

Luminary Device

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ENVR1005

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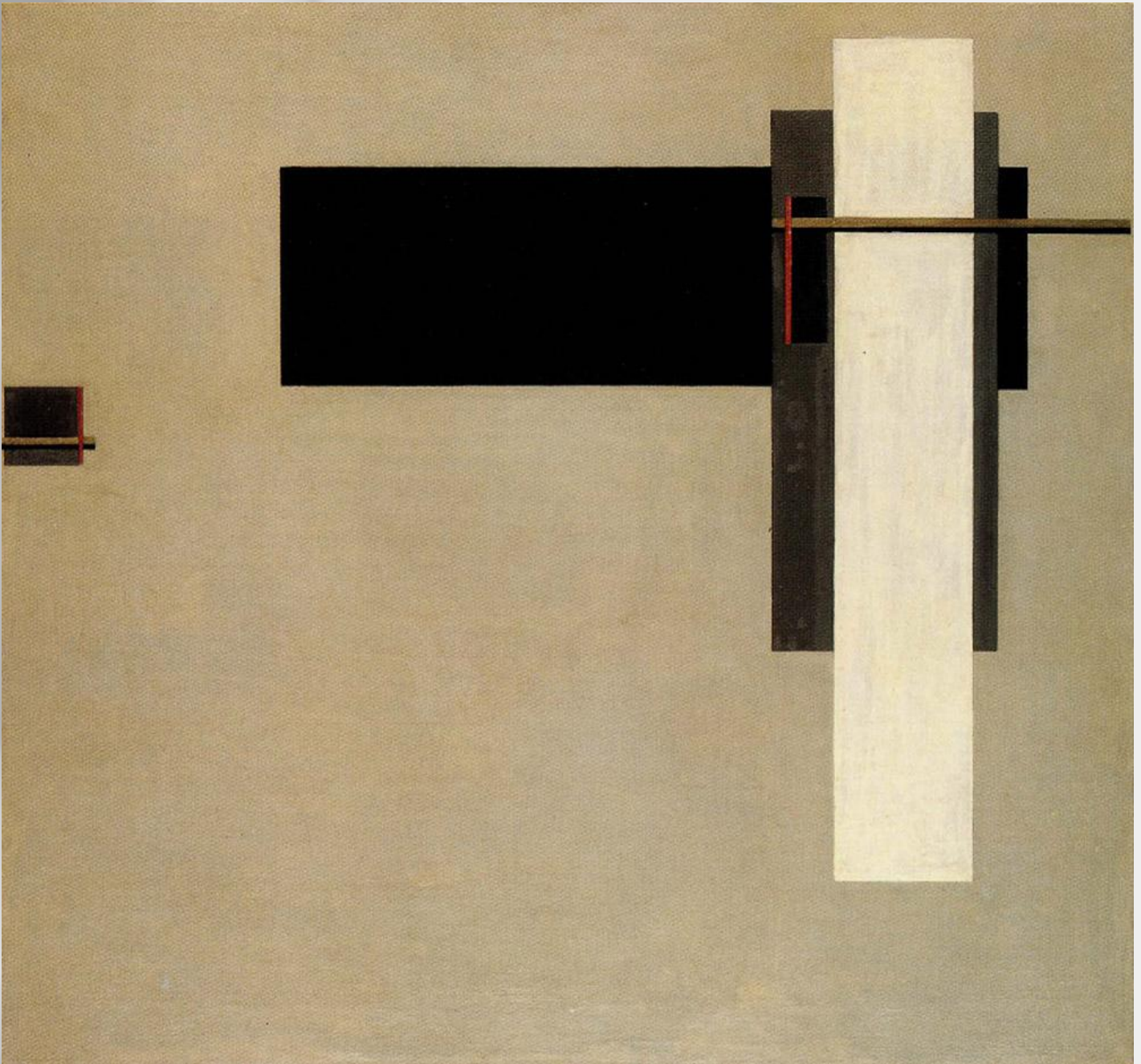


Plan of Action

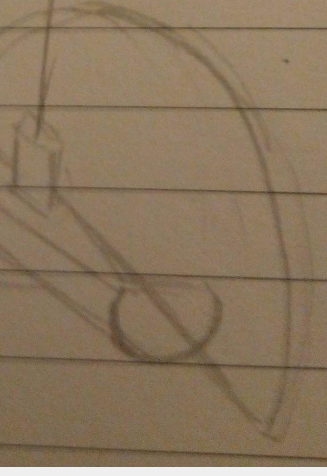
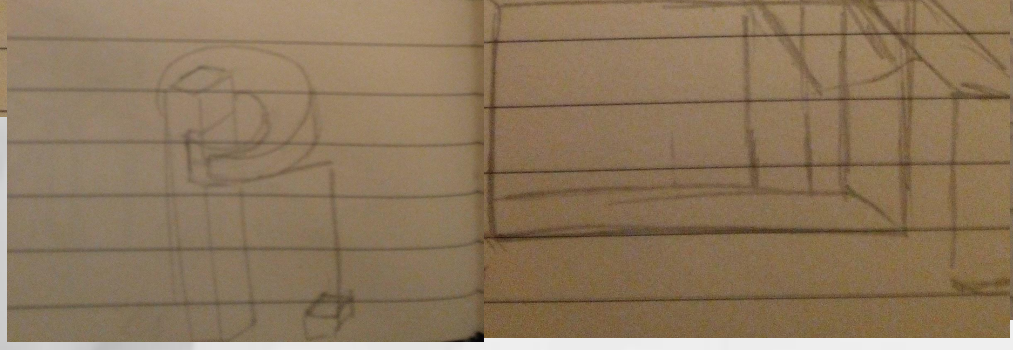
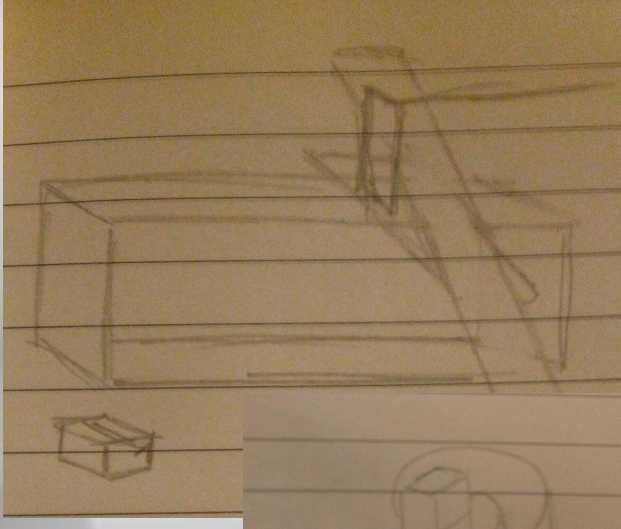
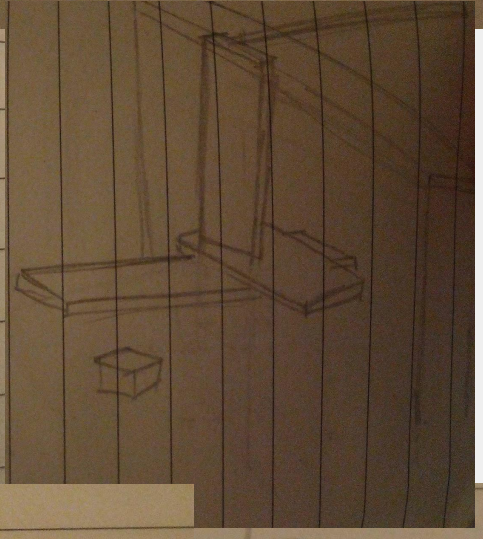
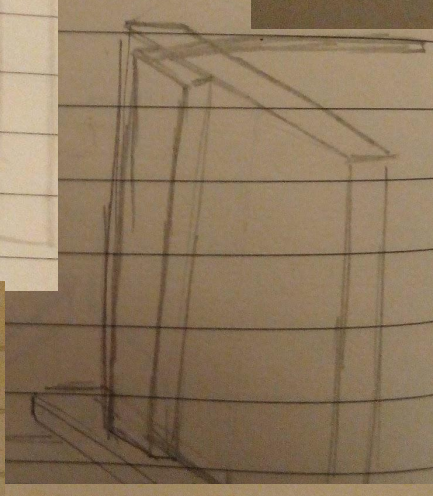
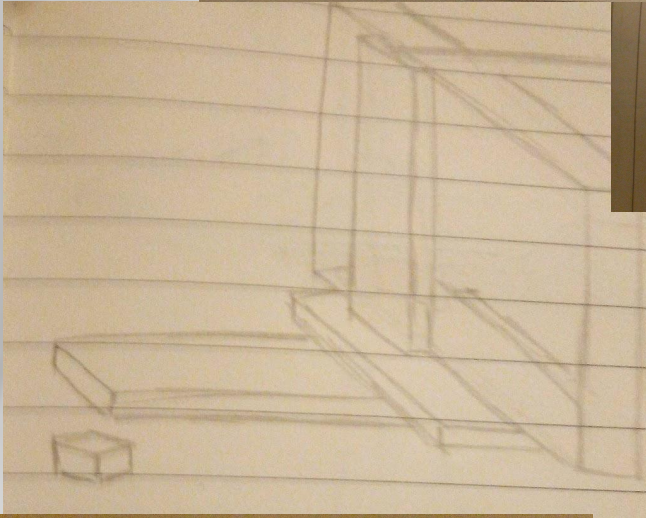
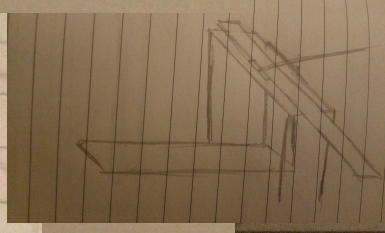
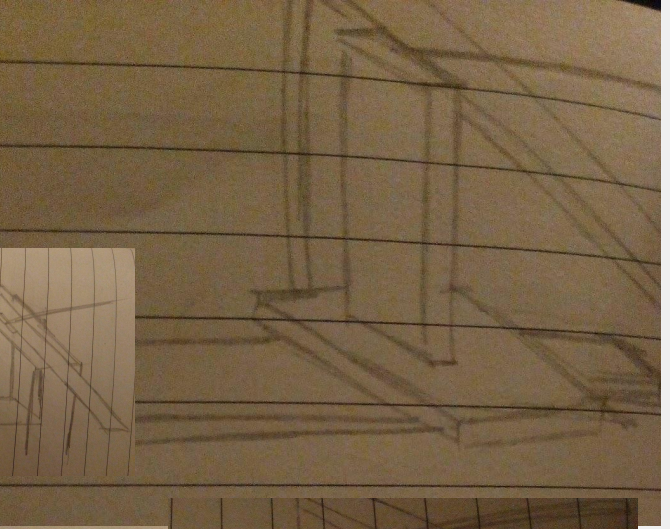
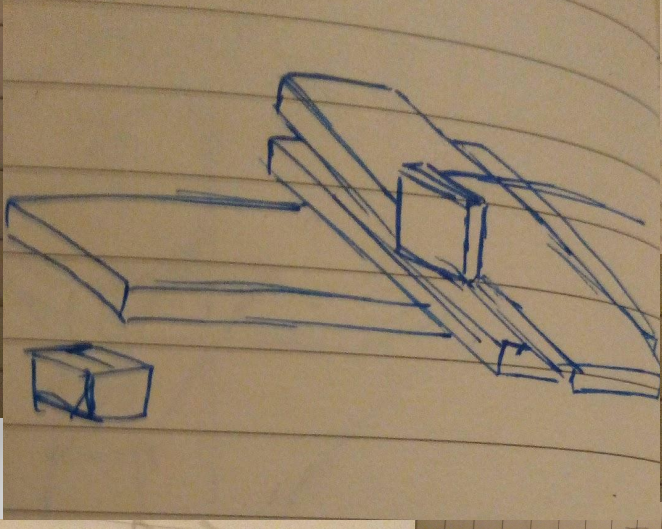
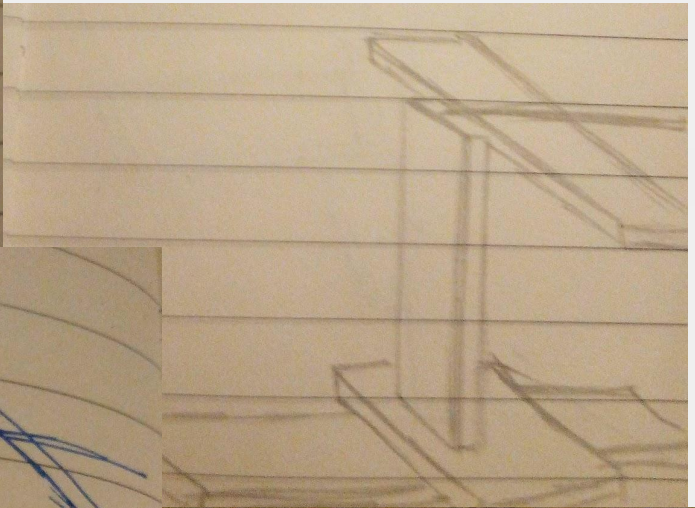
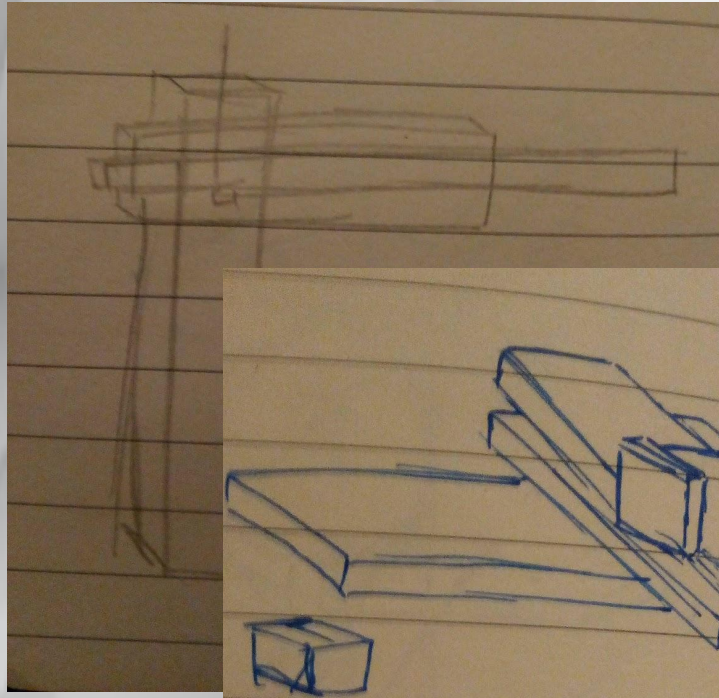
Action	Start Date	Finish Date
Design process - sketches	February 12th, 2018	March 22nd, 2018
Lighting Properties research	February 15th, 2018	February 16th, 2018
Prototypes and rough model explorations	February 20th, 2018	February 23rd, 2018
Statement of Reflection	February 2th, 2018	March 1st
Fabrication strategies exploration	March 2nd, 2018	March 4th, 2018
Rhino file	March 14th, 2018	March 19th, 2018
Laser cut files	March 15th, 2018	March 16th, 2018
Assembling the luminary device	March 23rd, 2018	March 23rd, 2018
Refinements of the model	April 2nd, 2018	April 3rd, 2018
Process book	February 13th, 2018	April 5th, 2018



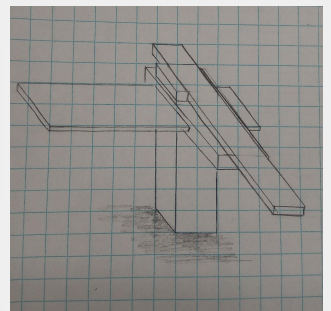
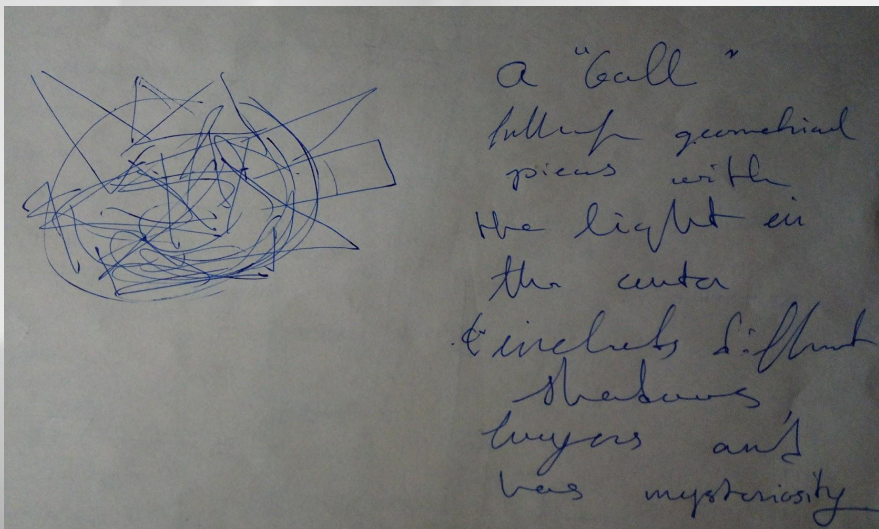
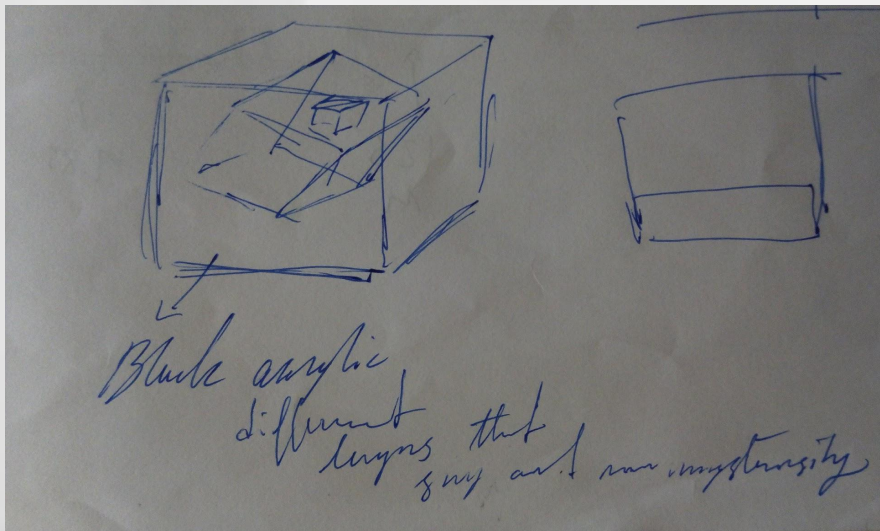
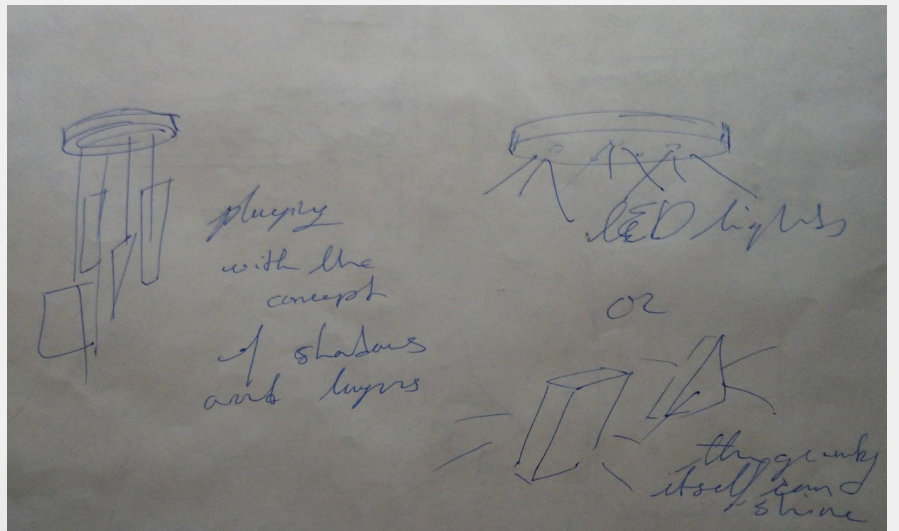
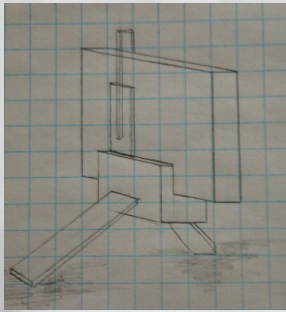
Concept Development

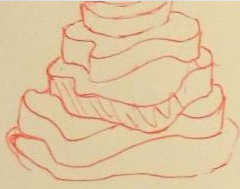


El Lissitzky's Proun

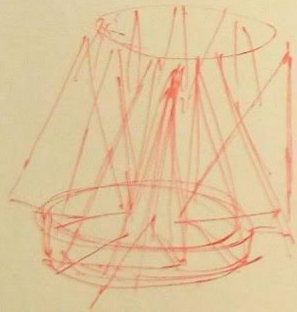



Sketches

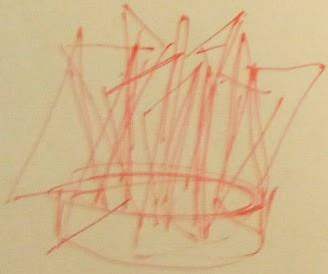





going on the
concepts of geometry,
mysteriousness, layers
and shadows,
and overlapping
disc pieces.



→ triangles
in one direction
in wireframe → 

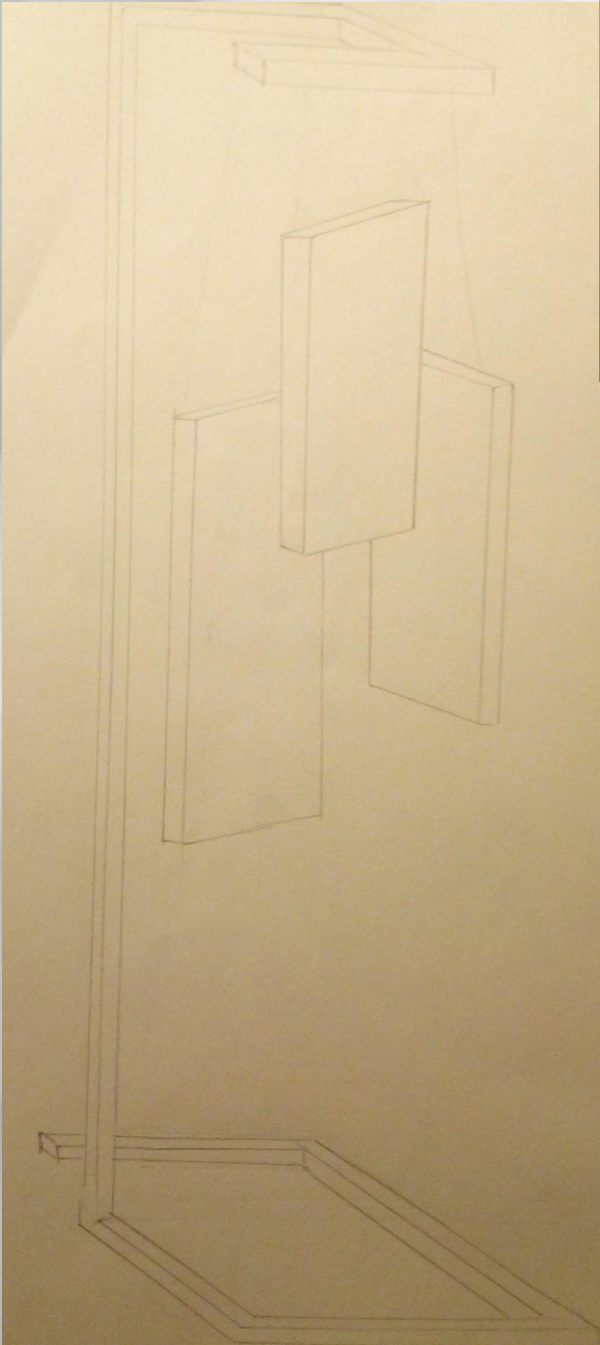


→ triangles are
changing positions → 

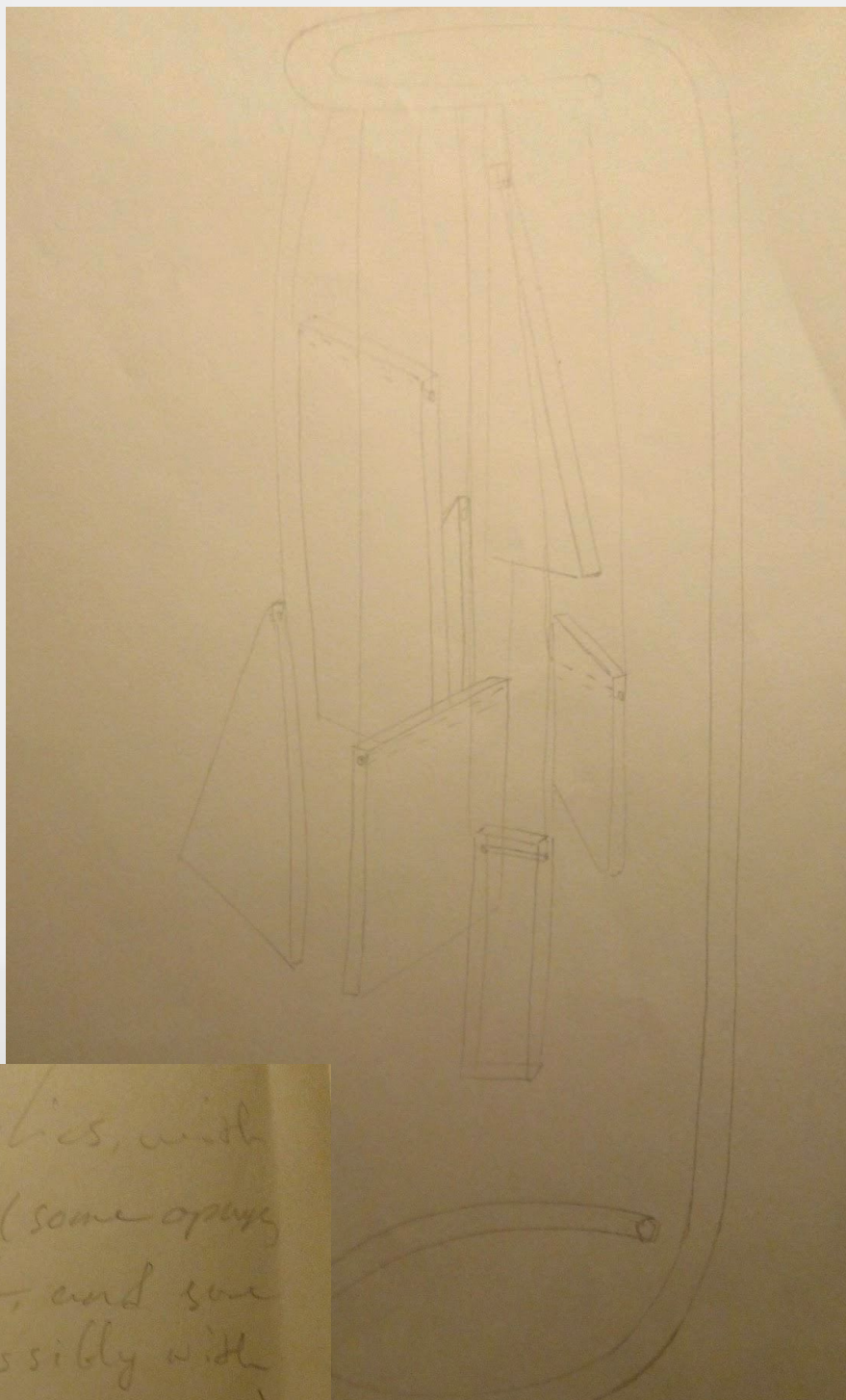
light is going from within
cutting shadows and an effect

Idea 1

using properties of light
such as material density
(the rectangular lenses are made
of transparent acrylic)
The surface of the prism like
lenses are also smooth to
a uniform reflection to take
place from one lens to
another. The thickness/width
of the prisms - from the inside
will be covered with LED strip
The stands to hold the lights
up will be metallic; the weight
of it will keep the light balanced.



Idea 2



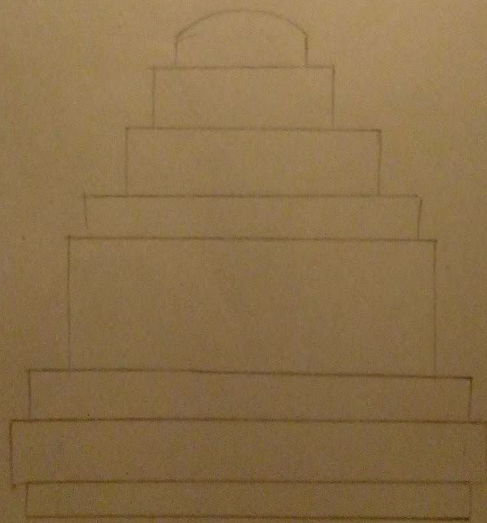
Different acoustics, with
different lenses (some opaque,
some translucent, and some
transparent; possibly with
the additional mirrors?)
LED light strips will be
shining on them from above
to create the different
layering shadows on
the surrounding.

Different species of variety
of minerals, layered on
top of each other. Light in
the center. The geometrical
shapes/arcs cast geometrical
shadows on the wall/surroundings.

Idea 3

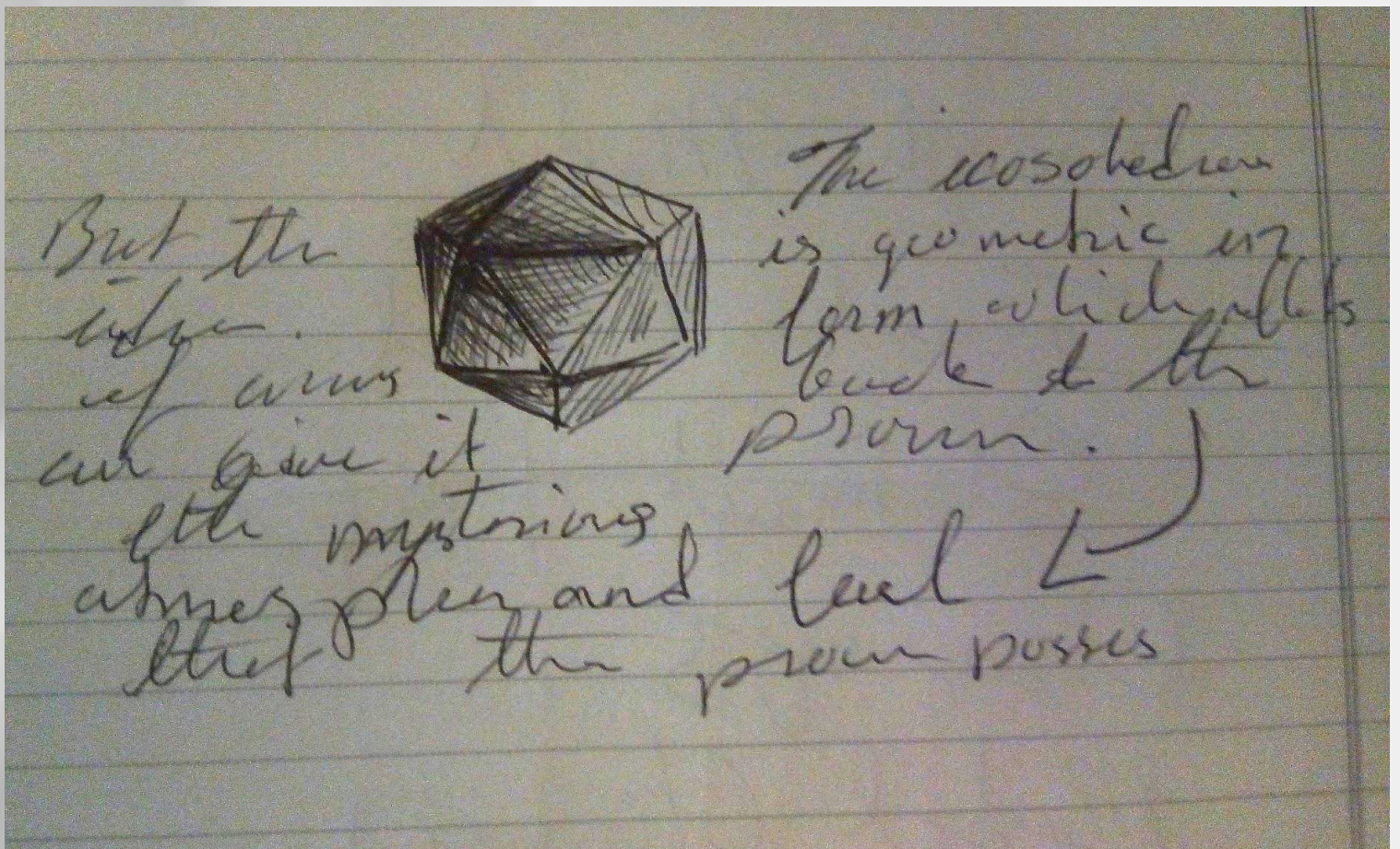



top view



side view/elevation

Idea 4



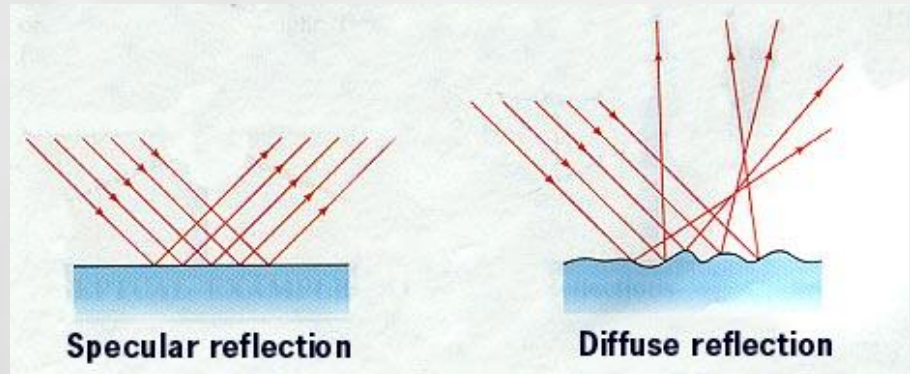


Research

Light Properties

● Reflection

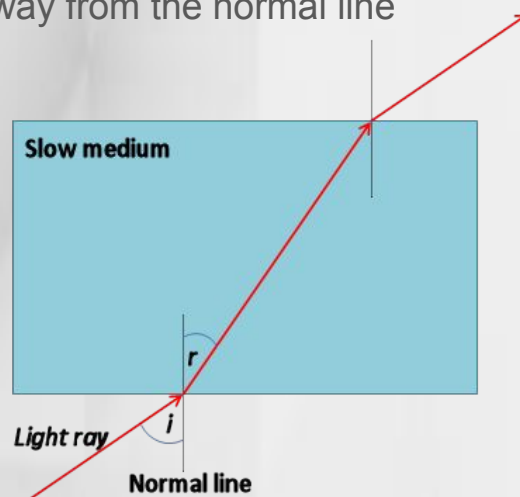
- Specular Reflection
 - Law of reflection states, “the angle of incidence is equal to the angle of reflection”
 - Happens on smooth surfaces
- Diffuse Reflection
 - Light rays and particles are scattered in different directions after the incidence



http://www.physics.louisville.edu/cldavis/phys299/notes/lo_speculardiffuse.jpg

● Refraction

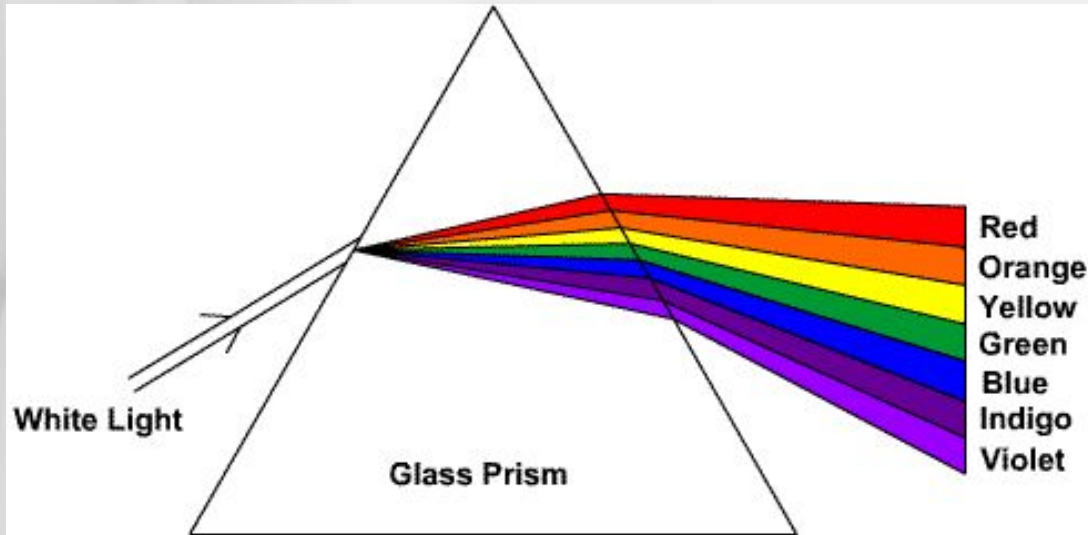
- Occurs when light changes from a medium to another (depending on the level of index of refraction)
 - Slowing down in denser materials, i.e. from air to water, therefore the light bends towards the normal line
 - Going faster in a less dense material, i.e. from water to air, therefore the light bends away from the normal line



http://www.engineerstudent.co.uk/Images/wave_refraction_diagram.png

- Dispersion

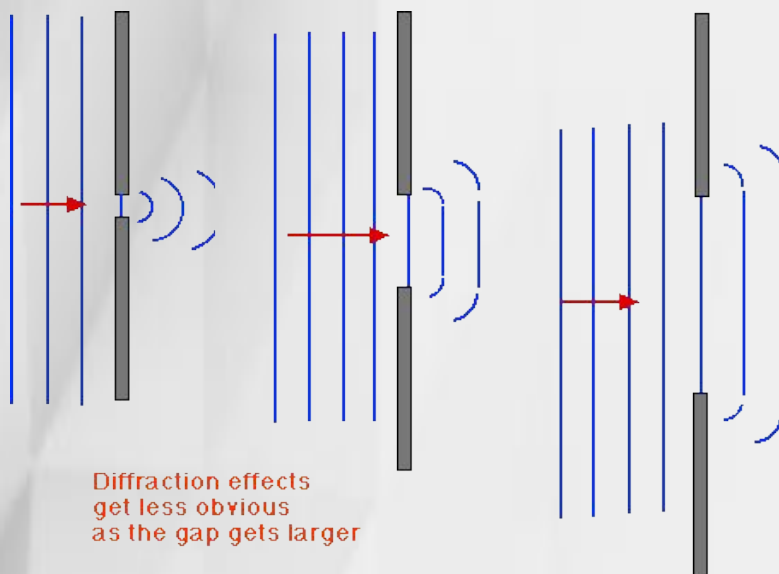
- The process in which white light passes through a triangular prism and separate into the 7 colours of rainbow



https://www.school-for-champions.com/science/images/light_dispersion1.gif

- Diffraction of Light

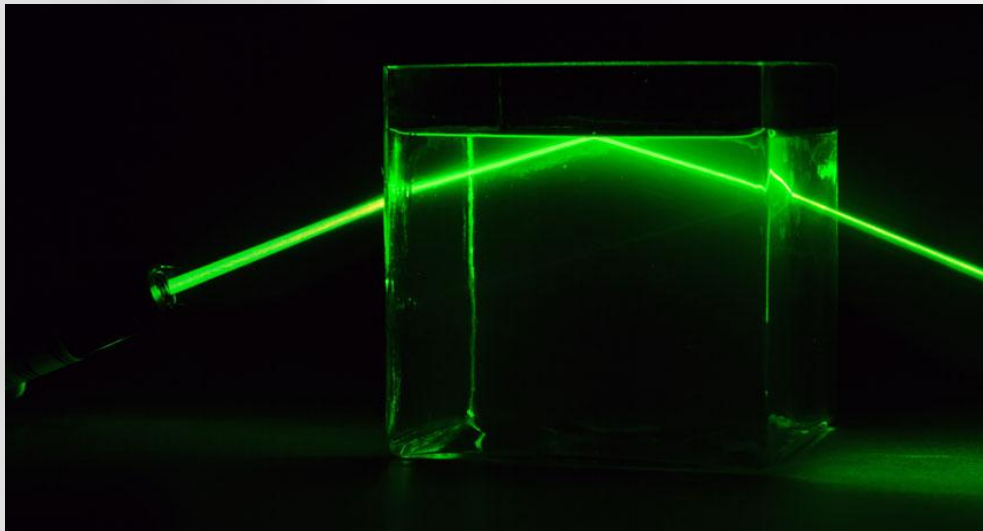
- The property in which light spreads out once it passes through a slit
 - The variables such as the separation of the edges of the slit and the wavelength change the outcome



https://d2jmvrsizmvf4x.cloudfront.net/CwWGE66iRQ626PX1tBc_diffgaps.gif

- Total Internal Reflection

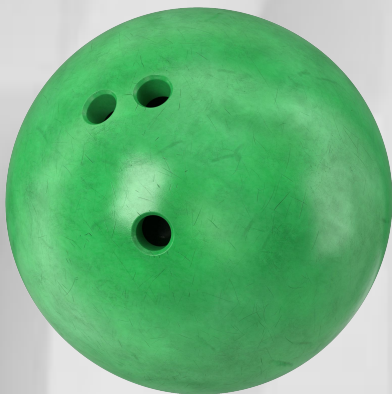
- The action in which the light is reflected within the medium



https://d1o50x50snmhul.cloudfront.net/wp-content/uploads/2017/08/22162642/c0220380-refraction_and_total_internal_reflection-spl.jpg

- Response of materials with light

- Opaque
 - Light does not pass through, entirely absorbs the light
- Translucent
 - Some parts of the light particles pass through, distorts the particles
- Transparent
 - All the light particles easily pass through



<http://webiconspng.com/wp-content/uploads/2017/09/Bowling-PNG-Image-53745.png>



<https://i.stack.imgur.com/KvJV4.jpg>



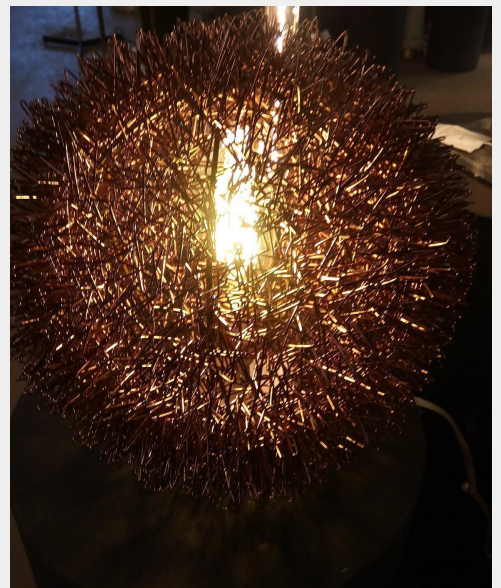
https://pre00.deviantart.net/fd1b/th/pre/i/2017/023/5/9/transparent_glass_of_water_render_by_disturbedmr-dawi7jt.png



Research

Precedents

These lamps are not only layer, but also have complex geometrical forms. The first one is consistent of layers of half ovals. The second is created from geometrical liner tubes, playing with the shadows. The third is playing both with shadows as well as the geometrical design of the lamp itself. For example, the curveliner strings from a geometrical cluster that layers on top of each other to create irregular shadows.



From "Ultra Lighting" store
Location of Store:
129 Spadina Ave, Toronto

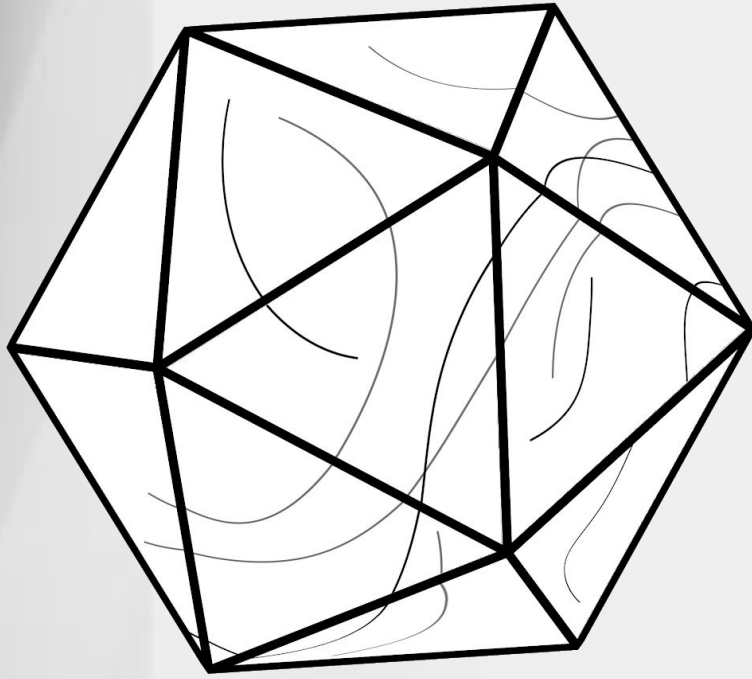


Drawings



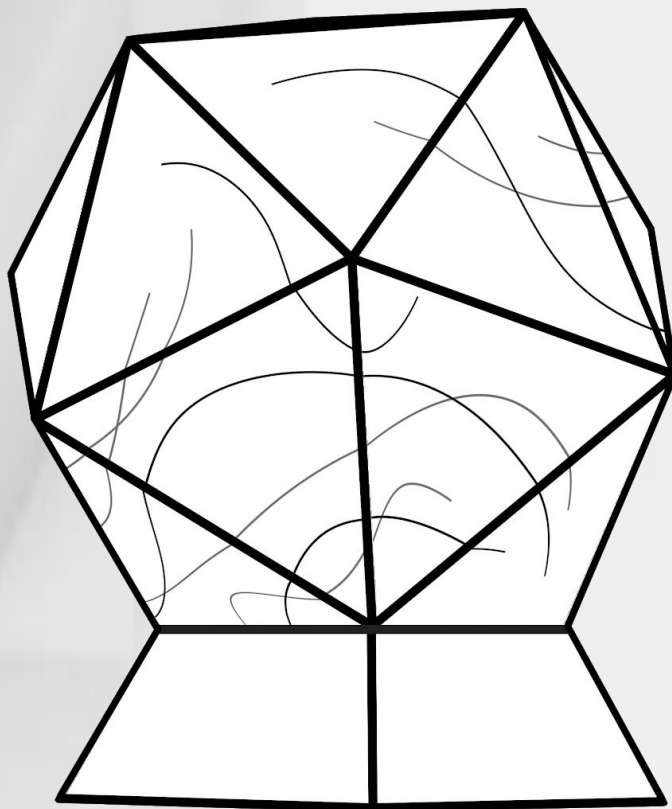
Rhino 3D model

10.5 cm

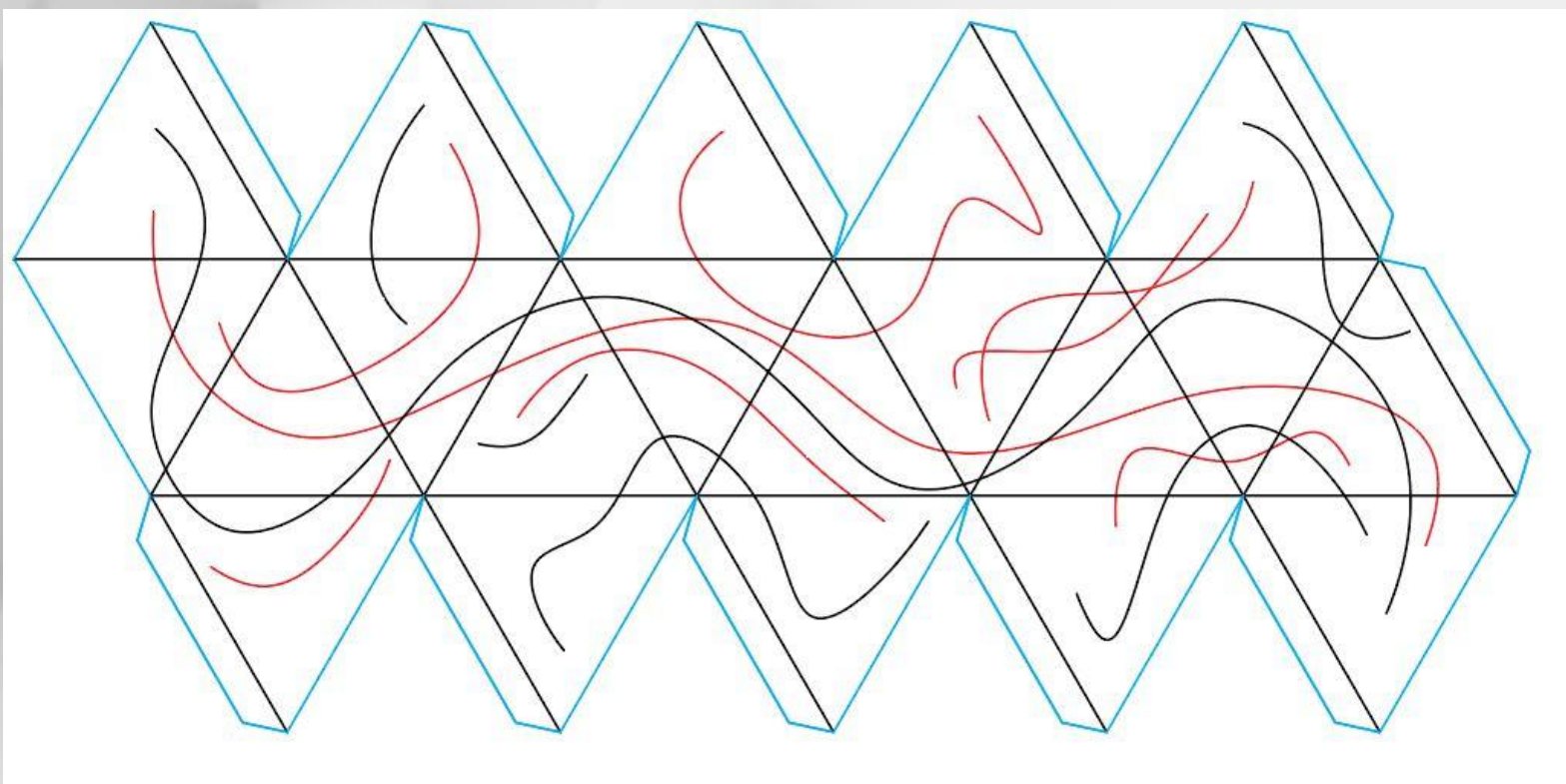


10.5 cm

15 cm



4.5 cm



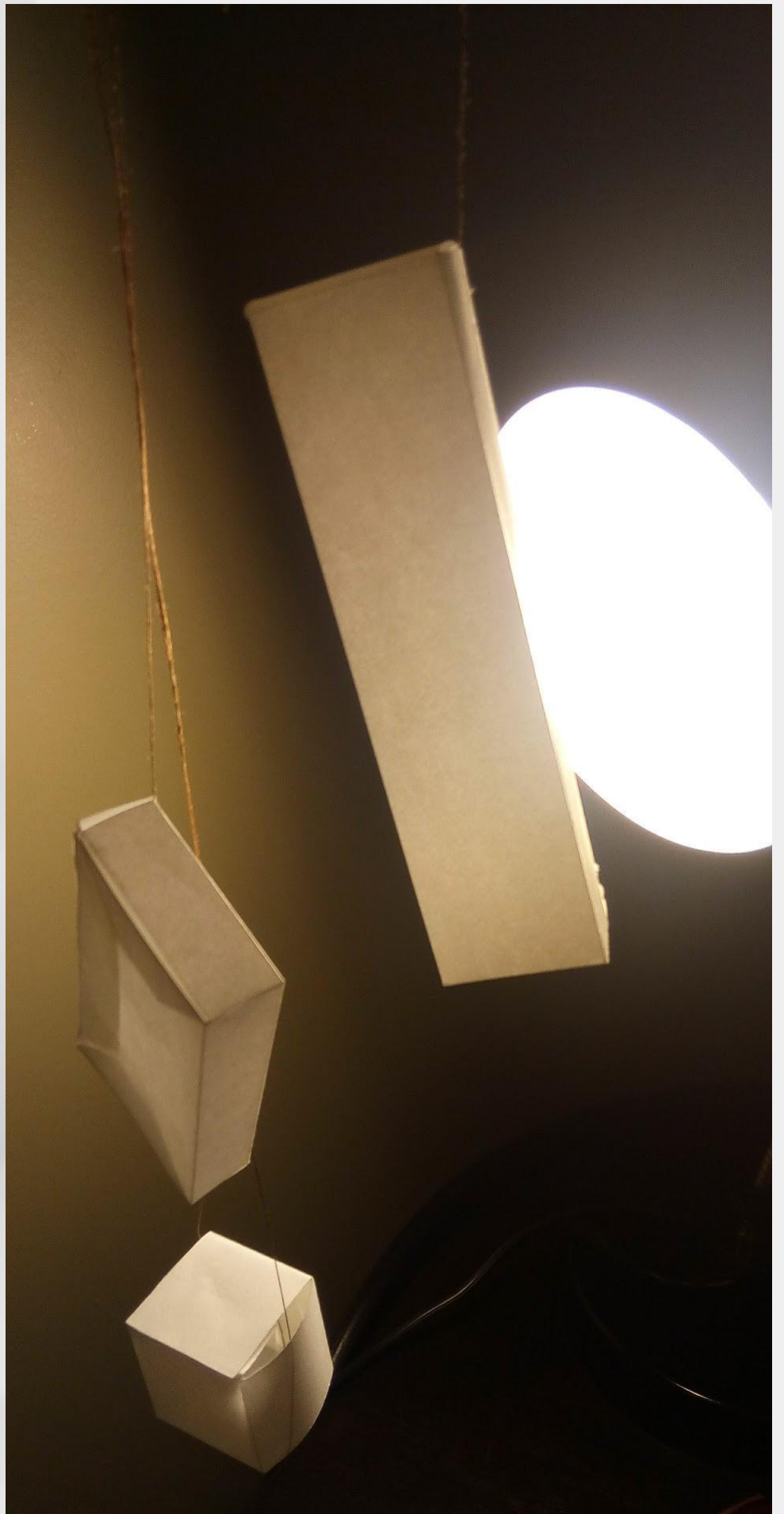
Laser Cut File



Rough Models

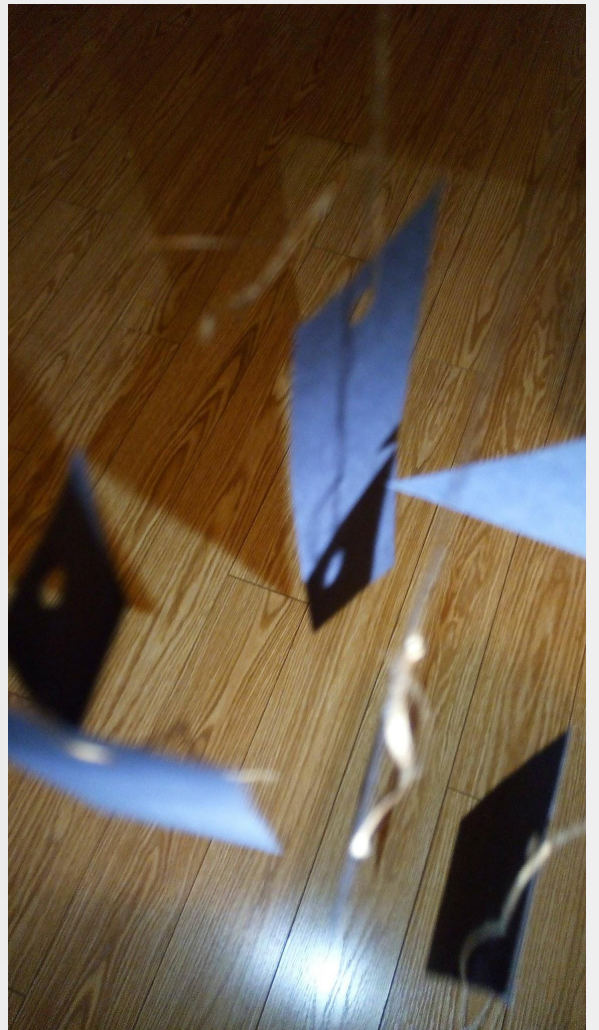


Idea 1





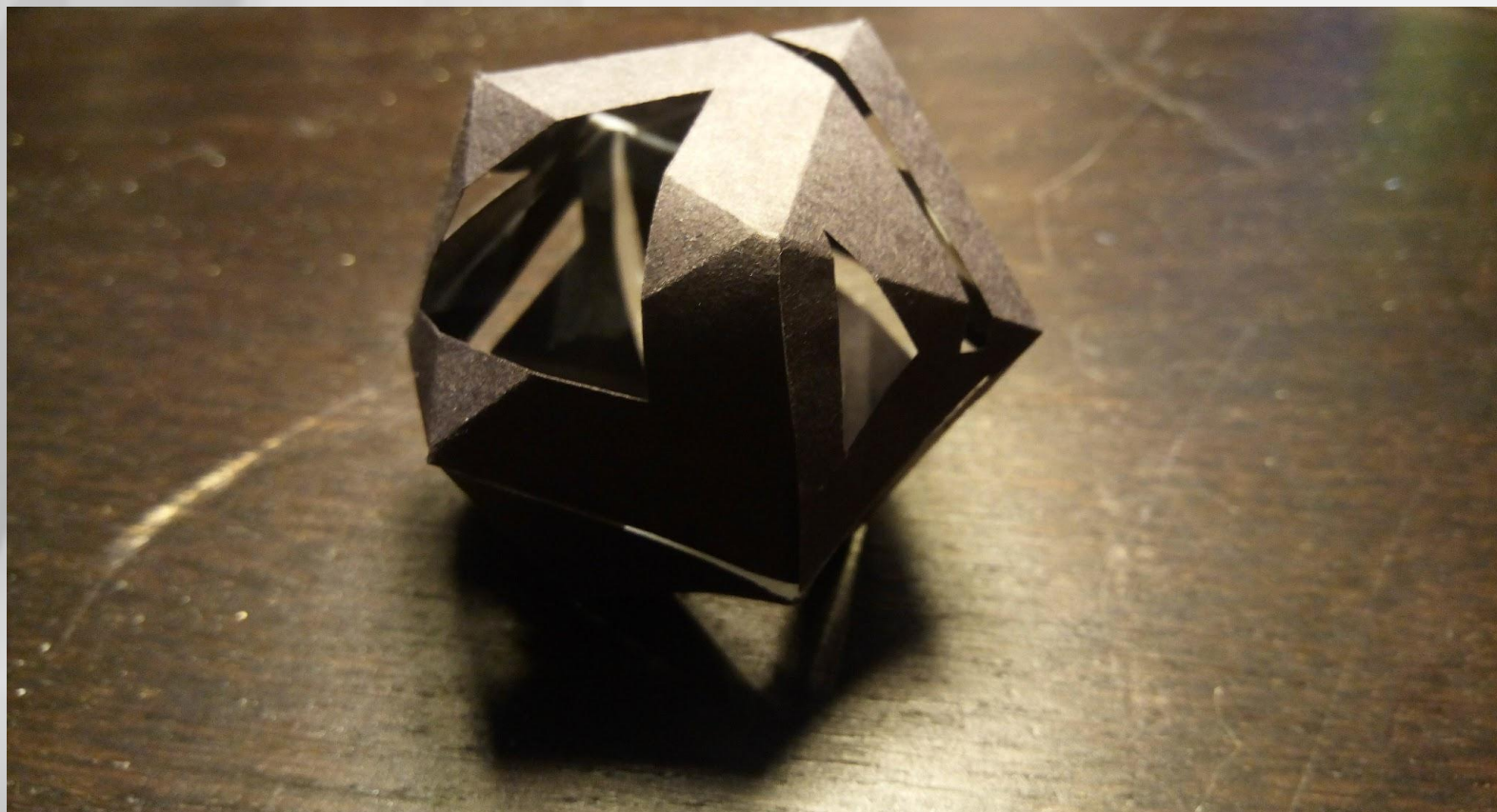
Idea 2



Idea 3



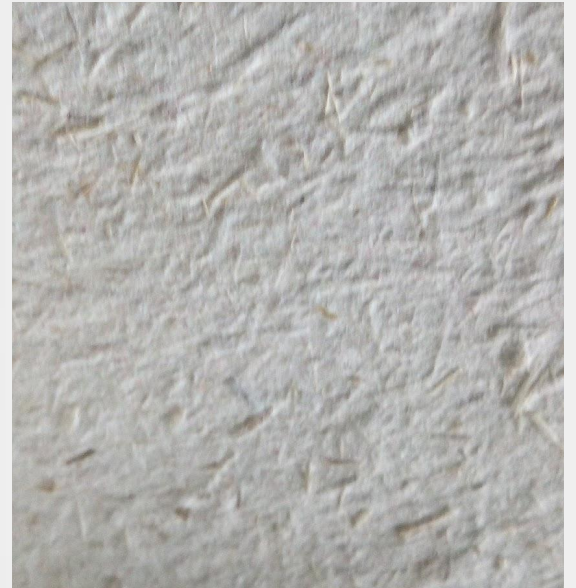
Idea 4





Materials

Thick
Watercol
or Paper



IKEA
Ramsta
Light



Double
Sided
Tape

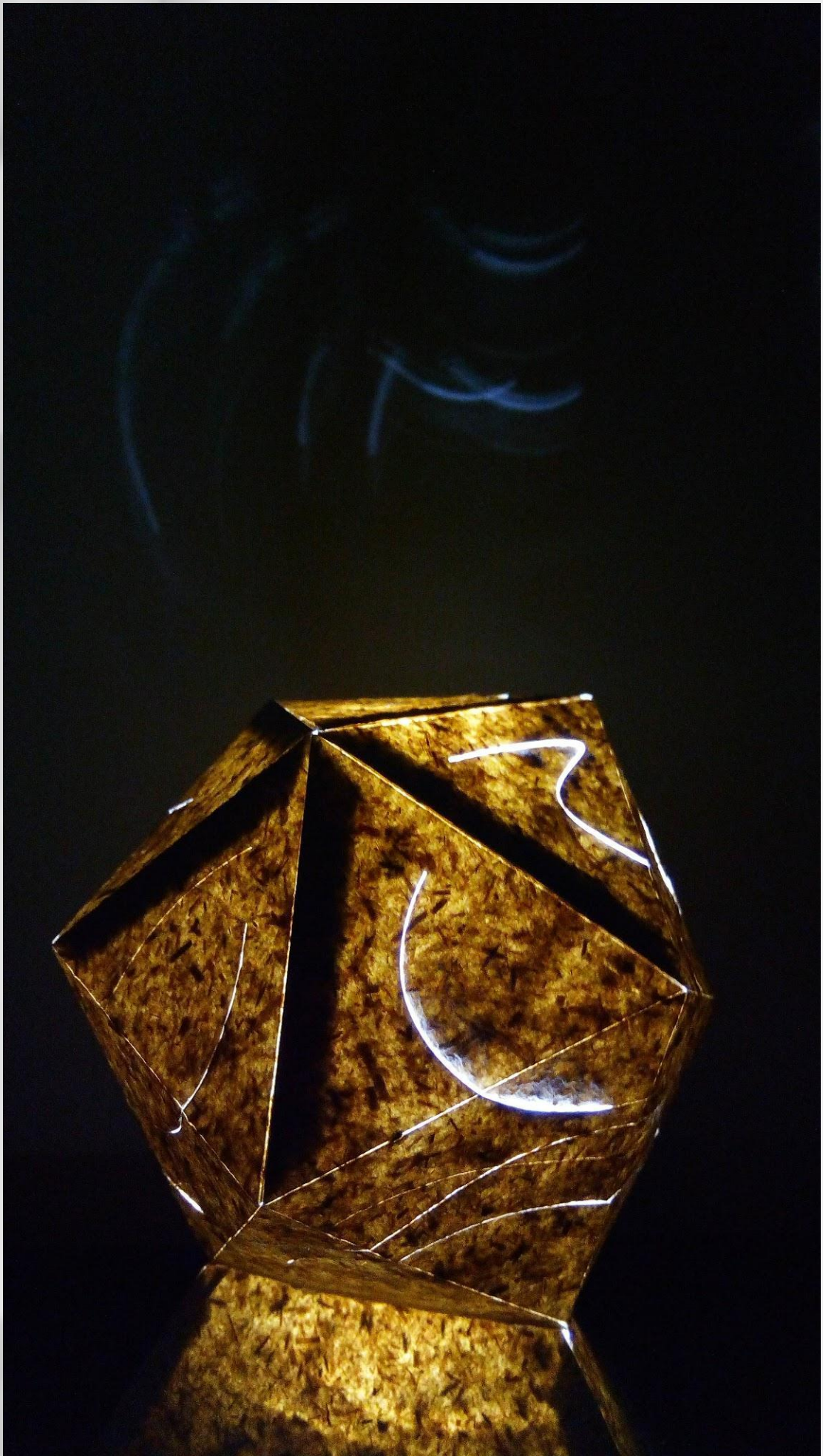


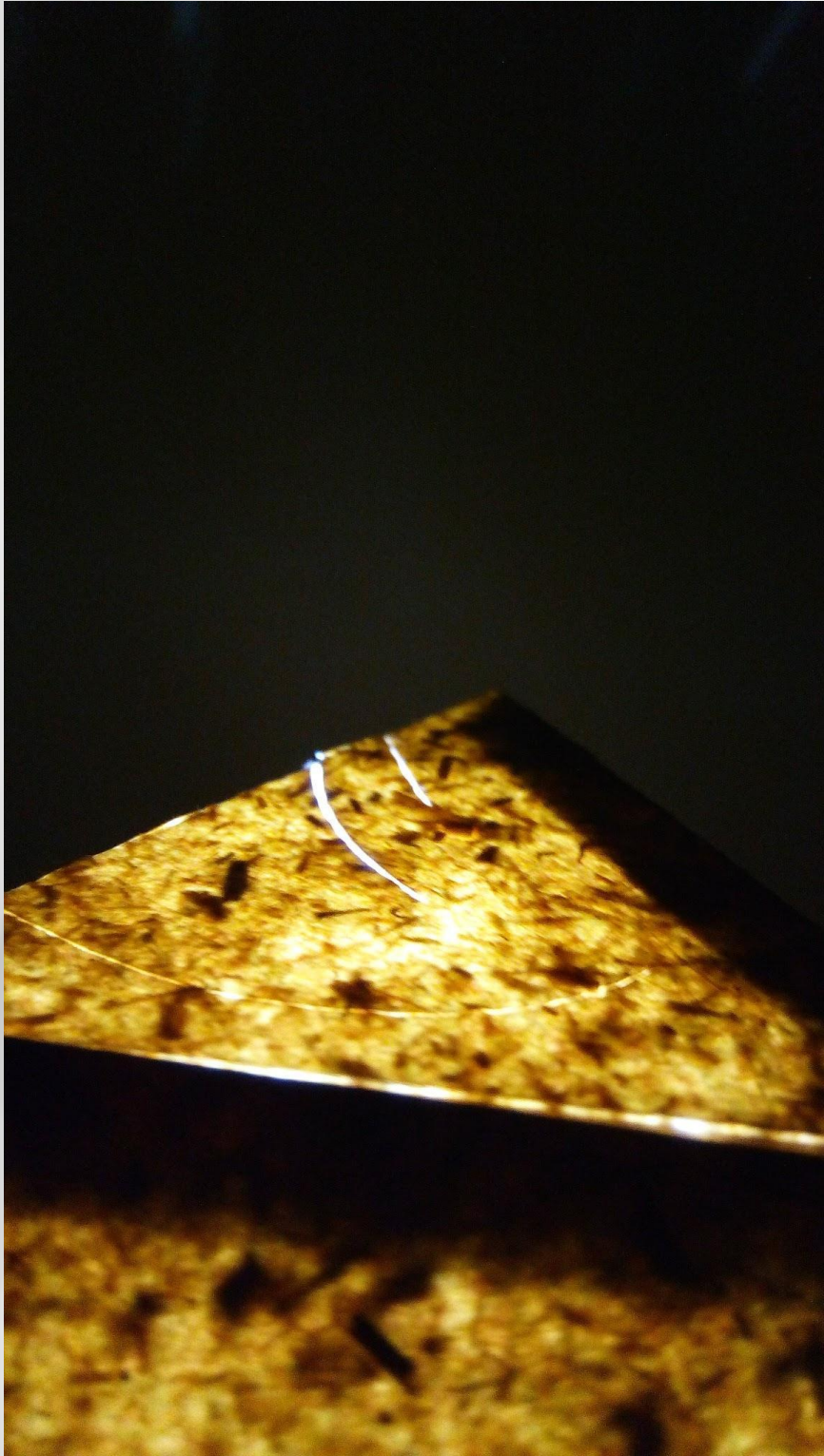


Final Model



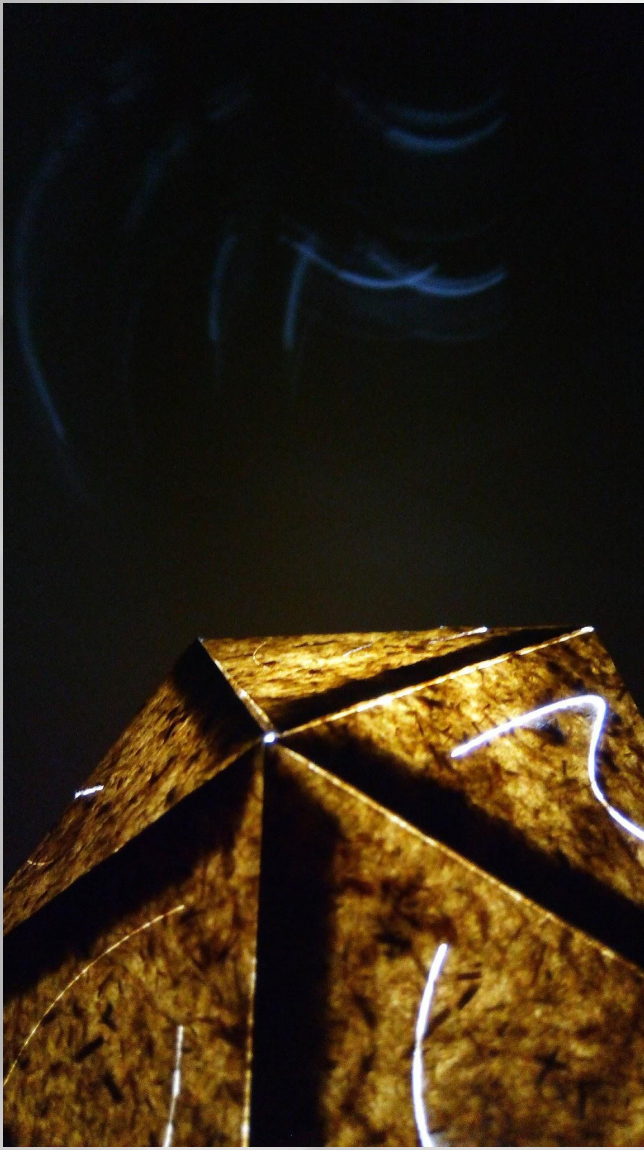






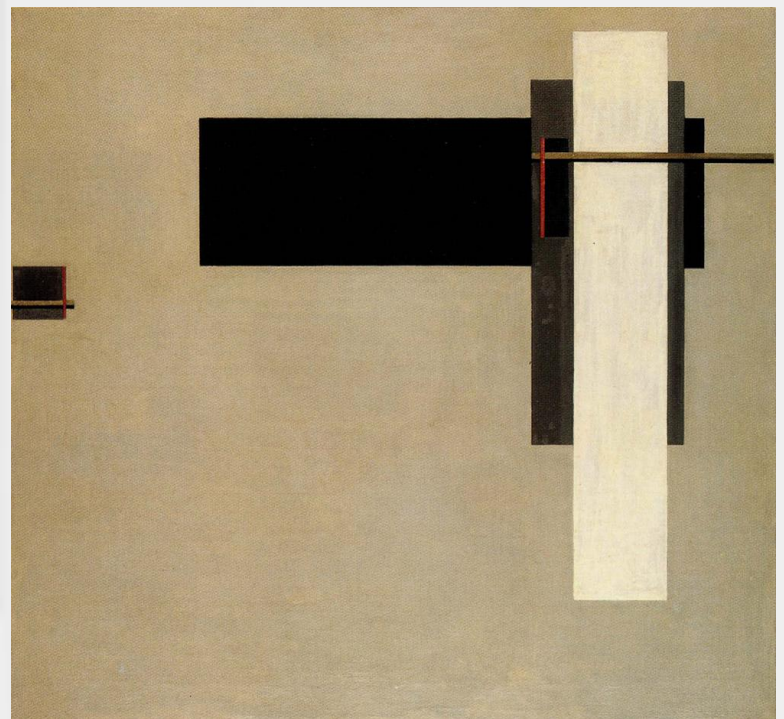


Statement of Reflection



El Lissitzky's Proun depicted a series of horizontal and vertical rectangles which varied in size and a very minimal range of colours. In order to bring this 2D geometrical shape into 3D world, I began by breaking down the concepts - or main messages - of the piece. I then concluded that it is based around the ideas of geometry, mysteriousness, shadows, peace, and layers. Since I relate the concept of peace with music and piano, I wanted to capture the essence of this proun and turn it into a lamp for my piano.

An example of this can be seen through the geometrical ball design. While it is mysterious in its overall form, it is yet geometrical in its individual pieces. Furthermore, the different layers of geometrical shapes allows for a playful and mysterious shadows - which are squeezing through different densities of engravings on the triangles.



Some of the challenges that I have faced in this project have been with the technological models - 3D rhino model and 2D drafts transformation of it. In order to solve the problem I made numerous prototypes, but ended up photoshopping the laser cut file on top of the 2D draft - that were derived from the 3D model from Rhino - as it provided the highest rate of accuracy.

Another challenge was in the assembly of the lamp. Since the paper is thin and easily thorn, I had to quite patiently tape the edges together with double sided tape. It became a challenge when the circle was closing in and I no longer could keep my hand in there to support and put enough force for proper taping. So it took quite a long time to tape them with a high accuracy in the craftsmanship. I also added a base, which was not included in the process design, which helps concentrate the light.

