MANCHESTER SCHOOL OF ARCHITECTURE

PLASTIC SHED

100% RECYCLED PLASTIC PRODUCTS

Visit msa.ac.uk for more information

MANCHESTER 1824
The University of Manchester

Manchester Metropolitan University

PLASTIC SHED

Gracie Davies, Yang Pengcheng, Rebecca Goode, Nur Hazirah Binti Abdul Samad, Lam, Sze Yik, Ian Wing Seng Thum.

MSA LIVE 25

Team

Gracie Davies (MArch1)
Ian Win Seng Thum (MArch1)
Lam, Sze Yik (MArch1)
Nur Hazirah Binti Abdul Samad (MArch1)
Rebecca Goode (MArch1)
Yang Pengcheng (MArch1)

Adam Batts (BA1)
Iqbaal Kusi (BA1)
Jessica Dillon (BA1)
Manon Evans (BA1)
Oscar Sortwell (BA1)
Ilham Noor Jamal Shamji (BA2)
Sean Mcgrath (BA2)
Syed Nadif Zaheer (BA2)
Shek Wing Chi (MLA1)

Partner

Plastic Shed, the UK's first high-street recycling centre.

The organisations creative inspiration comes from two outstanding projects, Precious Plastic and Men Sheds. Caitlin, the owner of Plastic Shed, is eager to build solidarity and empathy within the community through these recycling projects, bringing different people together and providing opportunities to do something meaningful together to solve the plastic problem.

Plastic Shed unites people to tackle plastic pollution. They do this by providing a variety of ways for people to participate in the reuse of local plastic waste. When they help people in the community work together to transform plastic waste into new and useful items through social activities, their approach also helps to strengthen community cohesion, empower people to take action, and support personal health and well-being. At the same time, the spread of Plastic Shed's deeds will also effectively make people aware of the significance of the plastic pollution and the diverse range of solutions to the problem.

Plastic Shed is based in Stockport, where they completed the UK's largest mural made from 100% recycled plastic bottle caps. In 2025, they are about to take the next step in the development of the organisation to the next stage - moving into their own workshop space in Stockport (currently in a shared facility).

And that's where we come in!

Introduction

Collaborating with Plastic Shed

Plastic Shed is a not-for-profit, community driven organisation that brings people together to creatively tackle and educate about the current global plastic waste crisis. They do this through hands-on workshops, turning plastic waste into useful saleable items, from hair-combs to collaborative artworks, giving plastic a second life while fostering connection, skill-sharing, and purpose. Her profits go back into the business to fund new machinery and equipment.

Caitlin mainly works with schools, community groups, and other businesses. At its heart, Plastic Shed is about more than simply recycling - it’s about sparking ideas, empowering/building community, and showcasing how small creative actions can lead to big change.

Role of Us (Architect) in this Context:

As future architects, we are taught to be creative problem-solvers, cost-driven, and innovators. Over the next two-weeks, we aim to blend our current design knowledge with sustainability to create a range of modular furniture that is de-constructable, and built to last - perfect for Caitlin's new workshop space.

Things we will consider while designing:

- Carbon Impact
- Circular Design
- Functionality
- Aesthetics
- Adaptability
- Waste

Over the next two weeks, we’re stepping out of the office and into Stockport's community, collaborating with our client, engaging with locals, and collaborating with our MSA group.

Action Plan

Aims for the Weeks

Having fun through turning plastic waste into innovative furniture prototypes.

With the Stockport community and Plastic Shed, we're giving their famous plastic bottle mural a fresh spring clean and proposing interior treatments for the new workshop space.

The goal? To inspire more people to recycle, upcycle, and see plastic waste as a resource. Transforming trash into treasure!

ORGANISATION
COMMUNITY
COLLABORATION
SOLUTION
REFLECTION
INSPIRATION

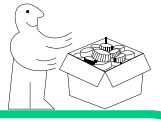
Week 1 Innovation & Social Engagement

DAY 1

Introduced Plastic Shed and our mission. Learned how to produce a plastic shed and familiarise ourselves with the materials.

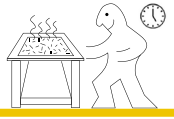
DAY 2

Brainstormed furniture and interior design ideas for Plastic Shed; drafted and selected concepts.



DAY 3

Attended a workshop with Caitlin and a 3D-printing artist, learning to turn ideas into physical models.



DAY 4

Hosted a community event to clean and restore the Plastic Bottle Mural; helped prepare materials for the shed.

DAY 5

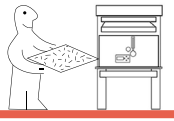
Continued developing the chosen designs with 3D modelling and testing.

Reflecting on what we did in Week 1 and developed our plans to continue in Week 2.

Week 2 Development & Solution

DAY 6

Continued designing prototypes such as the digital modelling of components.



DAY 7

Making in progress - making the physical model of the furniture.

DAY 8

Creating the assembly manual for the furniture.

DAY 9

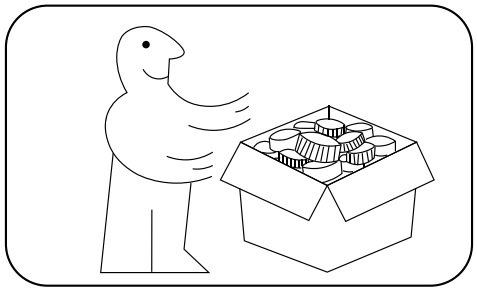
Design the interiors of the new Plastic Shed workshop.

DAY 10

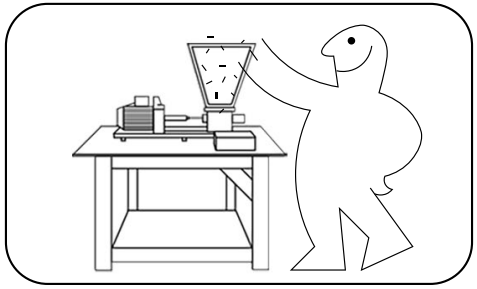
Documenting the progress and finalising the publication.

Exploration - Acknowledge the Material

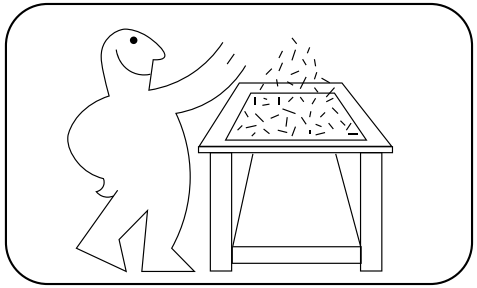
Participate in the Production Process



Step 1: Classifying
Sort the plastic bottle lids by their recycling label (Type 1 to Type 7), and choose only those made from Type 2 plastic.

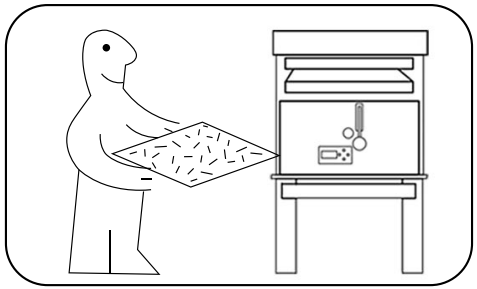


Step 2: Shredding
Slowly feed the selected bottle lids into the shredder and let it do its work.

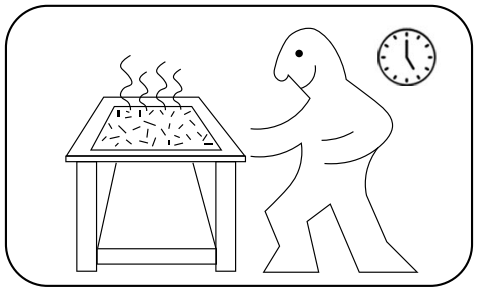


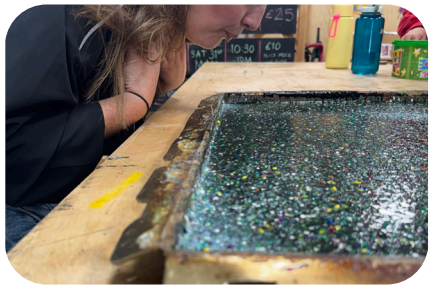
Step 3: Placing
Evenly spread the shredded plastic into the mold. Preheat the heat-press to get ready for the next step.

In promoting and encouraging the community to recycle plastic waste, Plastic Shed has many collection points in public spaces across Greater Manchester (libraries, shopping centres). Furthermore, they also hold workshops like the one we had during Day one, to demonstrate and educate the public about the potential of recycled plastic. Over the course of the day, we experienced the full process of transforming waste into usable materials. Led by Catlin, we sorted and identified the types of plastic lids and shredded them into small pieces. Overall, we produced one 60 cm x 60 cm plastic panel - which we will put to good use later!.

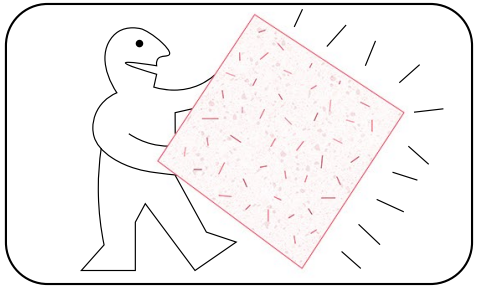


Step 4: Melting and Compressing
Place the mould into the heat-press machine and apply pressure to melt and compress the plastic.





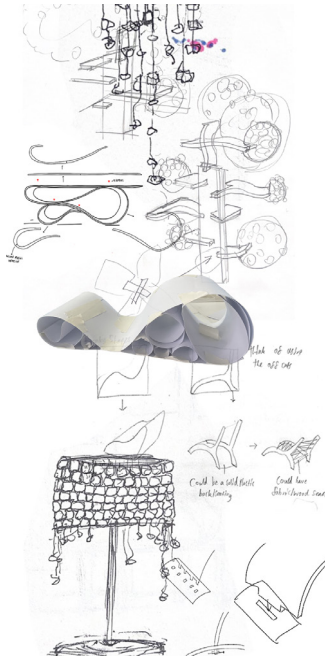
Step 5: Filling
Since the plastic sheet tends to shrink after heating, add another layer of shredded plastic to fill in any gaps and ensure the mould is full.



Step 6: Ready to Use
Once it has cooled down, take out the plastic sheet - it's now ready to use!

Design Workshop - Inspiration

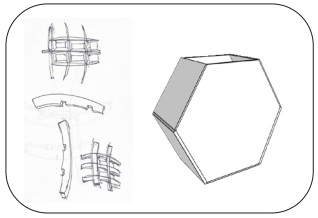
Design Process



On Day two, we split the BA and MLA students into small groups of 2 or 3, each with the freedom to design any peice of furniture that they liked. In the morning, MArch students circulated to give feedback, and we finished the session with everyone sharing their ideas at the end.

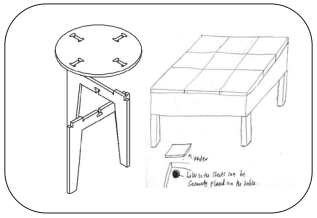
When choosing which designs to further develop, we assesed their coherence with Plastic Sheds ethos, functionality within the new workshop, and ease of assembly for future replication. The following products were selected:

Design Selection



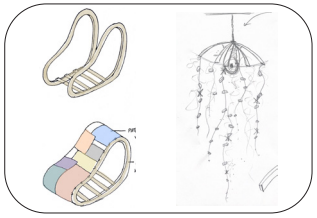
Group 1: Manon, Joy, Ilham

This group focused on using plastic panels to create a variety of flexible and practical furniture shapes - shelves and storage boxes. We asked them to keep developing these.



Group 2: Iqbaal, Sean

This group created a set of modular tables with a stool to match. This table was not only functional, but also a wide volume of hidden internal storage.



Group 3: Adam, Jessica, Oscar

A luxury lounger created using cut up vinyl banners (currently not recyclable in the UK), complemented with an eye-catching chandelier made of bottle caps.

Collaboration - Social Impact

Plastic Shed have made meaningful social impact's in the Stockport community through creative and workshops which get your hands dirty. They passionate engage with locals, for example, cleaning mural build by bottle caps and working in workshops to teach people about recycling plastic waste.

Public Engagement

On Day four, we helped Plastic Shed to clean the mural made last year with the community, created entirely from plastic lids, bringing its colours back to life. Many locals only noticed the mural for the first time while we were cleaning it, which is quite surpising to us due to its boldness. It was a reminder of how community work and public art can invite people to see their surroundings in new ways.

We worked with Caitlin at the Plastic Shed workshop to sort 25,000 clean bottle caps into colours. This was a lengthly process, yet very rewarding once we had finished.

Joining

Learning New Skills From Experts:

We participated in a recycled plastic waste workshop, a collaboration between Plastic Shed and Jamie-Lee, a 3D printing expert. She showcased a variety of prototypes made from 3D printing such as earrings, joining components and other experimental pieces , all made from HDPE and PP . Demonstration and techniques of using recycled sheets for small-scale production were shared to our students, opening their eyes to possibilities.Students then presented their furniture ideas to gain invaluable feedback from Jamie and Caitlin, focusing on materiality, form flexibility, and assembly methods, encouraging us to further explore furniture design.

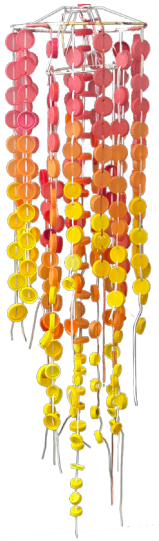
Fungi Workshop:

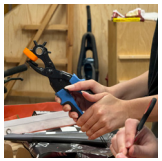
A little side quest away from our main activities, we participated in a fungi cultivation workshop facilitated by FungALL.

Product - Solution

Product A: STÜNNA (Long Lampshade)

Detailed Guidebook





Step 1
Bottle cap hole punching

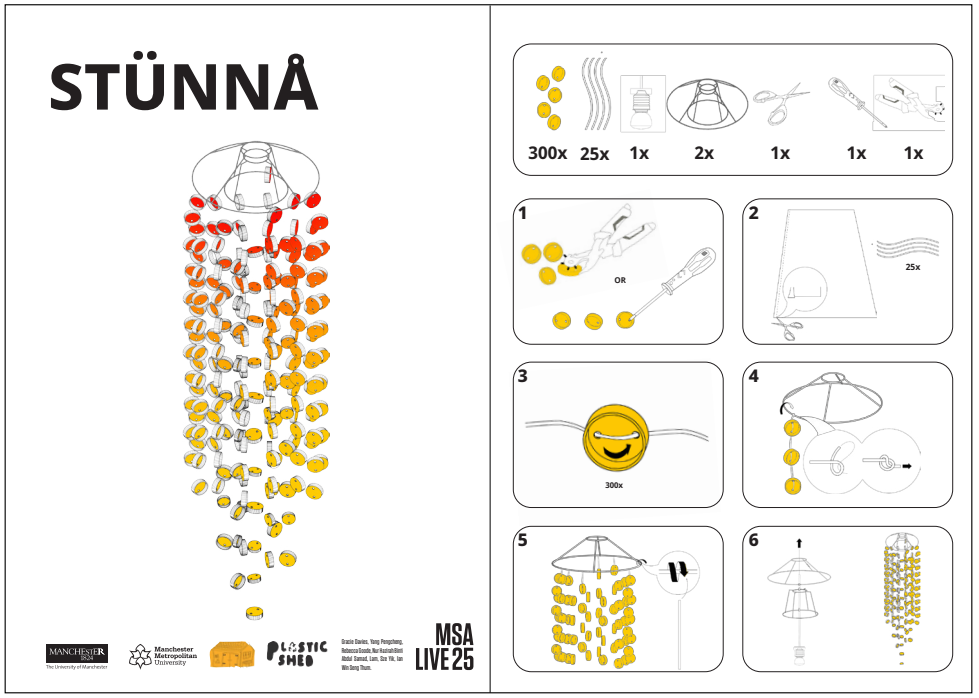
Step 2
Cutting vinyl banner

Step 3
Stringing bottle caps

Step 4
Knot to the lamp stand

Material : 130 plastic bottle caps, abandoned lamp stand and abandoned vinyl poster
The STÜNNA is a Chandelier constructed from re-purposed lamp shade frames and recycled plastic bottle caps strung together with old poster/banner vinyl strips. It doesn't only act as a perfect centre piece but a perfect representation of Plastic Shed's ethos.

Guidebook

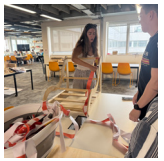


Product B: CHÅYA (Vinyl Cross Weave Lounge)

Step 1
CNC the ply wooden frame

Step 2
Cutting timber dowels

Step 3
Cut vinyl banner

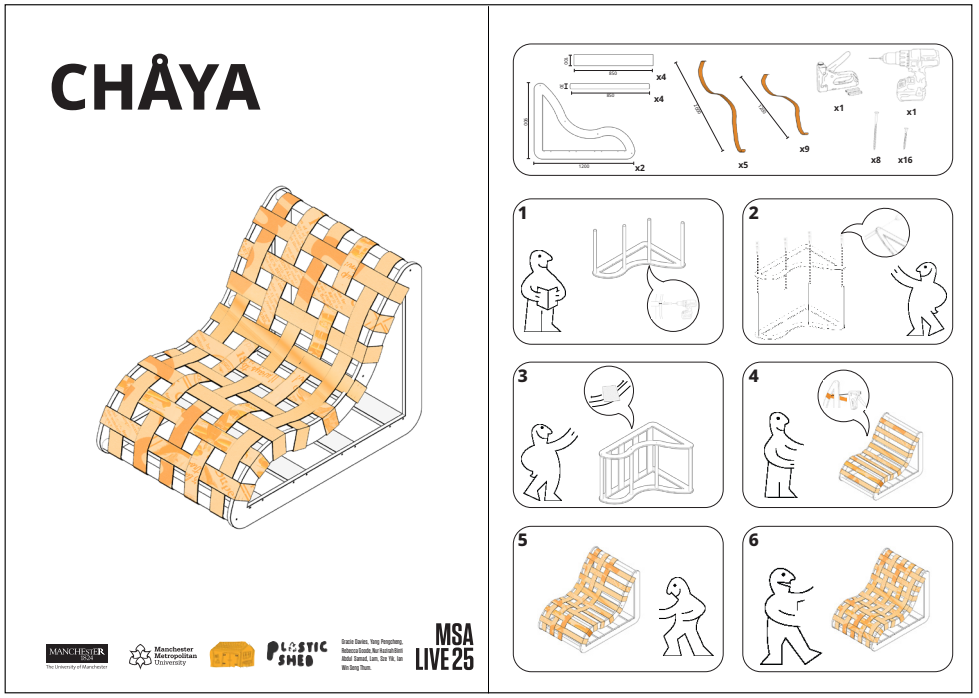


Step 4
Fix and weave vinyl strip

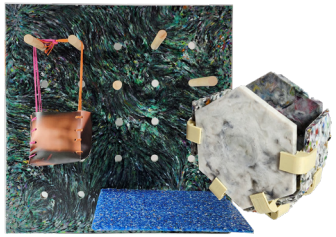
Material:
- 2 cm thick wooden frame
- Abandoned vinyl poster
- Wooden Dowel

During our Plastic Shed visit, Caitlin had shown us tote bags and camping chairs made from re-purposed vinyl banners. Poster/banner vinyl can't be de-constructed and recycled, this inspired us to embrace the strong fabric-like material to create a woven vinyl strip lounge chair, providing a new purpose to an additional single-use material, expanding our impact. We hope that she can batch produce these to sell, since she has a large supply of old banners.

Guidebook



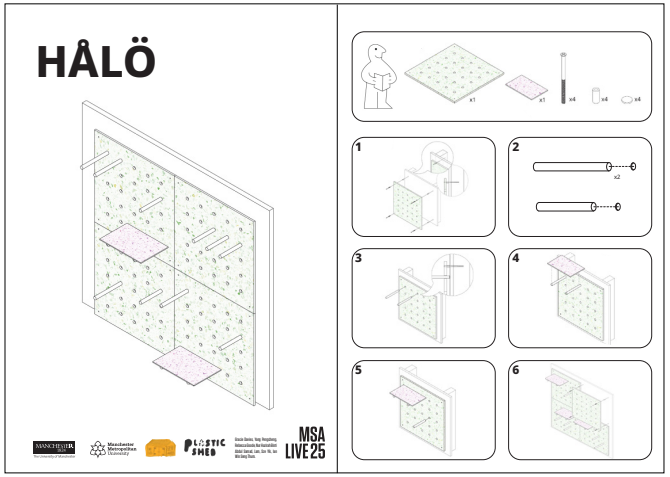
Product C: HÅLÖ & STORA (Pegboard and Hexagon Storage)

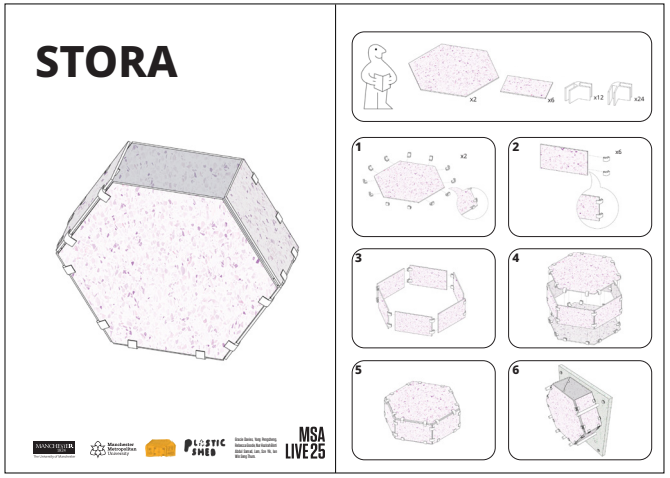


Material: 3D printed parts, plastic sheets and wooden dowel.

We have used 3D parts to construct recycled plastic shelving units, which we part-made in Caitlin's workshop and then assembled in B15. Creating modular load bearing shelves allowing for flexible assembly and useful bottle cap storage.

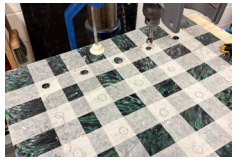
Guidebook





Step 1
3D Print joint parts

Step 2
Assemble plastic sheets together



Step 3
Drilling holes into plastic sheet

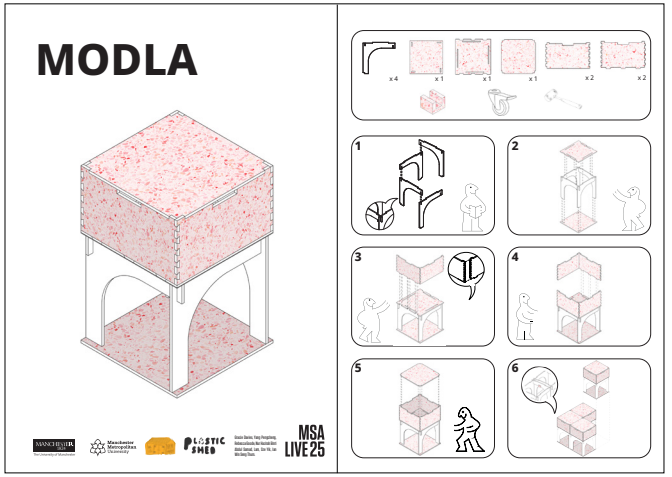
Step 4
Create a bespoke display

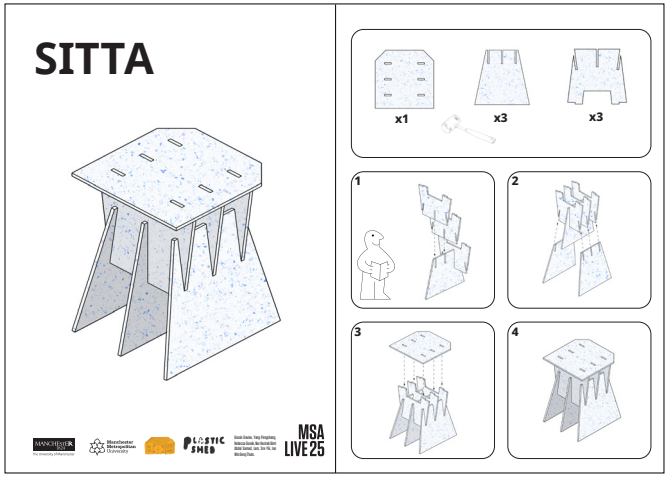
Product D: MODLA & SÏTTA (Template Chairs and Tables)

Material: 1 cm thick plastic sheets and plywood board

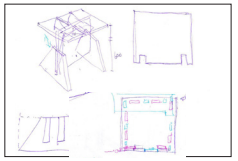
MODLA solves the problem of needing an adaptable workspace, and having a lack of storage through container-like design. SÏTTA is the only furniture piece made entirely of plastic, the modular panels use dovetail joints without the use of any glue or harmful materials, ensuring it can be recycled at end of life. These pieces form a beautiful yet functional set.

Guidebook



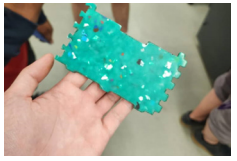


Step 1
Collaborative conceptual design



Step 2
Determine the exact dimensions

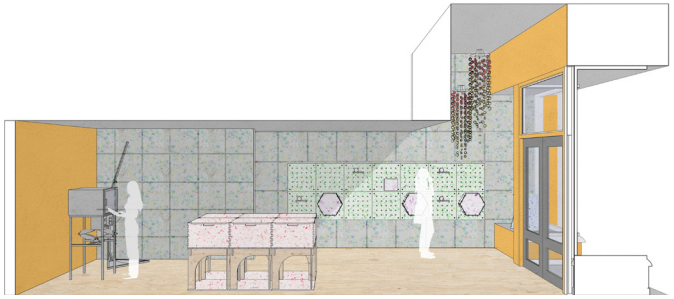
Step 3
Developing through 3D modelling

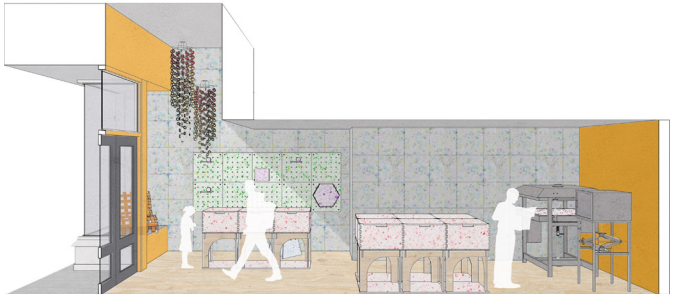


Step 4
Complete the physical model

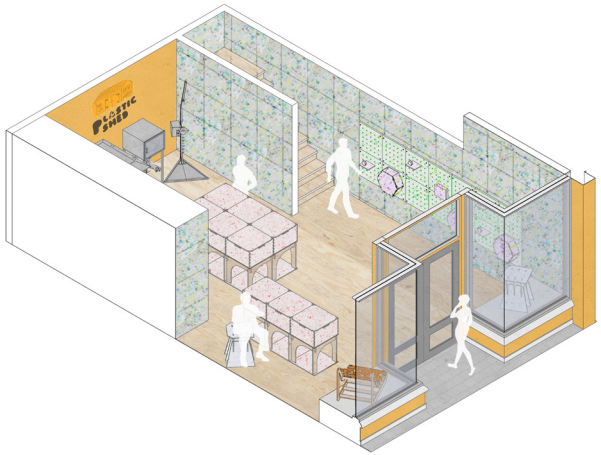
Interior Design - Solution

To aid the process of Caitlin acquiring her new studio, we have created a set of interior design elevations and visuals, hopefully allowing Stockport Council to fully understand her vision, expediting the leasing process. Since this will be her own space, we designed to our hearts intent. Here you can see our full furniture range in her new studio, showcasing our overall initial vision. Waste from Stockport community will be given a new lease of life, while enabling even more recycling through its function. We hope this will provide a strong foundation for a successful start!





HÅLÖ and STORA are designed to significantly enhance the available storage capacity to house large quantities of bottle caps and plastic sheets in the new store - a current limitation in the old workshop. The modular MODLA and SÏTTA designs offer customers versatile and flexible workspace options. CHÅYA provides comfortable seating for visitors to relax, while STÜNNA will serve as an aesthetic draw-in increasing the shops footfall.



Workshop Video

We also made a video of a walk through the new studio. Please scan the QR code above to experience the charm of our design in person.

Reflection & Documentary - Reflection

MSA LIVE provided a great opportunity not only to collaborate with The Plastic Shed Organisation, but to explore beyond the realm of architecture and into the world of sustainable product design. We learnt the processes and possibilities of recycling and reusing plastic bottle caps along with experimenting with the restraints and potentials of recycled plastic products.

During the first week, we immersed ourselves in all things plastic, from understanding the manufacturing process of up-cycled plastic bottle cap sheets, to understanding the importance of the tedious process of sorting and cleaning the different types of plastics collected along with learning how to identify the pros and cons of each type of plastic. Upon reflection, we would have liked to have allocated more time to experimentation with the properties/characteristic of plastic sheets - producing different mixes and blends of plastic to further push its potential. However, our focus on design development allowed us to produce a wide range of 'shop' furniture which we are extremely proud of and meets our clients' needs and wants.

In the second week, we focused more on publication in preparation to deliver the instructional "how to build it" manuals so our client can replicate our designs with ease. This process wasn't as streamline as we would have liked, with each team differing in strengths and weaknesses. However, this led to organic collaboration of the BA's, sharing their own individual practical knowledge – something we were quite proud to watch unveil.

Overall, we had fun as a team solving practical issues and collaboratively building physical prototypes, gaining further first-hand experience with plastic as a building material - knowledge that could be applied to our future architecture work. Working with creatives from different fields, with their overarching aims to make this world a better and more sustainable place to live was a very eye-opening experience which we were delighted to be a part of. Love the 'Plastic Shed x MSA' Team

Social Achievements

ABOUT

Each year the MSA LIVE programme unites Masters Architecture year 1 and Masters of Architecture & Adaptive Resuse students with those in BA year 1 and year 2 and Masters Landscape Architecture 1 in mixed-year teams to undertake live projects with external partners to create social impact.

LIVE PROJECTS

All MSA LIVE projects are live. A live project is where an educational organisation and an external partner develop a brief, timescale, and outcome for their mutual benefit.

SOCIAL IMPACT

All MSA LIVE projects are for community benefit or have social impact. Social impact is the effect an organization's actions have on the well-being of a community. Our agendas are set by our external collaborators.

EXTERNAL PARTNERS

MSA LIVE projects work with many organisations: charities, community groups, social enterprises, community interest companies, researchers, practitioners and educators.

STUDENT-LED

Our MSA masters students take the lead in the project conception, brief development, delivery and co-ordination of a small project. Other cohorts joined for an eventful 2 weeks of activities at the end of the academic year.

KNOWLEDGE TRANSFER

Working in teams within and across year groups and courses; MSA students participate in peer to peer learning. In addition, collaborators, participants and students engage in the transfer of tangible and intellectual property, expertise, learning and skills.

LARGE SCALE

This year approximately 650 students from 5 cohorts in MSA have worked on 40 projects with partners.

QUESTIONS

For questions about MSA LIVE please contact the MSA LIVE team:
msalive@mmu.ac.uk

BLOG

live.msa.ac.uk/2025

SOCIAL

#MSALive25
@msa.live.25
@TheMSArch
@MLA_TheMSArch

WEBSITE

www.msa.ac.uk