Endolumen

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Introduction

The first project for Space/Materiality consisted on the creative exploration of paper as multifunctional medium as well as a strong and efficient structure.

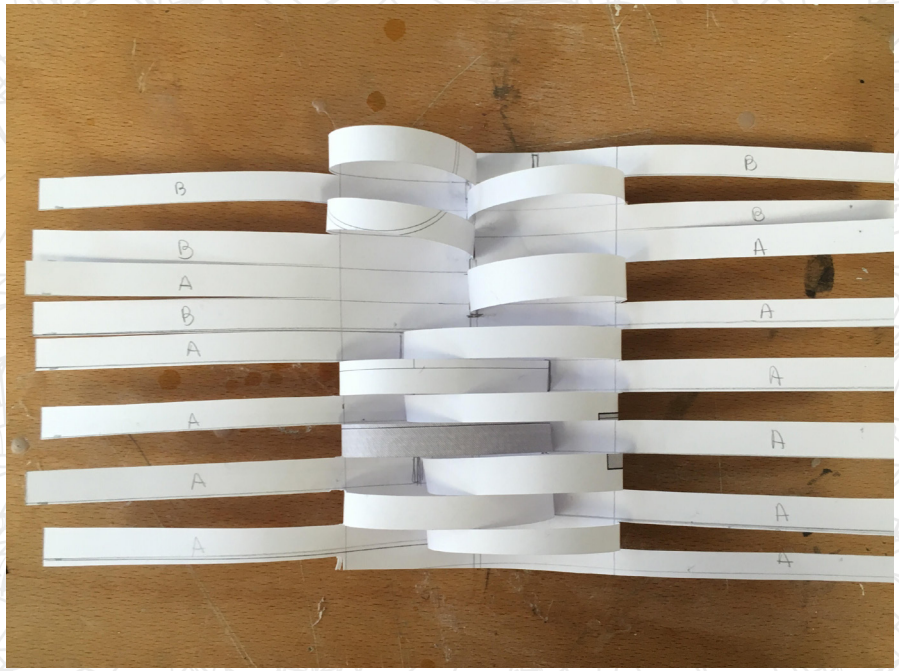
Throughout the initial weeks I did several experiments using different types of paper, ranging from a simple watercolour paper to a more sophisticated one, provided by Procédés Chénel.

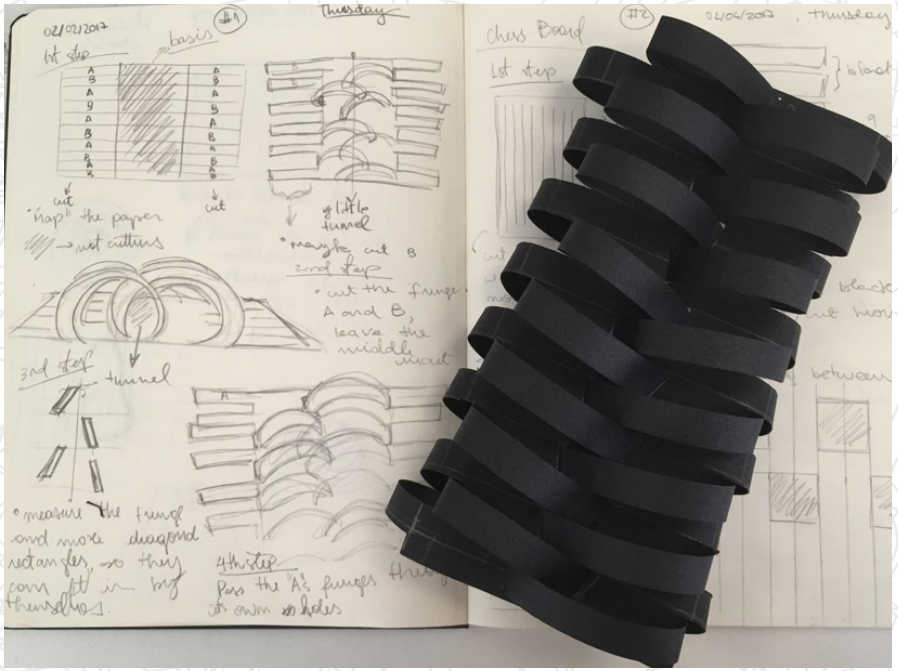
I was also able to develop small individual systems that turned out to be spine cord the most crucial part of Endolumen the lamp I designed.

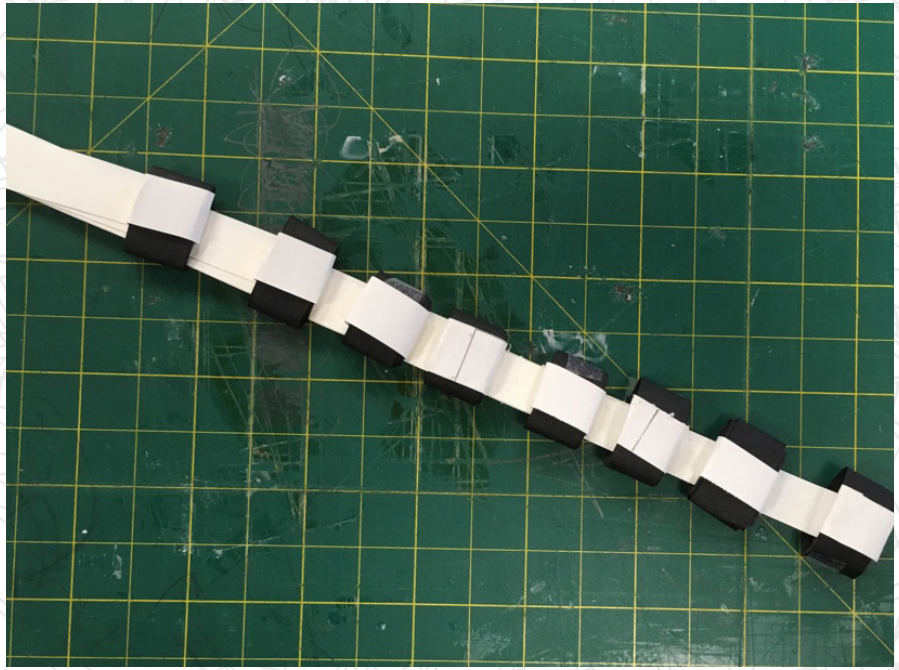
The Name

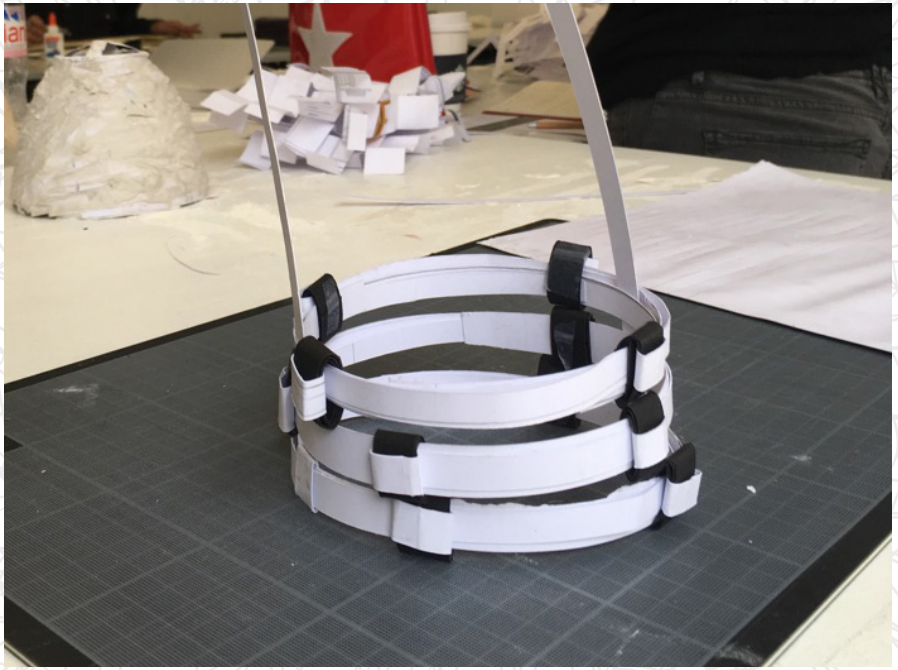
The name Endolumen derives from the idea that the lamp itself resembles an endoscopy, a medical procedure through which is an examination of the inside of the body by using an endoscope, a lighted and flexible instrument. "Endo" comes from Greek meaning within, and "Lumen" comes from Latin, meaning light.

Initial Experiments





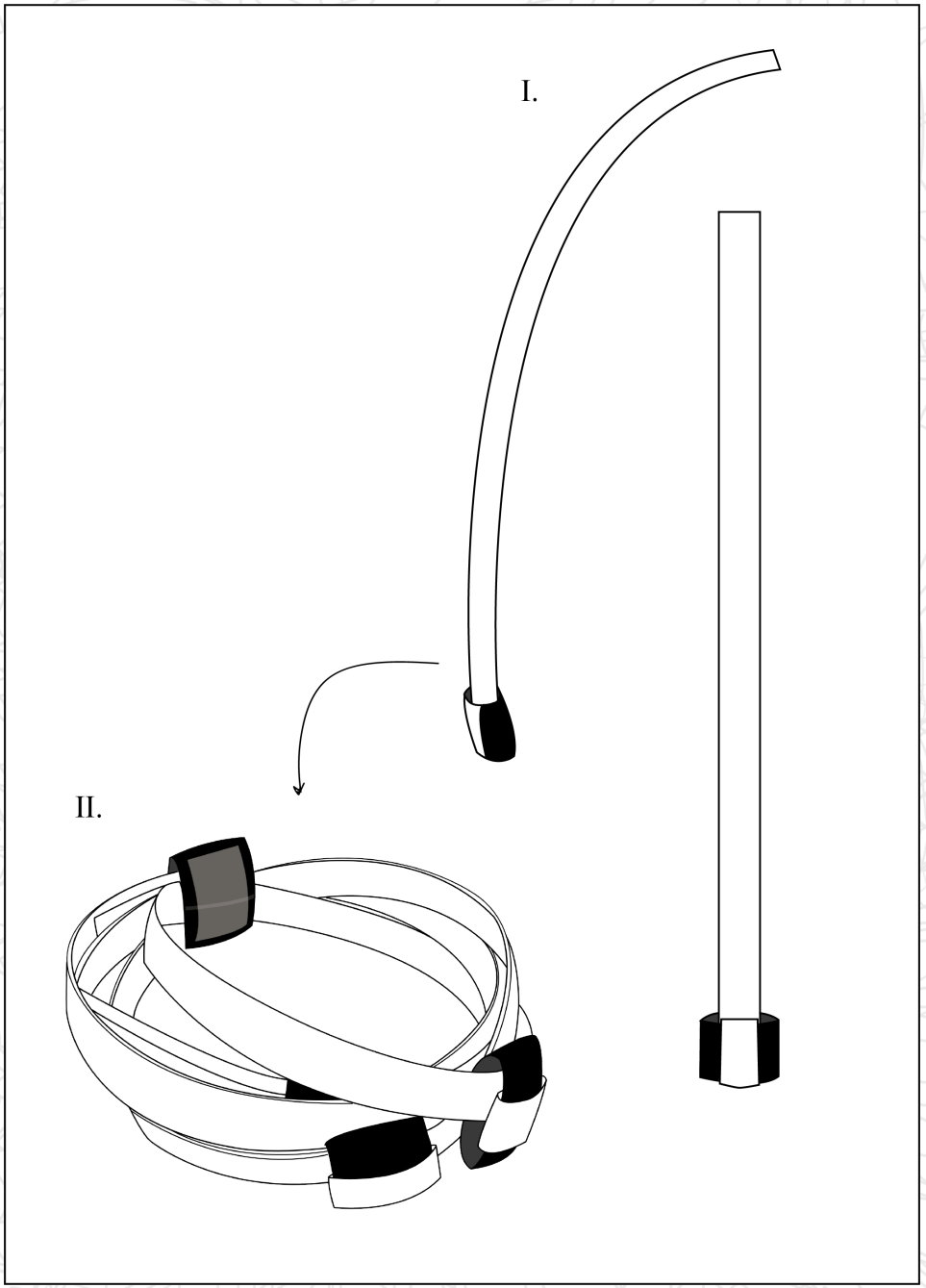


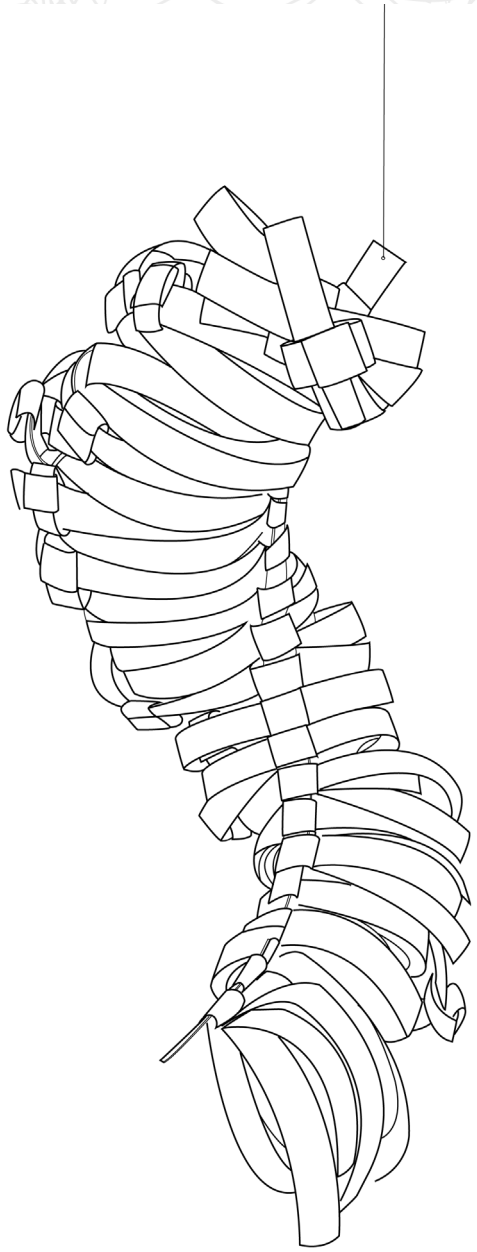


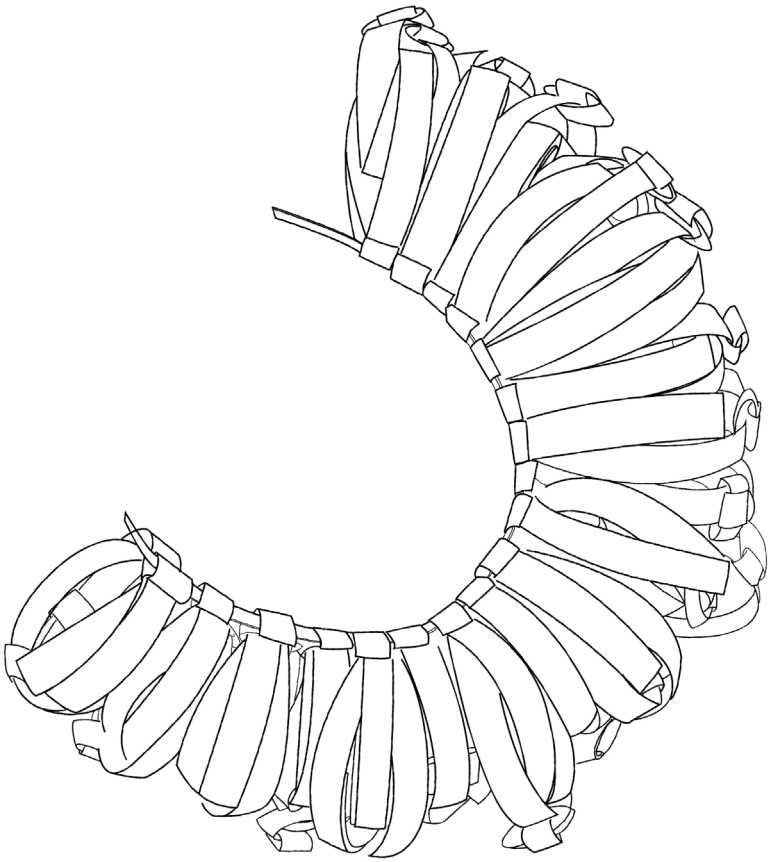
The System

After several explorations I was able to develop a very simple paper based system formed by stripes and rings.

The system itself is pretty successful because apart from small pieces of scotch tape on each ring, there is no extra material holding the loops together, it is only paper on paper.

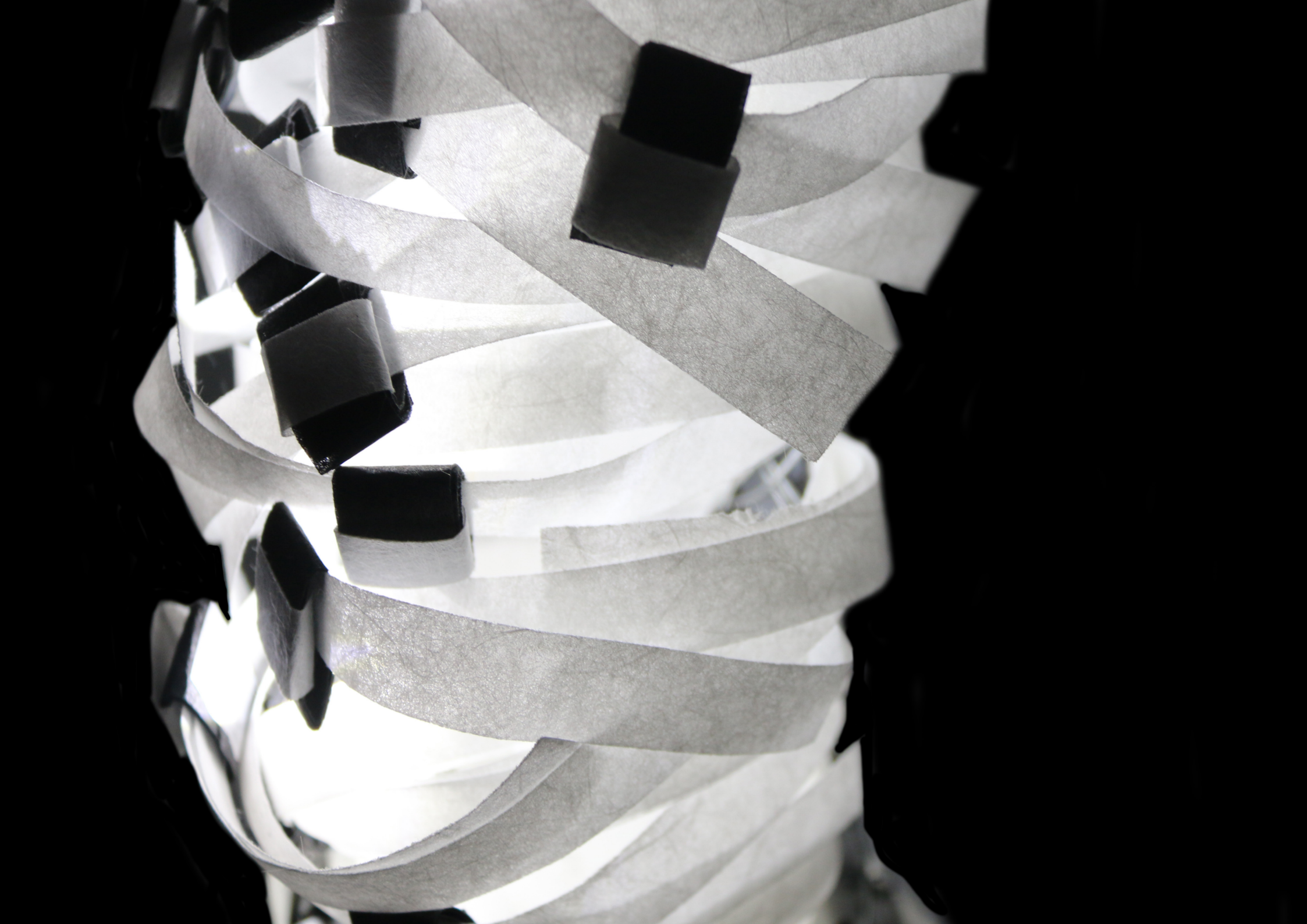






In Progress

Final



Tutorial Video

https://www.youtube.com/watch?v=soVCycHJ65s

Endolumen manual guide

Materials you will need:

1 A3 sheet of white Chénel paper

1 A4 sheet of black Chénel paper

1 A4 sheet of watercolour paper (300gm)

1 Cuter

1 Led light - FlexLed 1m, 230V

1 Metal wire roll (0,7mm)

1 Pencil

1 Ruler

1 Scissors

1 Scotch tape

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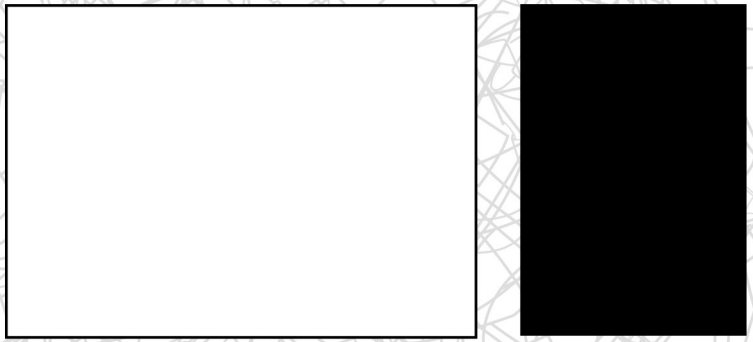
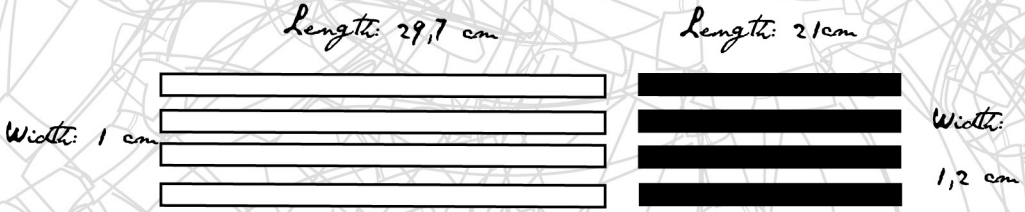


Step 1:

Cut 4 strips of the white paper in horizontal lines, 1 cm each. Then, cut other 4 the black paper in horizontal lines, 1,20 cm each.



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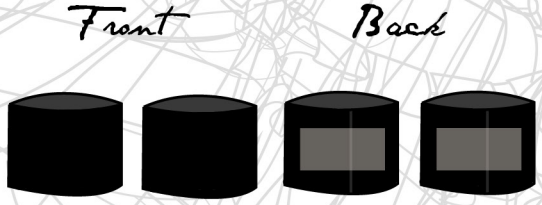
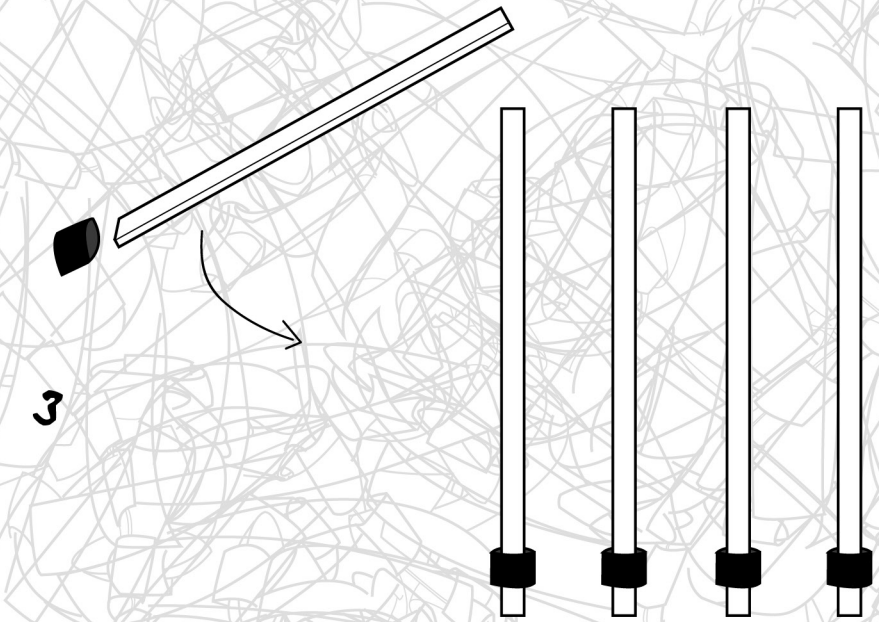


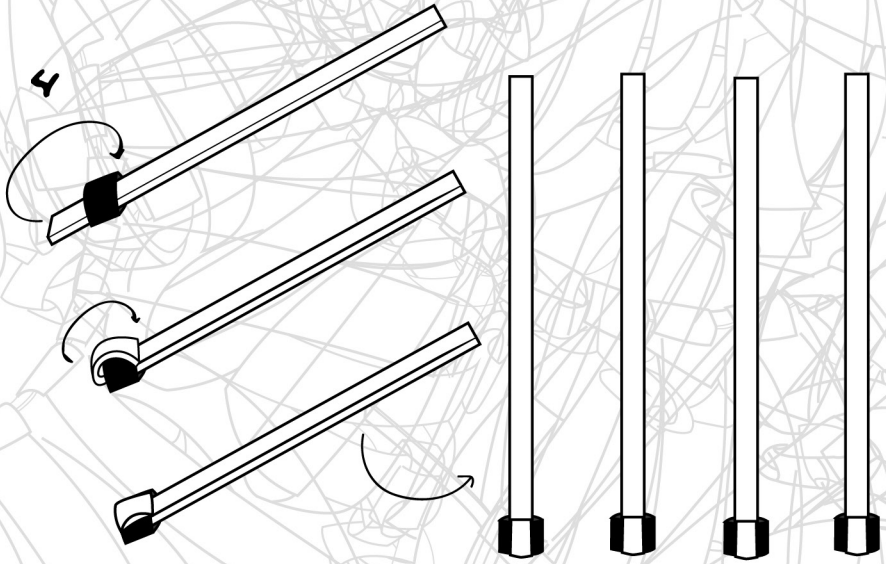
Step 2:

Roll each strip of paper individually making small rings, and then use scotch tape to seal the back of each ring.



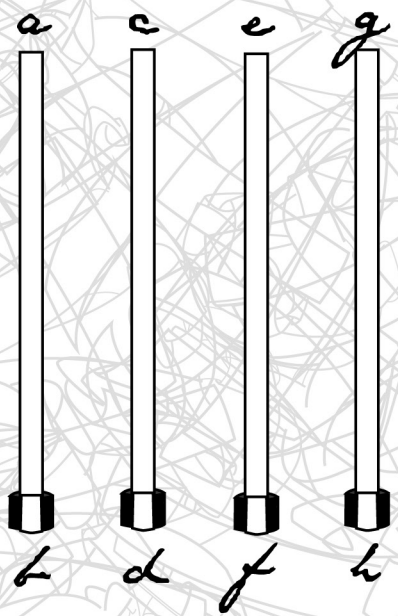
Step 3:

Pass one white strip through the center of one black ring and alocate the ring at one of the bottom of the white strip, 2 cm above the end.



Step 4:

Overlap the end tip trough the center of the black ring, the same used to pass the strip on Step 3.



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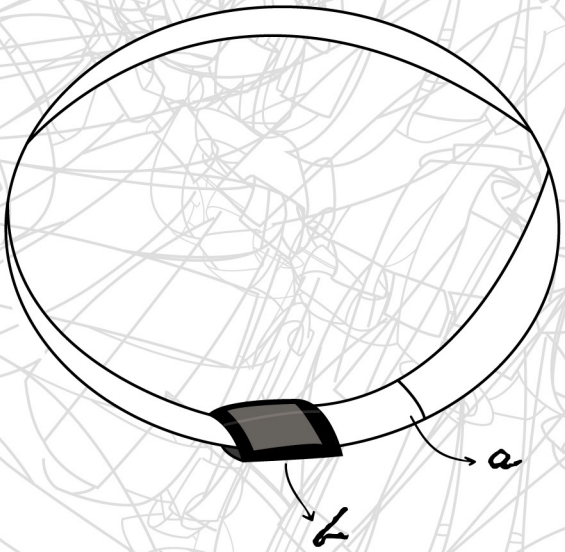
Step 5:

Name every strip with a letter, assign one for the top edge and another for the ring. This step is very important to avoid confusion on the further development.



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Step 6:

Pick the first strip and make a full circle with, passing "a" through "b".

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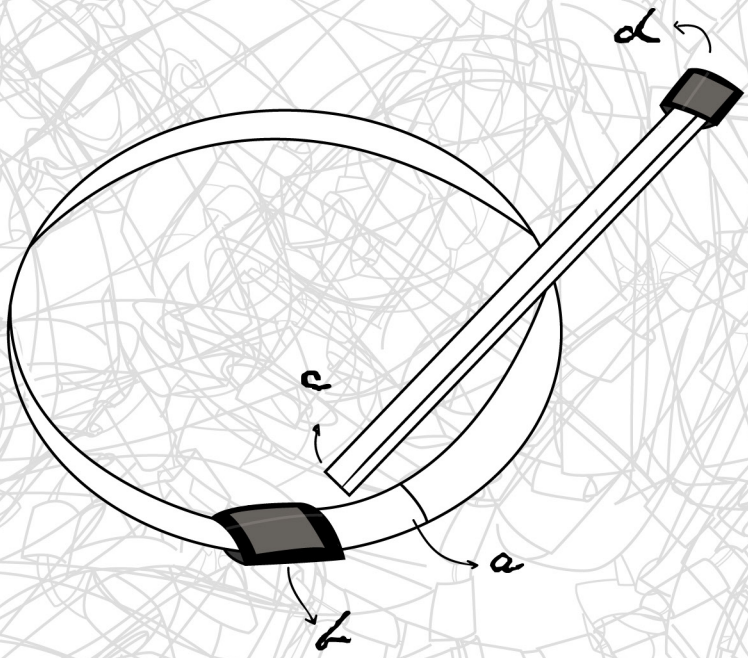
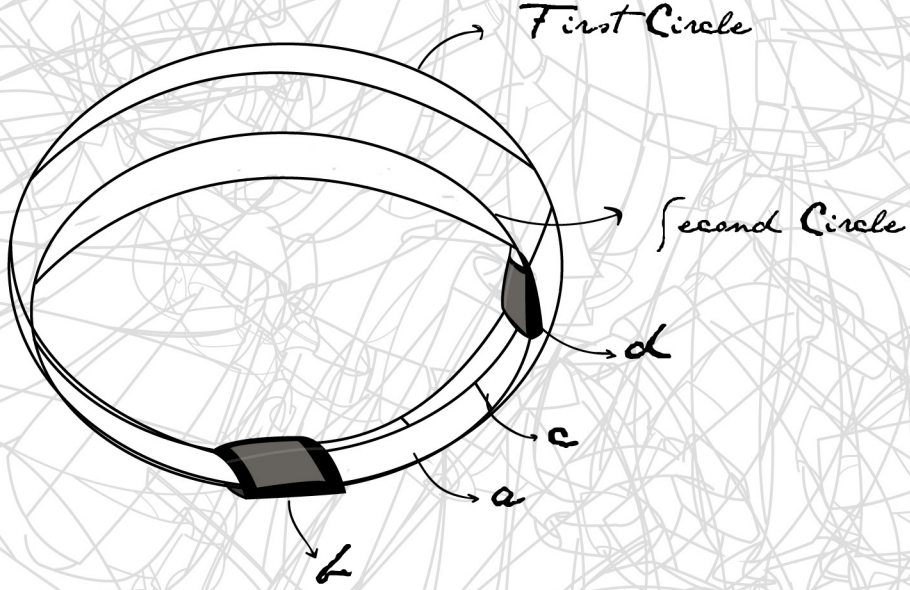
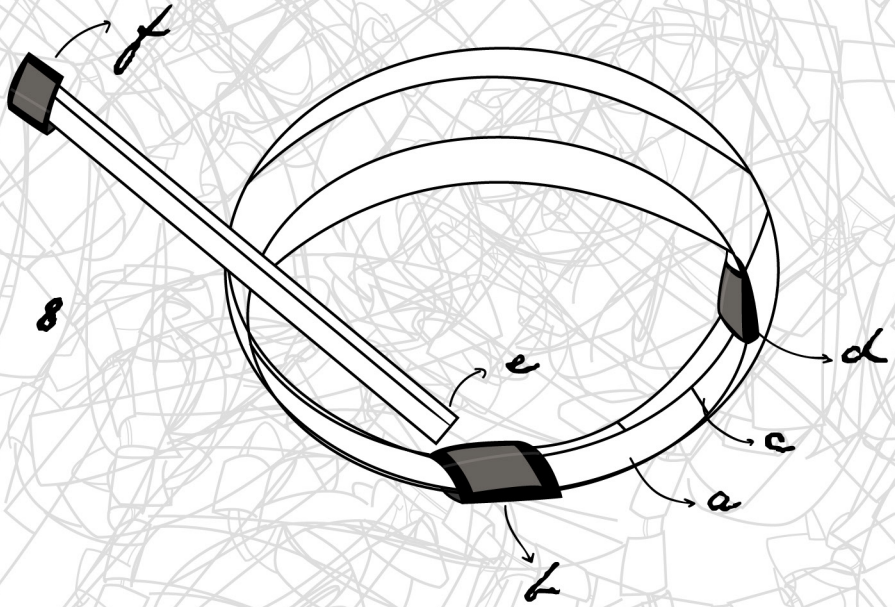


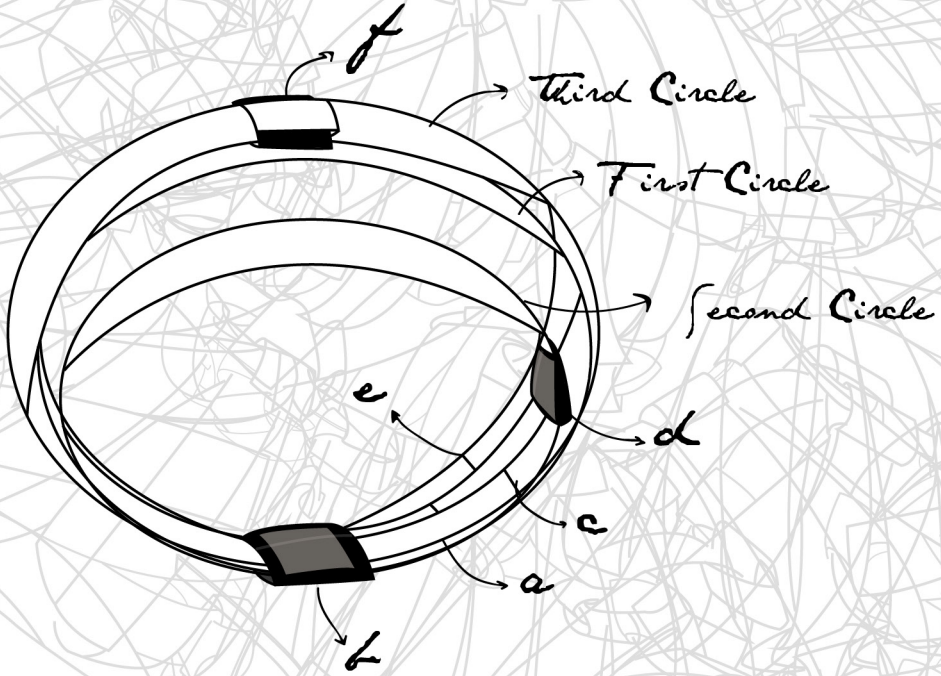
Step 7:

Pass "c" through "b" and then make a full circle, passing "c" through "d".

Keep the second circle smaller than the first one so you can fit one inside the other.



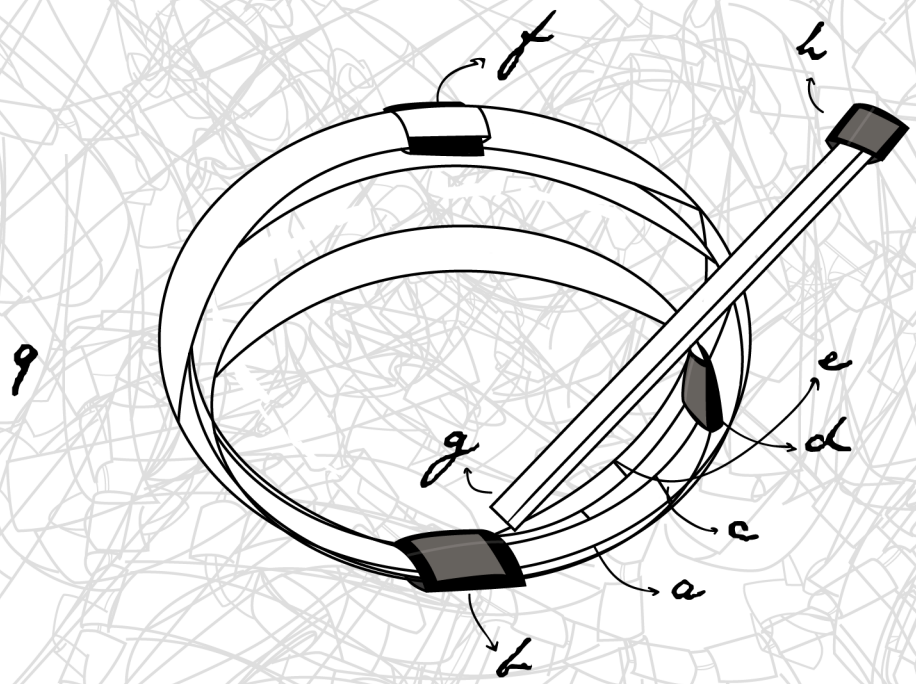




Step 8:

Pass "e" through "b" and then make a full circle, passing "e" through "f".

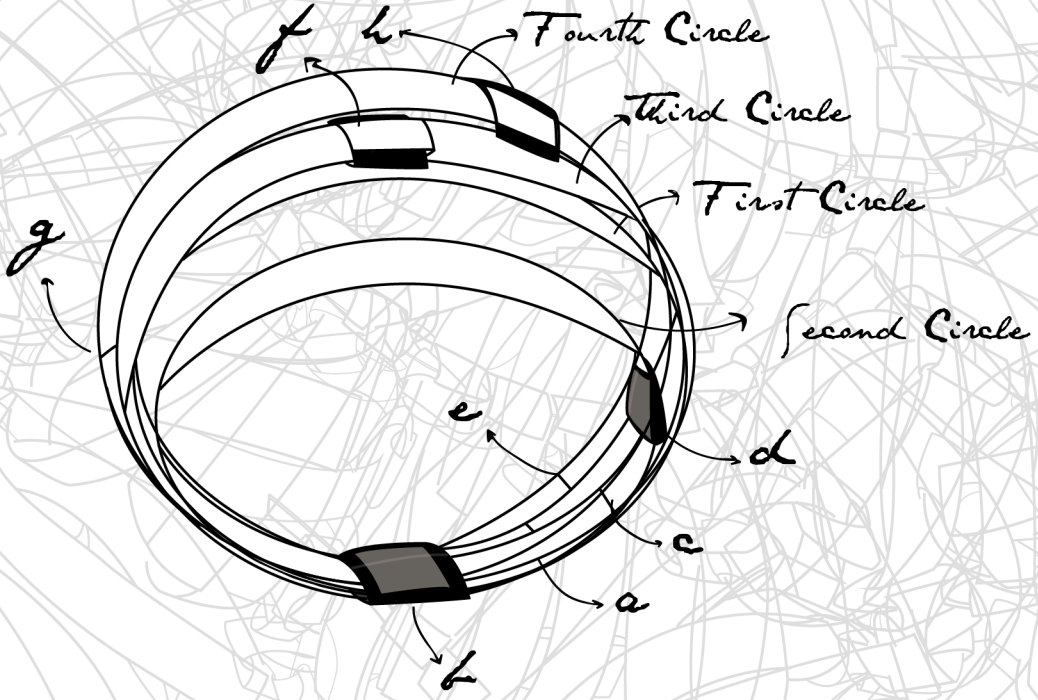
The third circle is supposed to encompass the two previous ones, so when passing "e" through "f" to close the third circle make sure the other ones are inside.



Step 9:

Pass "g" through "b" and then make a full circle, passing "g" through "h".

The fourth and last circle is going to encompass the entire structure, it will cover the other three circles. Only pass "g" through "h" once you are sure all the other circles are in between.



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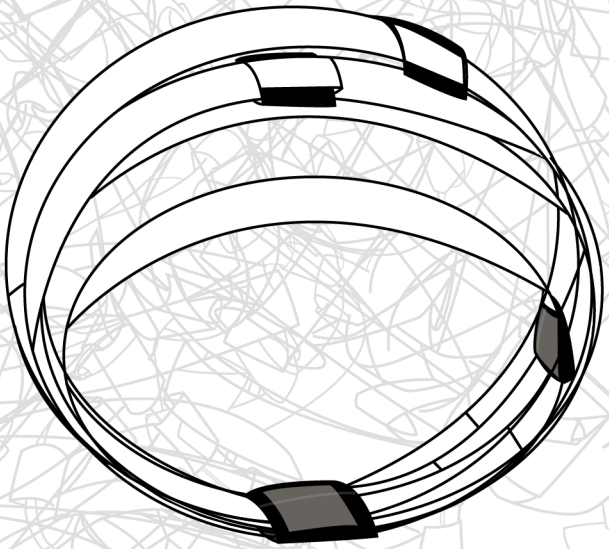

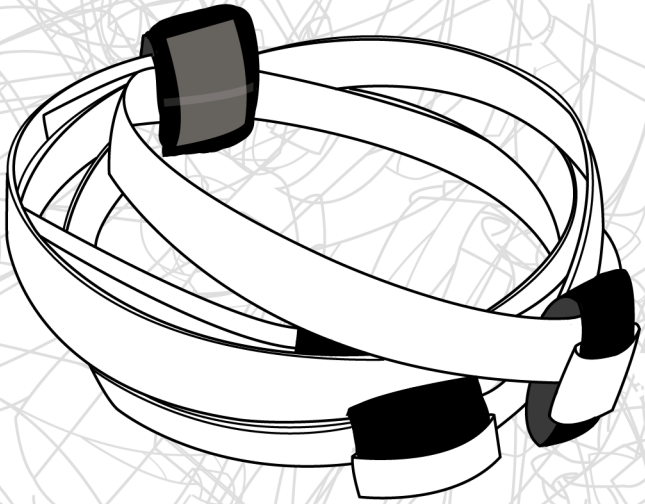

Step 10:

Now that you have made the first loop you will repeat the same process fifteen times to obtain a total of sixteen loops that form the overall skeleton.

Note:

The illustration on the left is simply a representation of a loop fom above. The idea is that the two last circles encompass the first two ones. The space between one circle and another should be clear, also they should not be too tight or too loose. Once handling the paper you should be able to find the balance point.

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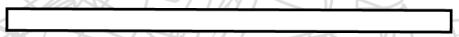
Length: 29,7 cm

Width: 1 cm



Step 11:

Pick the A4 sheet of watercolour paper (300gm) and cut one stripe. Width: 1cm, Length: 29,7cm. This exact stripe will be used to connect all the loops together.

Close up view

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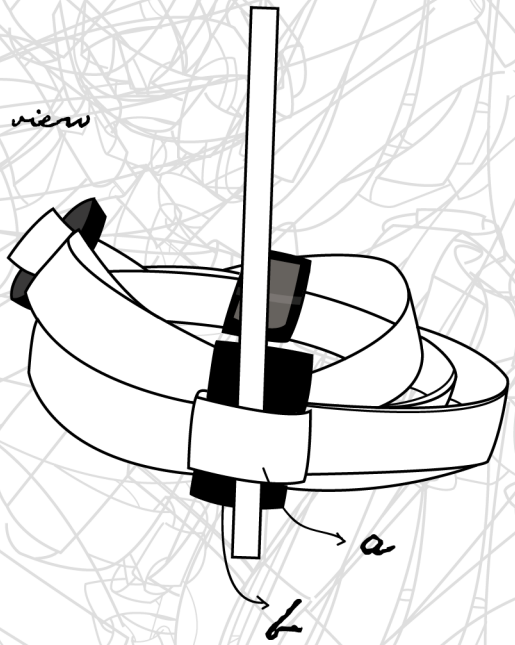

Step 12:

You will pass the watercolour stripe through the gap created between "a" and "b", which is made when they complete the first full circle. Then repeat the same process for each loop.

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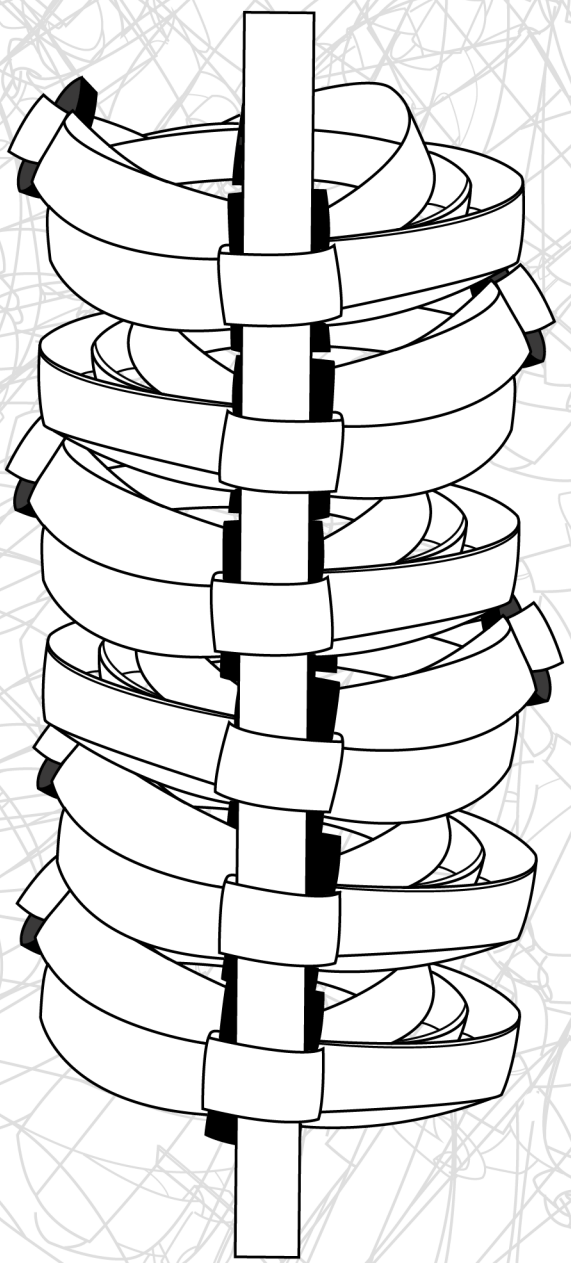
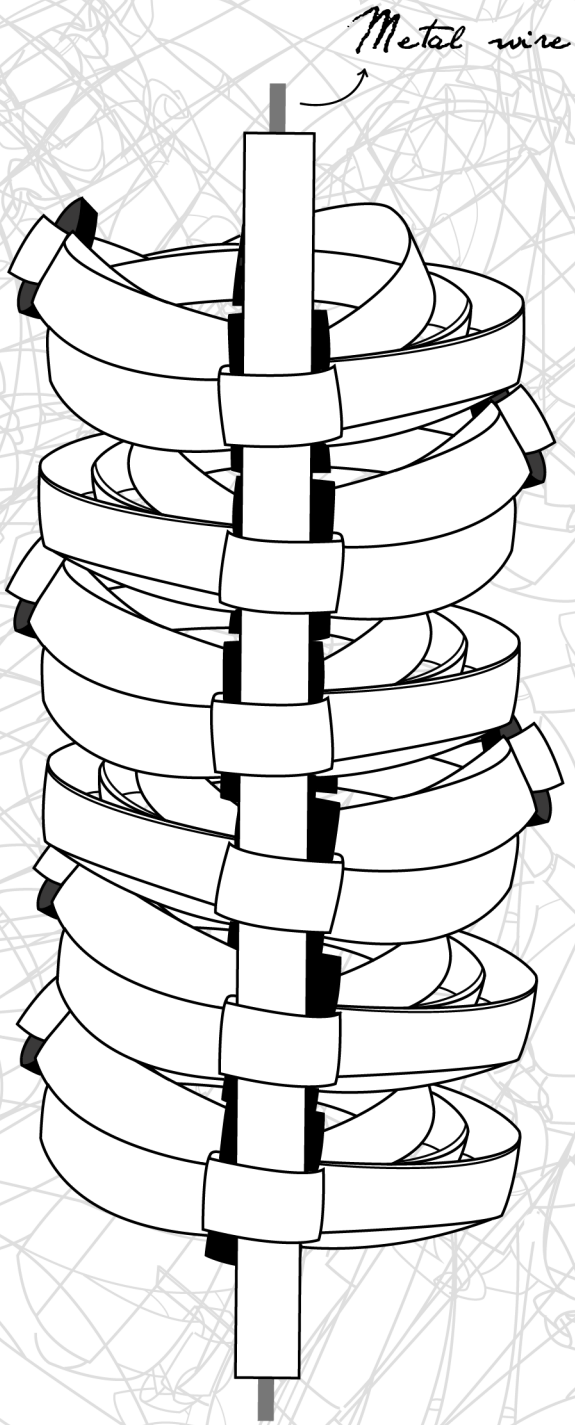


Step 13:

After passing through all the loops with the watercolour stripe the skeleton should look like the illustration on the left.

The stripe is meant to hold all the loops together.

Now, the skeleton has to acquire a more defined shape, and in order to create the spine cord of the lamp you will need small stripes of metal wire, 2 for each ring, 7cm each, total of 32 stripes.



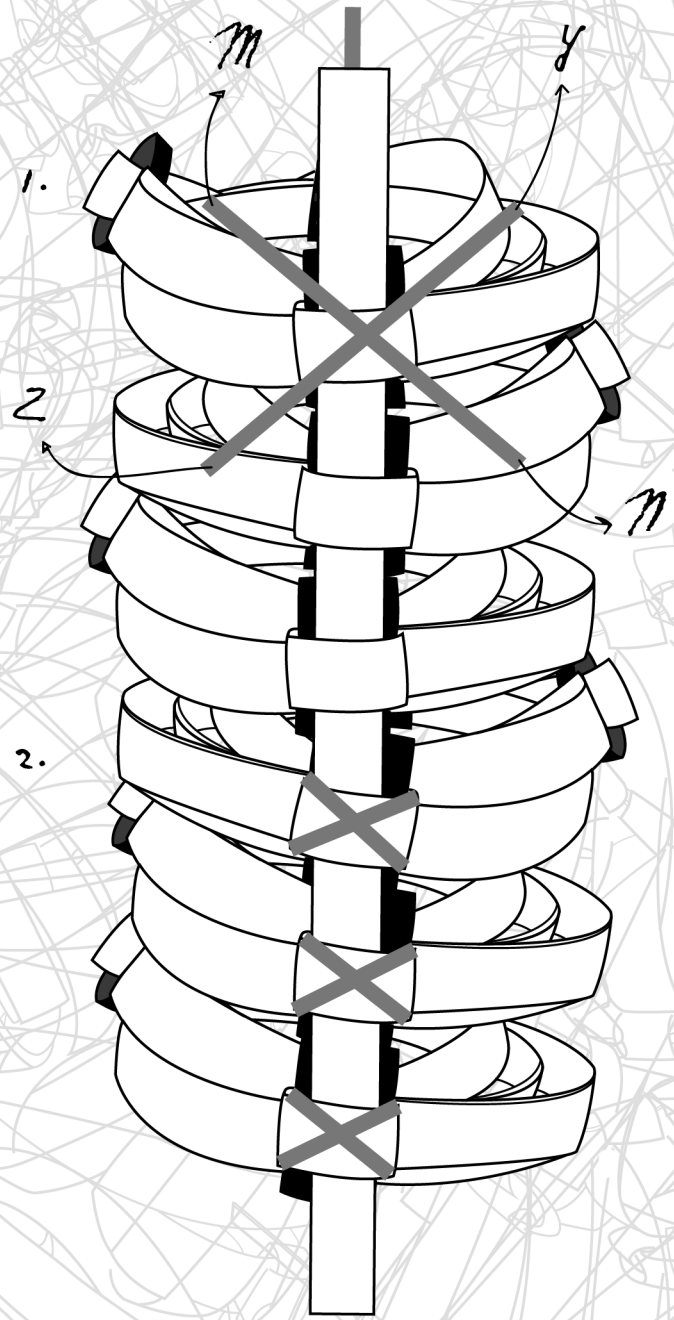
Step 14:

Pick a 30 cm long stripe of metal wire and pass through every ring. Place the wire behind the watercolour, on the inside of the skeleton. Do it in the same way you passed the watercolour paper, going from one end to another.

The idea here is that the metal wire stripe should not be seen from the outside. The wire's main purpose to the skeleton is to define the spiral shape the structure is going to take.

Note:

On the next illustrations the metal wire stripe is not entirely visible but is still there, behind the watercolour stripe. The top tip is the only part supposed to appear.



Step 15:

Place the first stripe of metal wire on top of the rings and pass it on a diagonal throug the top ring. Then, when both edges, "y" and "z" are on the inside of the loop you will cross them over, ecompassing the watercolour stripe as if making a circle on a diagonal.

After the first wire circle is completed, do another one same process but in the opposite diagonal, so when you are finished the wires make an "X" shape.

1. Shows how to position the wire on the loop.
2. Shows how it should look when finished.

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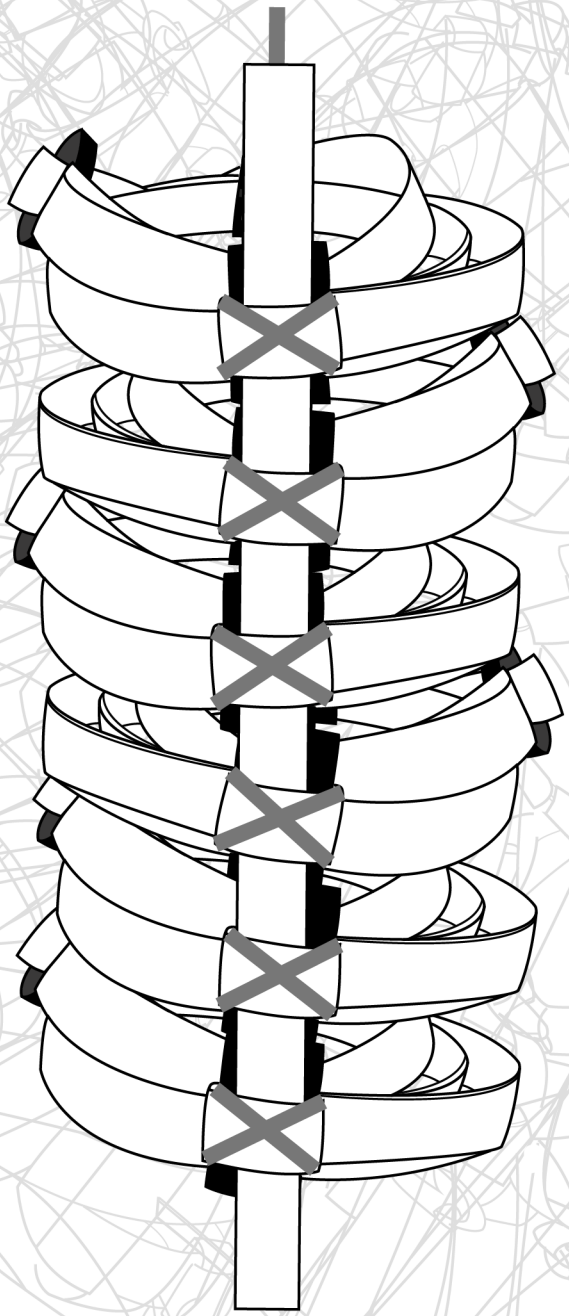

Step 16:

After you have finished all the metal wire "Xs" your result should look like the image on the left.

Now that every piece of the skeleton is connected you will have to twist the long metal wire stripe in order to obtain the spiral shape.

Do it by sections, going from bottom to the top.

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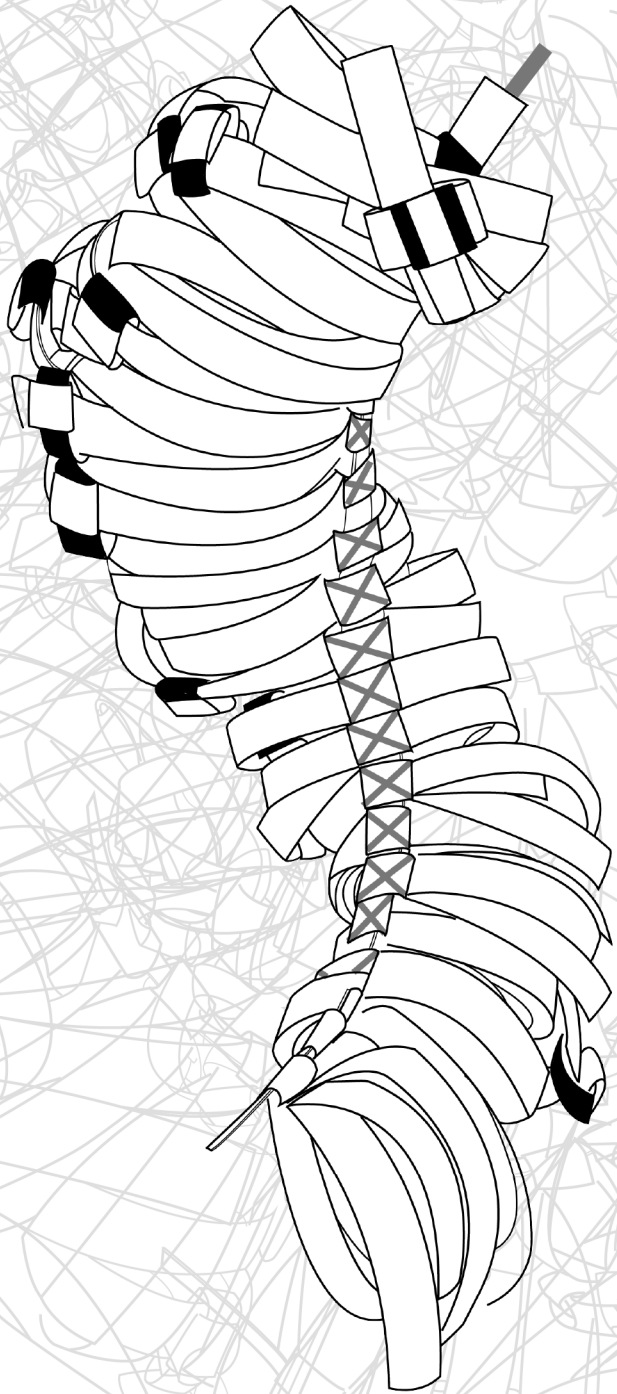

Step 17:

When twisted the skeleton should look like the one on the left.

Now, the last step is to pass the Led light throughg the entire structure. Do it carefully not to damage the structure and make sure you pass the led light throug every single loop.

Just plug the led on the wall and select the placement of your Endolumen!

Note:

The metal wire strip tip on the top can be used to hang your Endolumen in other surfaces.