Raindrop Switch
MAKER GUIDE

Makers Making Change
A Neil Squire Program

Overview

This document contains the necessary information to build the Raindrop Switch, a small affordable assistive switch.

Contents

Maker Checklist

This list provides an overview of the steps required to build and deliver the Raindrop Switch

Maker To Do List

- ☐ Read through the Maker Guide to become familiar with required components, tools, supplies, safety gear, and overall assembly steps.
- ☐ Talk to the User about customization options
    - Switch base and cap can be printed in different colours
    - How they would like to receive the “User Guide”
- ☐ Order hardware components
- ☐ Gather tools, supplies, and safety equipment.
- ☐ Assemble the device
- ☐ Test the Raindrop switch
- ☐ Print “User Guide” (if the User would like a physical copy)

Items to Give to User

- ☐ Raindrop switch
- ☐ “User Guide”

Tool List

Tools / Equipment

Tool ID	Description	Required / Recommended	Notes
T01	Flush Cutters	Required	Trimming unused parts of the button
T02	Soldering Iron	Required	Connecting the button and the cable
T03	Hot Glue Gun	Required	Securing the switch components to the base
T04	Pliers	Recommended	Straightening the leads to the button
T05	Wire Strippers	Required	Cutting the cable, and stripping the component wires
T06	Soldering Jig	Optional	Holds the button and cable in place for soldering

Supplies

Supplies ID	Description	Quantity	Notes
S01	Tactile Button	1	Button of the switch
S02	Mono Cable	1	Cable of the switch

Personal Protective Equipment (PPE)

PPE ID	Description	Notes
P01	Safety Glasses	Protecting your eyes

Customization Guide

The device can be printed in the user's desired colour.

The base and cap can be printed in the same colour or printed in different colours.

3D Printing Guide

The device was originally printed on an Ender 3 using Cura.

Default slicer profile was used for all prints.

3D Printing Summary

Metrics	Single Unit
Total Print Time (min)	56min
Total Number of Components	3
Typical Total Mass (g)	6g
Typical Number of Print Setups	1

3D Printing Settings

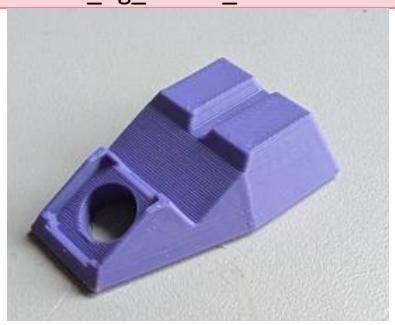
Print File Name	Qty	Total Print Time (hr:min)	Mass (g)	Infill (%)	Support(Y/N)	Layer Height/ Nozzle Diameter(mm)	Notes
Raindrop_Base_v1.2.stl	1	0:12	1	20	N	0.2/0.4	
Raindrop_Cap_v1.0.stl	1	0:08	1	20	N	0.2/0.4	
Switch_Jig_12mm_v1.0.stl	1	0:36	4	20	N	0.2/0.4	

Post-Processing

Inspect the 3D printed parts for any printing defects, sharp edges, or burrs. Sharp edges and burrs can be removed with sanding or deburring tools.

Examples of Quality Prints

Compare your 3D prints to the images here. If there are significant differences, you may need to reprint the part.

Raindrop Switch		
Raindrop_Base_v1.2.stl	Raindrop_Cap_v1.0.stl	Switch_Jig_12mm_v1.0.stl
		

Maker Component List

Raindrop Switch								
A01	Tactile Button	QTY: 1	A02	Mono Cable	QTY: 1	A03	Raindrop Base	QTY: 1
								
A04	Raindrop Cap	QTY: 1						
								

Part A: Required Tools and Supplies

- Flush Cutters
- Soldering Iron
- Hot Glue Gun
- Pliers
- Wire Strippers
- Switch_Jig_12mm

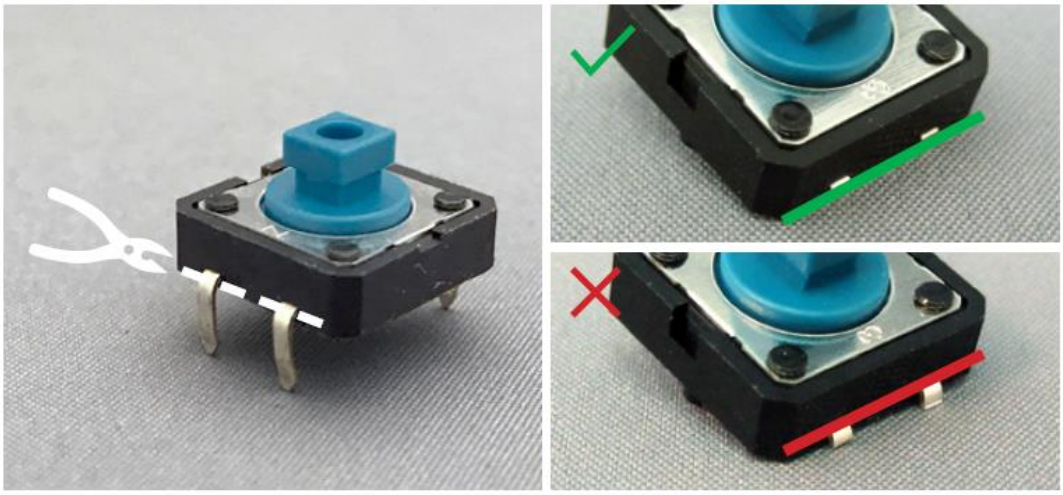
Part A: Required Personal Protective Equipment (PPE)

- Safety Glasses

Part A: Raindrop Switch Assembly Steps

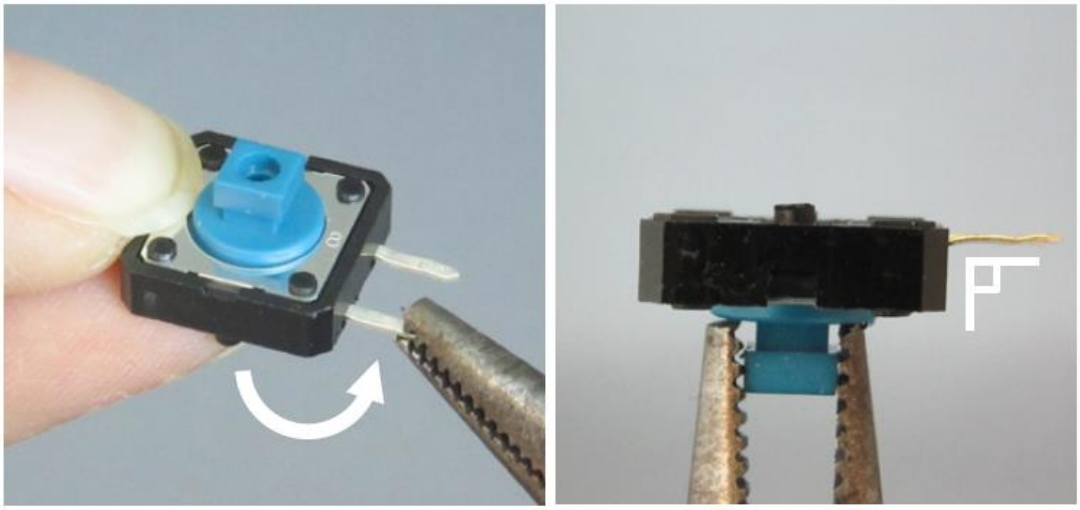
Step A-01: Trim the button leads

Cut off the two leads flush on one side of the button (A01) using the flush cutters (T01)



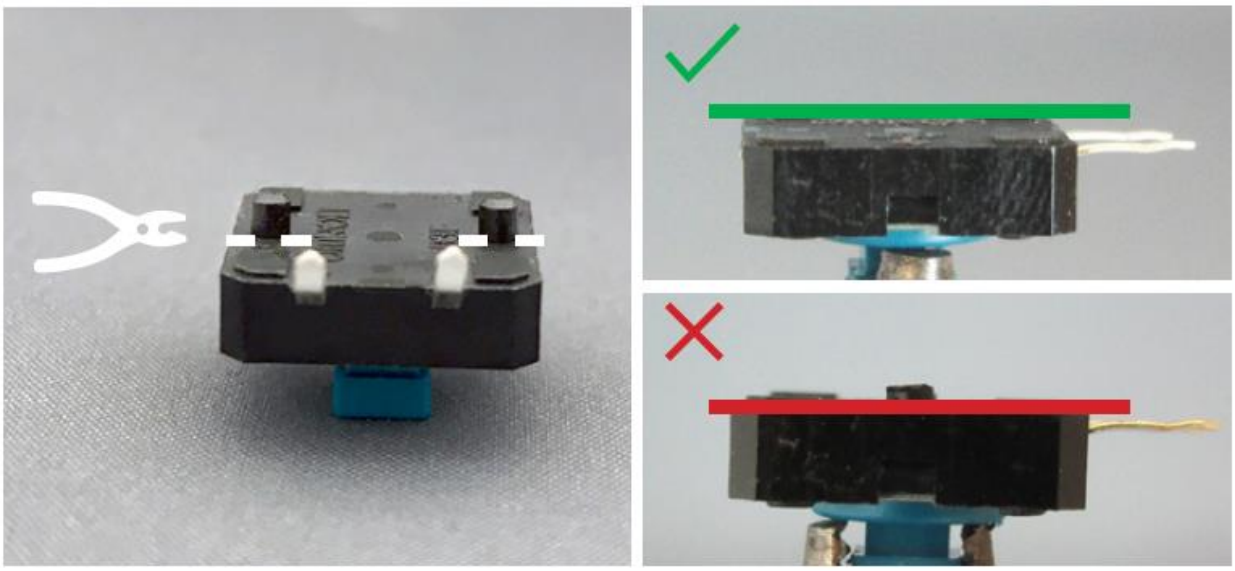
Step A-02: Bend the remaining leads

Take the two remaining leads on the button, and bend them 90 degrees using pliers (T04)



Step A-03: Trim the mounting lugs

Cut off the two plastic mounting lugs completely flush using flush cutters (T01)

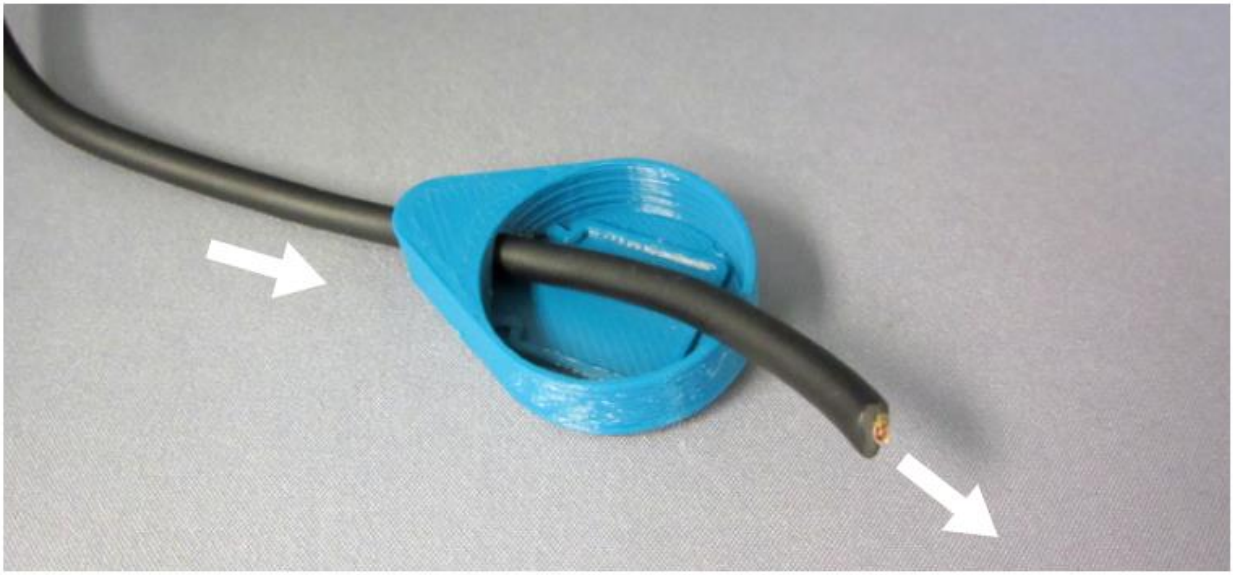


Step A-04: Cut the mono cable in half

Using flush cutters(T01), cut the mono cable (A02) in half

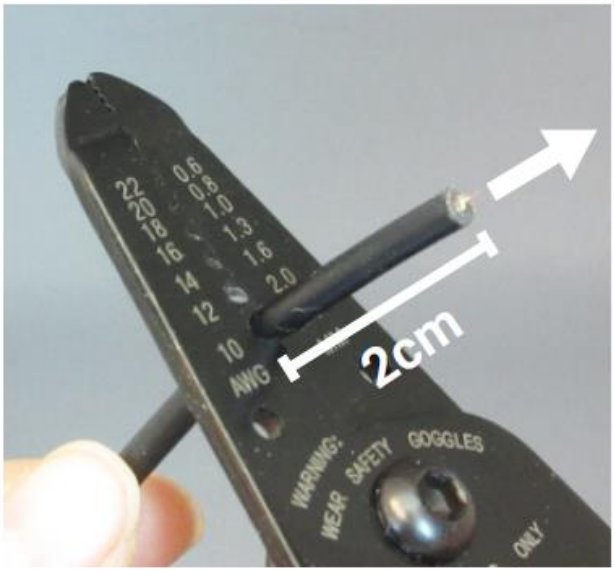
Step A-05: Thread the cable onto the base

Thread the cut end of one half of the mono cable through the hole in the base of the switch(A03)



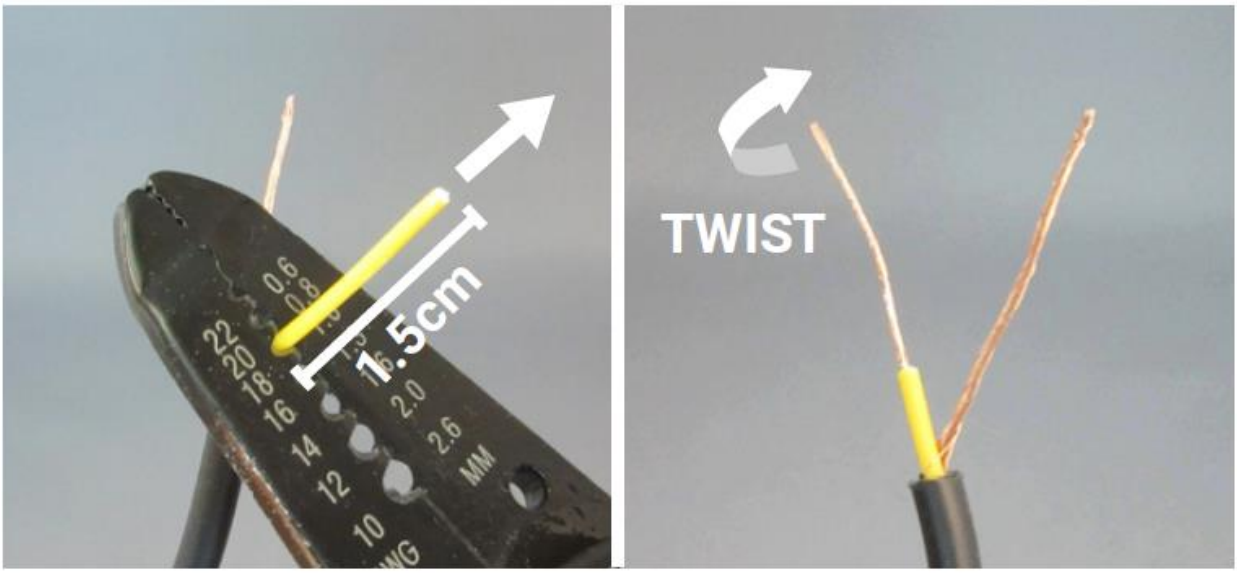
Step A-06: Strip the end of the cable

Using wire strippers(T05), strip the last two centimeters of the mono cable. Twist the loose copper into a solid strand.



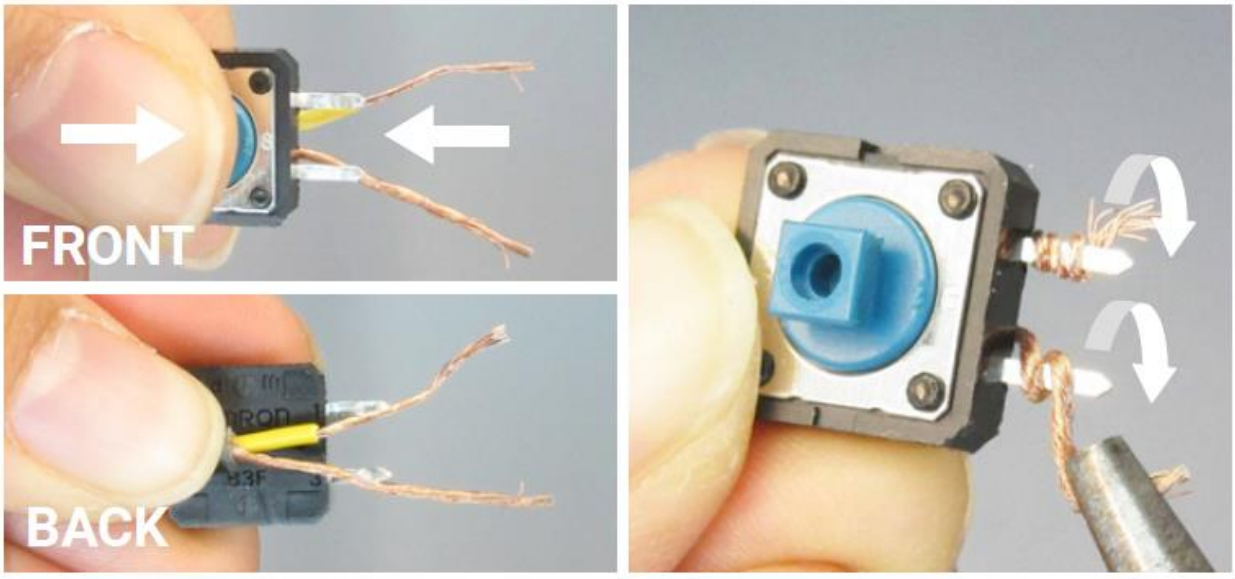
Step A-07: Strip the interior cable

Strip the insulation off the remaining cable, and twist the loose wires into a solid strand.



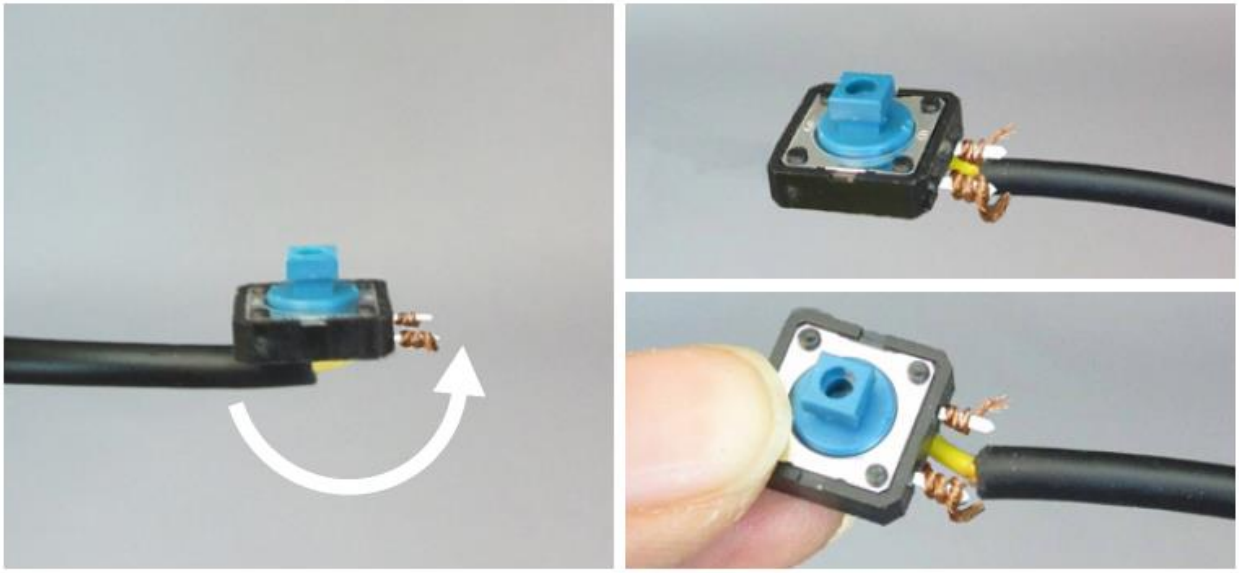
Step A-08: Wrap the wires around the switch leads

Hold the wire behind the switch and wrap the wire around the switch leads with a plier.



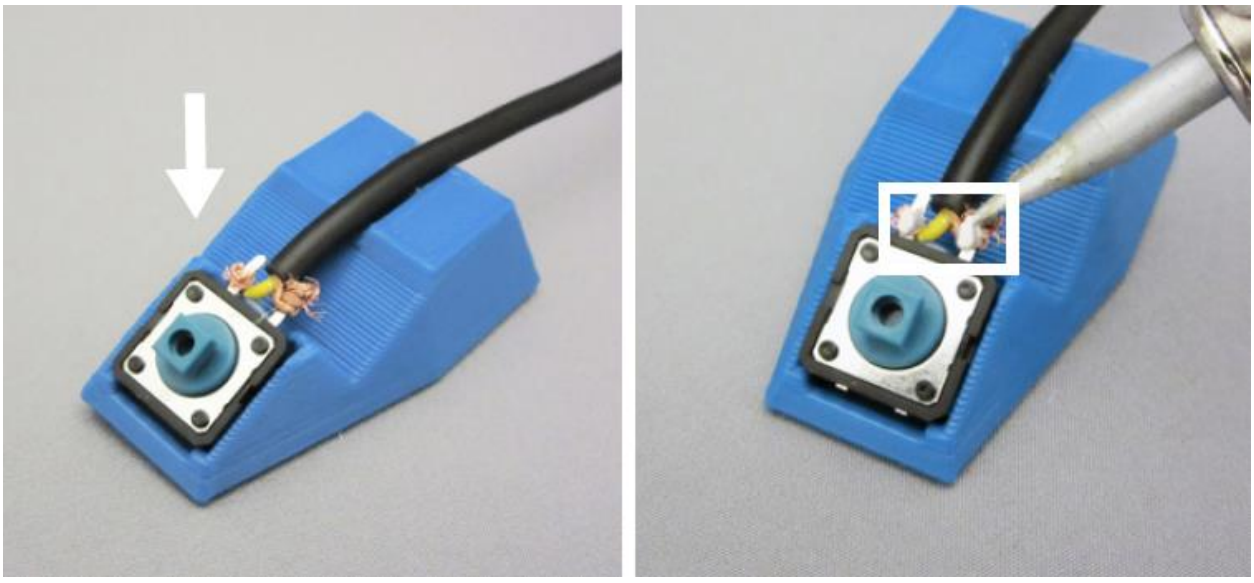
Step A-09: Bend the wire

Hold the switch in place and bend the wire in between the two switch leads



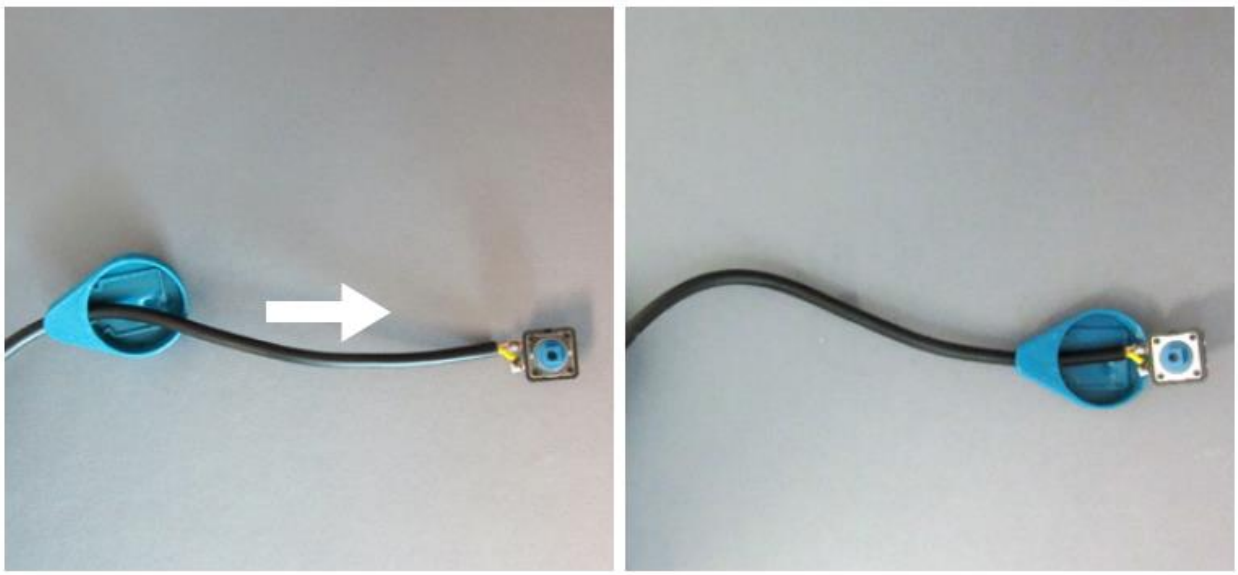
Step A-10: Solder the cable to the button

Solder the cable to the leads on the switch using a soldering iron(T02). The soldering jig(T06) can be used to hold the assembly together while soldering. **IMPORTANT: After soldering the two leads, test the switch by following the instructions in the testing section.**



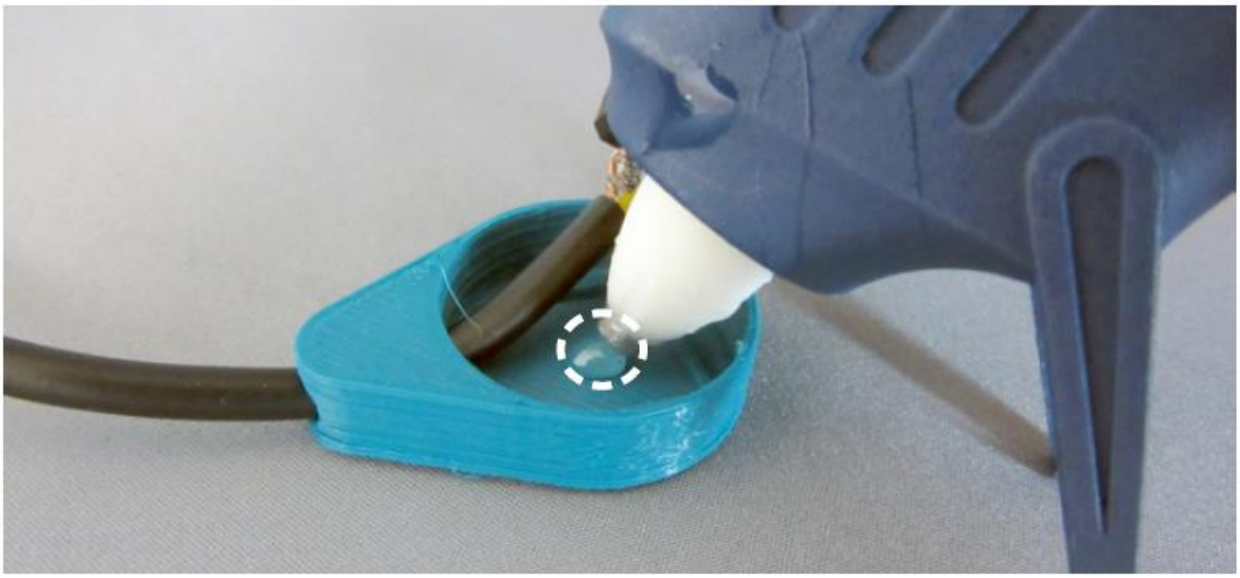
Step A-11: Move the case closer to the switch

Pull the cable through the base so that the switch assembly is much closer to the base.



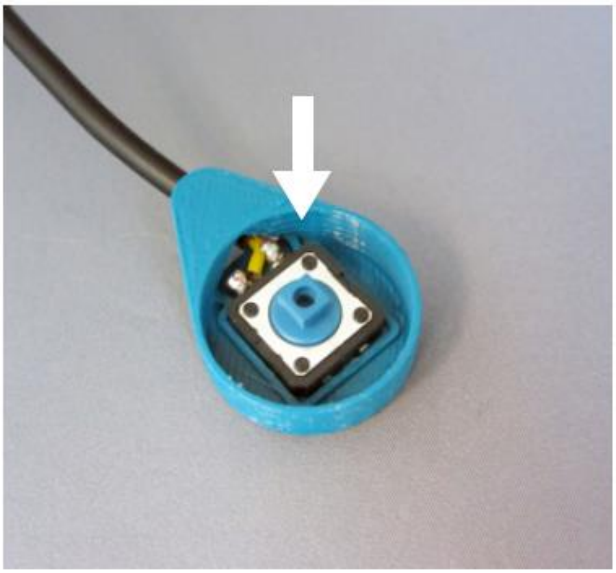
Step A-12: Add hot glue to the base

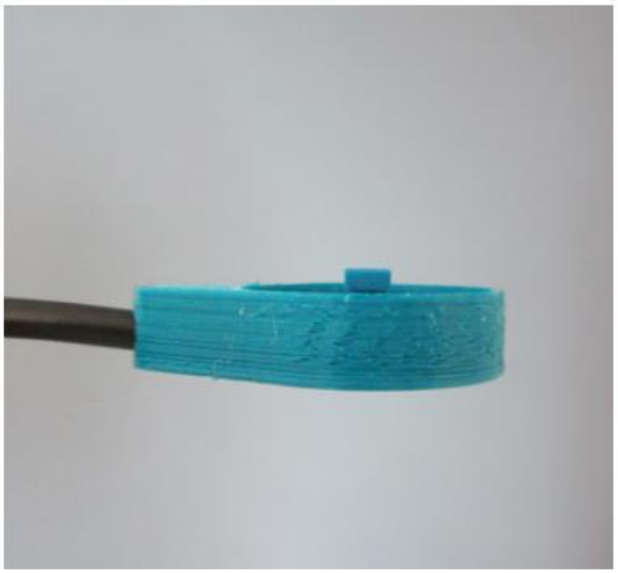
Add a small drop of hot glue (T03) to the base. Do not add too much, a pin head sized blob is enough.



Step A-13: Press the switch into the base

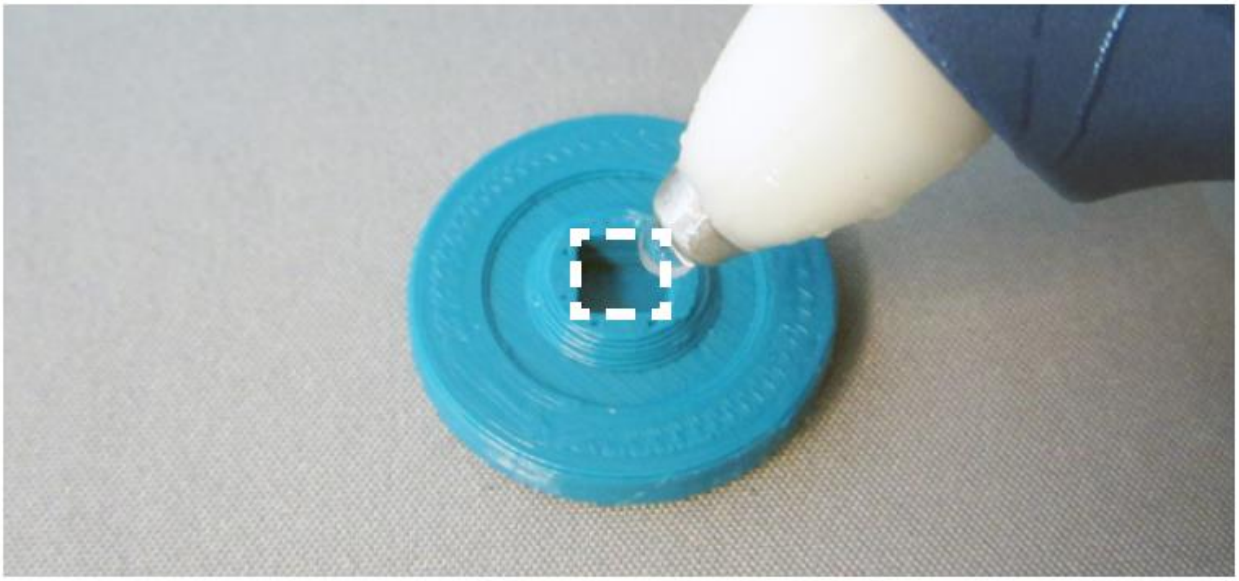
Press the switch into the recess in the base with the hot glue drop in it. Make sure the switch is sitting level in the case.





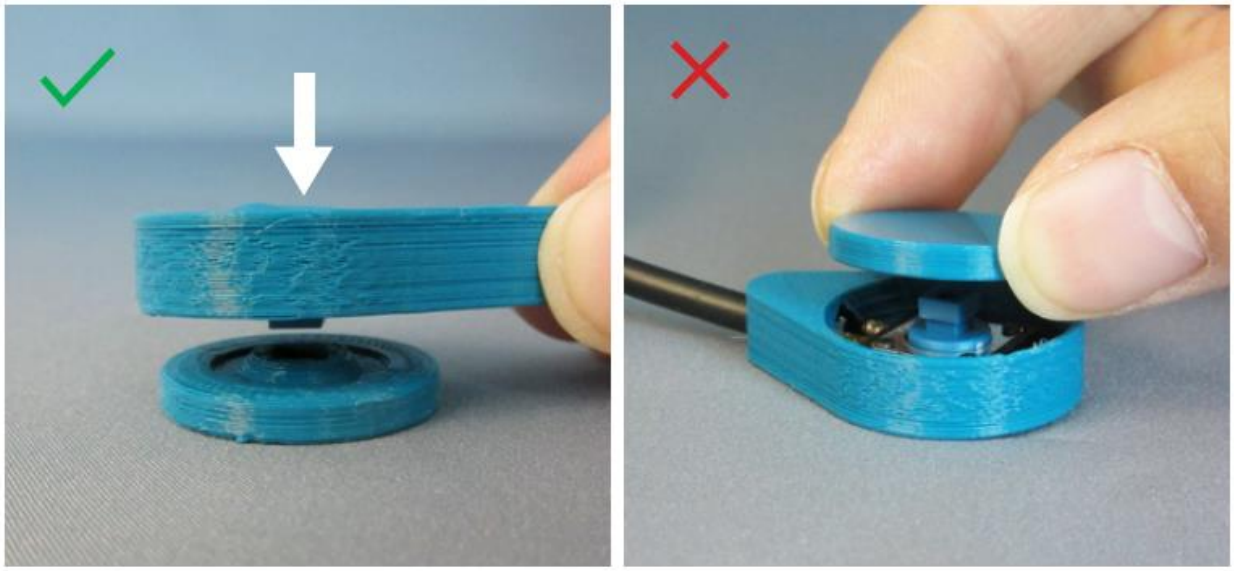
Step A-14: Add hot glue onto the cap

Add a small drop of hot glue in the square recess in the cap. Do not add too much.



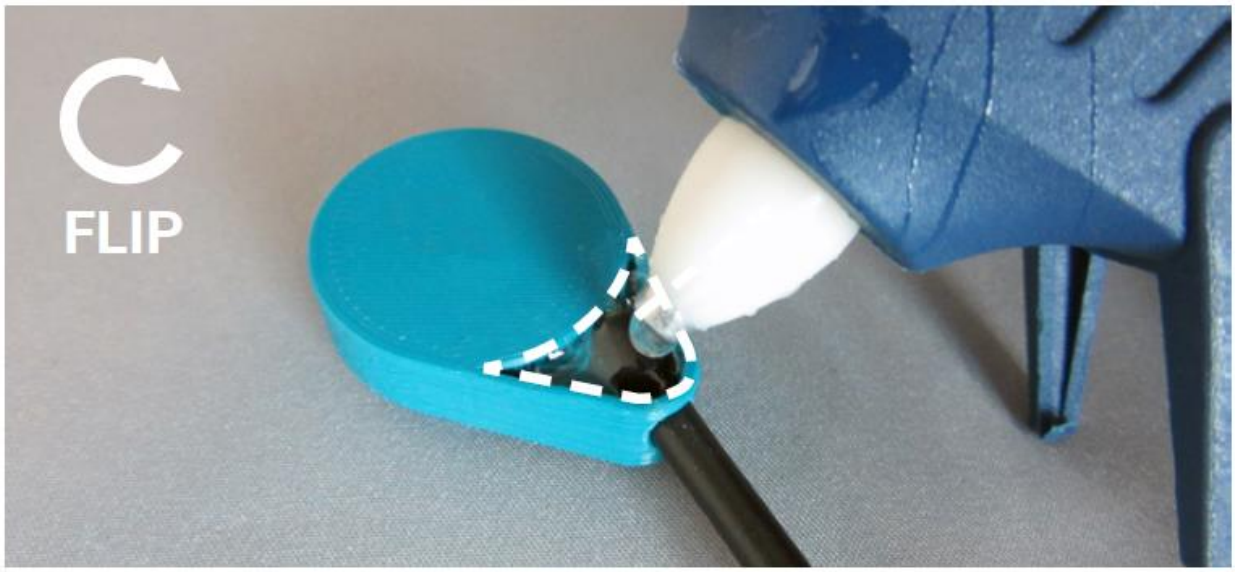
Step A-15: Press the assembly onto the cap

Press the knob on the switch into the hot glue on the cap. To prevent hot glue in the cap from oozing downwards, press the case assembly onto the cap.



Step A-16: Fill the hollow on the switch bottom

Fill the hollow on the bottom of the switch with hot glue to secure the cable.



Testing

Using a switch tester, test that the switch is working. The light should turn on when the switch is pressed, and turn off when the switch is released.

Troubleshooting

If the switch is not working properly, check the solder joints between the button and cable to make sure the cable has not come loose from the cable.

If the lead on the button has broken off, replace it with a new button.

If the wire has broken off the cable, cut the cable back a centimeter and repeat steps 6-10 to reattach the cable.