



# BIOPLASTIC LANDSCAPE

FOR WARHAMMER

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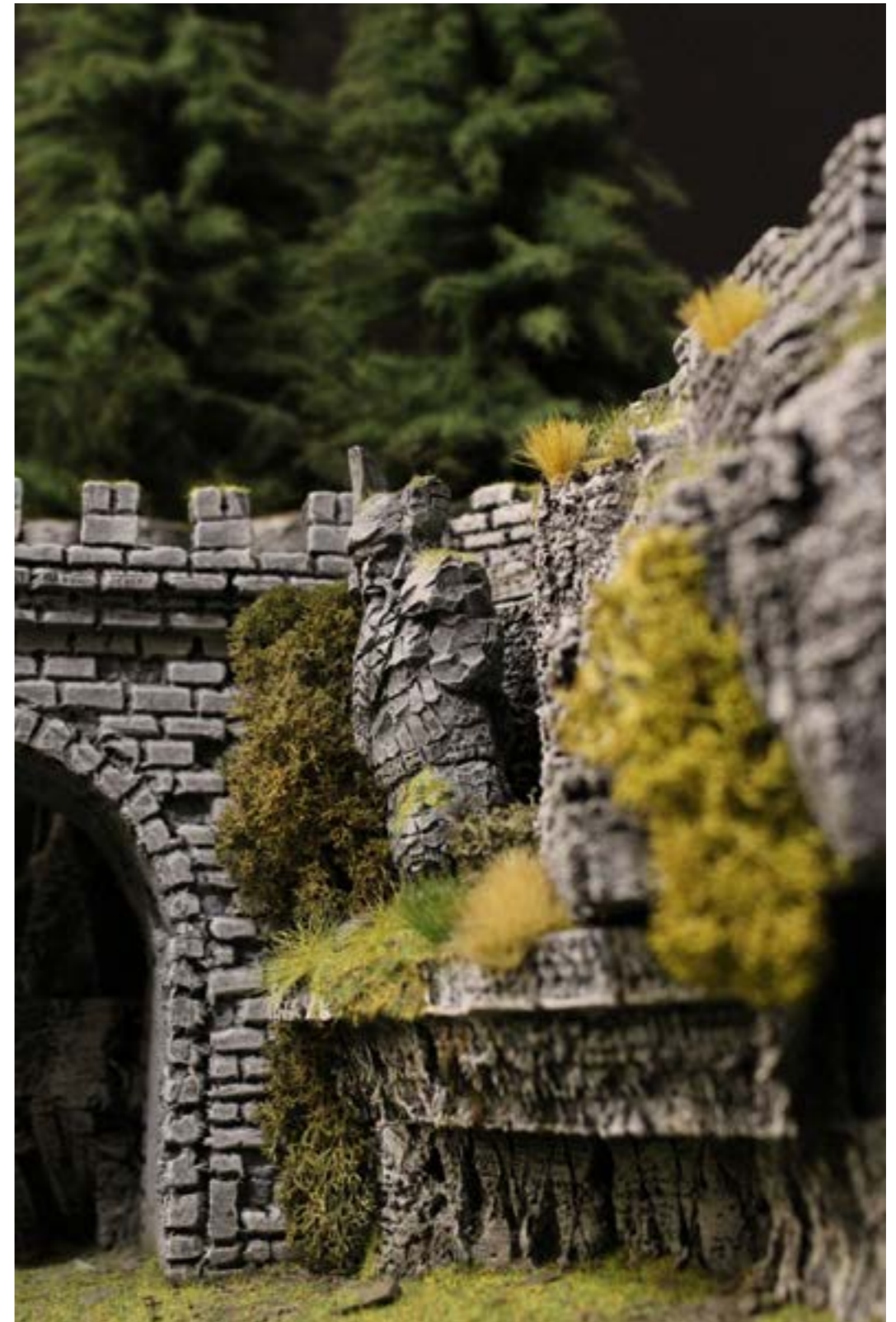
Imagery of final product

## WARHAMMER: A TABLETOP GAME THAT MAKES 'NATURAL LANDSCAPES' WITH ENVIRONMENTALLY DAMAGING PRODUCTS

It's brought chaos to the kitchen tables for over 30 years. If you're remotely interested in strategy gaming, you've probably heard of Warhammer. Players collect forces of miniature plastic models and use them to play out on a tabletop battlefield. The tabletop can be made by players themselves with help from several how-to guides that can be found [online](#) but also in [books](#).

Players spend hours building and painting their miniatures, a process that requires patience, money, dedication and, sometimes, considerable artistic skill. During this process of building, many products that are used, are environmentally unfriendly.

The most commonly used chemical products to make the landscapes with are, epoxy, plastic, Styrofoam and paint.



A beautifully made Warhammer landscape by [Maerlibrett](#), 2018



# BIOPLASTIC LANDSCAPE

## THE CONCEPT

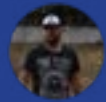
During my studies at the minor Makers Lab, I have redesigned a Warhammer landscape from a DIY sustainable perspective. My goal with this project is to influence the Warhammer

community to replace the chemical products that are used today, to make Warhammer landscapes with.

**BIODEGRADABLE PLASTICS  
ARE PLASTICS THAT CAN BE  
DECOMPOSED BY THE ACTION  
OF LIVING ORGANISMS,  
USUALLY MICROBES, INTO  
WATER, CARBON DIOXIDE,  
AND BIOMASS AND ARE  
THEREFORE FRIENDLY FOR  
THE ENVIRONMENT**

**“SEA FROM SPACE”  
BY NASA, 2015**

Players make their own boards because it saves money, it gives satisfaction and you can create your own storyline



**Pim Hollander** Wat een leuk project! Ik houd er zelf van om met rest materiaal iets te maken. Upcyclen Zoals hierboven beschreven is.

Het voordeel van zelf maken tegenover kopen zijn natuurlijk de kosten. Een leger van miniaturen kopen en schilderen kost best wat geld en tijd. Dus ook nog scenery van GW kopen kan mijn portemonnee niet aan.

Ook geeft het maken van je eigen terrein voldoening en je maakt je eigen verhaal.

## DESCRIPTION OF THE LARGER CONTEXT

### INSPIRATION AND RELATED FIELDS

**The issues I want to address/critique/design for**  
My goal is to find an environmentally friendly replacement for the most commonly used chemical products that are used today in the Warhammer community for the landscapes.

I hope to create awareness among the Warhammer players that make the tabletop battlefields, and make this branch a more sustainable one.

#### Related fields and critique

During my study I have looked into various Warhammer videos, especially [Luke Ape's videos](#) were very helpful. The videos teaches players how they can make their own board. The boards are relatively expensive when bought at the shop.

Making your own storyline by creating your own board gives satisfaction and is also a big reason why Warhammer players like to make their own boards (Pim Hollander, 2020).

That is why there is a big online community of DIY-videos and articles for players that want to make their own boards. The players like sharing their knowledge and experiences.

Most Warhammer players that make boards use the same technique to set up the base of the board; Styrofoam is used as a base to play on, but also to make mountains with.

To model the styrofoam and get rid of the 'ball structure' it has, it is set on fire. Setting styrofoam on fire is not only toxic for the environment but also for the creators themselves.

#### Inspiration and best practices

I've gotten so much use out of [materiom.org](#) and the bioplastic cookbook from Margaret Dunne. Every recipe I used are either from one of those two websites. Some certain ingredients are added to change the structure or the color.

To get more information about the Warhammer community I've added myself to various Warhammer FaceBook communities. I have asked questions on here and have looked into people's Warhammer projects.



*Piece of landscape made out of Styrofoam & plastic, Crysania Taylor*

# MY PERSONAL MOTIVATION TO START THIS PROJECT

## THE PERFECT OPPORTUNITY

Art has always intrigued me. In my previous art projects, my art has always been on paper (2D) or digital. I have never made something that was 3D. I once met Merian, an old friend of mine that made his own Warhammer boards and I remember that it got my attention because it looked so beautiful. I started looking into it and so I stumbled into the miniature world. The things that people make look so realistic and it makes you want to go in that world yourself. I've always wanted to recreate something like that for myself.

When this bioplastic theme came up, I thought that this would be the perfect opportunity. Not only to make the miniature landscape but also to bring a change into these communities.

I believe that the plastic problem that is going on now can only be changed when we engage with small target groups like these ones.

A big problem can't be solved all at once but only with small steps with a project like this.

# UPCYCLING IN THE WARHAMMER COMMUNITY

## TRANSFORMING TUPPERWARE

I have added myself into various Warhammer FaceBook groups and contacted some diehard players and creators. I came to the conclusion that not everyone has the same idea of being sustainable. Some Warhammer creators think that they are being sustainable, while they're not, because they don't have the knowledge of what is and what isn't.

I've also found out that upcycling is something that a few creators are already doing. Not only to save money but also because some creators are already aware of the plastic problem in this community and like to change this as well. Old Tupperware or other food packaging are sometimes used to create castles and towers. Although upcycling is a good start into making Warhammer projects more sustainable, buying a tons of Pringles cans for your project is still not the answer to creating a better environment.



Tower made from a Pringles can, Dalton Obrey, 2020

# FEEDBACK ON THE BIOPLASTIC LANDSCAPE FROM THE WARHAMMER COMMUNITY

## COUNTER ARGUMENTS



**Paul van den Berg** Ik ben verbaasd. Meeste mensen gebruiken piepschuim dat al van een verpakking afkwam. Het wordt dus al gerecycled. Als we foam kopen is dit meestal isolatiemateriaal dat vanwege energiebesparing ook in huizen wordt gebruikt. Als ik print is dit met pla. Ik heb begrepen dat dit "goed" afbreekbaar is. Onder sommige omstandigheden zelfs bij het gft afval. Food waste als verf lijkt me gevaarlijk.

Leuk - Beantwoorden - 1 d



**Harm Ronald Maris** Tja ik wordt zelf nogal moe van dat eeuwige quasi milieubewuste gewauwel. Veelal is het een halfbakken product met vooral een flinke marketing saus. Ik vind het fijn om in de hobby met goed materiaal te werken en bepaalde zaken zijn mogelijk milieubelastend maar dat moet ook kunnen. Gaat er vooral om hoe men met zijn afval omgaat.

Leuk - Beantwoorden - 23u



**Bert Tennekes** Ik maak alles zelf van terrein kijk waar het goedkoo is en veel dingen van buiten zoals takken

Leuk - Beantwoorden - 9u

When introducing my bioplastic landscape project to the Warhammer community on FaceBook there were a few counter arguments. One of these arguments were that some creators are using styrofoam (isolatiemateriaal) that was already in the packaging of the bought Warhammer set, and this was sustainable in their eyes. This is again, upcycling, but not the best way to be sustainable. I see this as a mistake from the Warhammer sets creators, the styrofoam that is in the packaging could easily be replaced with a more sustainable product that can be used instead.

Another argument is that figures are 3D printed with PLA. PLA is a 3D printer filament that is plant-based (according to NatureWorks, the world's largest producer of PLA). PLA is biodegradable but a PLA bottle can however take up to a 1000 years to fully decompose. NatureWorks have openly accepted that it's products would not fully break down in landfill sites.

Harm Ronald Maris has mentioned on my post, that the products that are sustainable are using the sustainability as a marketing trick and that the products are actually not as good as how they get advertised. The quality is more important than the sustainability of a product for him.

Bert Tennekes is making everything himself and finds the price the most important thing, what seems one of the biggest reasons among the most players why sustainable products are not used.

## “I AM ANNOYED BY THE LAXITY OF THE WARHAMMER COMMUNITY”

### SUPPORTING ARGUMENTS

Hoi! Ik PM je effe omdat ik echt zo fucking hard achter minder plastic zoi in de hobby sta. Ik erger me echt helemaal kapot soms aan de laksheid van veel mensen. Dus ik ben echt heeeeel erg blij met dit.

Kan je wel wat linkjes sturen naar gave upcycle projecten en zo. Hoe populairder dat aspect van de hobby wordt hoe beter voor iedereen.



A screenshot from my conversation with a diehard Warhammer player & creator, Mick Maes, 2020

## “THERE IS NO HARM IN MAKING A HOBBY, THAT IS BASED ON PLASTIC, MORE SUSTAINABLE”

### SUPPORTING ARGUMENTS



Jan Zwaard Cool project! Ik denk dat DIY een groot onderdeel is van de hobby, van 3D printen, tot materialen uit de natuur gebruiken voor basing en dioramas, tot kitbashing. Ik denk dat dit soort informatie zich goed laat delen via een website/blog/YouTube/Social media.

En overall denk ik dat het geen kwaad kan om een hobby die gebaseerd is op plastic en verf milieuvriendelijker te krijgen.

Ik ben benieuwd waarom je voor dit project hebt gekozen, als je zelf niet al in de hobby zit.

A screenshot from my conversation with a Warhammer player & creator, Jan Zwaard, 2020

One of the supporters of the Bioplastic Landscape is Mik Maes. He has studied ArtScience Interfaculty. This study offers a master’s program that fosters curiosity driven research as an approach for the making of art. During his study he has immersed himself in projects that show how transposing ideas or strategies from one field to the other often results in radical innovation. I could relate with Mik’s projects a lot and got some inspiration out of it.

Mik’s argument for supporting the Bioplastic Landscape is that Warhammer creators can be lax in creating something that is environmentally friendly. He says the more awareness there is in creating something that involves less plastic, the better it is for everyone.

Jan Zwaard commented on my post about the Bioplastic Landscape in the Warhammer FaceBook community. He mentioned that the ‘DIY’ a big part is of Warhammer. He gave some good tips on how my project can be revealed to the public. Jan thinks that there is no harm in making this hobby, that is based on plastic, more environmentally friendly.

That is also an answer to the question he asked me; Why did I chose this project, if this is not my hobby? It chose this because I like to create a better environment by replacing unnecessarily environmentally unfriendly products with more sustainable products.





# OUTCOMES OF THE FEEDBACK

**“THANKS TO THE  
COMMUNITY I AM  
MAKING A PRODUCT  
THAT IS WANTED AND  
WILL BE USED”.**

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I've had many supporting comments on my project from the Warhammer community. Also less supporting ones, but these actually helped me the most. Due to Paul van den Berg his comment (p. 13) I know now that there are Warhammer sets where people use the packaging for their landscape. This gave me the idea to make my own 'Warhammer DIY-kit' where I replace the unsustainable packaging by bioplastics with a how-to guide for making a greener landscape (p.17). Due to the supporting feedback I've gotten back from the community I know now that DIY is a big part of Warhammer and why people chose to make it themselves over buying landscapes in the shop. Thanks to them I am making a useful product that is wanted and will be used.



# HOW-TO GUIDE FOR A GREENER LANDSCAPE WITH A DIY-KIT

FIRST IDEA FOR HOW-TO

For my how-to guide my first idea was to make a DIY-kit for different scenery elements (f.e. mountains) to make a Warhammer landscape with.

The mountain DIY-kit contains instructions with the bioplastic recipe and adequate ingredients (sawdust, Knauf gypsum and foodwaste for the dye) including inspiration pictures.

This kit is for Warhammer creators that want a more sustainable landscape and are willing to be free in their creations.

# SHARING YOUR KNOWLEDGE FOR FREE, INSTEAD AS SELLING IT IN A KIT, INCREASES THE CHANCE IN SUCCEEDING WITH MAKING WARHAMMER MORE SUSTAINABLE

## SECOND THOUGHTS

DIY is a big part in the Warhammer community. Creators love making their own battlefields and to go crazy in their creativity and sheir the outcomes of their creations. I think that is why it is important to sheir my knowledge of these biolpastic creations, how I replaced certain environmentally damaging products with more sustainable ones.

Instead of sharing my knowledge and selling it as a kit, I would like to share my knowledge for free. This way, their is a higher chance of succeeding in making this hobby more sustainable.

That is why I choose to didge the DIY-kit and share my knowledge in these communities



# How-to guide

## MOUNTAIN RECIPE

Besides mountains, to replace styrofoam, I've made other landscape elements to replace chemical products. I have made my board with self-made clay instead of with styrofoam and wood, water with agar, instead of with epoxy, a blossom tree with gelatine foam and branches, instead of with plastic and coffee grounds & agar for soil instead of sand with glue. However, in this zine I will just explain how I have made mountains because I think this is my most successful element and my most unique one that I haven't found on the internet yet. If you are interested in how I made the other elements, please take a look at my Gitbook.



*Bird view from sawdust mountains & landscape, Dusanka Prvulovic, 2020*

# INGREDIENTS

MOUNTAIN RECIPE

*3 Grams*  
**SAWDUST**  
Petshops, supermarkets



*3.5 Grams*  
**WATER**  
Tapwater



*3.5 Grams*  
**DEXTERIN**  
Van Beek



*1 pack* \*  
**GYPSIUM**  
Gamma/Praxis



*4 Grams*  
**CINNAMON**  
Supermarket



## \* IS GYPSIUM BIO-FRIENDLY?

The gypsum of Knauff is actually a 100% natural product. It is in certain places in the earth. Knauff's fabrics are located at gypsum quarries. Knauff's policy is: what we get from nature should also be given back to nature. Gypsum quarries that are no longer used are set up as new nature reserve. This involves collaborating with universities to achieve a more diverse growth of flora and fauna than there was before the quarries and this results in beautiful new nature reserves.



*Materiom, Sawdust recipe, 2020*

## COOKING

SAWDUST & DEXTRIN

- 1.** Weigh the dextrin and mix it with water.
- 2.** Put the mixture in a double boiler cooking pot. With medium heat mix it until it thickens without boiling it.
- 3.** Put the dextrin mixture in a hermetically sealed container until it cools.
- 4.** Once the dextrin mixture is ready, mix it with the sawdust. Pour the mixture into a flat-bottomed mold.
- 5.** Drying time depends on the ventilation of the mold and the temperature and humidity of the place.



*Dusanka Prvulović, step 3, 2020*

## MODELLING

GYPSIUM

- 1.** Rip some pieces off your finished sawdust and stack it onto each other, depending how big you want your mountain to be.
- 2.** Mix up the gypsium with water according to the instructions on the gypsium package.
- 3.** Cover your stacked sawdust with gypsium and wait until it is hardened.

# PAINING

DECORATING

- 1.** Cook some cinnamon in water till boiling point and let it simmer for 1 minutes
- 2.** Add coconut oil to thicken the water and to get a paste structure
- 3.** Let it cool down and pour it into a jar
- 4.** Paint your hardened mountain. Instead of cinnamon you can also use another spice in the color you want to paint your mountain in.
- 5.** Cover it with for example stones or grass that you've found in nature to give it a more natural look.



*End result bio-mountain, Dusanka Prvulovic, 2020*

# MAIN REFRAMING MOMENTS

The main reframing moment during my project was when I decided to change my concept. My initial idea was to make a bioplastic board game. I realized that there is no market for this. I would also be more focused on the game concept instead of creating something with bioplastics.



Necromunda Warhammer landscape set (\$92,99), Amazon, 2020a

Since I was already making a landscape, the step was easily made; I decided to make a landscape for Warhammer; a tabletop game where [landscapes](#) are made with various chemical products.

I have seep myself into the community to find out how the Warhammer gamers and creators are making their landscapes. This is when I found out the most commonly used chemical products are: epoxy, styrofoam, plastic and paint. My project has shaped itself from here. I wanted to find a replacement for this chemical products so that this hobby would turn into a way more sustainable one than it is now.

DIY is a big part of Warhammer because it's cheaper, it gives more satisfaction than a bought landscape and the creators can create their own storyline.

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**“DIY IS A BIG PART OF WARHAMMER BECAUSE IT’S CHEAPER, IT GIVES MORE SATISFACTION AND YOU CAN CREATE YOUR OWN STORYLINE“.**

[Warhammer sets](#) are expensive and takes away the creativity what the landscape creators actually like the most!

I came up with my own how-to guide for making a greener landscape with a DIY-kit where the creators are still free in their creativity. The guide will just explain the basic steps and bioplastic recipes with some inspiration photo's ([like the Warhammer inspiration books](#)), how it will be shaped or painted is all up to them, unlike the Warhammer sets.

When changing the habits of a small group of people that are using unsustainable products, it is a small step to solving the big plastic problem. I hope that my part can help with changing these habits of these communities.







## Hack

**Hetinvloket.nl has a map of all the soil types in Holland. The **clay soil** is also visualized, with this soil you can make your own clay**

Maker skills & attitude



## Hack

Instead of using **styrofoam** for sculpturing you can make bioplastics from sawdust and dextrine and then cover it with lime plaster.

Maker skills & attitude



## Question

**How can I make bio paint with a color scheme that fits in a landscape scenery for the boardgame?**

Collaborative learning



## Hack

In miniature landscapes the **fake water** gets made of Epoxy and hardener which is not bio-friendly at all. If you want to make the fake water in a biodegradable way you can use 4g Agar, 3.16g Glycerine and 420ml water and use a teaspoon of Spirulina to make it blue.

Maker skills & Attitude



## Insight

The process of **creating epoxy** starts with a number of chemicals: propene, chlorine and allyl chloride. During the processing of Epoxy, some of these chemicals can release vapors and are of course not good for the environment because it will always end up in the environment (vapors or ultimate waste). To use epoxy and hardener for making fake water is very useless since the bioplastic way will come out almost exactly the same.

Design research skills



**Insight**

**Miniature trees are normally made out of various chemical products like, aluminium foil, paper-mache and glue for modeling, and sometimes iron wires. After that spray-paint or paint is used to paint the trees. Trees can also easily be made with gelatine foam, cooked in beetroot to dye it and sticking pieces of foam onto real branches. This way it is more environment friendly and also biodegradable**

Maker skills & Attitude



## Insight

**The gelatine foam recipe from the Bioplastic Cookbook by Margaret Dunne is a great recipe if you're looking for something fluffy and doesn't shrink at all because of the amount glycerine. It is very suitable for making bushes in trees or clouds.**

Collaborative learning





## Doubt

**The miniature trees that can be bought in stores and are made from plastic or aluminium foil look more realistic than the bioplastic ones. Is this really a concern or does it have its own aesthetic?**

Design research skills



To gain more insight to make my product '**remakable**', I want to ask questions to my target group, to be sure that my DIY-guide is made in the right way for the right people. I will be asking the following questions:

- 1) Would you like to learn new techniques to create landscapes?
- 2) How would you like to receive this information for copying scenery and landscapes?
- 3) What do you think of the idea of replacing certain products that you're using now with biodegradable products?

Collaborative Learning



## Insight



**The Agar coffee recipe from Materiom.org is a good recipe to make fake soil with. Normally for fake soil, a lot of glue mixed with sand is used. With this recipe there is no glue needed. It could also be used as clay since it is still modelable when it hasn't totally dried yet.**

Design research skills





*Landscape in a showcase, Dusanka Prvulovic, 2020*





Bird view from the landscape, Dusanka Prvulovic, 2020











*Gelatine foam blossoms, Dusanka Prvulovic, 2020*



*Bridge made from branches instead of plastic, Dusanka Prvulovic, 2020*





