

# Notes on creation

Samantha Sanchez Morales

To my sister and mom  
Camila & Sheila,  
love you always.

Notes on creation

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Fabricademy

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# Intro

The origin of this project stems from my conviction that we can change our patterns of consumption and the ways we create.

Experimenting with alternative materials that can degrade and leave no residue is my response to an ongoing search for solutions to this issue. I wanted to combine this principle with one of my longest and strongest fascinations: jewelry. As long as I can remember, I have loved wearing these accessories; I would even say they are my favorite objects.

However, my concern regarding the materials and production methods used to create them has grown over time. Through this project, I aim to intersect these two interests and begin constructing my voice as a designer, one that is closely tied to my increasing social and consumer awareness.

This journal is a compilation of the notes I took, and the decisions made during my creation process, this is part of my commitment to responsible creation and to share the ideas I developed throughout this journey, with the hope that it may serve as inspiration for others to pursue projects of this nature. It is my small contribution to a movement that has been unfolding for years. In many ways, this journal is the guide I wish I had before starting this project, and I am certain it will serve as a foundation for my future ideas, this is only the beginning.



'Maybe the real treasure was the friends we made along the way'

This internet phrase kept playing in my head while i was writing this page, it definetly sums up what im trying to say with this project. It's not only about the final object, but about the process that led to it.

Eggs,



Eggs

&

Eggs

2 weeks, 37 eggs, 18 break-  
fasts are 300g of eggshell  
powder and the base of a  
material i experimented with.

I didn't know this was possible  
until i crossed paths with Ali-  
cia's instagram. Alicia Valdes  
(@\_aliciavaldesselbach\_) is a  
designer specialized in material  
& waste research, in one of her  
posts she explains the design  
process and material creation  
behind her jewelry brand ba-  
sed on mainly eggshell powder.



By Alicia Valdes via Instagram

It opened up my perspective and, honestly, became one of the main sources of inspiration for this project. I came to understand the importance of being open about your process, as it can serve as a foundation for someone else's inspiration and contribute to collective knowledge.



## Why eggshells?

Eggshells are a very abundant organic waste, discarded on a large scale by both the food industry and households. Using them gives new life to something that would otherwise be thrown away. They are rich in calcium carbonate (95-98% of their composition), which provides a natural mineral load that contributes structural support. In short, their use improves the mechanical properties of the object, reduces waste, and reinforces a circular approach.

By circular approach i mean designing with the entire life of an object in mind, from material sourcing to its reintegration into the enviroment.

## A BRIEF TIMELINE

Long before biomaterials became a field of study, ancient civilizations were already experimenting with the aesthetic potential of eggshell. This timeline traces its journey, from dangerous, wild hunts in North Africa, to elite tombs in Etruscan Italy, to Phoenician trading ships crossing the Mediterranean. The material we work with today carries thousands of years of human fascination.

Source: Hodas, T. (2020).

ostrich egg



regular egg

● Early bronze age  
3rd millennium BCE

The first luxury eggs, decorated ostrich eggs first appear in elite funerary contexts across Mesopotamia and the Levant. Engraved, painted, and fitted with ivory and precious metals, they were among the most prized luxury objects of the ancient world.

● Late bronze age  
1300 BCE

The Uluburun Shipwreck. Unworked but blown (emptied) ostrich eggs were found aboard the Uluburun shipwreck off the southwestern coast of Turkey. This suggests that raw eggshells were traded as a material across the Mediterranean. The shell itself was the commodity.

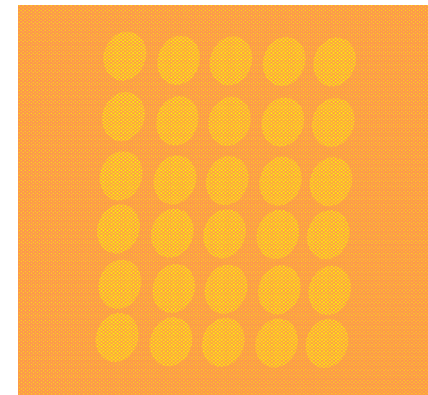
● Iron age  
625-550 BCE

The Isis tomb at Vuci. Five decorated ostrich eggs were found in an elite Etruscan burial, the Isis Tomb, alongside Egyptian faience beads, bronze vessels, and gold objects. The eggs were carved and painted with animals, chariots, and geometric motifs, and fitted as vessels with metal attachments.

To disinfect the eggshell and obtain homogeneous mixtures for experimentation, it is necessary to turn the shell into a fine powder.

I used three types of recipes to create a type of ceramic with this powder; my binding agents were **gelatin**, **xanthan gum** and **sodium alginate**.

Binding agents are substances used to hold particles together.



# RECIPES

## Xanthan gum

### Ingredients:

100 g of eggshell powder  
100 ml of water  
4 g of xanthan gum

### Instructions:

1. Add xanthan powder to the water and stir until it starts to thicken. To completely dissolve the lumps that are formed at the beginning, use a mixer or wait longer.
2. Add the powder until they are mixed in a smooth paste.
3. Fill an extruder container with the paste (I used a 20 ml syringe), create your object and store it at room temperature until it completely dries.

Recipe by Ana via [materialom](#)

## Gelatin

### Ingredients:

24 g eggshell powder  
12 ml water  
5 g gelatin

### Instructions:

1. Mix water and gelatin in a pan (the water should have a medium high temperature).
2. Add eggshell powder and mix until a slightly viscous and sandy like paste is reached.
3. Pour the mix into a mold and let it dry in room temperature. You can accelerate the demolding process by putting it in the freezer and then taking it out of the mold and let it dry in room temperature.

Recipe by Sofia via [materialom](#)



## Sodium alginate

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### Ingredients:

20 g of eggshell powder

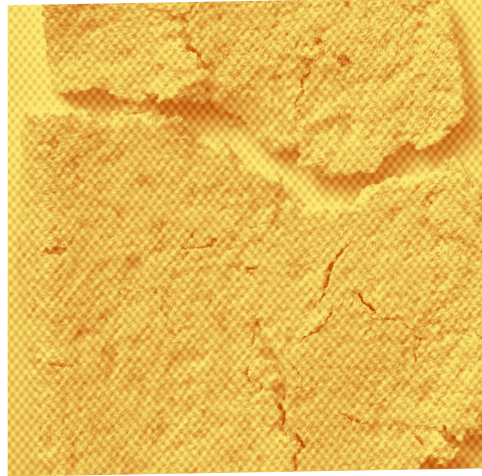
22 ml of water

5 g of calcium alginate

### Instructions:

1. Sieve the alginate in a bowl and then add the water, mix thoroughly so that no lumps remain.
2. Gradually add the 20 grams of eggshells into the water-alginate mixture until a paste clay-like is formed.
3. Put your clay into a mold or shape your object by hand.

Recipe inspired by Midushi Kochhar via [materiom](#)



Each recipe has a different reaction depending on the binder. I never stop being surprised when I'm experimenting with the creation of biomaterials, it never goes the way I expect... honestly, sometimes I panic that they won't turn out well, until I remember that I have to trust the process and wait to see how they evolve.

Xanthan: la mezcla más líquida de todas a la hora de preparar, sería fácil de verter en un molde, es la que más tarda en secar

Pero

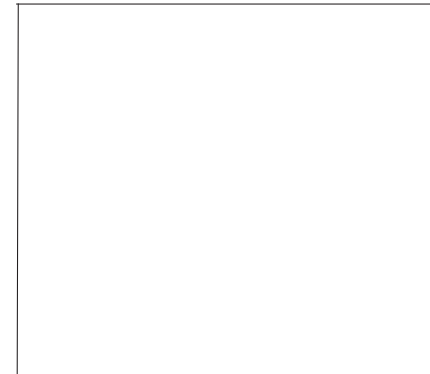
tipo material	secado	textura	vertir en molde
Xan	48h de los tres	rígida áspera y unida	Después de prepararla es la mezcla más "tráida" y por ende la más fácil de verter en moldes que se adapte

glen	5h	rígida y áspera	se seca casi al instante de hacerla tendrías que verterla en el molde lo más rápido.
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Sodio	48h	rígida y áspera, se craquea durante el secado con el contacto	la mezcla resulta en una tipo masa/placo fina es fácil de manipular y meter en molde pero difícil que tome todas las detalles de este.
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After a few days of drying, I evaluated and observed the qualitative properties of each material.

\*Flip the cards to see the data sheets\*





# BIO-RESIN



The bio-resin was one of the materials I was most excited about for its potential and what I imagined I could do with it. I took my recipe from Loes Bogers Fabricademy page, what is interesting about her page, apart from the innovative recipes, is that it gives you a whole insight into the materials, their history, and the environmental implications of producing the material, as well as each ingredient needed to make it. Her recipe uses gelatin as a -

binder. From what I have read and researched so far, gelatin offers great stability and consistency to biomaterials. However, I question what consequences its use has, since this is a material of animal origin that not only involves the sacrifice of an animal but also the greenhouse gas emissions that livestock farming produces. On the other hand, it is argued that gelatin extraction takes advantage of animal waste.

In this project I decided not to limit myself to experimenting with this material, but I also want to experiment with creating materials that do not include it.

Regarding glycerin (also required for the making of this material), I obtained two types to experiment with. One of them does not specify its origin on the bottle, but it is most likely biodegradable USP-grade vegetable glycerin (high-purity glycerol, meaning it is safe for human consumption

and use). I also noticed that it is produced in Mexico, in Hidalgo, a state not far from where I live (Puebla). The other one I used is vegetable glycerin produced in Mexico and distributed at a local health store. I believe that questioning where ingredients come from is something I want to make a key part of my process, and I can admit that this is the first time I am doing so. There is a truth I cannot escape: I live in an industrialized world where we -

depend on oil, fuel burning, and animal exploitation. However, I believe that making better decisions (with knowledge) in the design process can make a difference and plant a seed for change. Simply looking for locally produced product alternatives supports the local economy and reduces the carbon footprint from transportation, or checking whether a product is petroleum-free or free from animal exploitation.

what I mean is that we are in charge of our purchasing decisions, and these small actions can make a difference.

## RECIPIE

Ingredients:

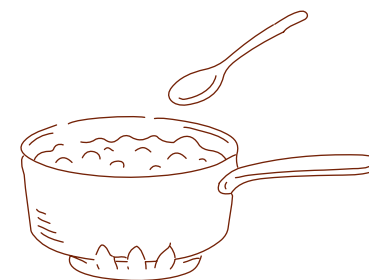
10 g of gelatin

2 g of glycerin

70 ml of water

\* I reduced the quantities of the original recipe\*

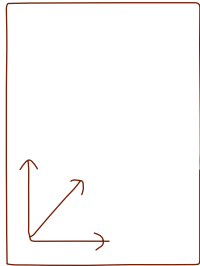
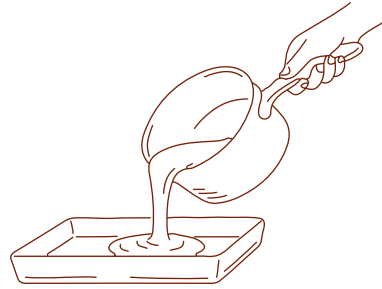
1. Bring the water to a boil, then add optional natural dye, glycerin, and gelatin, keeping the temperature below 80°C and stirring very gently with a spoon to avoid bubbles.



2. Simmer the mixture between 60-80°C for at least 20 minutes up to an hour without letting it boil. The longer you cook it, the more water evaporates, which reduces shrinkage and gives a thicker liquid, ideal for larger castings. If foam appears on the surface, remove it with a coffee filter or kitchen paper.



3. Let the mixture cool briefly until slightly gelled but still pourable, then cast it slowly into the mold from the center without moving it. Leave it to dry in a cool, well-ventilated place to avoid fungal growth.



4. Expect a shrinkage of around 5-15% in thickness, width, and length.

## Considerations:

You can customize the recipe by adding natural colorants like hibiscus or beetroot, adjusting glycerin levels for more rigidity, or adding fibers for extra structure. Oils like almond or sunflower can reduce shrinkage, and leftover dried bioresin can be remelted with a little water-

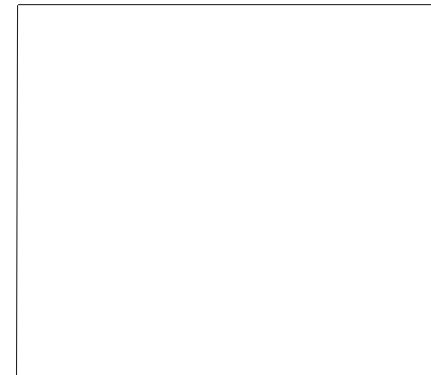
to create a concentrated mixture that shrinks much less when cast. Pour all of the ingredients all at once to the pot for them to mix homogeneously.

Recipe by Loes Bogers via fabricademy



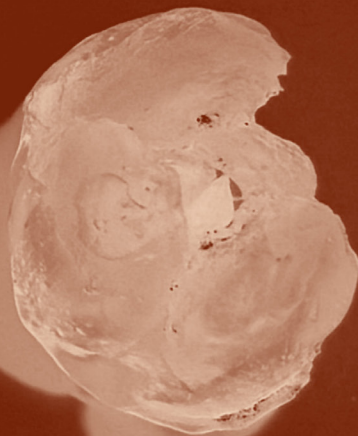
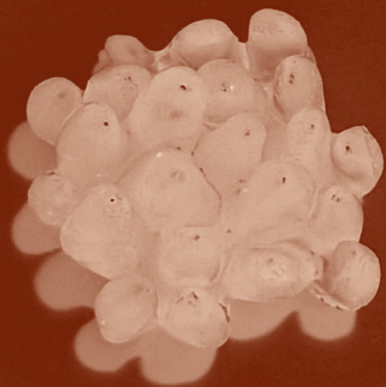
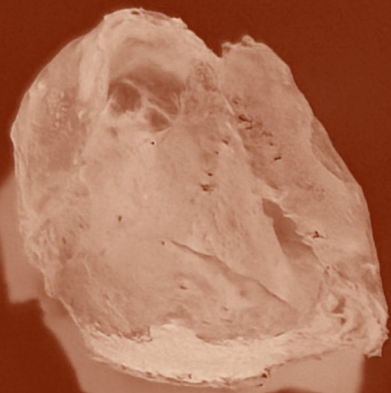
I made variations of the recipe: one was the original, another had **hibiscus dye** added, other was the original recipe plus 10g of **eggshell powder**, and for the last one I used **agar**.

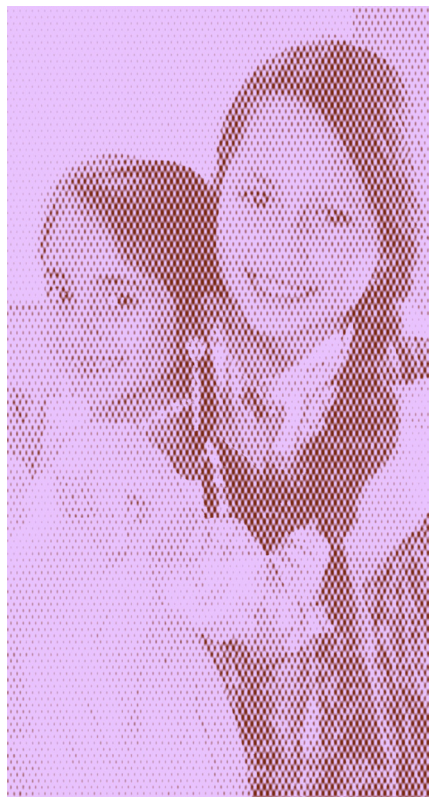
\*Flip the cards to see the data sheets\*



More details:







## WHERE DOES INSPIRATION COMES FROM?

At an architecture conference I attended a few months ago, the speaker shared that he had an interaction with Luis Barragán, a very iconic Mexican architect, where he told him that design style does not exist. Rather, the essence of our creations is the result of the binomial of culture and the nature of our surroundings, and since this is constantly changing, you cannot commit to a single style. This phrase stayed deeply with the speaker, who added a few more elements to the possible definition of style, or those phenomena from which we draw inspiration. One of these is history, and by this he not only referred to the heritage and cultural richness we have in Mexico, which is a vast source of inspiration for any creative, but also to your personal history. Delving into your past can give you a great deal of information; the work of introspection, who you were and who you want to become. These words were the foundation of my project and-

I can say that I was a fortunate girl. I grew up in a home where I was able to develop and express myself freely, and I had the means, space, and time to do so. This allowed me to be a creative and imaginative person. One of the ways that helped me channel these qualities was through objects, of all kinds. For me, these made tangible everything that was going on in my head. For example, I really loved princesses and therefore I would ask to be bought costumes, crowns, necklaces, and plastic earrings to build my fantasy world. I believe that this kind of thing is where my fixation with objects was born. I see them as tools to channel my creativity.



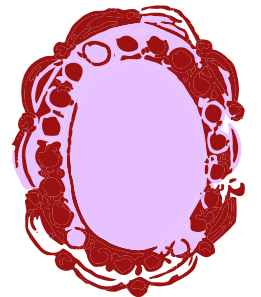
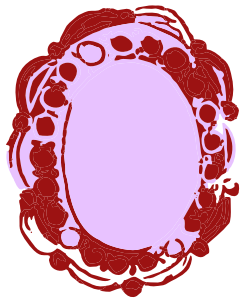
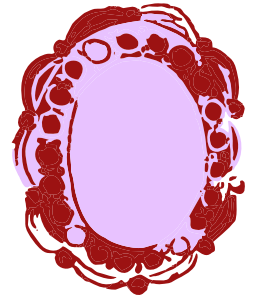
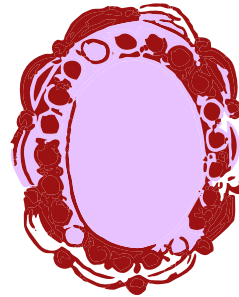
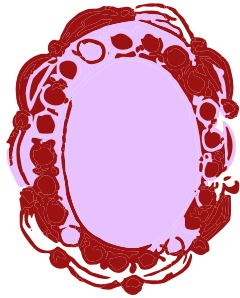
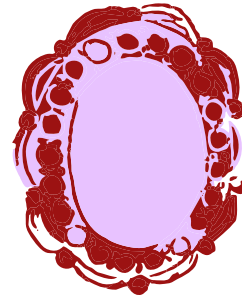
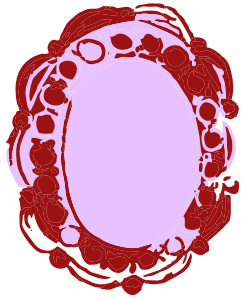
Today, although I celebrate objects, I now question the way we produce them and the consumerism that pushes us to see them as disposable and to always want more. I believe that consumerism is the biggest problem, but design is the solution. If we create things responsibly and contemplate their life cycle from the earliest stages of design, which is the choice of materials, we can begin to change our relationship with them. There are many options for conscious material application and selection, one of which is biomaterials, and that is where my proposal comes in.

To do sustainable design you do not necessarily have to choose bio-based materials, but in this case I specifically wanted to focus on them because I find them fascinating and they represent a new way of seeing, feeling, and creating in the world. Every contribution adds to collective knowledge and helps drive innovation in this area. Who I aspire to be as a future professional is someone who places the life cycle of my creations at the center of the design process. This is just one of the many ways it can be done.

My inspiration for this project was born from words I heard at a conference and my interpretation of them, reflecting on your past and present in order to represent the future.

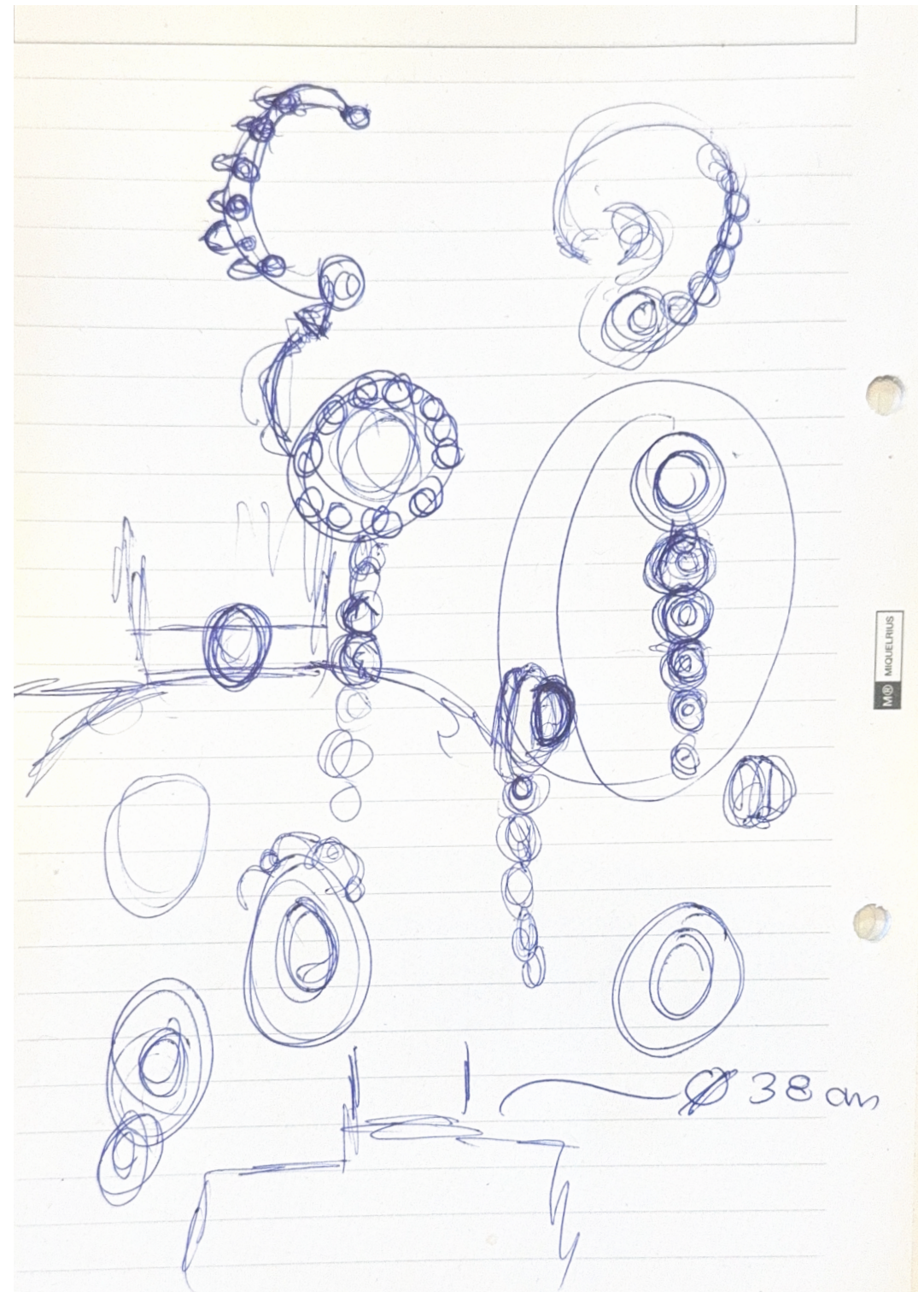
My way of representing my future is by reinterpreting my past. The girls in the photo I included a few pages back are my sister and I, years ago, dressed up and wearing plastic jewelry from our favorite princesses at the time. I used this image as a reference and an **illusion to my past**, and decided to recreate, or rather reinterpret, the accessories we are wearing in the photo using biomaterials. This, in turn, is my way of **shaping my future**.





# MOLD MAKING

When I evaluated the behavior of the materials I experimented with, the one I liked the most and found most suitable for this project was the bio-resin. Since I used molds for its creation, it made logical sense to use this technique for making my pieces. The main pieces are earrings, an ear cuff, a locket and a choker.



For the chokers I drew inspiration from the woven human hair bracelets of the 19th century. During the Victorian era it was very common to wear jewelry made from the hair of loved ones, whether living or deceased. This not only reflected mourning, it was also a demonstration of friendship, and affection.

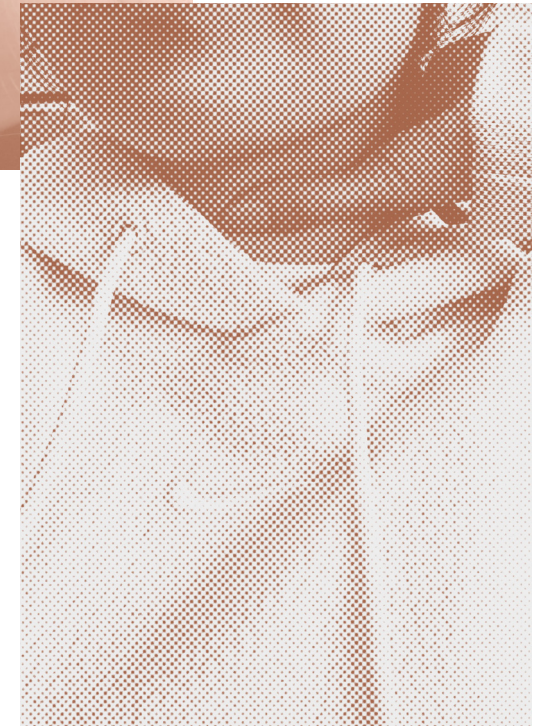
These usually had a locket at the center as a romantic ornament, so I combined these two concepts for my final idea.

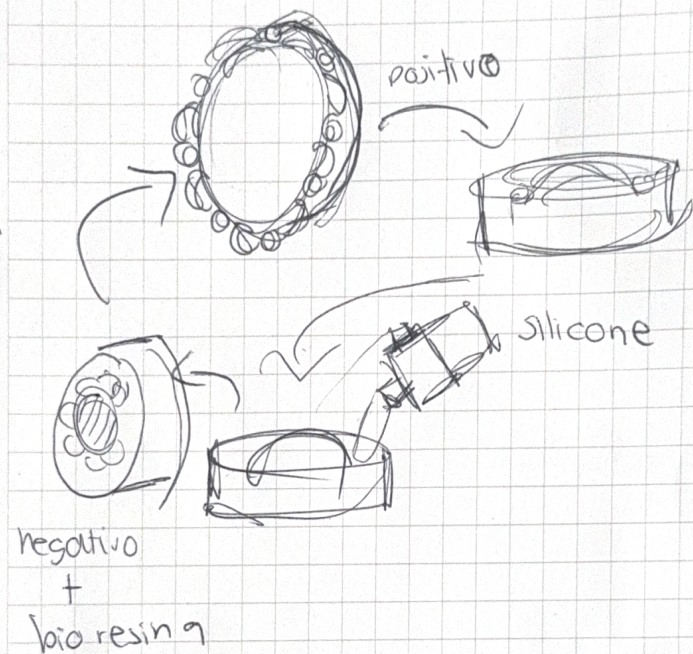


Citrine Gold Filled Victorian Hair Bracelet  
via Boylerrf



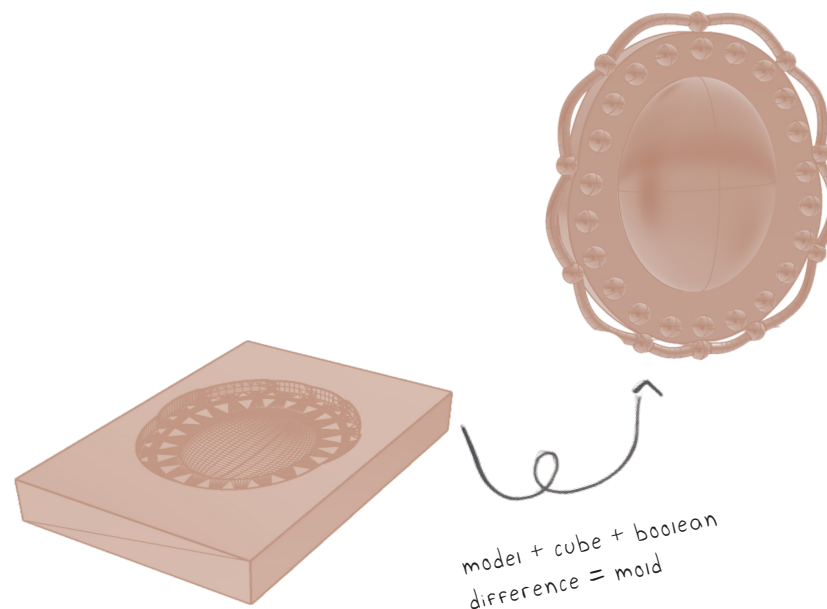
Took some measurements





I then modeled my pieces in Rhino based on my sketches, and once I had them ready I proceeded to make the molds. Mold making follows the logic of positive and negative, or the inversion of volumes. A solid object (positive) creates a hollow cavity (negative), which in turn is used to replicate new solid pieces (final positives).

In Rhino there is a tool to carry out this process digitally, called, Boolean difference. In my first attempt at making molds, I took my piece model, created a cube and overlapped it, then used this tool to carve my figure into the cube. Once this was done, I 3D printed it.





1

2



3



### 1. TPU molds.

I chose to print in this material because it is flexible. To hide the print lines I filled it with wood filler, which turned out to be a mistake as it detached along with the pieces. I do not think this is the ideal technique for pieces that require depth or high detail.

### 2. PLA molds.

This plastic is rigid but ideal as a base for the silicone mold. For this mold, I placed my positive and a barrier around it to contain the silicone. I also made this removable base so the final piece could be taken out easily. This material can be sanded and repaired comfortably; for this one, I did use plastic filler.

### 3. Silicone molds

Good for capturing details, and the final piece is very easy to demold.

### Considerations:

Silicone has a high ecological footprint; its waste and the energy required to produce it are its main drawbacks, although it does not release toxic substances. Its advantage is that it can be reused many times, just like PLA. To make the most of the plastics used, I will continue using these molds to keep testing materials rather than treating them as disposable.



Earrings + old metal earrings



Locket earrings + old metal ones



Boil



Ear cuff



Locket's

Ear cuffs

Choker

Choker + my mom's hair

# Lessons learned

conclusions about the technique

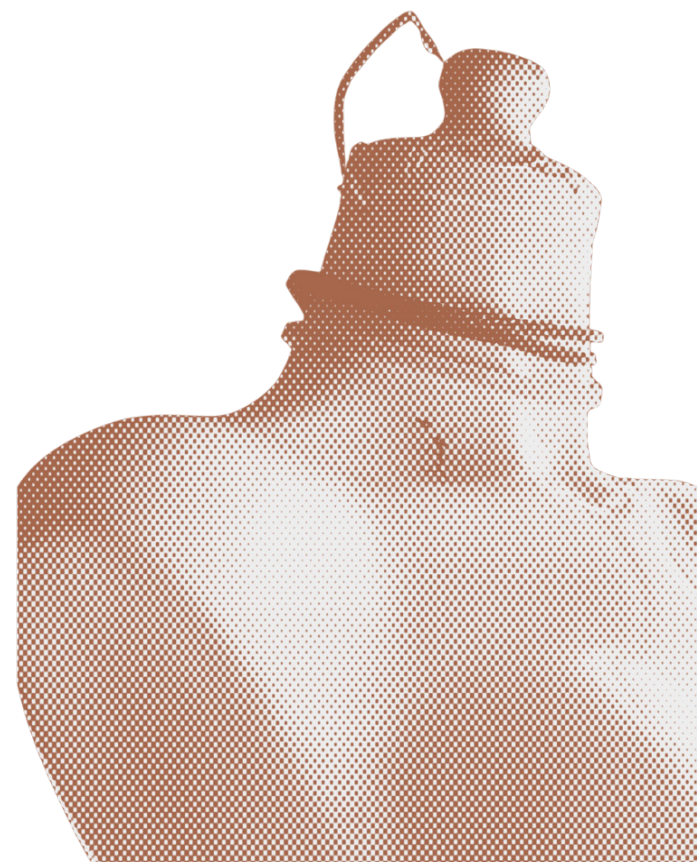
Experimenting with different types of molds and shapes through trial and error, the ones that worked out became my final pieces, but there were also quite a few that I was not happy with, and at the time thought my project was not going to come together. I am just beginning to learn not to get attached to ideas and to recognize when it is time to let go and try again in a different way.

Overall, this is what I learned and reflected on while working with this technique and material: for the resin to pick up the details of the mold well, especially when they are small, pour the mixture in its most liquid state possible, although this may result in a longer drying time. For faster drying, you can remove your piece from-

the mold after 12 hours, but be aware that doing so can cause the piece to warp. If you want it to stay flat, you can tape it onto a straight surface and let it dry that way.

For the chokers, for example, I let them dry on a mannequin by attaching the pieces to the neck and leaving them to air dry, they were ready in 24 hours. This not only sped up the drying process but also ensured that their final shape was anatomically correct, making them comfortable and ergonomic to wear. This resin is also sandable for cleaner final results, and it is NOT waterproof, if it comes into contact with water it becomes slightly sticky. This is precisely an area of opportunity for further experimentation-

with these materials. The next step is finding a way to make them water resistant, as well as finding alternatives for creating molds without continuing to rely on plastic. These are things I can focus on to keep growing with this project.





# The End

Since I first took photography as an elective in high school, my sister has always been my go-to model, and of course, this project was no exception.

Working on this piece has given me so much. It pushed me to be consistent, to stay organized, and to really lean into creativity when obstacles showed up in my path. But beyond that, it became something more personal, it helped me reconnect with myself. For the first time, I had the freedom, the time, and the resources to fully dive into a project of my own, and it made me genuinely happy to explore topics that truly matter to me.

In the end, I feel proud and satisfied with what I created, but I also know this is just the beginning. There's still so much more to discover, to question, and to keep experimenting with.





















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This journal documents an exploration into the world of bio-materials, an experimental journey of trial, error, and discovery through the creation of jewelry pieces made from bio-resin. Equal parts personal and technical, it traces the process of reinterpreting childhood memories through sustainable design, asking three fundamental questions along the way: Who was I? Who am I? Who do I want to become?

A document for curious minds, makers, and anyone who believes that design can be both deeply personal and a force for change.