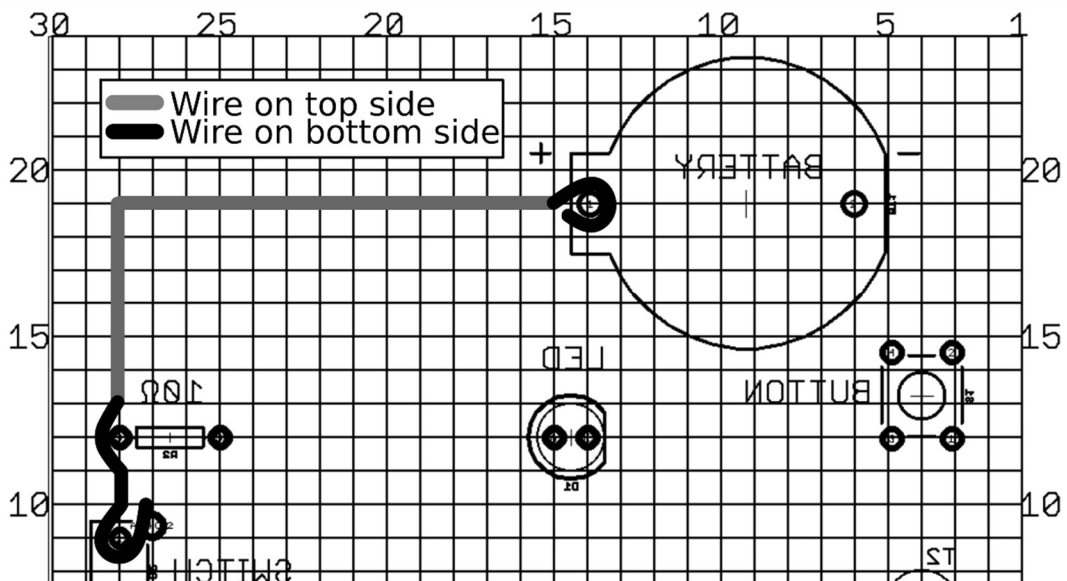2) From the top of the board, put a wire through the hole next to the hole for the battery pin.

3) Bend the wire towards the whole for the battery pin.

4) Wrap the wire around the hole (put a pen-tip into the hole to help wrap the wire). Trim off any extra wire with flush-cutters.
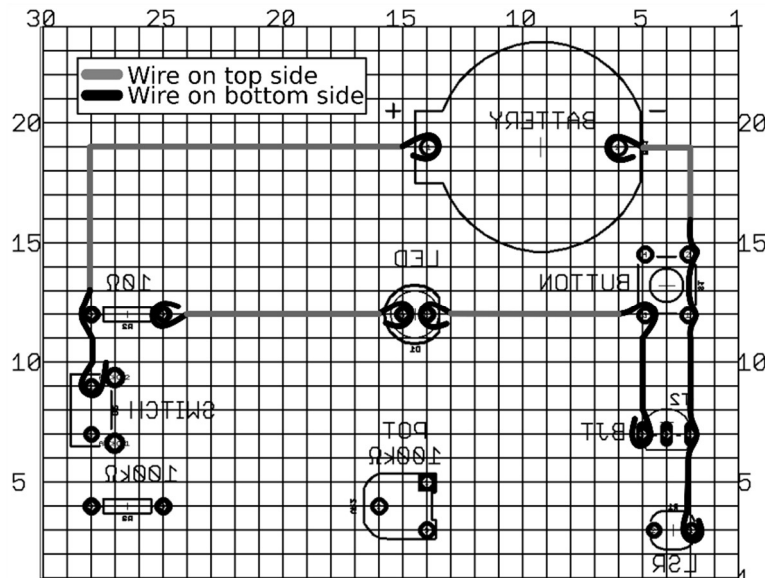
Repeat 1) to 4) for the hole where the 10Ω resistor pin and switch connect to the wire from battery +. After bending around the resistor pin, the wire can continue along the bottom of the board to the hole for the switch. This is what the wire will look like, viewing the board from the bottom where the metal plates are:
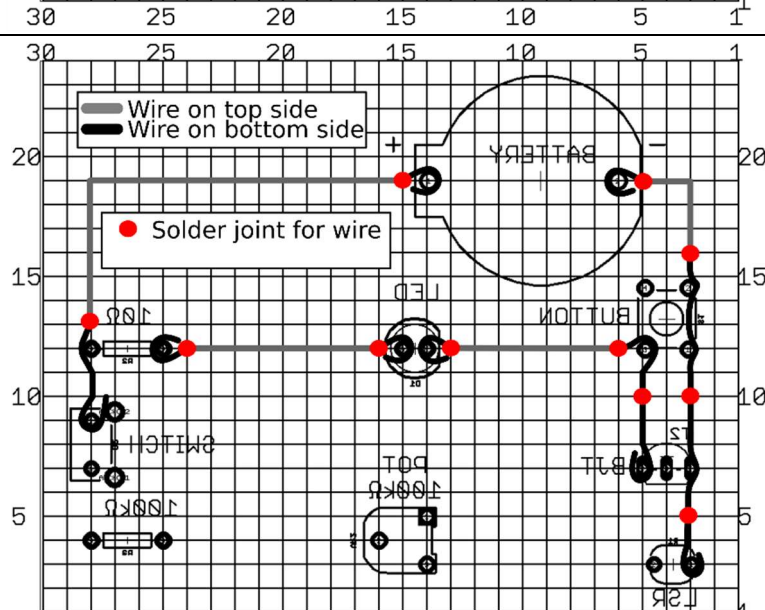
## Part 2: Insert the Parts and Solder Them to the Wires

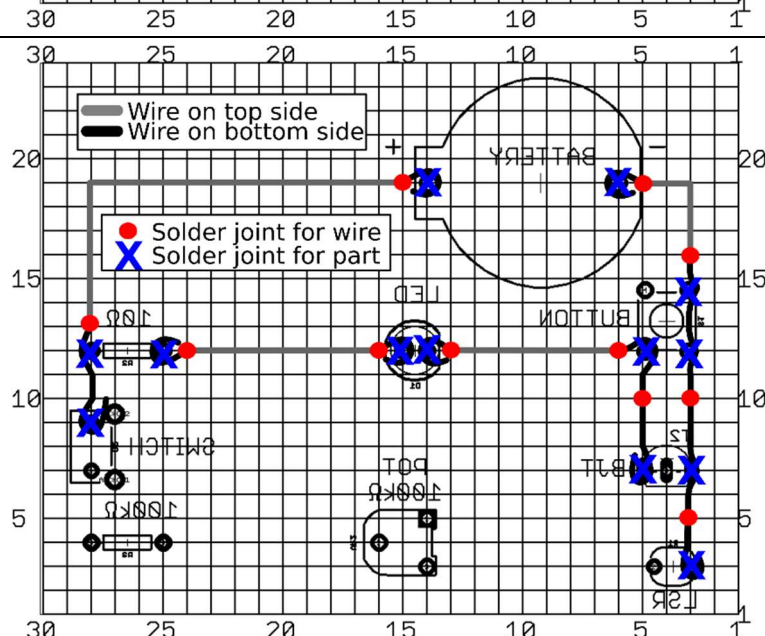After all four wires are in place, we will solder in the parts.



Start by securing the wires by soldering them where they come through the board. If the wires are on the bottom of the board, they can also be secured by soldering them directly to one of the metal plates below the wire.
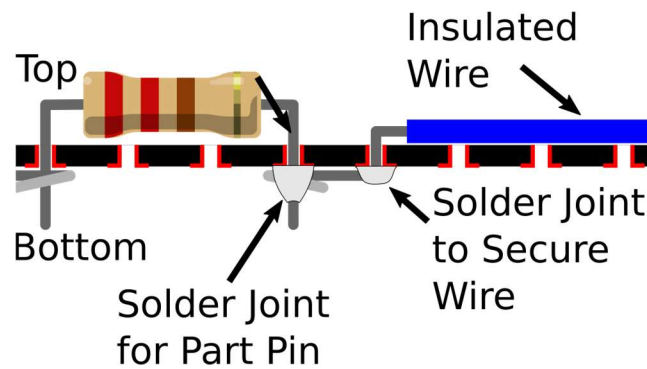


Place each part in the board and ensure the pins contact the correct wires.

Make a solder-joint to connect the part pin, wire, and metal plate. Be sure to contact all three metal parts with the soldering iron before applying the solder wire.
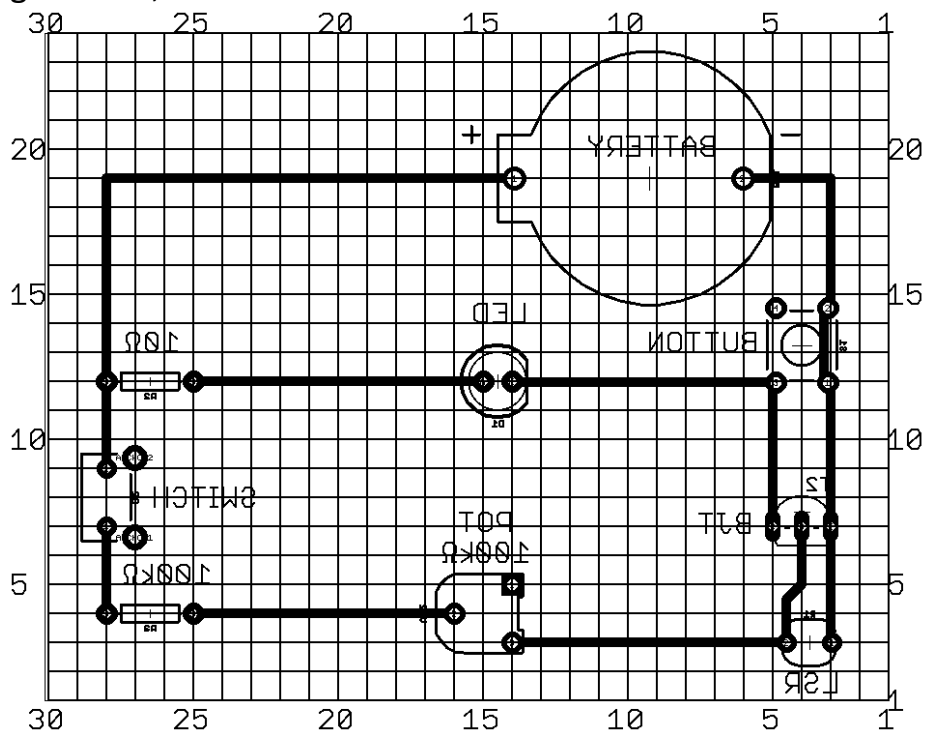
This is an example of a solder joint for a part pin, and to secure a wire:

Top

Insulated
Wire

Bottom

Solder Joint
for Part Pin

Solder Joint
to Secure
Wire

After the soldering is complete, insert the battery into the battery holder (+ side facing up) and test to see if the LED light circuit works by pressing the button!

## Complete Night-Light Circuit

If the LED circuit is working properly, apply the instructions of Part 1 and 2 to add the Control Circuit and complete the Night-Light. The final circuit will look something like this, viewed from the bottom:

## Soldering Safety Review

Safety Glasses      Ventilation      Hot Iron      Wash Hands