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**Group 6**

**BME 2920 Technical Drawing Assignment (Group assignment)**

***Purpose for the NX model / technical drawings:***

The NX model and technical drawings are meant to be used in order to build an accurate and well-designed prototype. Creating the model in a software such as NX forces us to set exactly how we want the sanitizing case to look, rather than relying on flexible sketches. Following this with technical drawings allows for a more dimensional analysis of the design with multiple views on one spread.

The audience for the NX model and technical drawings are the people who will be viewing and judging our final presentations at the end of the semester, as well as those who will be attending the funding presentation. The model and drawings need to communicate specifics about the design as well as an overall feel for how it will function and look like in real life. It should be able to represent all the tiny details and dimensions while also maintaining a simplistic and easy-to-understand format.

***Description of each of the 3D model parts***

The shape and dimensions for our case were chosen based on being able to fit most if not all nonelectrical toothbrushes but using the smallest amount of material possible. We researched that the average length of a toothbrush is around 17 - 18 cm and we wanted to make our product have a snug fit so we made the case 21 cm long with .5 cm thick walls. We also did research to find that the average width of a toothbrush is around 1 - 1.5 cm so we made the width of our case 5.3 cm. It was important that our battery fit inside the case to remove excess material so this left us with roughly 4 cm of space for our battery. The battery we found to most efficiently power this kind of device and width of that is about 20 - 30 mm which left us with great room in between our toothbrush and our battery. The walls are about .75 cm thick which left us with roughly .5 cm of room between our toothbrush and our battery. Our walls are 2.8 cm high which gave us a snug fit for the height of our ultraviolet light. Using this data allowed us to confirm that our toothbrush case would fit a brush and all the components with enough but minimal breathing room.

The case was built using fairly simple features. We build two blocks side-by-side the exact measurements we wanted to build our case at. Each being 21 cm X 5.3 cm X 2.8 cm. Then we created two more blocks inside of the first blocks and subtracted them to create the inside of the case. The block’s dimensions were fairly smaller to create the inside walls of the case. Each being 20 cm X 3.8 cm X 1.8 cm. We then created the open/close button on the bottom by subtracting a cylinder right in the middle but at the top of the bottom half that had a diameter of 1 cm. Then we created the same cylinder on the top half in the same spot but put a sphere on top of it to create the button. We then put in the battery which was a block that sits on the bottom corner by the hinge that is 14 cm X 3 cm X 2 cm. Then connected to the battery sitting directly above it is the ultraviolet light which is a block that is 4 cm X .5 cm X 20 cm. Then we edge blended the battery at  10 cm as well as all the edges of the outside of the case. There is three blocks we put in that represent a stand for the toothbrush so that motion doesn’t make it so it doesn’t get clean. The three blocks were united and face blended to look nicer. Finally, we used the move object feature using the angle function to rotate the top half 45 degrees upward so the device looks like a case instead of two blocks side-by-side.

The biggest questions in our design review came the practicality of our device rather than changes we can make to the design. The biggest question we got was about about adding hinges to our device to make it look more like a case rather than two halfs just pushed together. Honestly, I looked into trying to get this to workout but I wasn’t really sure what kind of hinges would be most efficient. I’m still research what kind would work the best and be the cheapest but hinges are something that we will for sure add to our final device.

***Technical drawings of the assembly and/or individual parts***

In these technical drawings of our device we wanted to show the different dimensions of our device as well as the different sides of our device and also the inside of our device. In our technical drawings we included the top view, the front view, the side view, and a corner view. I felt all these views were necessary to see the device in its entirety also so we could point out each of the individual dimensions of the the device. The front view is probably the least important but we felt it would help to see the open/close button from the front as well to see how the device looks open from the front. The corner view is nice because it clearly shows the stand that holds the toothbrush. And the side view shows the opening closing structure of the case itself which isn’t shown in any other picture. Ultimately, we wanted to show the device in it’s entirety and wanted to show every individual part the best we can. We felt as though these foru pictures represented that extremely well.

***Description of the assembly***

To design our model, we did not really have to do it into separate components or parts. It was just a case and by using the nx features we could do it without assembly. We did the model as a group and let each one gives their thoughts about the best key design features to use.

***Conclusion***

Technical drawing is the best way to visually communicate with the functionment of our device. As engineers, it is an effective tool to communicate with rather than written plan. It is very important to be accurate , specific and detailed to get the best product. Also this will allow us to get the best pricing information before production and make any changes necessary to fit our budget.