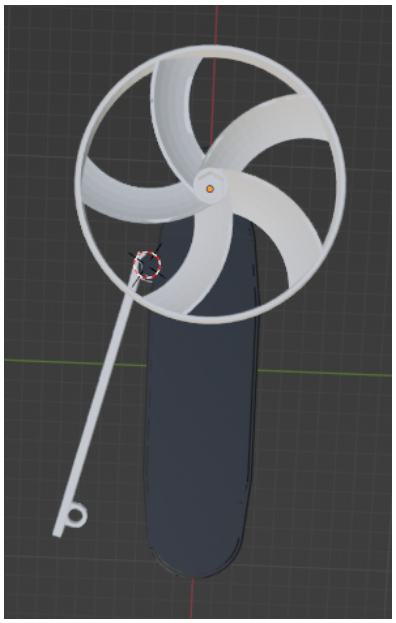


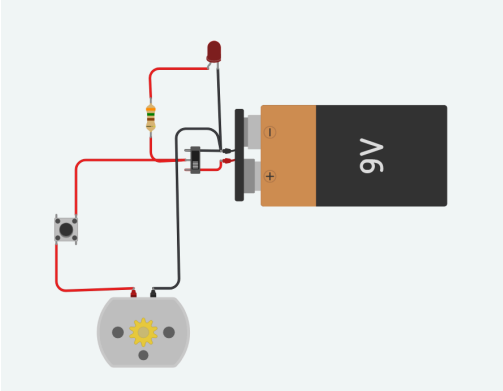
Hand Held Fan

My objective was to create my own fan that was portable, light, and able to cool me down. In this project, I utilized a resistor, a DC motor, a push button, a switch, as well as an LED. There are a few stages that I am accounting myself to in order to complete this project in a timely fashion

Stages of Development

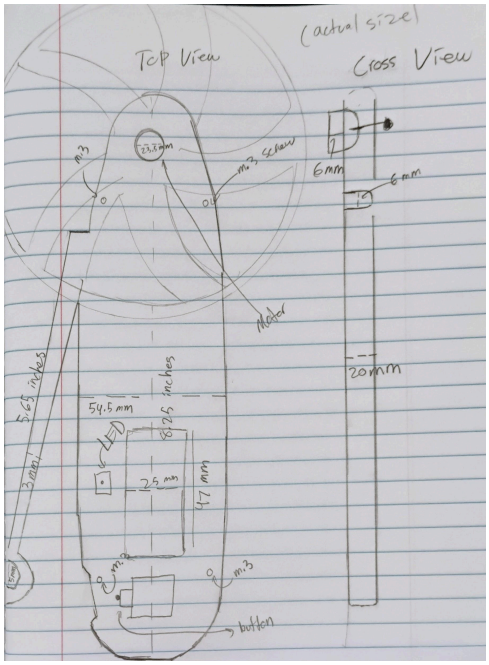
- [x] ~~Planning~~
- [x] ~~Designing the circuit~~
- [x] ~~Drawing a model~~
- [x] ~~Modeling the case~~
- [x] ~~Testing components~~
- [x] ~~Modifications~~
- [x] ~~Documenting my project~~
- [x] ~~Turning in a working project~~

Visualization of the Circuit:



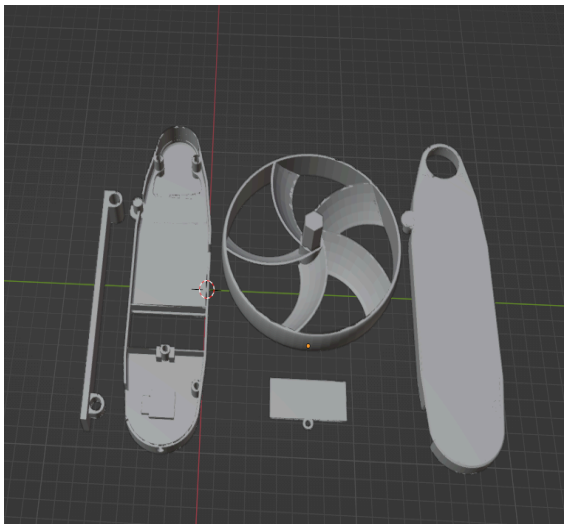
My switch is connected to the 9V battery which the LED and the push button are connected to. The motor is then connected to the push button and grounded to the battery. This allows the LED to always be on whenever the switch is toggled, while the motor only spins when the button is pressed down.

Case Design

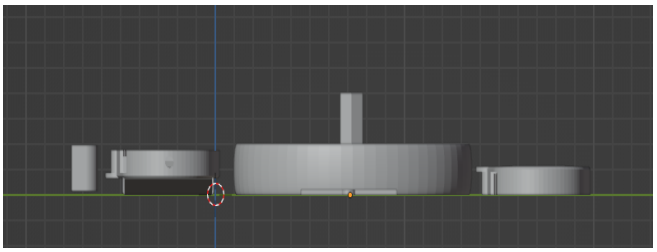


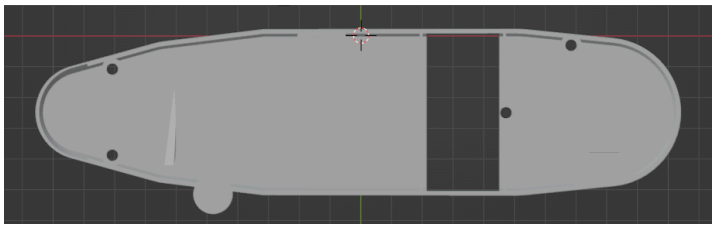
My initial drawing included a larger fan with a side trigger that internally clicks a push button to turn the motor on. The trigger is hollow in its hinge which is overlaid between the top and bottom piece of the fan. A battery compartment is on the back of the fan which can be opened with a screwdriver. Next to this compartment is a small hole in which an LED is located to indicate whether the fan is on or off.

Case Modeling

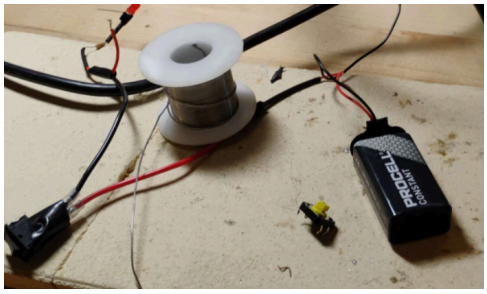


I used Blender to model my fan, along with an Ender 3 v2 3D printer to print these objects. In order to bring my design to my printer, I first exported my parts individually as STLs, then placed them onto a flash drive which was then plugged into my printer. This allowed me to select which object to print and queue them up. My objects were printed at 20% infill, an infil pattern of Cubic, with supports touching the baseplate.





Wiring Process



In order to connect my fan into a finished piece, I had to solder the connections to create a single circuit. I color coded wire to its function (red was power, black was ground). I utilized a soldering iron, wire strippers, a pair of scissors, as well as solder. I also decided to solder GPIO wires to my motor, as I knew I would eventually need to disconnect them. This proved to be quite useful as when I had to place my circuit into my case, I was easily able to slip the motor through to fit into the lid. All of my connections were either insulated with electrical tape or with heat shrink tubing to prevent any short circuits. Each component was also either glued or taped into the case to prevent any moving when the fan was shook. My clicking mechanism utilized a push button which rested on the side and triggered the motor when the shock trigger was struck. One challenge while soldering was holding the wires in place, thus I braided each connection prior to soldering this. This made it significantly easier to create the connection between the two wires.

Final Product

Video to Fan

My final product seems to work very well and doesn't seem to have any issues. As seen in the video, the motor will only trigger if the switch is toggled and the shock trigger is being held down. The fan pushes cool air into my face and works perfectly. If I was doing this project again I would not use Blender. This is because Blender is not designed to be used for real measurements and it was difficult to predict the size I needed for my casing. By using a software like Fusion, I would not have had to find alternatives to get certain designs and shapes to work.