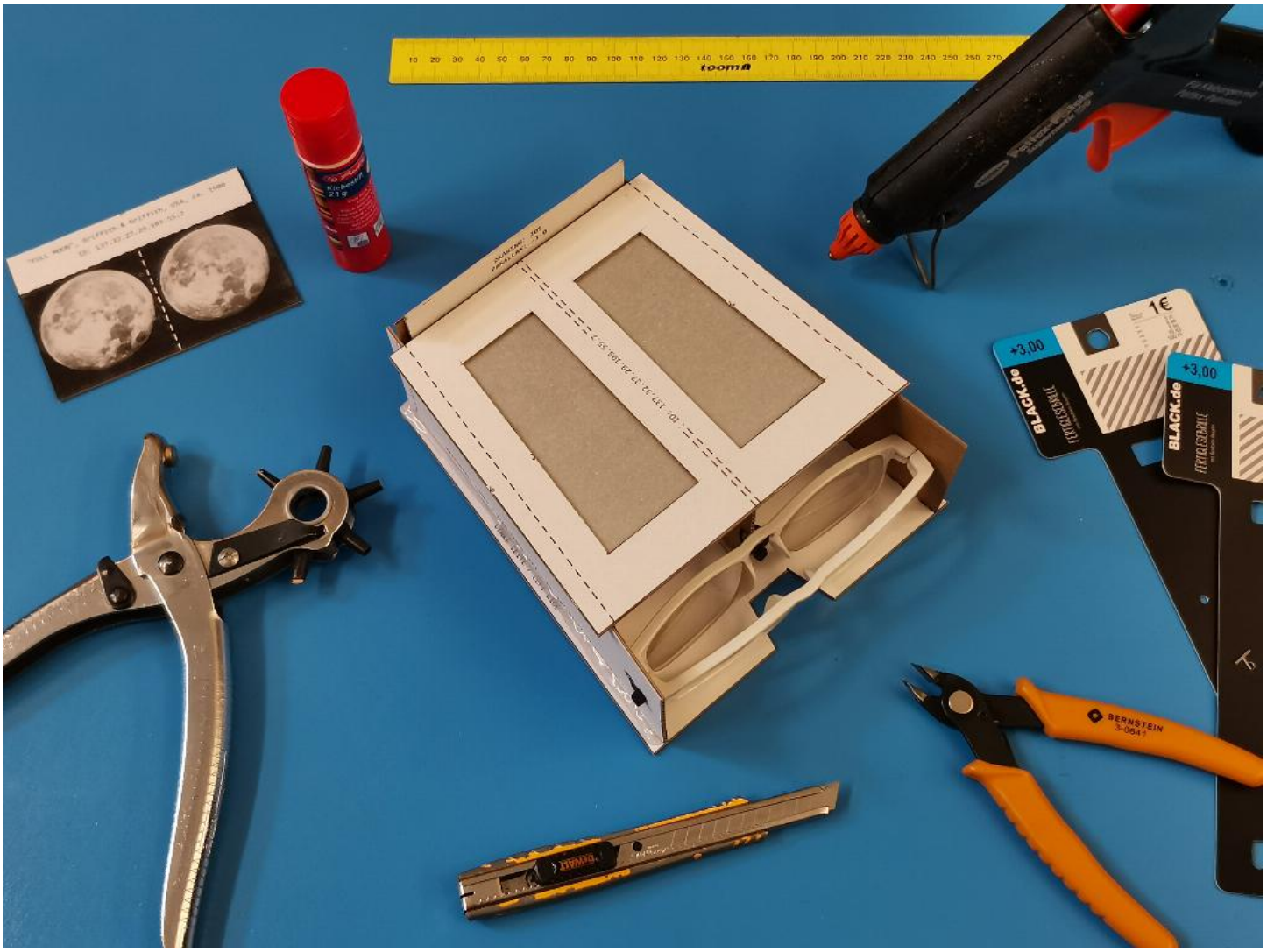
DIY Stereoscope assembly instructions

CC-BY Niklas Roy (https://niklasroy.com/)
Developed during the FlieKü residency 2022

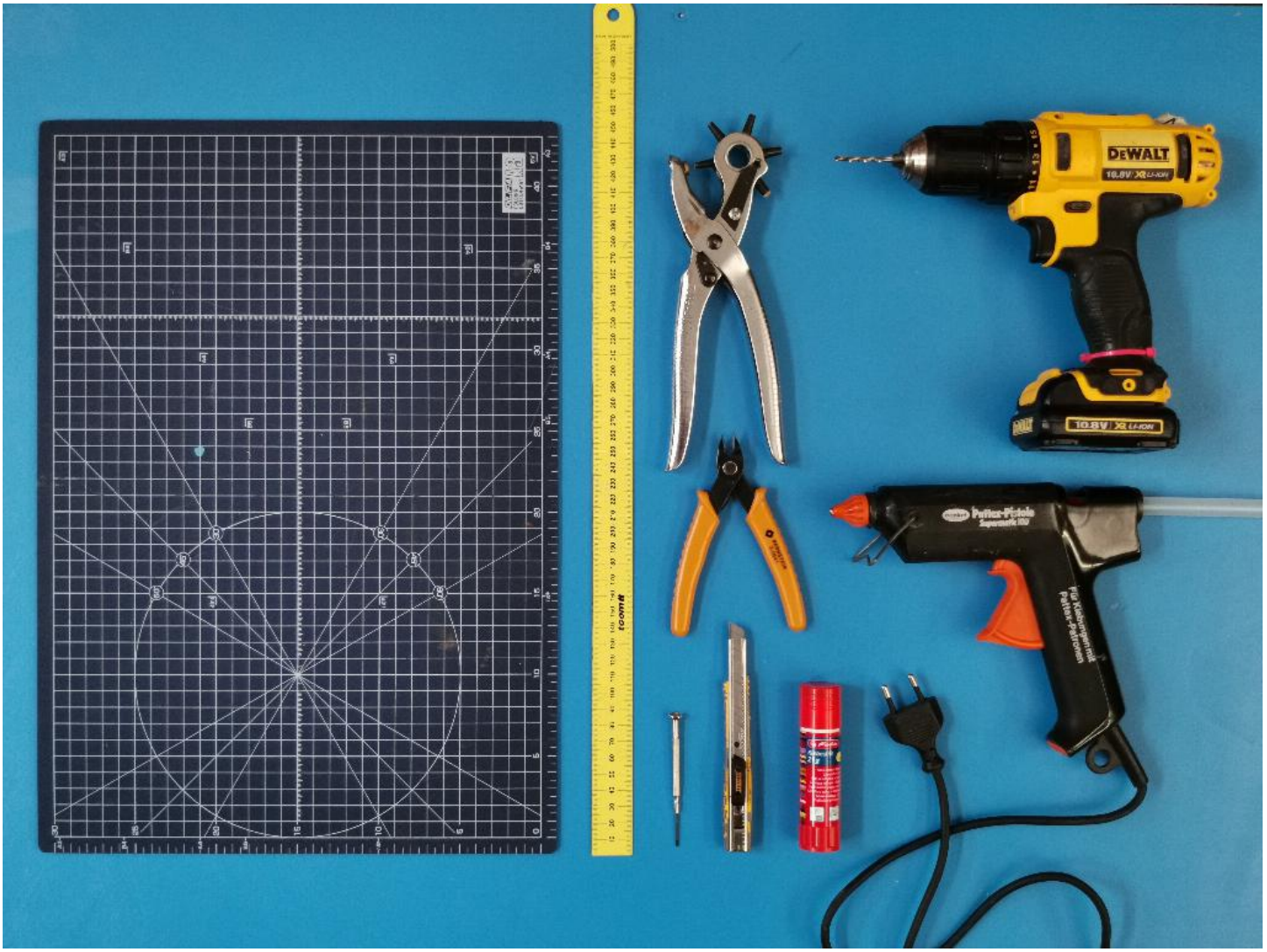


A stereoscope is a device for viewing a stereoscopic pair of separate images, depicting left-eye and right-eye views of the same scene, as a single three-dimensional image.

A typical stereoscope provides each eye with a lens that makes the image seen through it appear larger and more distant and usually also shifts its apparent horizontal position, so that for a person with normal binocular depth perception the edges of the two images seemingly fuse into one "stereo window".

(Source: https://en.wikipedia.org/wiki/Stereoscope)

This DIY instruction shows how you can make your own stereoscope out of cardboard and reading glasses.

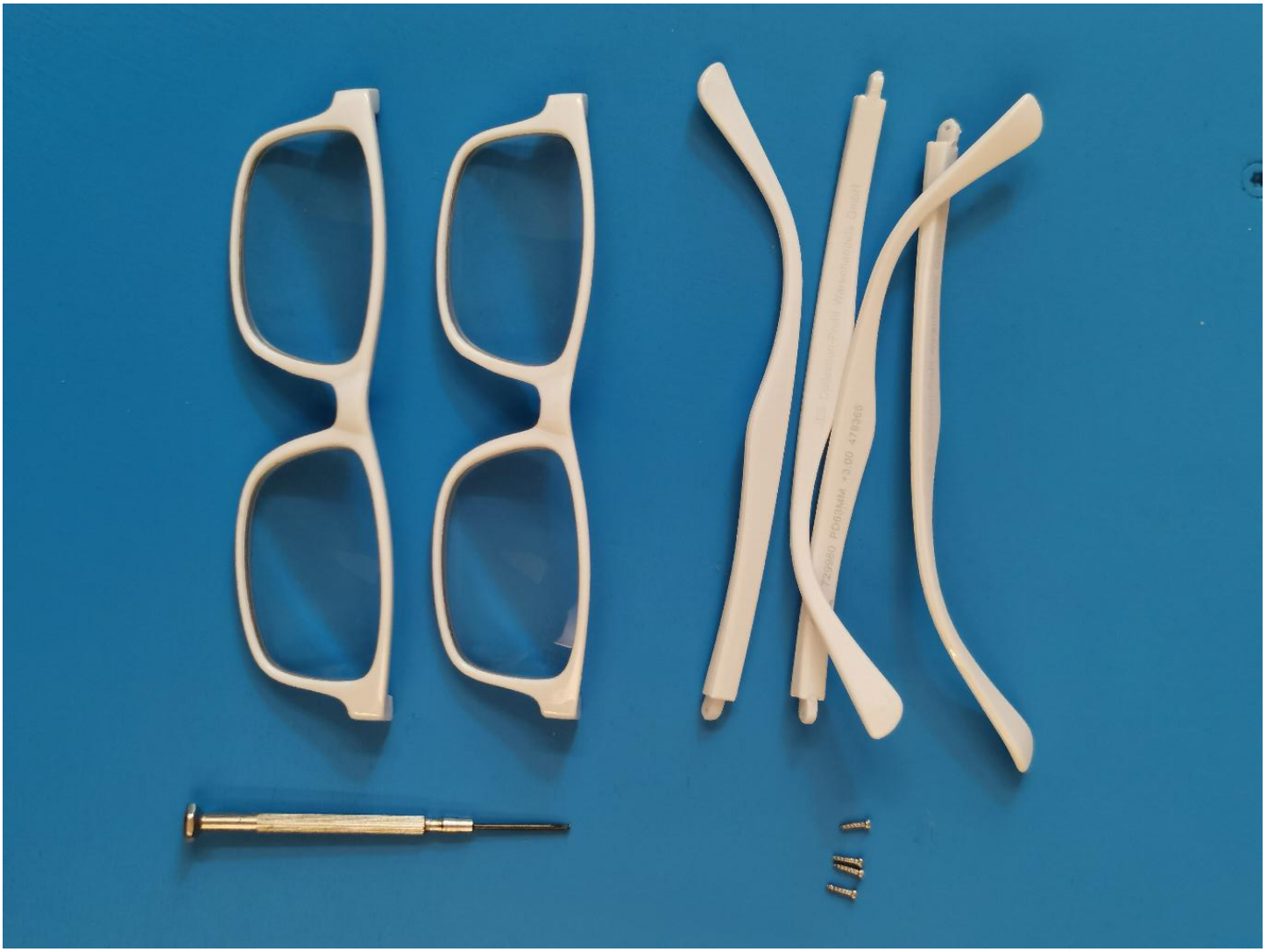


Required tools:

- Cutting mat
- Metal ruler
- Cutter
- Electronic side cutter
- Glue stick
- Hot glue
- Tiny screwdriver
- Cordless drill with 3mm drill bit (& 1mm drill bit)
- Revolving punch pliers (alternatively: Knitting needle)

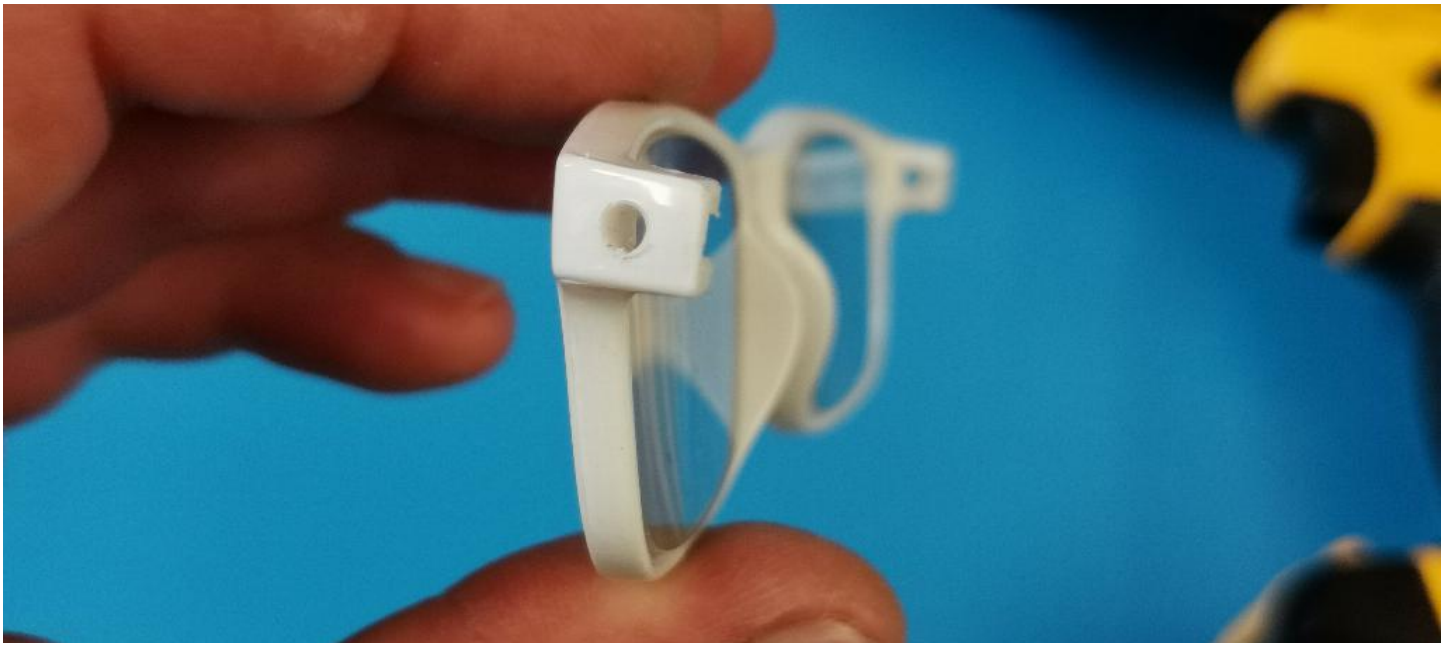
Required materials:

- 2x plastic reading glasses with +3.0 diopter
- 5x zip ties (2.5mm x 100mm)
- A4 sheet of transparent paper
- Cardboard (I used 2mm brown corrugated fiberboard stock - but anything goes. It's good if both sides of the cardboard have the same color, though.)
- Printed templates (print at step 6)



Step 1:

- Unscrew and remove eyeglass temples
- If there are still hinge parts on the glasses: cut them off with the side cutter

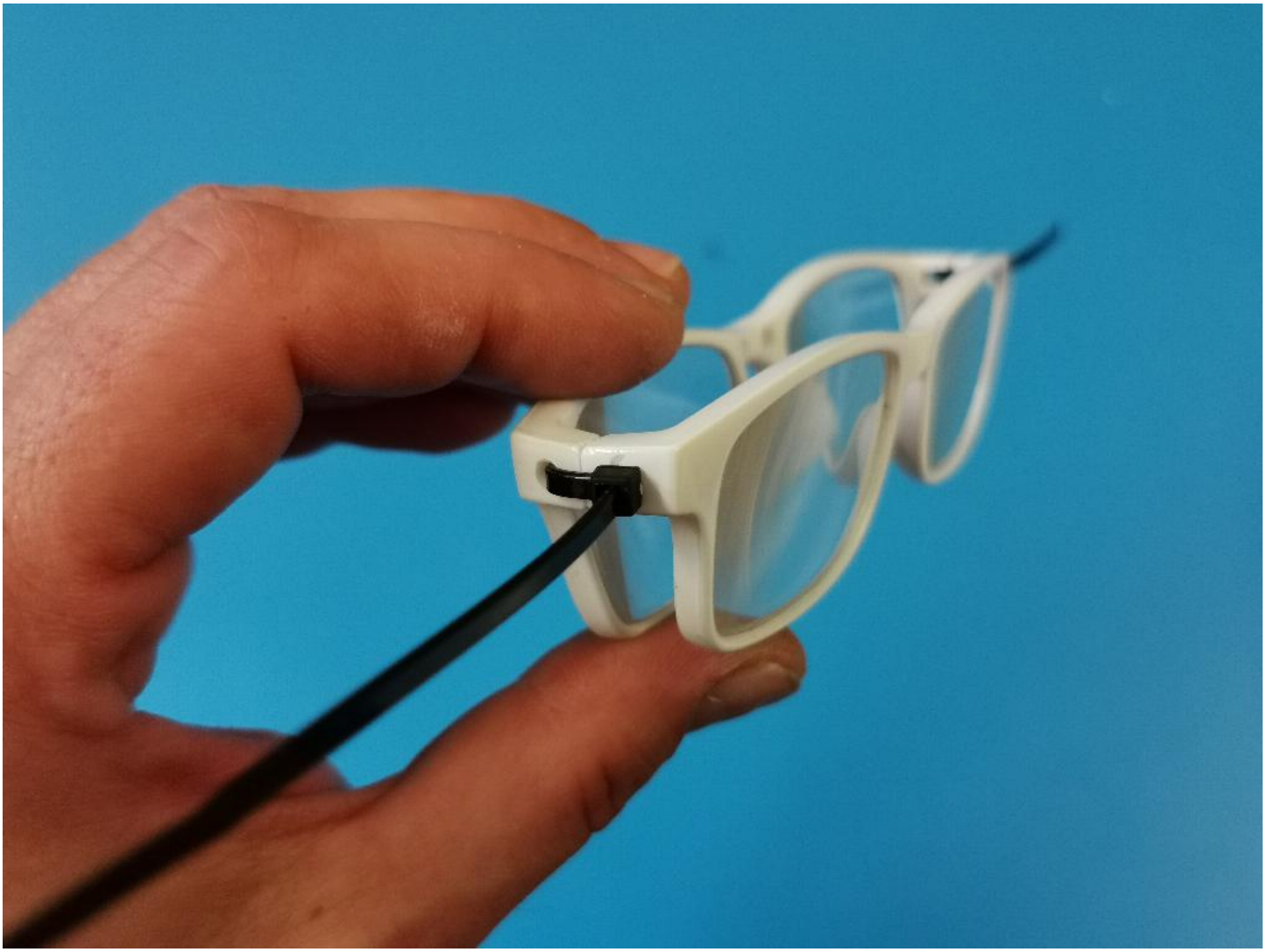


Step 2:

- Drill 2x 3mm holes in bridge of one eyeglass
- Drill 3mm holes in the sides (hinges) of both glasses

Pro-tips:

Use a piece of scrap wood and drill on top of it.
Drill first with a small drill bit (e.g. 1mm), then widen the holes with the 3mm drill.

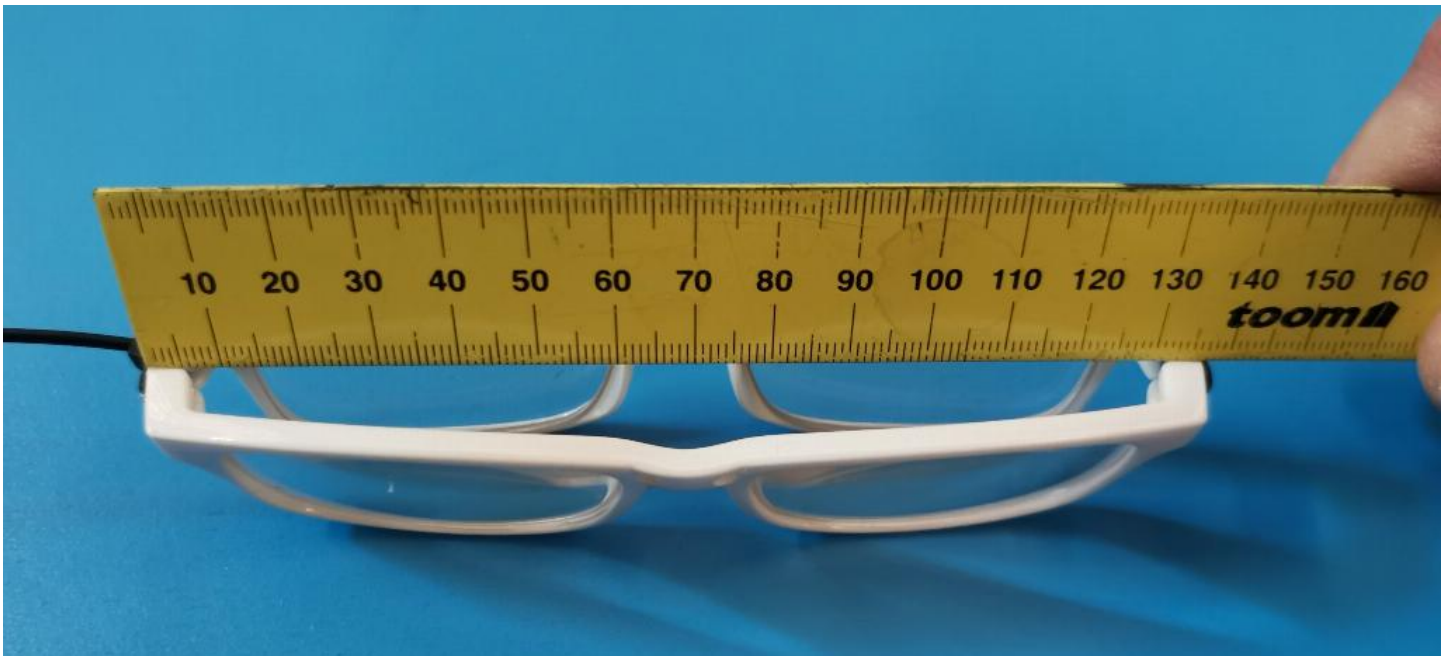


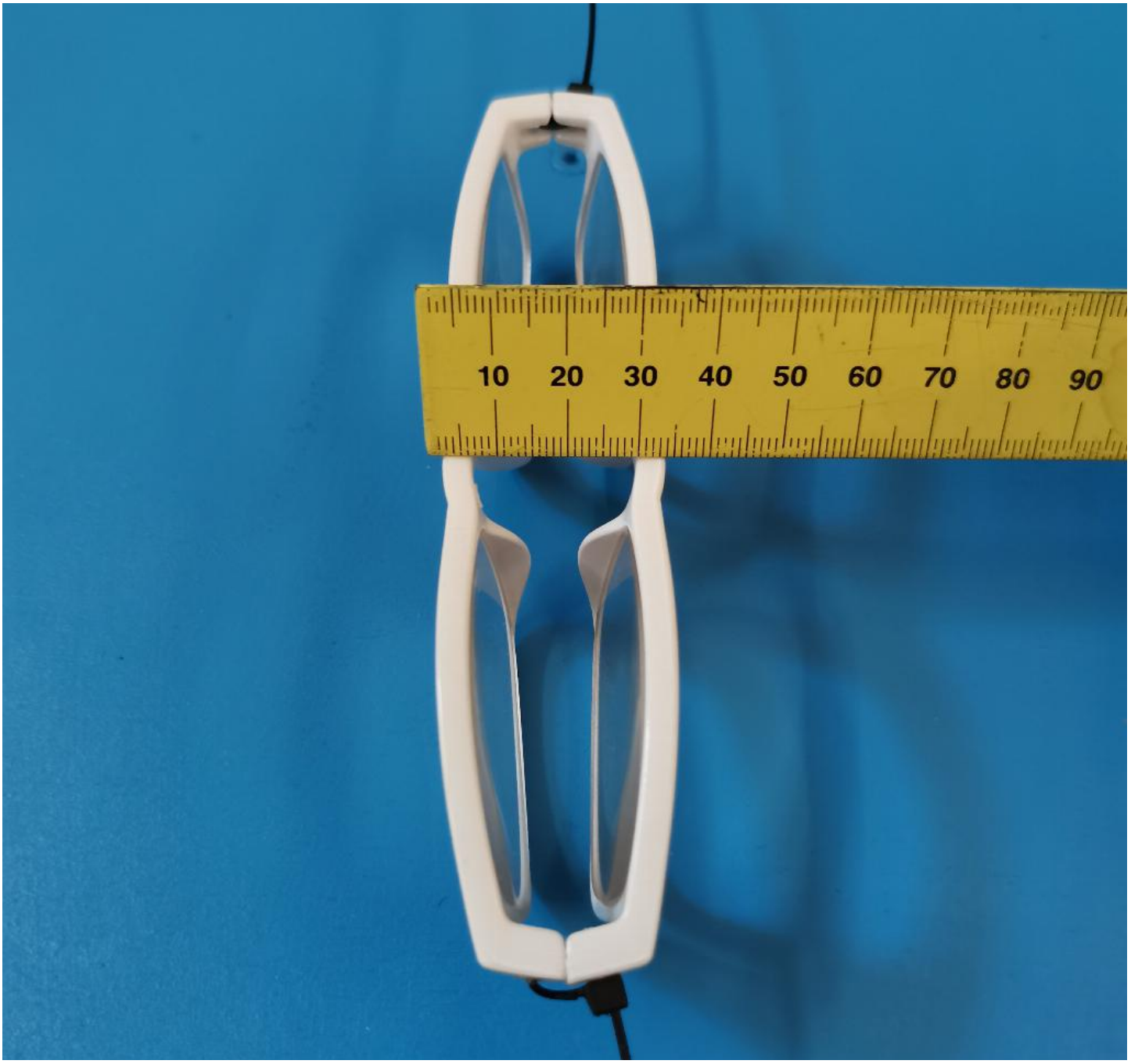
Step 3:

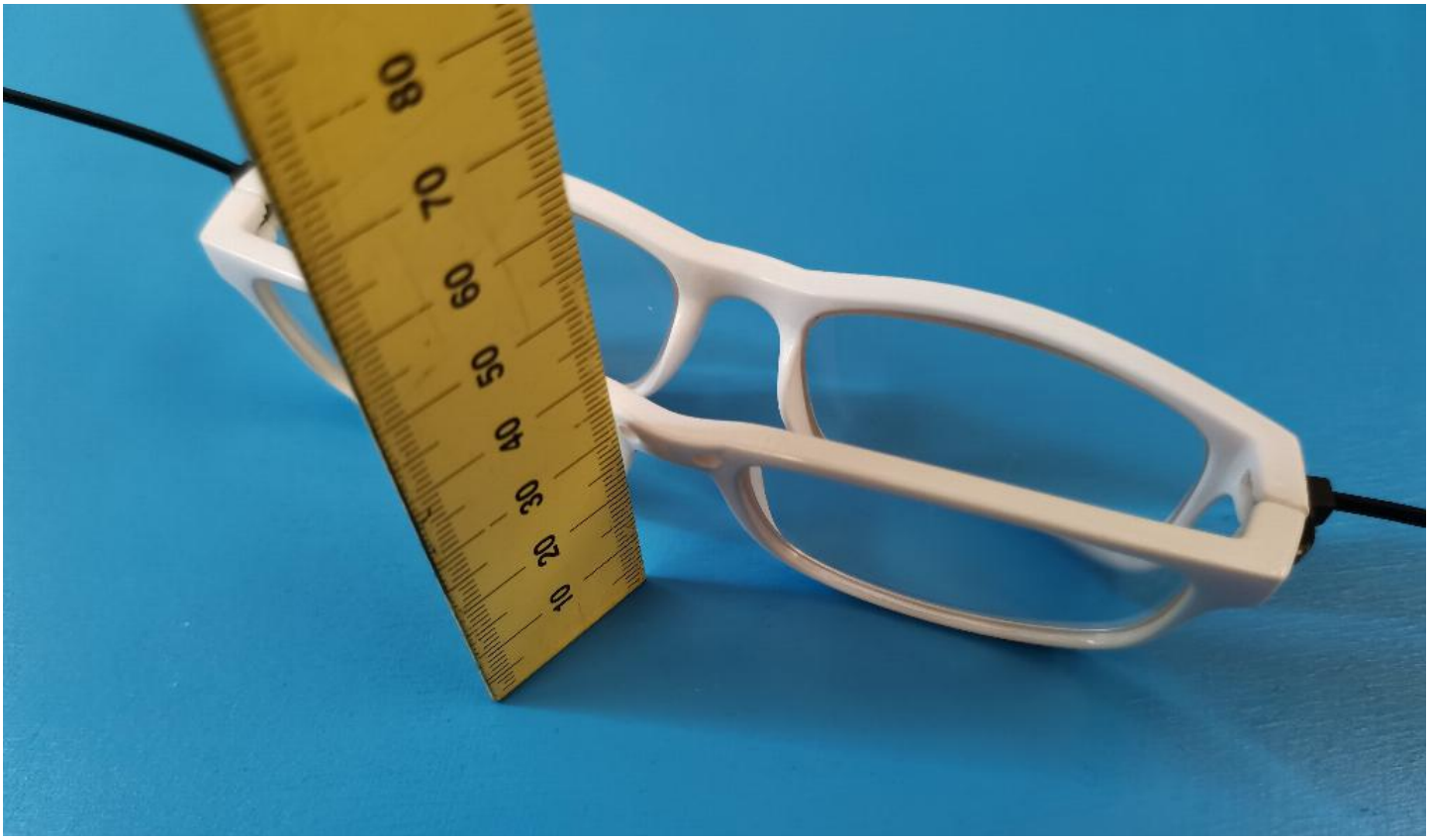
- Connect both reading glasses at their hinges with two zip ties

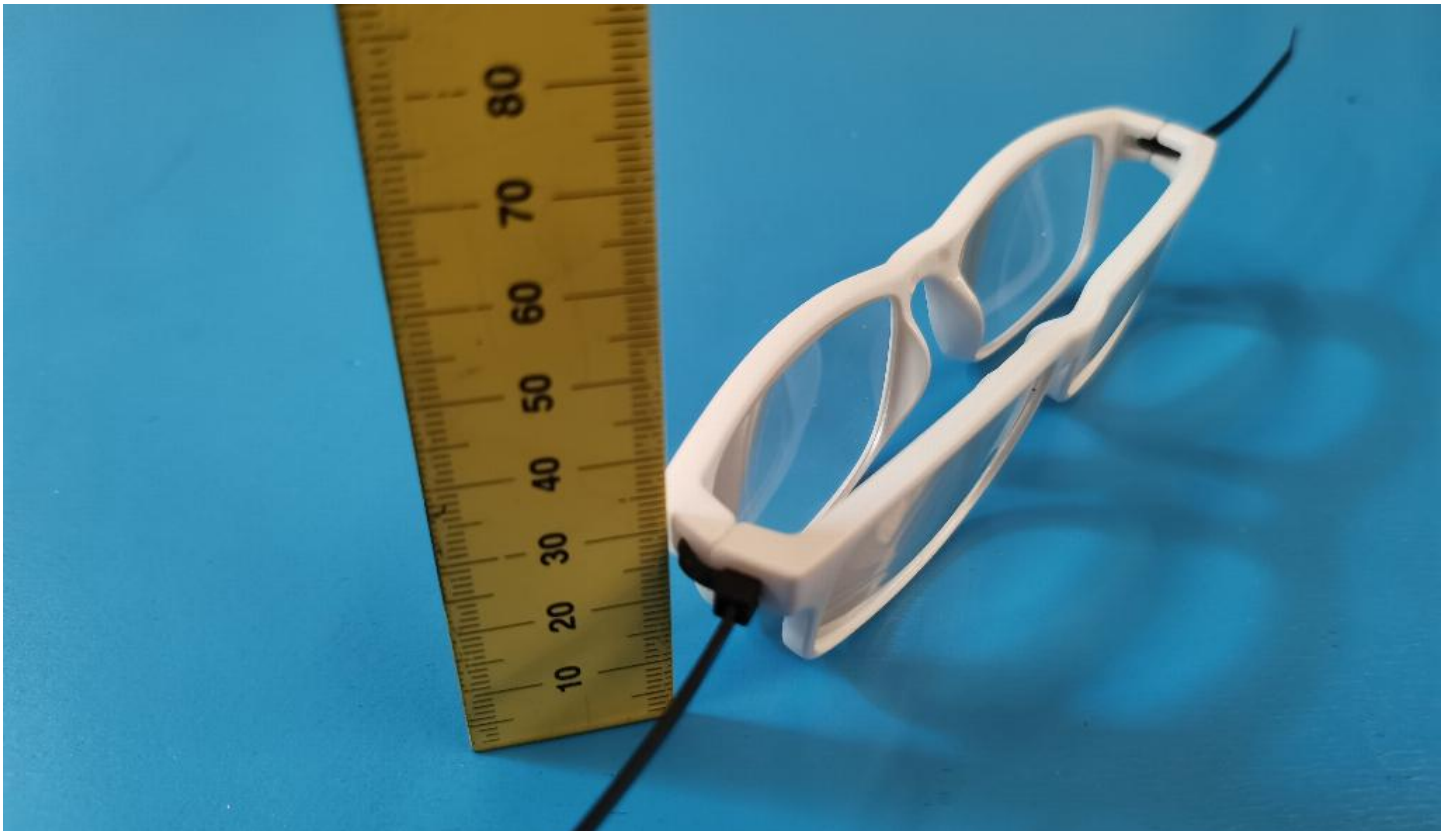
Why two glasses?

The stronger the lenses, the shorter the stereoscope can be. Since ready made reading glasses aren't super strong, we just combine two pairs of them in order to achieve a more compact build.


10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
toom

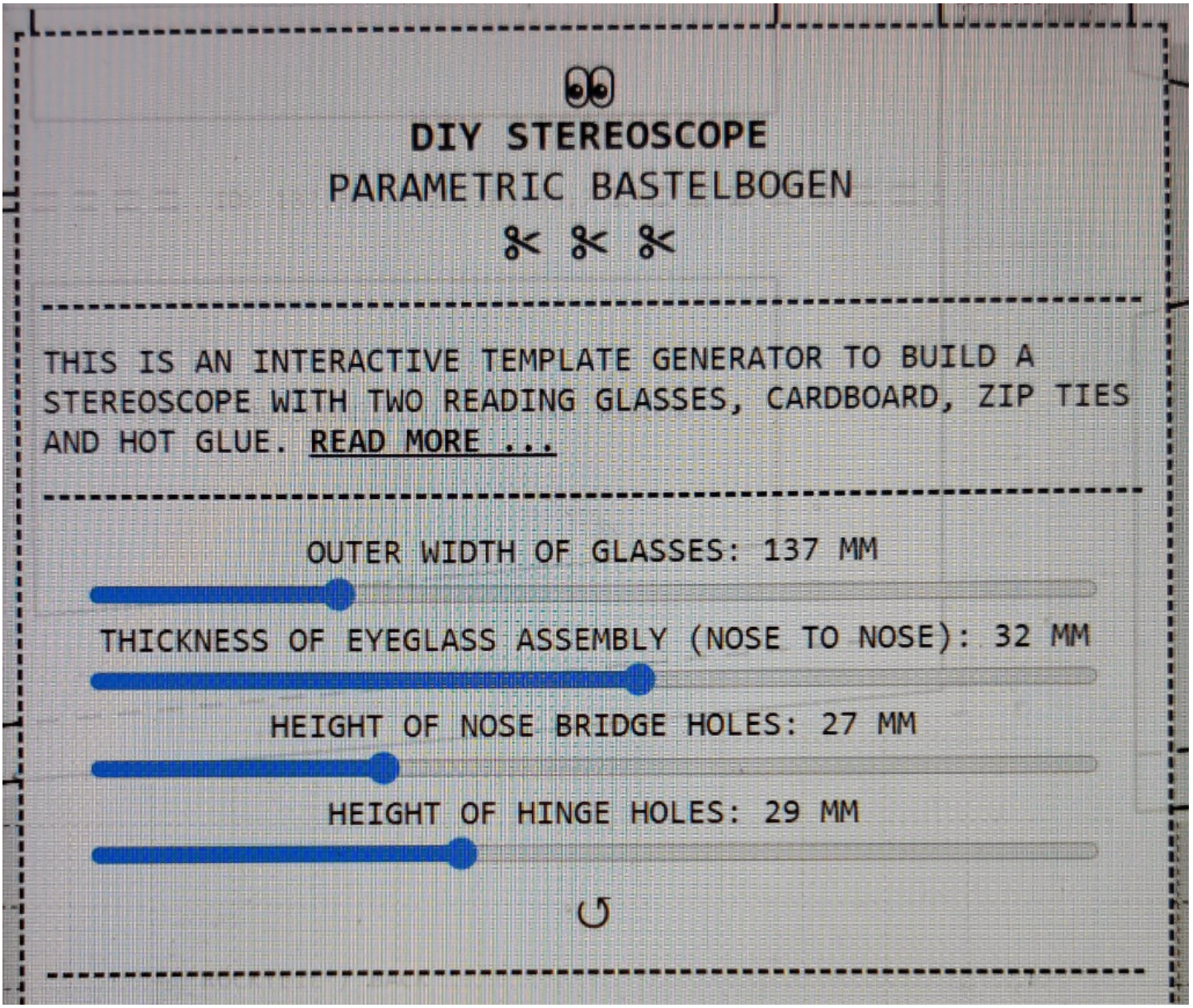

10 20 30 40 50 60 70 80 90





Step 4:

- Measure the width of the glasses assembly
- Measure the thickness of the assembly
- Measure the height of the center of the holes at the nose bridge
- Measure the height of the center of the holes / zip ties at the hinges

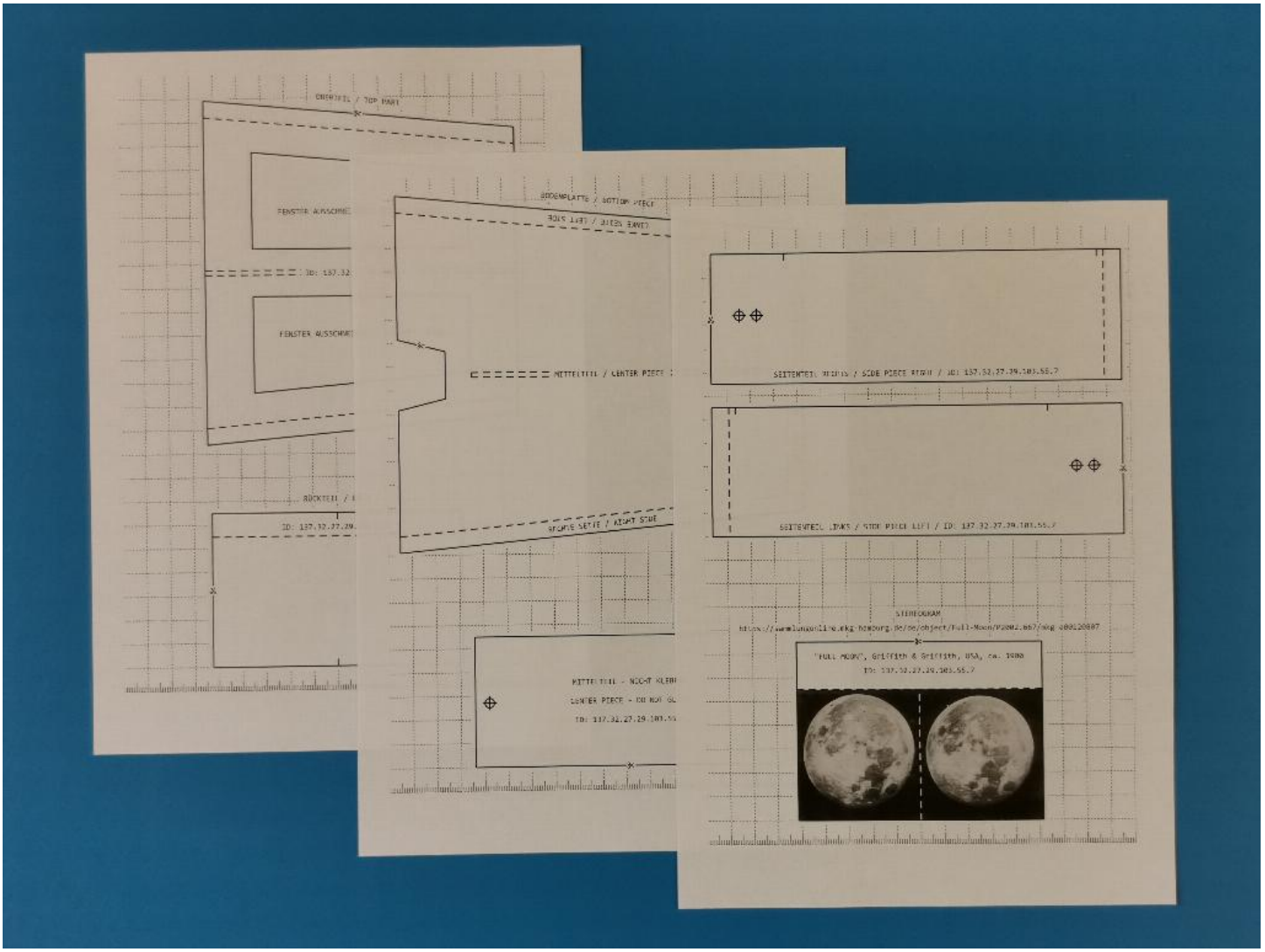


Step 5:

- Go to https://niklasroy.com/stereoscope/bastelbogen.html and adjust the parametric Bastelbogen (= craft sheet) to the dimensions of your glasses assembly

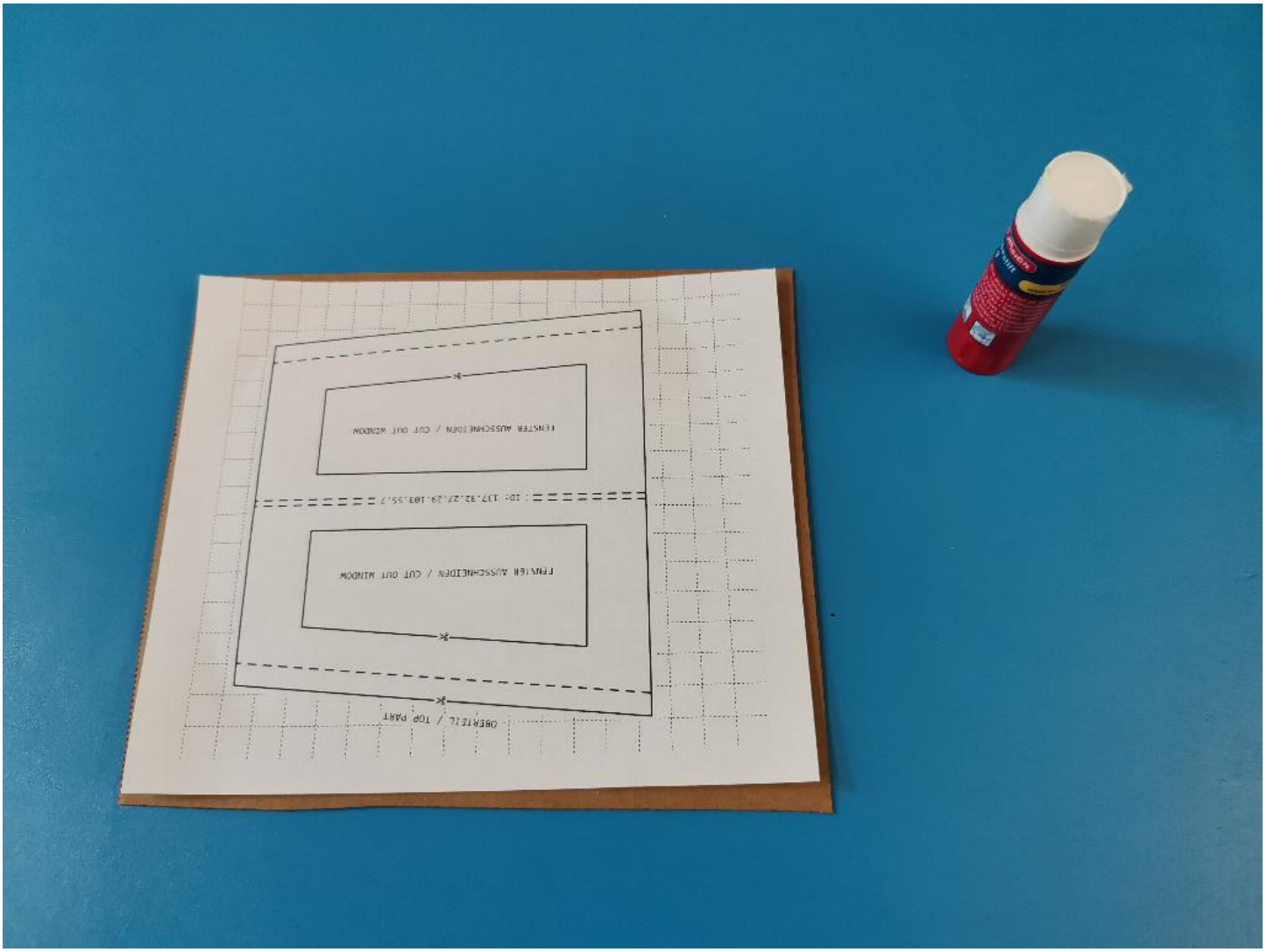
You do not need to adjust the settings for the stereograph size and for glue & cardboard, except if you want to experiment with different stereograph sizes and with reading glasses with different diopters.

There will be a number printed on each part, the "ID". This ID is a list of numbers which you have entered. The ID is helpful if you make several stereoscopes at the same time with different sizes (e.g. during a workshop), as it makes it easier to understand which part belongs to which stereoscope. It also helps if you want to rebuild a specific stereoscope as you can just enter the numbers of the existing stereoscope again in the Bastelbogen generator.



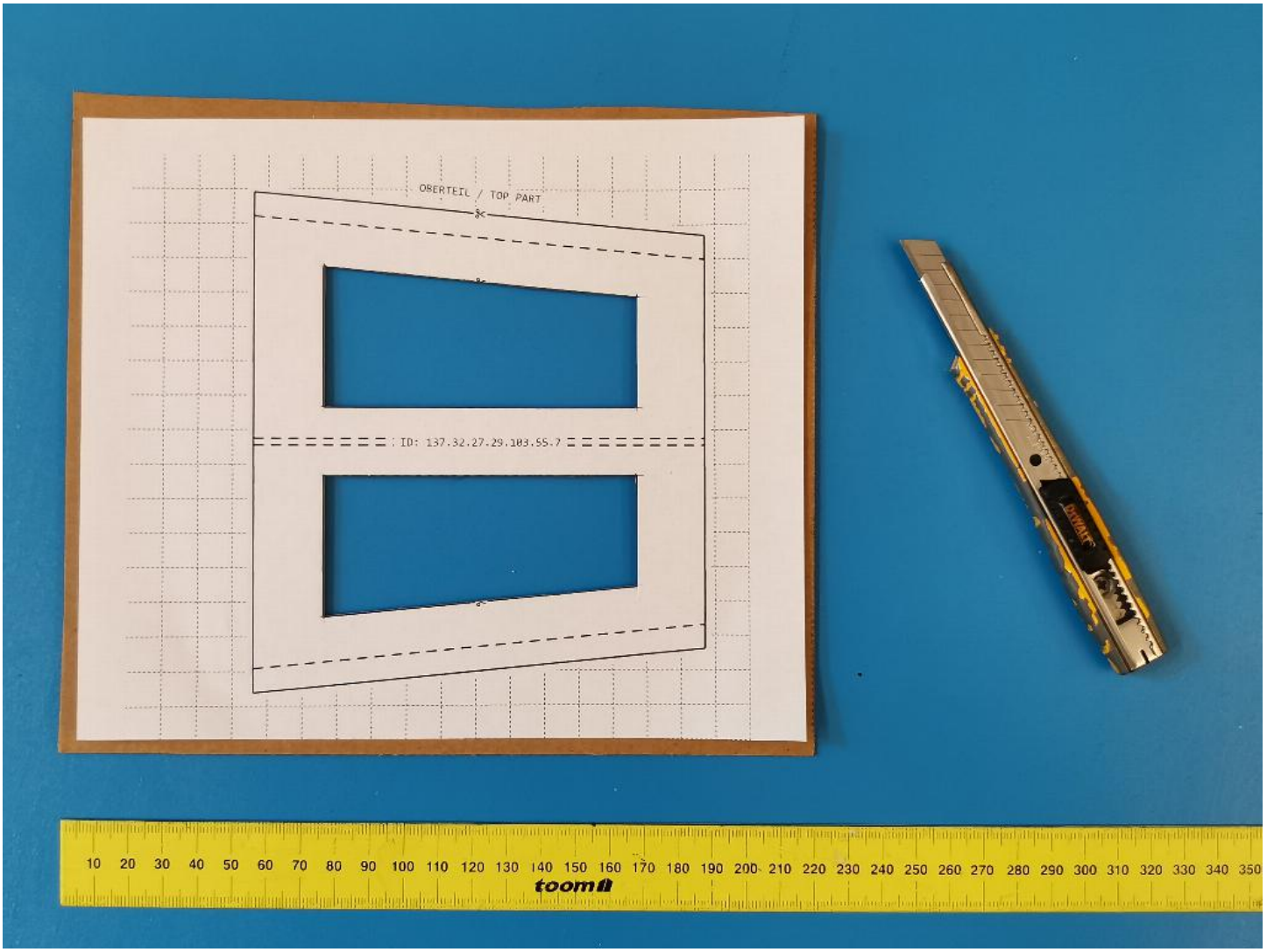
Step 6:

- Print the Bastelbogen in 100% size



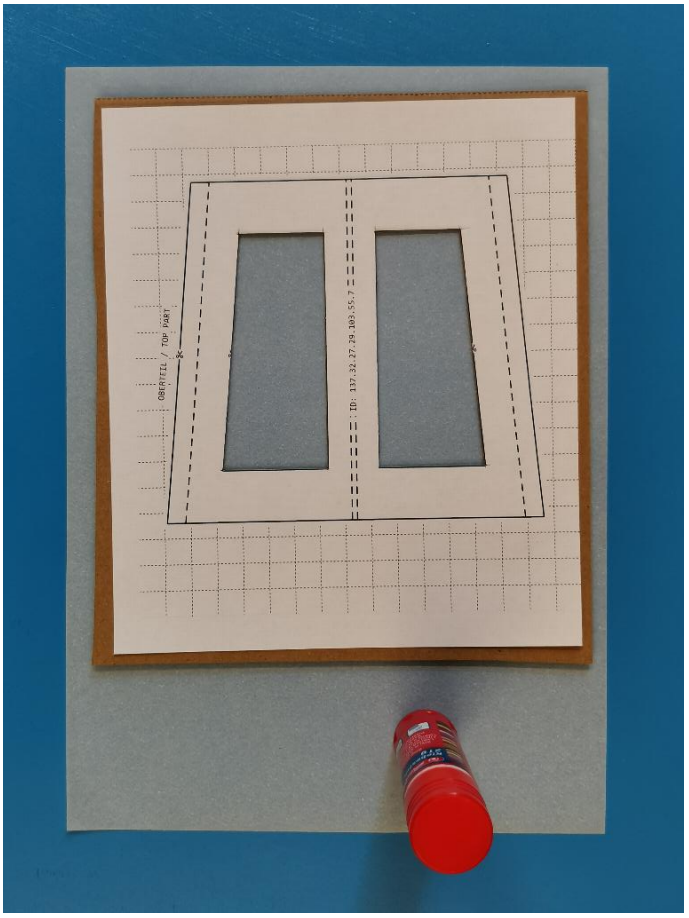
Step 7:

- Roughly cut the top part (Oberteil) of the template and glue it onto the cardboard



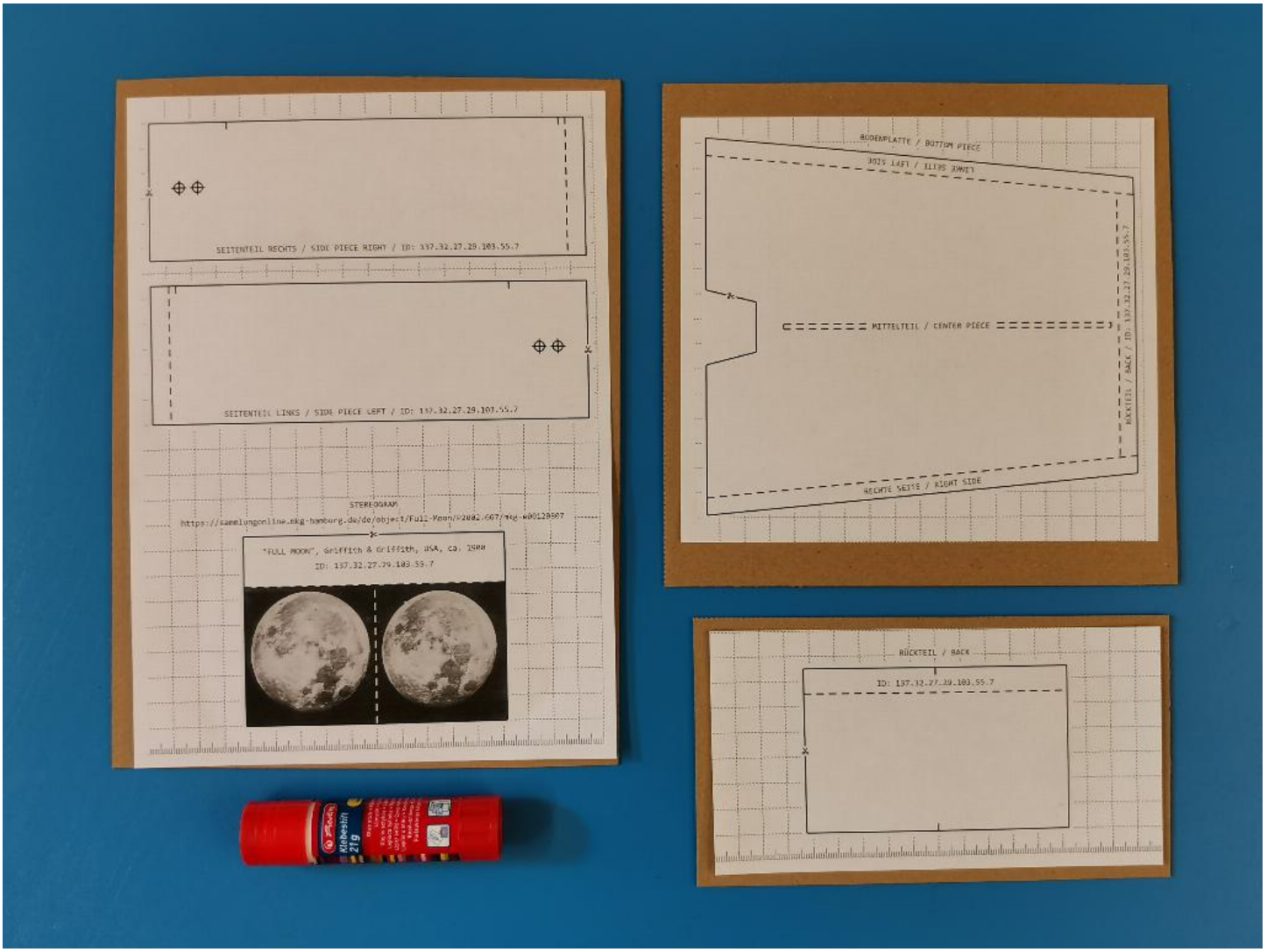
Step 8:

- Cut out the windows of the top part



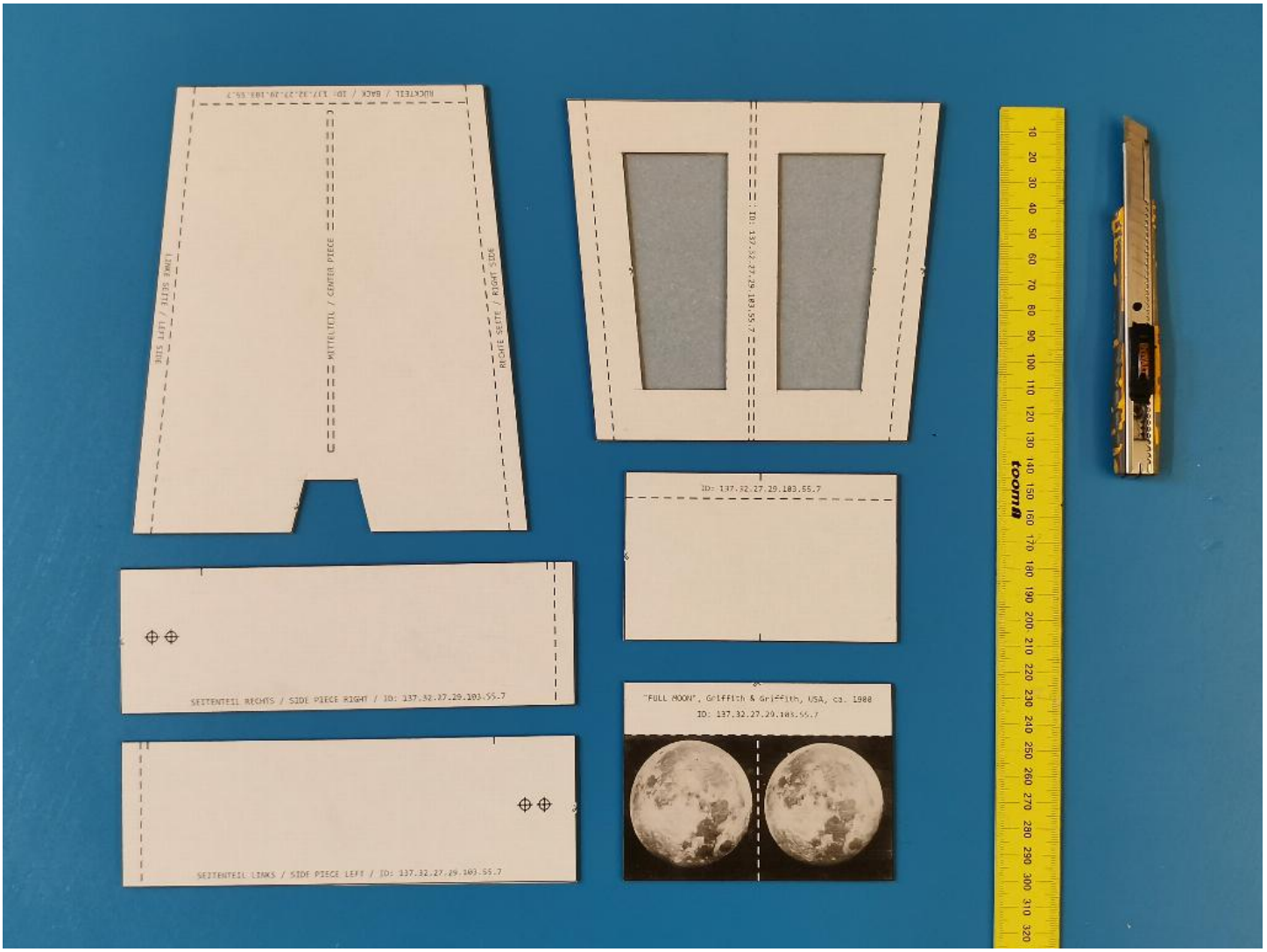
Step 9:

- Use glue stick to glue the transparent paper on the back side of the top part



Step 10:

- Glue all the other templates on the cardboard - except the center part!

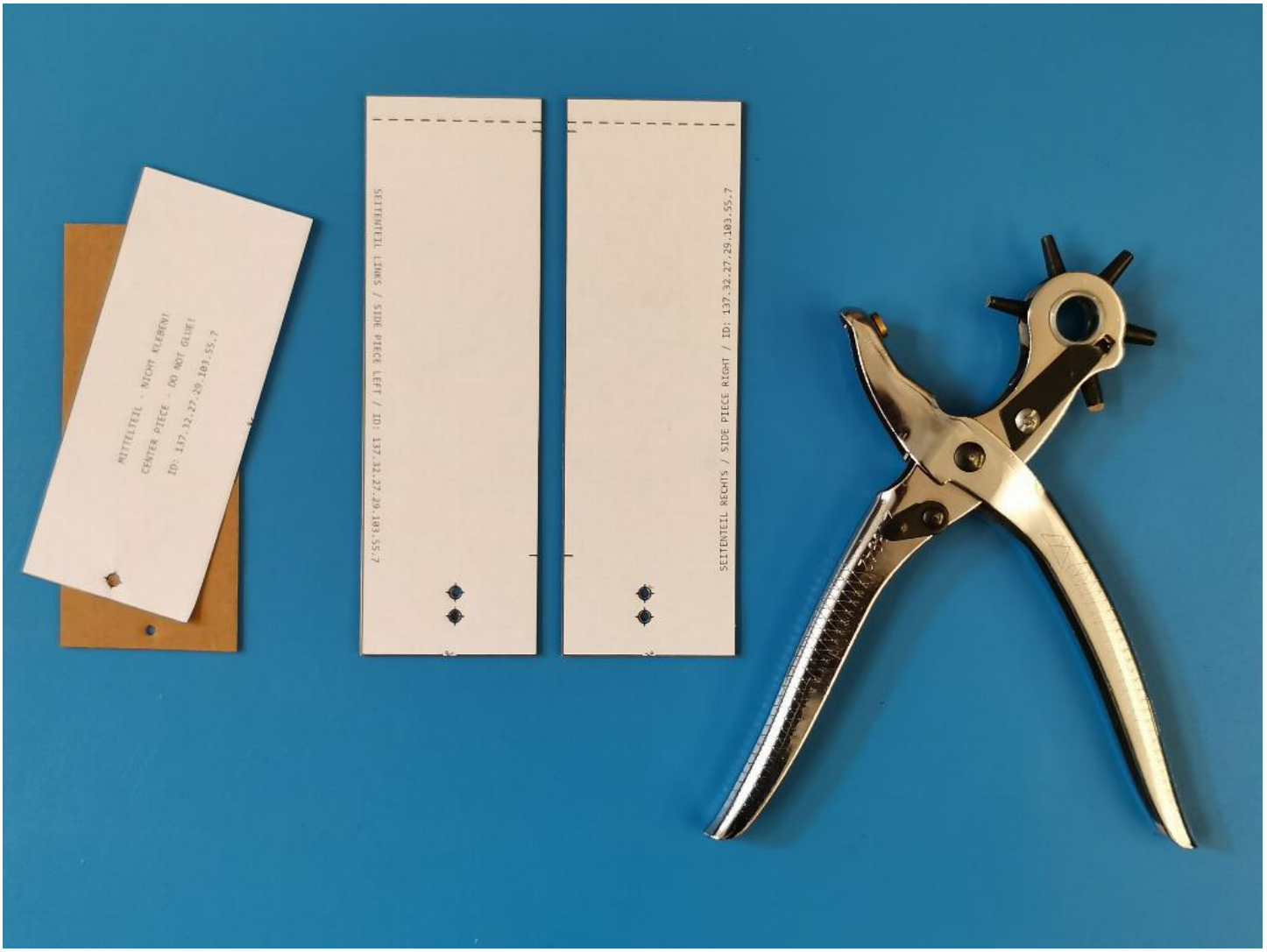


Step 11:

- Cut all the parts

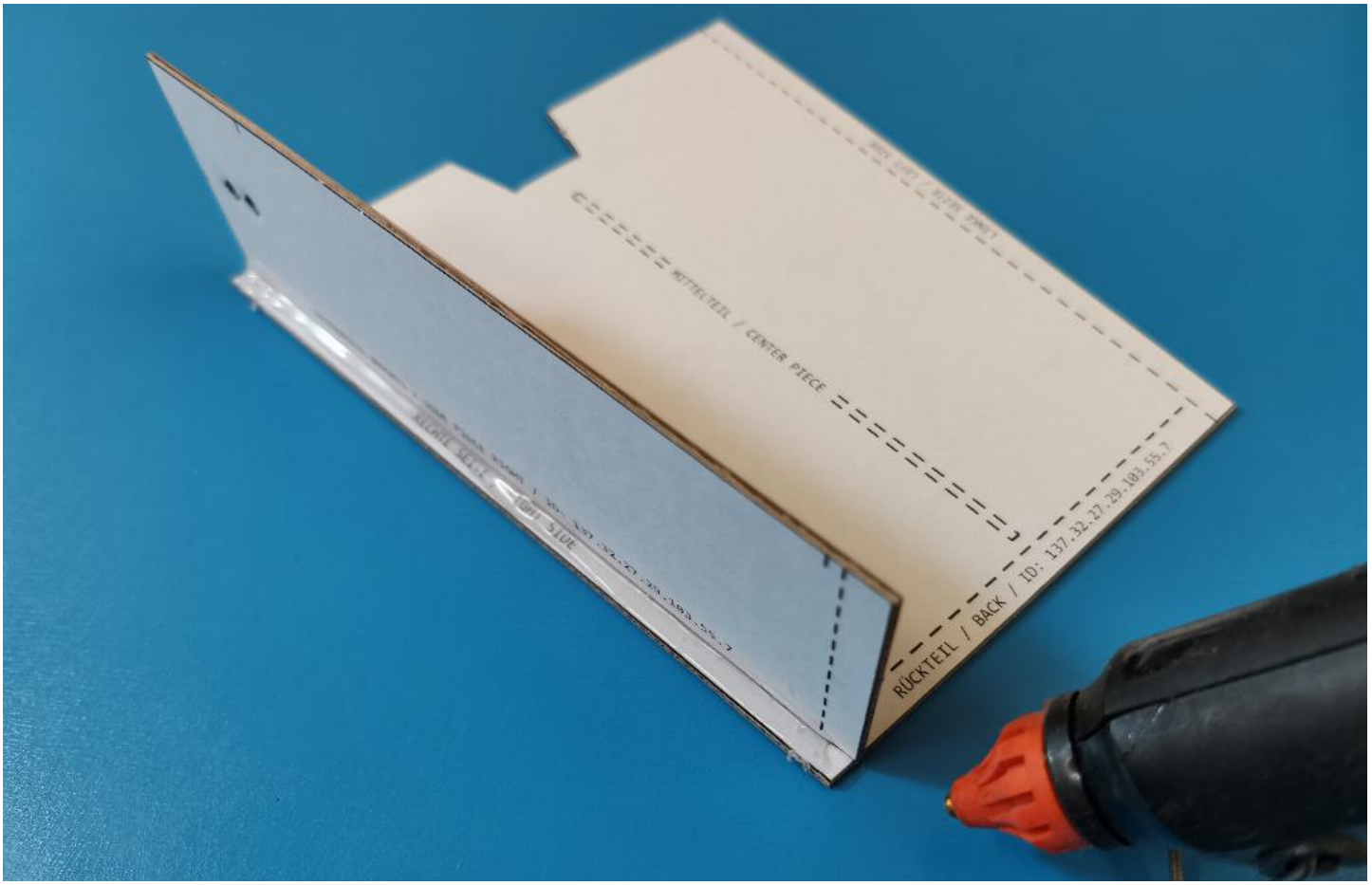
Step 12:

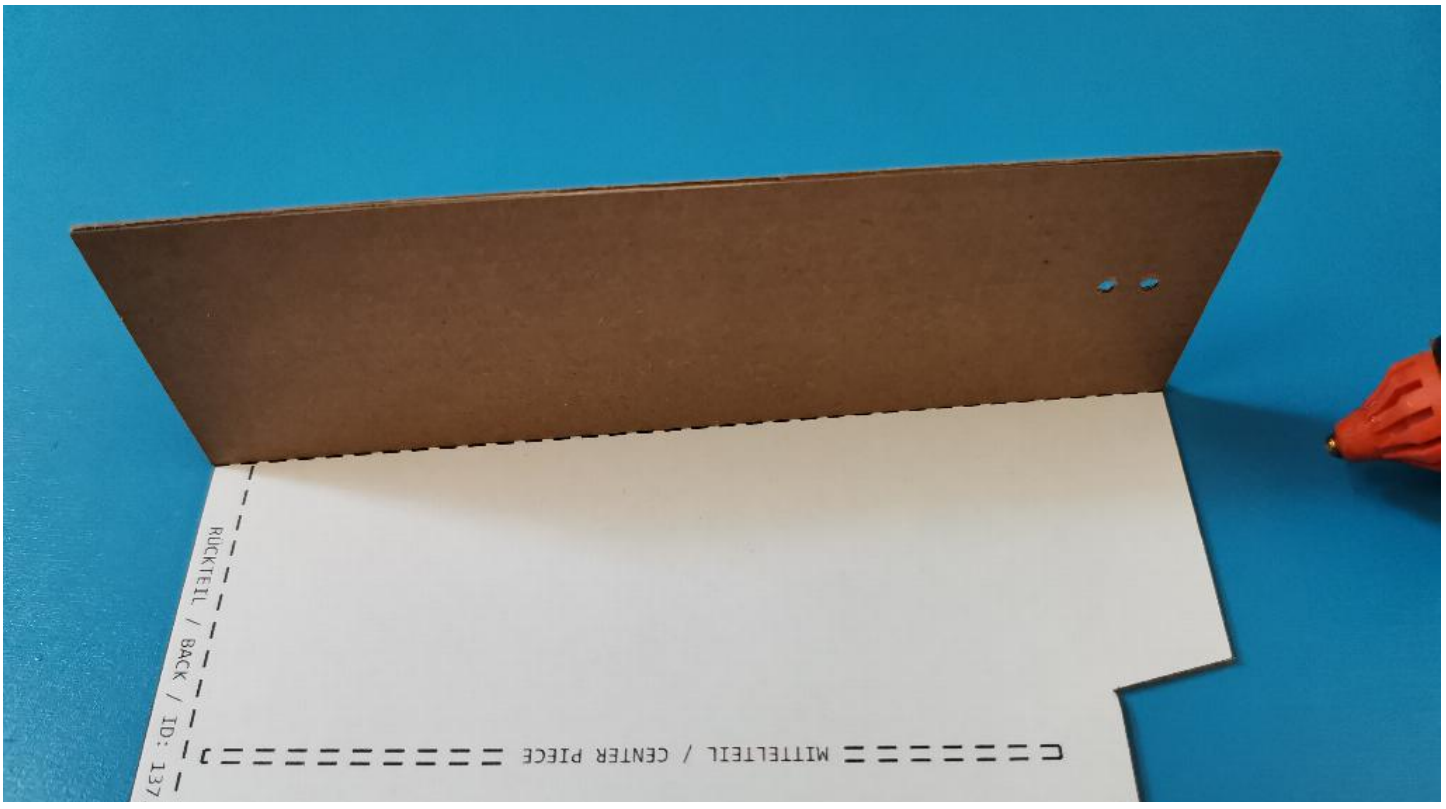
- Cut the center part without gluing the template onto the cardboard (we want both sides of the center part to have the same color)



Step 13:

- Punch holes into side parts and center parts (you can also do that with a knitting needle, if you don’t have hole punch pliers)

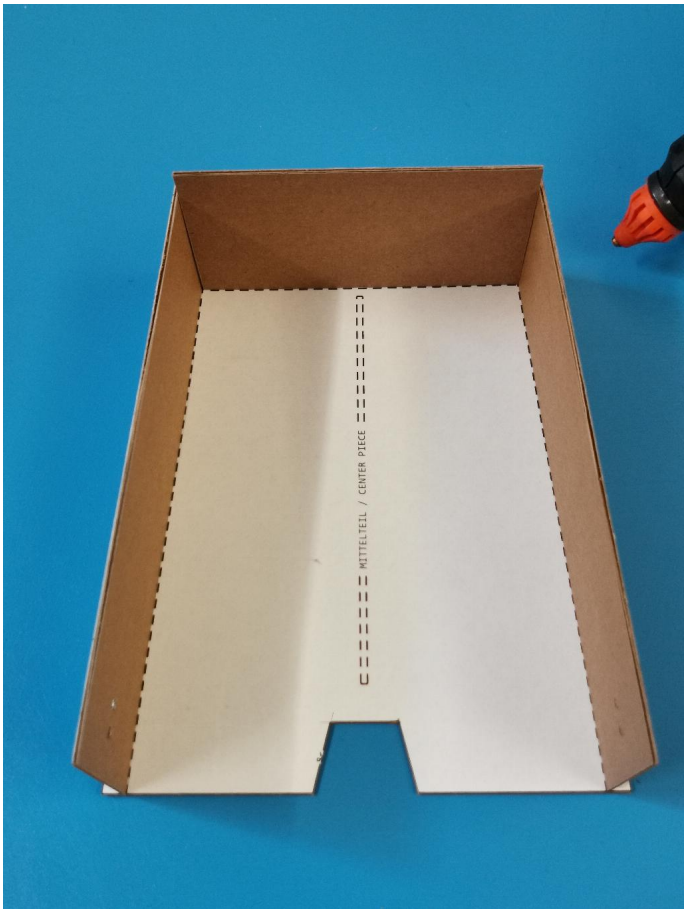




Step 14:

- Hot glue one side piece to the bottom part. Make sure the inside of the side wall aligns with the dashed line.


Produkt-Farbe

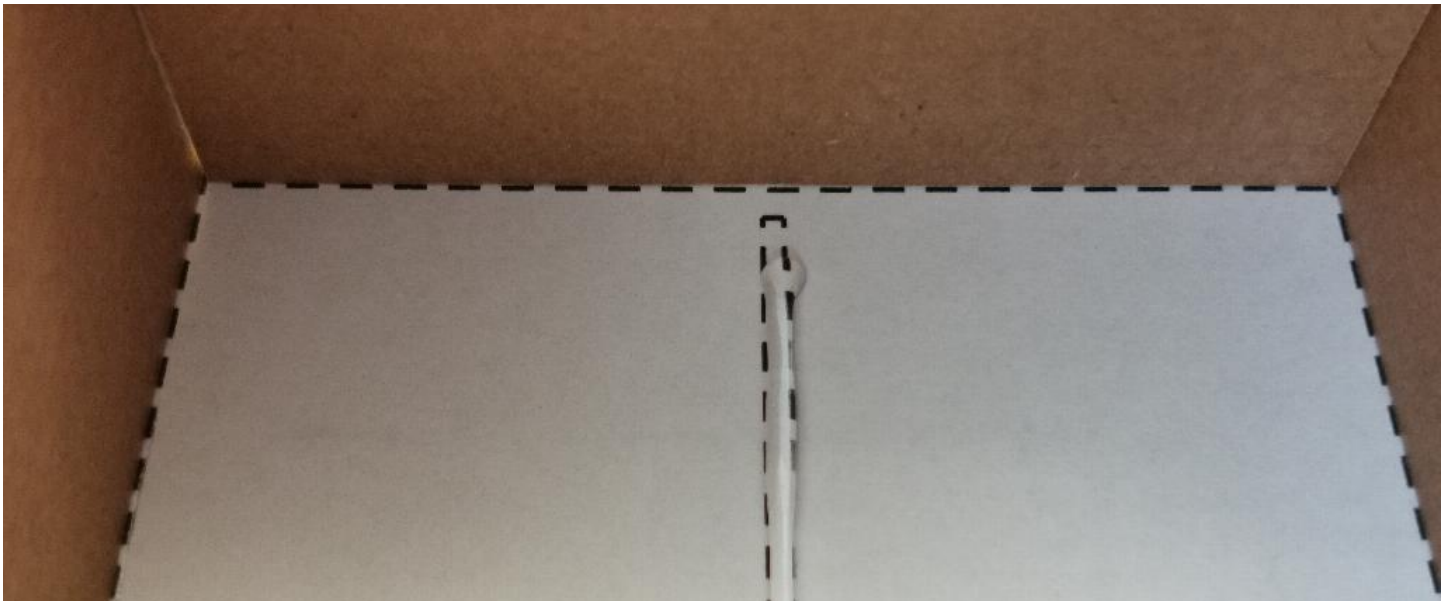


Step 15:

- Glue the other side piece and the back piece onto the bottom part in the same way.

Pro-tip:

With a few heavy items (e.g. a can of paint or some books) and some masking tape, you can build a makeshift rig that holds the pieces in place until the glue becomes hard.

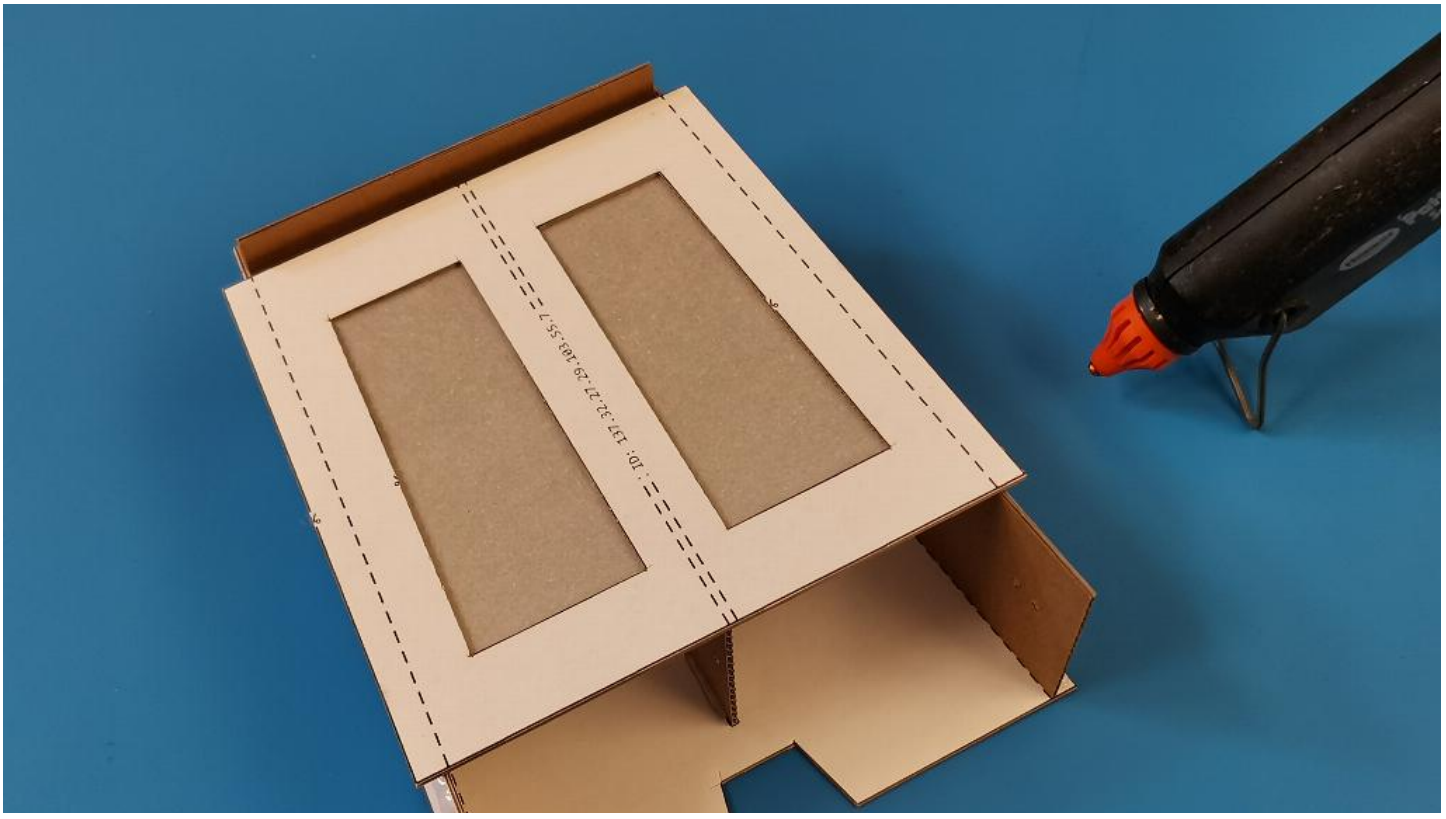


Step 16:

- Glue the center piece.

Make sure to leave a gap between the center piece and the back wall, as the stereograph will slide in here!

Make sure to orient the center piece correctly. The hole has to be on the eye side. The height of the hole has to fit the height of the nose bridge holes!

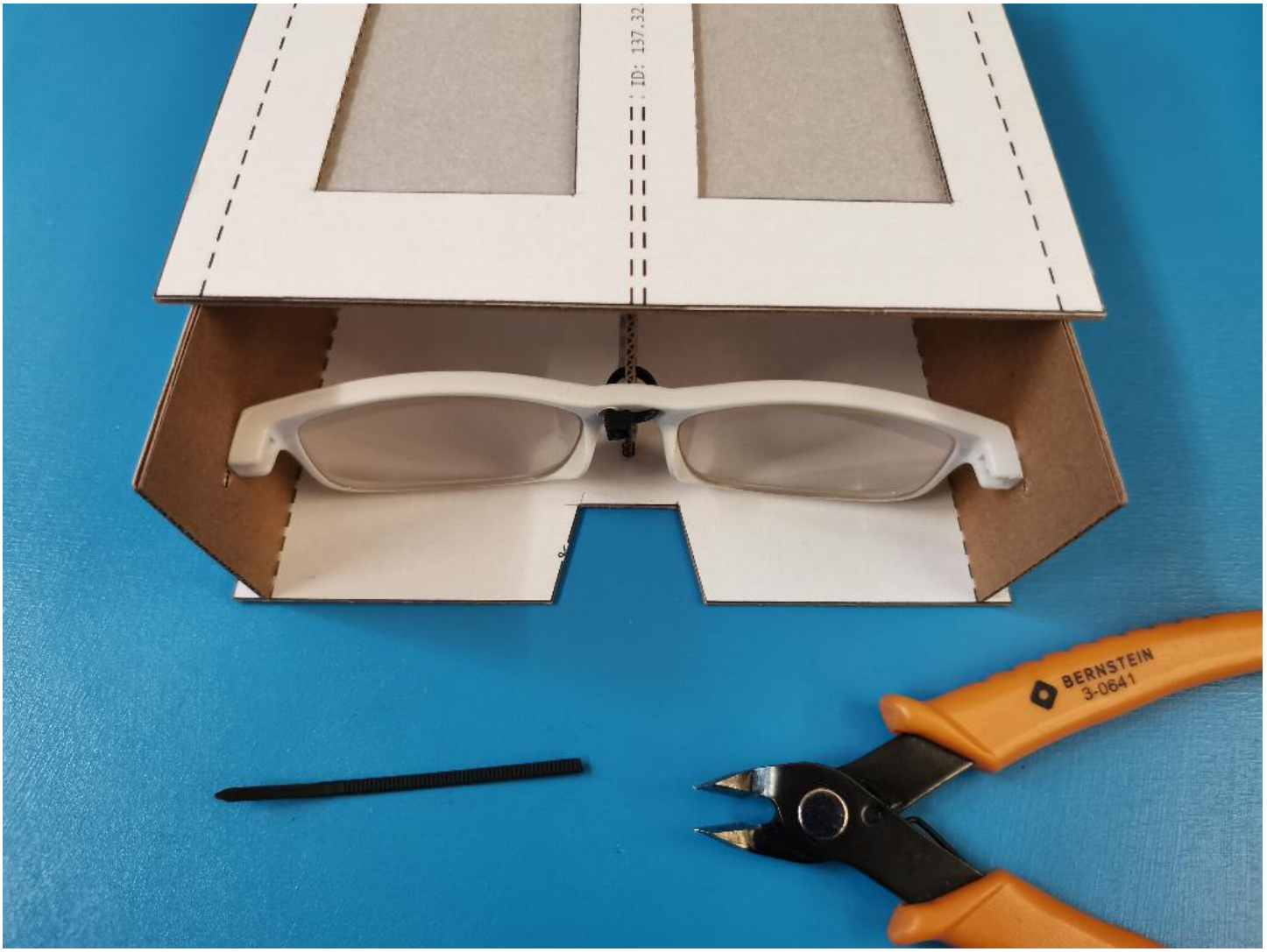


Step 17:

- Glue the top plate onto the lower assembly. The little lines on the top of the side pieces indicate the position of the top plate. When glued correctly, the front and back sides of the top plate will align with the center piece and a slot for the stereographs will remain at the back side.
- A weight helps to hold everything in place until the glue hardens.

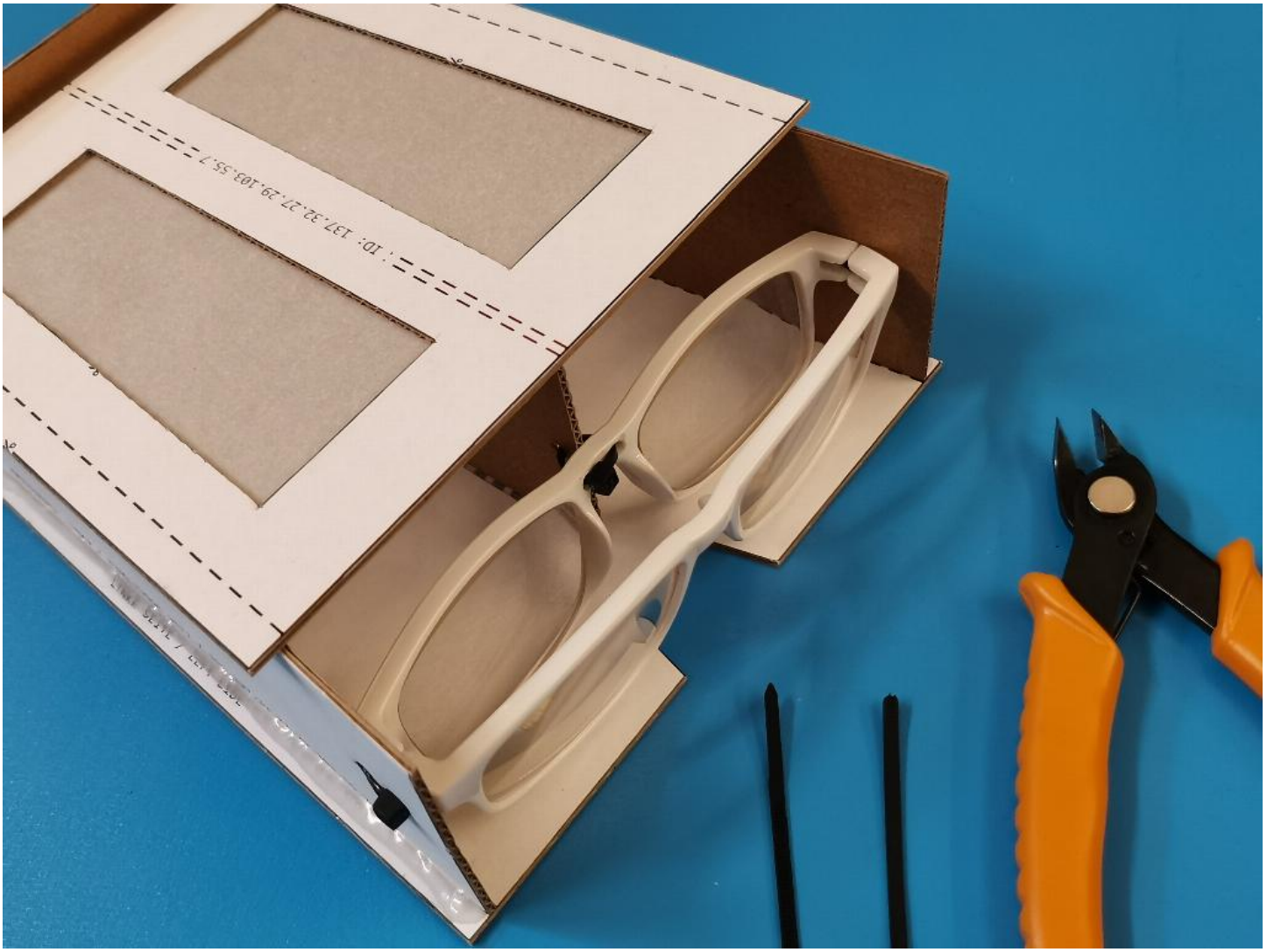
Step 18:

- Cut the zip ties which connected the reading glasses



Step 19:

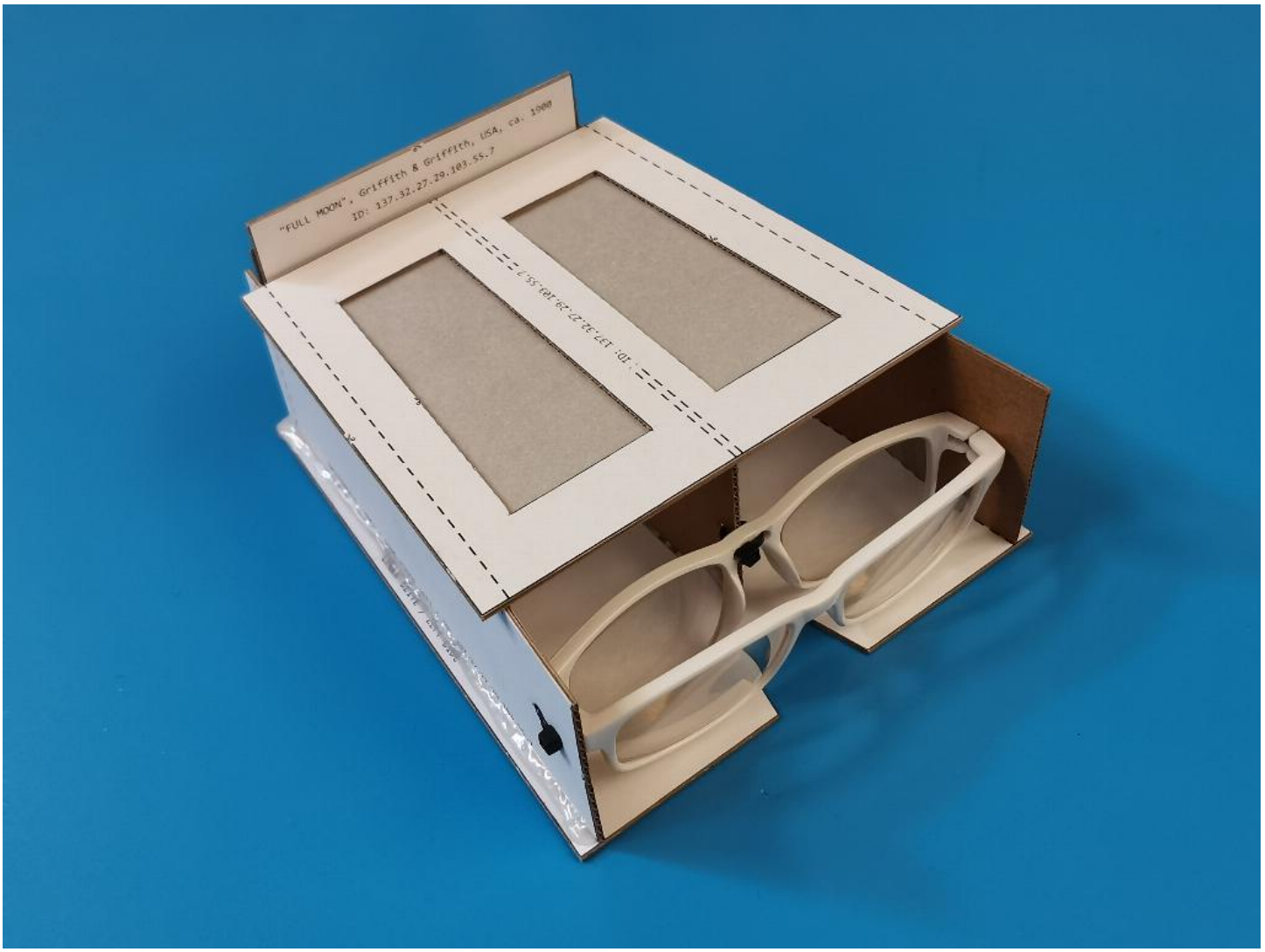
- Connect the reading glass that has holes in the nose bridge with a zip tie to the center piece.



Step 20:

- Use the two remaining zip ties to connect the second pair of glasses with the first pair and the side pieces.


"FULL MOON", Griffith & Griffith, USA, ca. 1000
ID: 137.32.27.29.103.55.7


"FULL MOON", Griffith & Griffith, USA, ca. 1000
ID: 137.32.27.29.103.55.7

Congratulations!

You have now made your own stereoscope! In order to try it out, slide the stereograph that came with the Bastelbogen in the back of the stereoscope, then look through it. Both eyes will see a slightly different picture, but your brain will assemble them into one 3D image.

You can also search for further stereographs on the Internet, there are plenty.

Finally, you can also give your stereoscope a personal touch by decorating it e.g. with washi tape and googly eyes :)