Laser Cut Geometric Zen Lights

MATERIALS

- **3 Pieces of 16 by 24in of Recycled Material/Board (I used found cardboard, but you can use any material that is able to be Laser Cut) These need to be precisely cut to fit the printer cavity.**
* * *Please note the material must be flat, able to have a solid structure, and slightly bendable. You may need to check with your laser printer technician to be sure about what sort of board you are able to cut and what the price differences will be.
- **The stencil file I have provided in this tutorial**
- **One bright LED light bulb**
- **Light socket (compatible with your bulb) with long cord**
- **Fishing Line**
- **Gel Super Glue (I recommend 2 bottles)**
- **Staples**
- **Ribbon (1/2 inch width)**
- **Metallic Spray Paint**
- **Command Strip with Metal Hook**

TIME
- Total: 4 hours

DIFFICULTY:
- **Medium to Advanced**

STEPS

### STEP ONE:
- Take the stencil file to a Laser Printer along with your 3 pieces of 16 24in board.
- There should be a technician there to make sure everything is cut correctly on your pieces.
- Essentially, you are cutting out 21 modular triangles (one extra, but 20 to build the light- it is an Icosahedron) (see link to understand this structure: https://en.wikipedia.org/wiki/Icosahedron)
- Once these are cut and ready to go, you should have 21 triangles with geometric patterns cut into them. You may need to spend some time cutting out any pieces that weren't perfectly removed by the machine. I used an Xacto knife to cut out these stubborn pieces.
- Put aside the one pentagonal shape. This is going to be used at the end.

STEP TWO:
- You are going to need to lay out the triangles like I have shown in the diagram below. **Please note that the side facing you will be the inside of the light fixture, so if you have a damaged or stain side, make sure it is facing up while you lay out the shapes together)**
- The surface you set them on needs to be clean and flat, and the pieces need to be aligned perfectly. If the geometry of the shape is not correct, the assembly will not work. Make sure there isn't air between each separate piece.
- Take the ribbon and cut it into approximately 7 inch strands. The amount you are going to need is going to depend on your process and success assembling the icosahedron. I kept cutting as needed.

Example from: https://en.wikipedia.org/wiki/Icosahedron
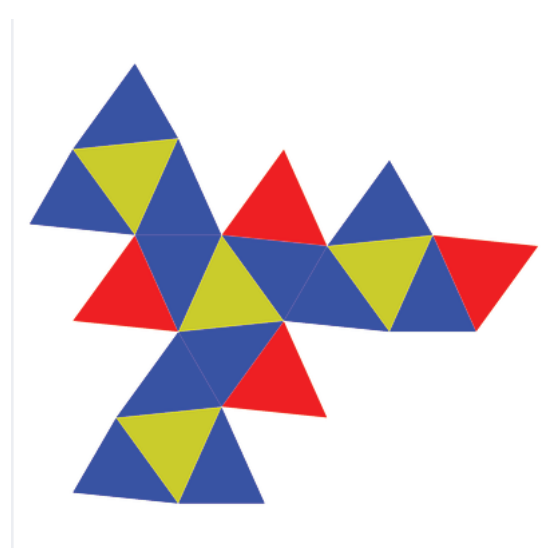
- Lay out the pieces as shown.
- Take the super glue and, beginning anywhere on the form, start by picking two triangles that share an edge together.
- Begin by dotting the glue on the edges of two triangles. What you are doing here is joining the edges of the triangle together.
- You need to be fast during these steps or the glue will dry.
- Next place the 7 inch strand of ribbon carefully along the edge of both triangle to join the sides together.
- It is **CRUCIAL** that there is not space between each triangle or there will be gaps in the end product.
- With the layout remaining flat, join ever triangle edge together and wait about 30 min for the pieces to dry together.

STEP THREE:
- Begin by folding the pieces inward.
- This part should be pretty intuitive. You are going to start having to slowly start joining the triangle edges together to form the icosahedron shape.
- The shape has many angles to it, you may need to begin by dotting one triangle edge with glue and then attaching half of the width of the ribbon to the edge. After this has dried, dot glue on that triangle's edge partner and attach the other half of the ribbon so that now the two edges are closely joined together.
- Be patient during this part as it may take a while. You are going to need two of the edges open so that you have ample room to later install the light.
- For added support, bend staples into the holes at each vertex to attach the triangles together. Do this at every main vertex where there are 5 triangle edges coming together to form one vertex.
- I also used fishing line in the holes cut in the vertices for added support.

STEP FOUR:
- Take your form to an area where you can spray paint it. Spray the entire surface of both the inside and outside carefully with the paint. I sprayed the inside first and then the outside.
- Take the pentagon shape and spray both sides of this piece.
- Wait at least 2 hours to dry.

STEP FIVE:
- String the light cord through the pentagonal shape. Attach the light bulb. Switch the socket into the ON position.
- Carefully place the light inside the icosahedron shape until it is hanging it so that the socket touches a cluster of 5 triangle vertices. Enclose the final edges by taking fishing line and stringing it through the holes of the vertices of the final two unconnected pieces. This will allow you to later remove and replace the light bulb later.
- Hang the piece wherever you'd like. I recommend plugging it into an outlet that has a corresponding light switch so that you can turn it on and off with a switch. Use the cord to hang using the metal command strip from the ceiling.