

Criterion D: create

The process of making

Day 1
Tuesday 9 March

I began the creation of my product by drawing the nets of the cubes which will hold the light bulbs. As planned, I used a T-square and a triangle to draw the net of the first 10-cm cube on a sheet of tracing paper, adding flaps where needed. To obtain neat edges, I cut the net out using a sharp razor. I folded it over and glued the sides together at the flaps using a glue stick. However, I noticed that the cube is extremely fragile, and that the slightest touch is enough to crush it, because the tracing paper is thin and flimsy. Also, the cube looked rather sloppy, and the glued flaps could be seen through the translucent paper. Therefore I decided to change my design. Instead of making the cubes out of tracing paper and drawing Japanese lettering onto them using a marker, I decided to make the cubes out of thicker cardboard, with engraved Japanese characters which would allow the light to shine through. Since we do so many projects at school, I have accumulated many scrap pieces of cardboard that were left over. I decided to put them into good use by reusing them for my project instead of buying new cardboard. I found 3 relatively large scraps of cardboard, and drew 3 nets to make 3 cubes, adding flaps where needed, then I cut them out using a sharp razor. I also lightly scored the inner outlines of the nets to make them fold over more easily. Next, I searched the Internet for images of Japanese characters. I don't want to put haphazard letting on my lamp, and so I chose meaningful symbols like luck, beauty and happiness. On Adobe Photoshop, I resized the symbols so that they fit onto 10X10 cm squares. I printed them out and traced the symbol of 'luck' onto alternate sides of the first net. I traced the symbol of 'beauty' on alternate sides of the second net, and 'happiness' on alternate sides of the third net. This way, when the nets are folded over and glued, the engraved lettering will be on opposite sides of the cube. Using a compass, I drew two small circles at the center of the top and bottom faces of the cube, and cut the out to make openings for the bamboo stick.

Day 2 Wednesday 10 March

I cut out the 50-cm bamboo stick that will act as the spine of my lighting unit. I found a long stick, measured 50 cm, and cut it out using an electric saw. After doing this, I discovered that the bamboo stick is not completely hollow. This is a problem because the wiring of the lamp is supposed to go through the stick, so I will have to find a way to make an opening. I also decided that I need to give the cubes a bit of color instead of keeping them plain white. Since we are implementing the principles of green design, when I went back home I used moistened tea bags to color the nets instead of using ordinary paint. The tea gave a stained effect, which matches very well with the color of the bamboo. Next, I cut out pieces of tracing paper, and glued them onto the inner sides of the engraved lettering, so that lamp will give a misty effect when the light bulbs are switched on.

Day 3 Sunday 14 March



I began assembling the circuit for the lighting unit. Because the bamboo stick is not hollow, I had to think of a way to make an opening all the way through for the wires to pass. The DT department does not have a drill bit that is long enough, so I used a long piece of thick steel wire to unblock the inside of the stick. After a few attempts I managed to make a big enough opening for the wires. With the help of a ruler, I marked on the bamboo stick the points where I want the light bulbs to go, and using the electric drill, I made small holes so that I can connect the bulbs to the wire which will be hidden inside the stick. Next, I inserted two long electric wires into the hollow bamboo stick, and used a special hook to bring a loop of wire out of each of the 3 holes I made with the drill. Before attaching the lamp holders, I slipped the bamboo stick through the holes I made earlier in the nets of the cube, because I won't be able to fit the stick through the holes once the lamps are attached. Next, I cut the ends of each loop, and attached each pairs of ends to a bulb holder, and fastened a bulb to each holder. Each one of the bulbs requires 6V, which adds up to 18V in total. One battery provides a voltage of only 9V, which would not be enough to light the three bulbs brightly. The light would be dim, and the battery would run out very quickly. Therefore, I decided to use 2 batteries instead of just one, so that their combined voltage would be 18V, which is supplies an adequate amount of energy to the light bulbs. So I connected two battery holders in series, as well as a switch, to the wires that are coming out from the bottom of the bamboo stick, so that I ended up with a complete circuit. I did this using a solder iron and solder wire. Finally, I used a glue gun to completely seal the nets at the flaps, forming 3 cubes which contained light bulbs inside them.

Day 4 Sunday 21 March

Today I made the base of my lighting unit, which will hold the batteries and wiring. In my original plan, I was supposed to make it out of tracing paper, with a piece of scrap MDF at the bottom to weigh it down. However, I found an empty plastic container that I thought suitable for using as a base. Instead of throwing it away, I decided to put it to good use. I also think it's more practical, because it has a lid, so the case can easily be opened to replace batteries. First, I made holes in the lid for the bamboo stick and the switch. I heated the end of a metal knife until it glowed red hot, and I used it to puncture the plastic. I made a very small hole where the switch is to go, and a slightly bigger hole for the bamboo stick. Next, I used teabags to stain a piece of white cardboard, which I wrapped around the container to make it similar to the light-containing cubes. Finally, I inserted the components and the bamboo stick into the container, and secured them in place using glue from a hot glue gun. I attached batteries to the battery clips, flipped the switch, and a soft light lit up in front of me!