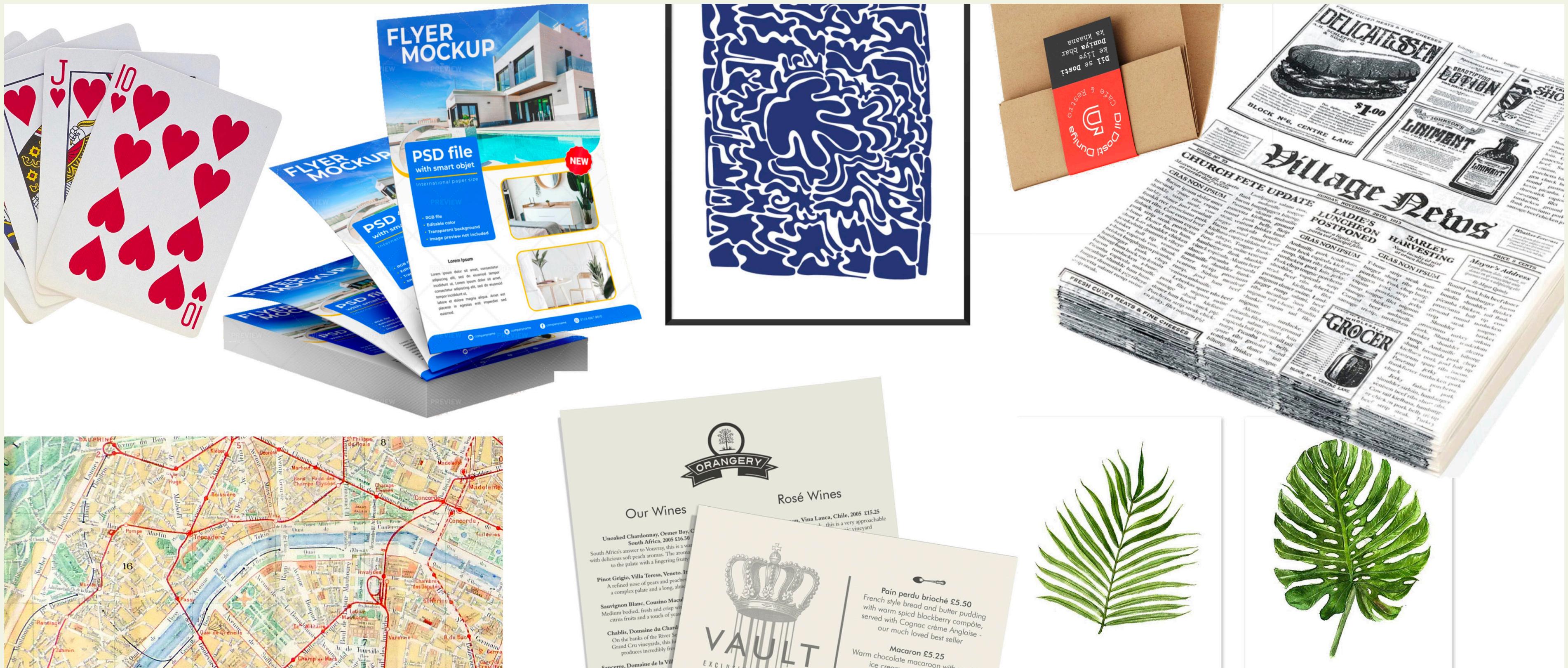


Radical Design Project Part 2:

Printing in a resource deprived world



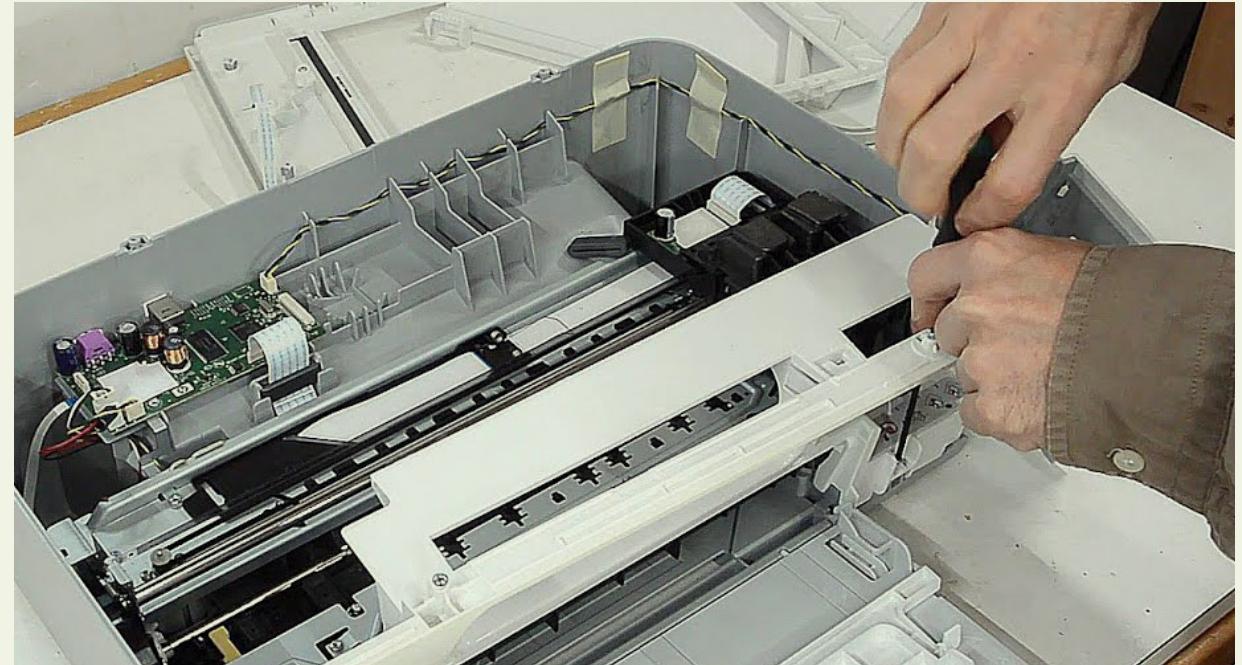
In a world where printing remains essential, how can we develop solutions that overcome resource limitations?

Our reliance on Printers

Introduction

Printing is an integral part of modern life, permeating nearly every aspect of our society. From education to artistic expression.

How Printers Work:



1. User Input:

- User selects a document/image from their device.
- Printing preferences are selected.

2. Data Translation:

- The printer's driver converts the document/image into a printer-readable format.

3. Printer Processing:

- The printer interprets the commands from this data.

4. Paper Handling:

- A mechanism pulls paper from the tray incrementally.

5. Ink Application:

- The print head moves across the paper and sprays ink.

6. Final Output:

- The printed page emerges from the printer.

Importance of printing

Survey of 18 University Students:

17 of the 18 Students have used a printer before

Printing is a regular activity:

- 11% Use a printer more than twice a week
- 56% More than 3 times a month

Printing is used for diverse applications:

- 67% Use a printer for For School / University
- 39% for Artistic / Creative purposes
- 39 % for Important documentation
- 27% for Photography

Different paper sizes are used:

- 89% A4
- 33% A3
- 22% A5

Four Pleasures Analysis

1. Physio-pleasure

- Tactile satisfaction: Smooth buttons, touchscreens, or soft paper feeds.
- Speed and efficiency
- Low noise operation: Especially in home or office environments.

2. Socio-pleasure

- Collaboration: Helps with group projects or small business tasks.
- Customisation: Ability to print invitations, greeting cards, or anything that fosters social connections.

3. Psycho-pleasure

- Ease of use: Intuitive setup and clear instructions.
- Reliability: Low rate of paper jams or ink issues.
- Creative expression: Promotes crafting, or journaling.

4. Ideo-pleasure

- Sustainability
- Ownership and independence: Having a personal printer
- Professionalism: High-quality prints for resumes, reports, or portfolios reinforce a sense of ambition and achievement.



3rd Century AD

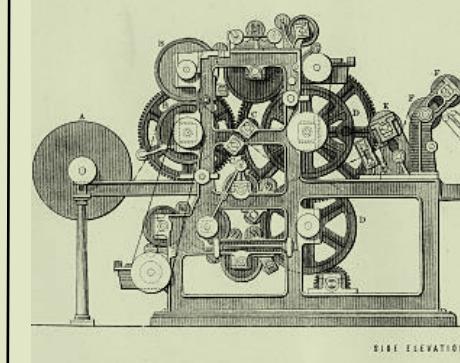
Early woodblock printing, where letters and symbols were carved onto wood.



1440s

Invention of the type printing press, allowing mass production of books and documents.

Timeline of printers



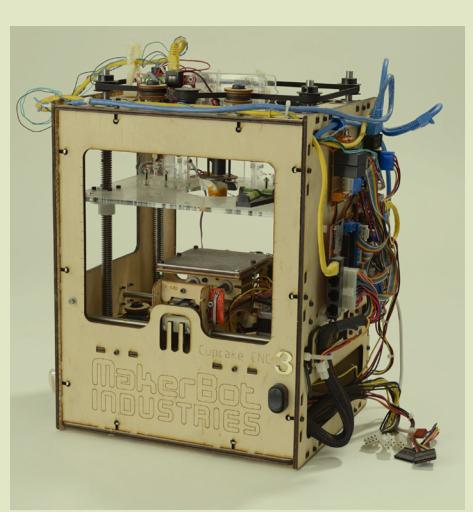
1700-1800s

Mechanical printers began emerging, driven by industrialisation.



1970s - 1980s

The development of laser and inkjet printers made high-quality, efficient prints.



1993

The first 3D printer, using stereolithography, initiating additive manufacturing.

The Resource Deprived World

The Constraints

- **No Fossil Fuels:** This eliminates most energy infrastructure and petrochemical-based materials.
- **No Rare Earth Minerals:** This eliminates modern electronics. We'll need to think about alternative ways to process information and communicate.
- **No Virgin Metals/Plastics:** We're working with a closed-loop system, relying on recycled materials.
- **No Wild Animals:** Our protein will come from farmed sources
- **Finite Agricultural Land:** Sustainable land use is crucial. This requires efficiency material production, and energy generation.
- **Significant Climate Change:** Increased temperatures, potential sea level rise, and more extreme weather.



Implications for Printing

- **No Electronic Printers:** We can't rely on laser or inkjet printers due to the lack of electronics and rare earth minerals.
- **No Modern Inks:** Standard inks utilise petroleum-based chemicals.
- **Energy Requirements:** Most printing methods, including older technologies like letterpress, require energy for machines.

The return of mechanical printing:



Some inspiration can be drawn from **pantographs**. Essentially, a mechanical linkage where the movement of one pen, produces identical movements in a second pen producing an identical and enlarged copy.



Industrial mechanical printing solutions have existed in the past, and will likely regain popularity for publishers/Newspapers in these circumstances. Therefore I will re-define my brief:
> I want to **focus on personal use printers**

Three Target Users

Teachers / Educators

Values:

Inclusion, adaptability and collaboration

Primary Goals:

Make homework sheets or handouts

Printing Needs

- Making many copies
- Specific document layouts
- Colours and varying font size



Small Business Owners

Values:

Efficiency, Professionalism and Customer-Centric



Primary Goals:

Making flyers, brochures, invoices or contracts

Printing Needs

- Fast and multiple copies
- Consistent and structured style

Independent Artists

Values:

Creativity, Authenticity and Flexibility

Printing Needs

- Custom Graphics
- Different page sizes
- Different colours and fonts



Key Challenges

The obvious and enormous challenge is overcoming the translation of data into a printable format (like the modern printer does so well)

However, in a resource deprived world, without advanced electronics:

- Digital photography is no longer possible as cameras and mobile phones require advanced electronics.
- Even extremely basic cameras would be virtually impossible to make, due to the complexity of film development.

So we can forget about printing images.

This leaves us with **text, symbols, art** and other forms of graph-ism

The second crucial challenge is the printer Ink.
Most modern inks rely on petroleum-based ingredients as solvents and binders and the pigments use Rare Earth Minerals.

Therefore, in this world we need to focus on:

- **Biomass:** Plant and fungal-based materials.
- **Land Competition:** We cannot use crops that will directly compete with food production.

Thankfully, there are many natural dyes and their extraction has been practiced for years before the industrial revolution:

Black: Biochar/Charcoal

Browns and Yellows: Roots, bark and leaves

Reds and Pinks: Beetroot/Berries

Greens: Chlorophyll and algae

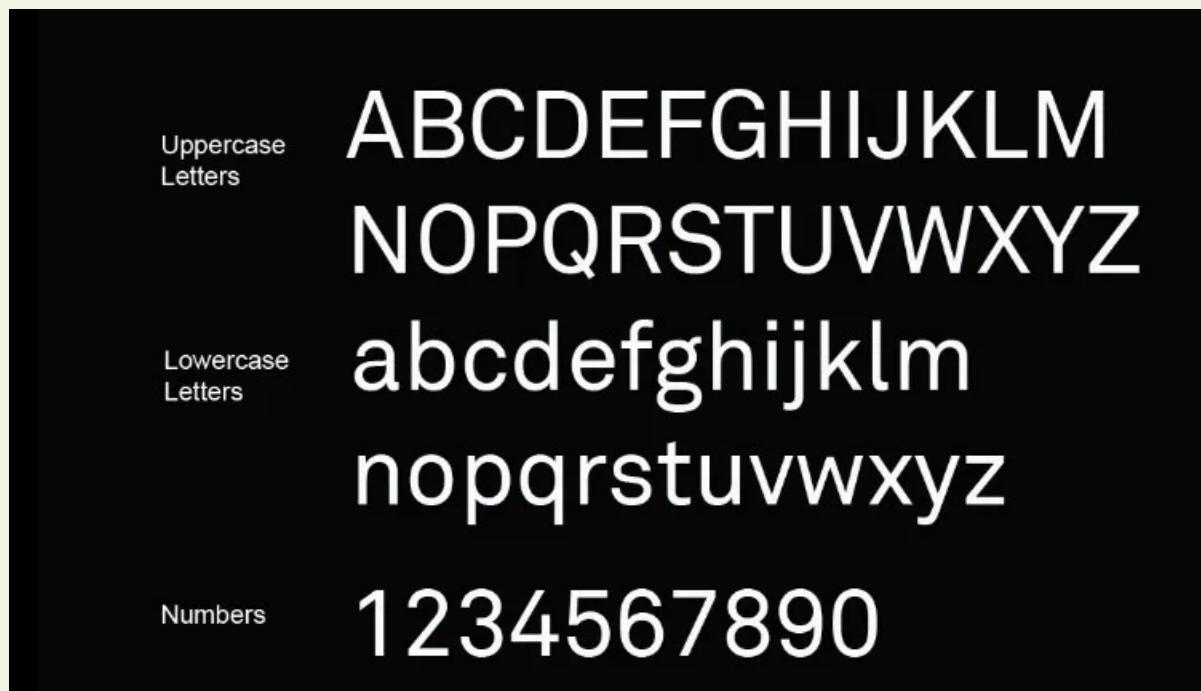
Blues and Purples: Fungal dyes



Requirements

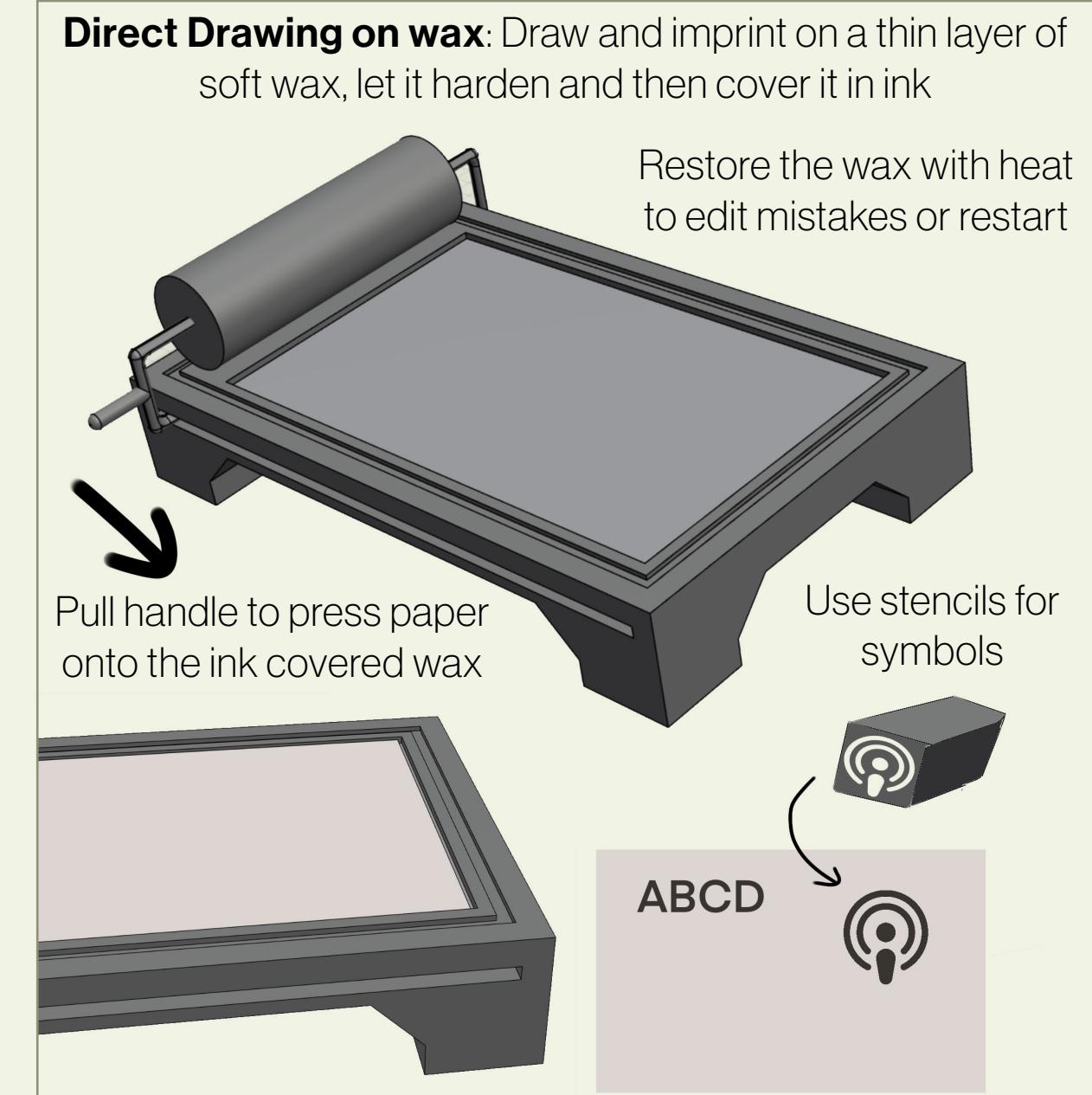
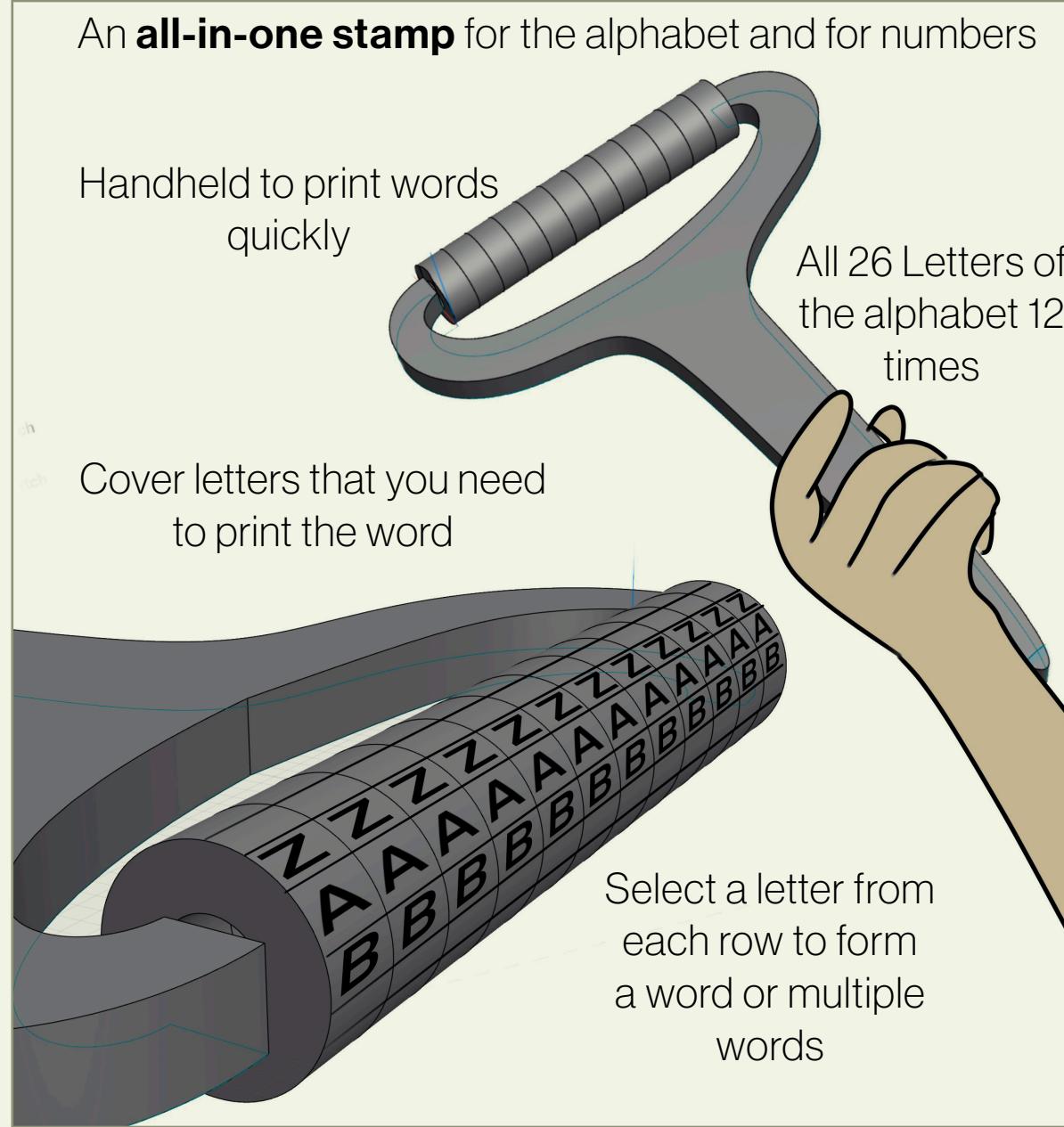
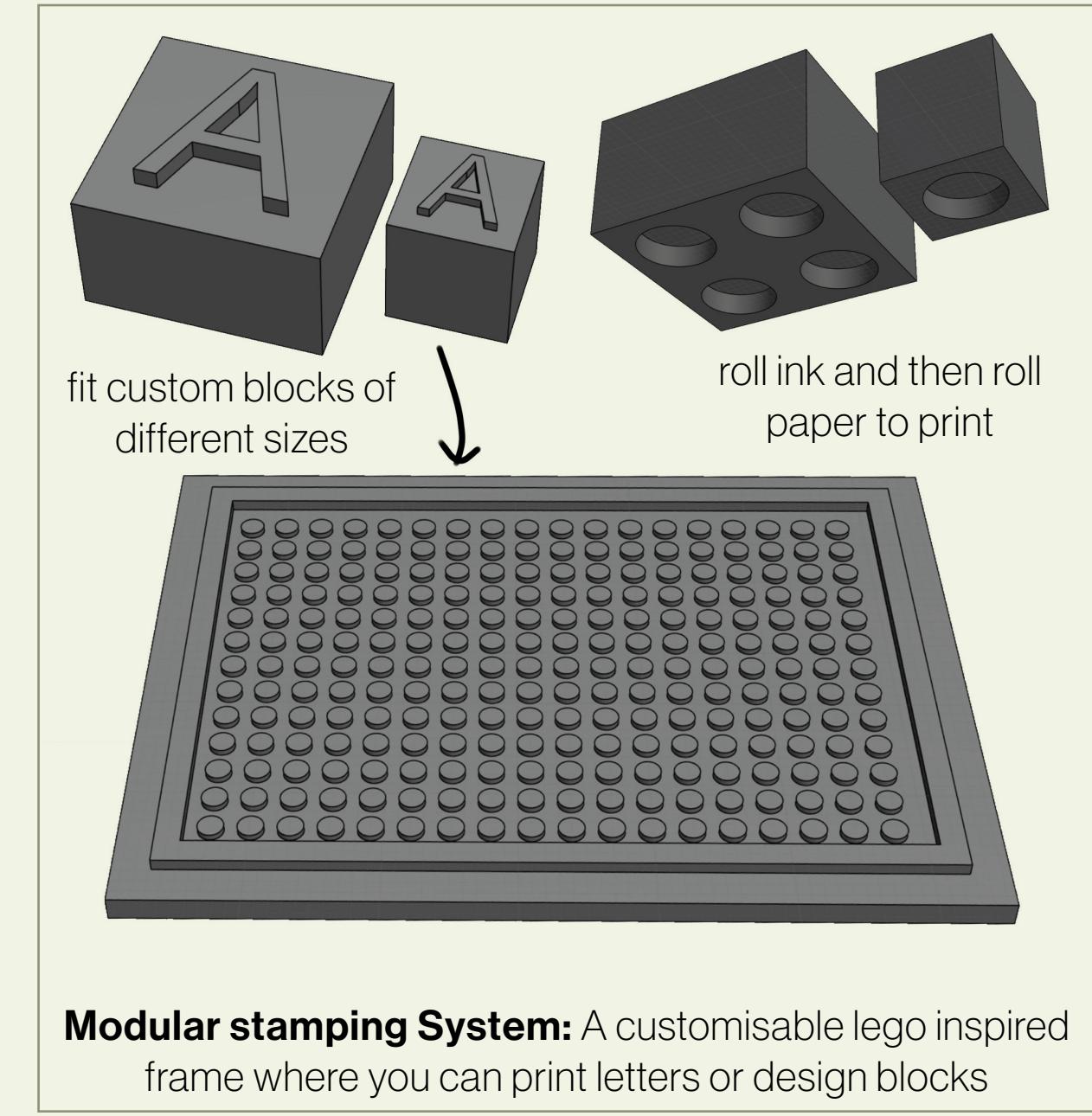
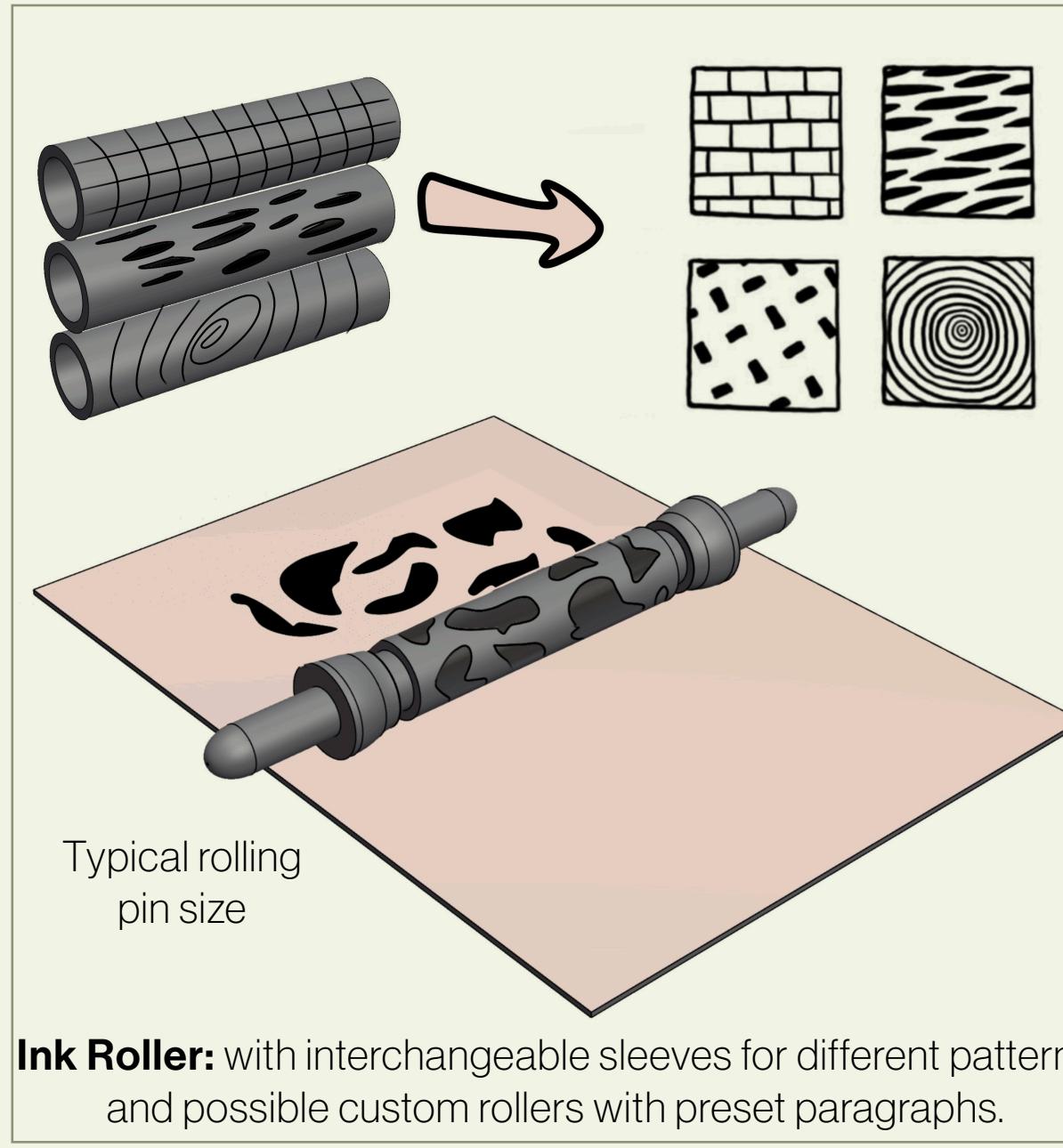
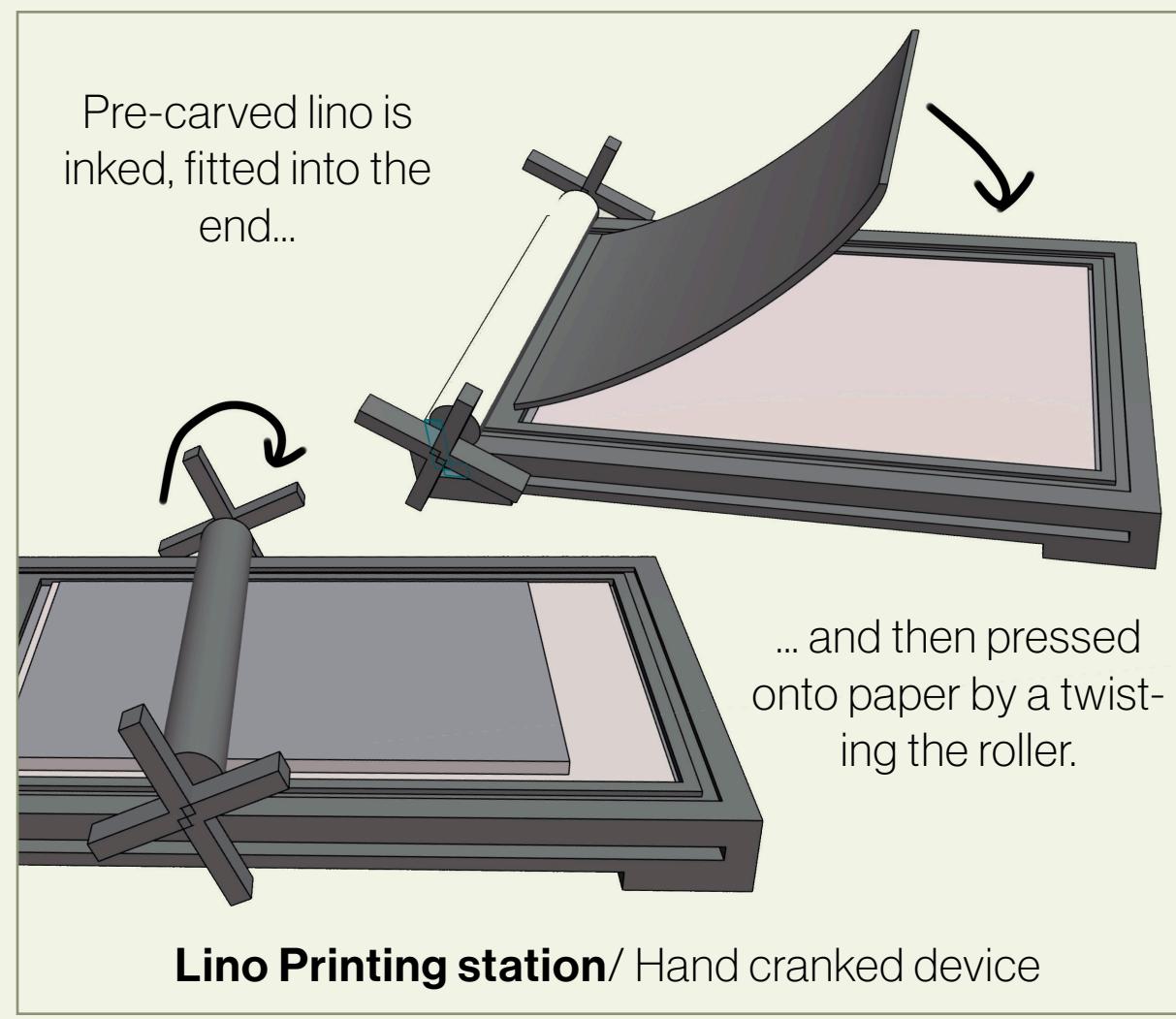
Biomass based inks already exist and their fabrication is relatively straight forward. Their manufacturing process would remain almost unchanged in a resource deprived world.

Therefore, I will assume ink is cheap and readily available and focus solely on the **printing mechanism** for my design.



Title	Description	User Needs	Evaluation Method	Source	Priority
Similar printing preferences	Ability to print on different sizes, multiple copies and in colour or black & white.	Document standards and artistic preferences	Product functionality	Printing for various uses; smaller for letters, larger for posters	High
Efficiency & Simplicity	Printing methods should be easy to learn and execute, using simple tools.	Making copies should be faster than handwriting them individually	User testing, with minimal instructions	Need for many copies (classroom, flyers.. etc)	High
Recycled or readily available materials	The materials should be available and or abundantly recycled	Longterm solution to printing, possible to repair	Assessment of Material availability	Resource deprived world	High
Produces clear prints	Accurate and Precise text and or symbols	Readable text or illustrations	Font size tests	For documentation printing	High
Size of the printer	Small enough to fit on a standard home desk or table top	Storage in home, office or studio	Measuring the dimensions	Home usage	Med
Cost	Price should be accessible to the average consumer	Should be more valuable than using a printing company	Material cost estimates (with some uncertainty)	Personal/ small business printing needs	Med

Initial Concepts



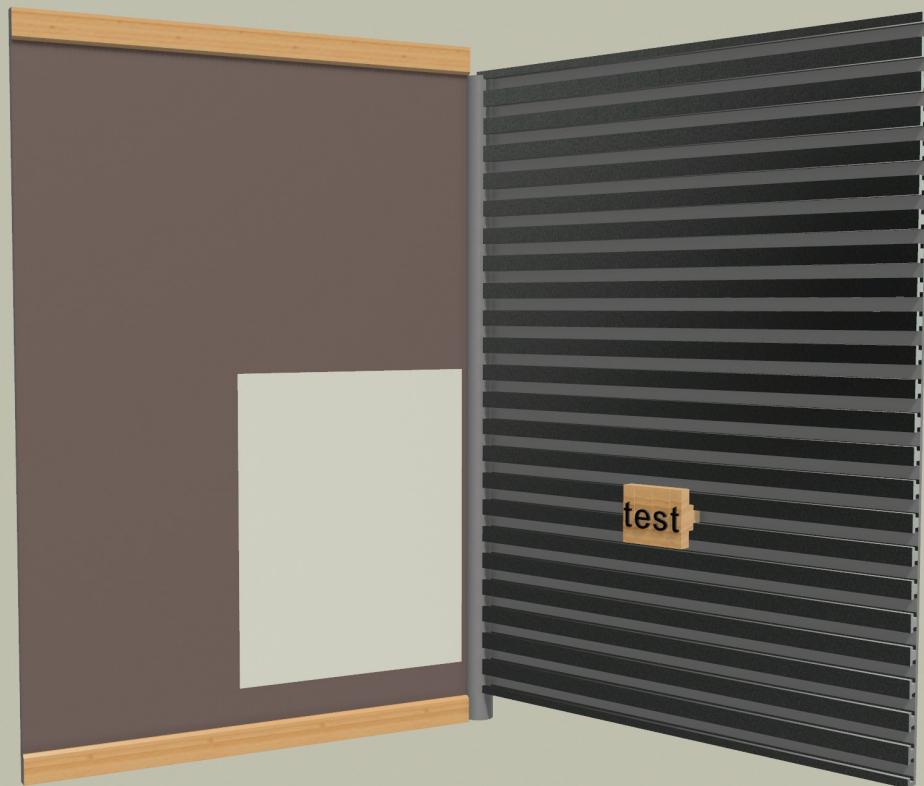
Evaluation

Life Cycle Assessment Score: +66
Score Against Requirements: 29/50



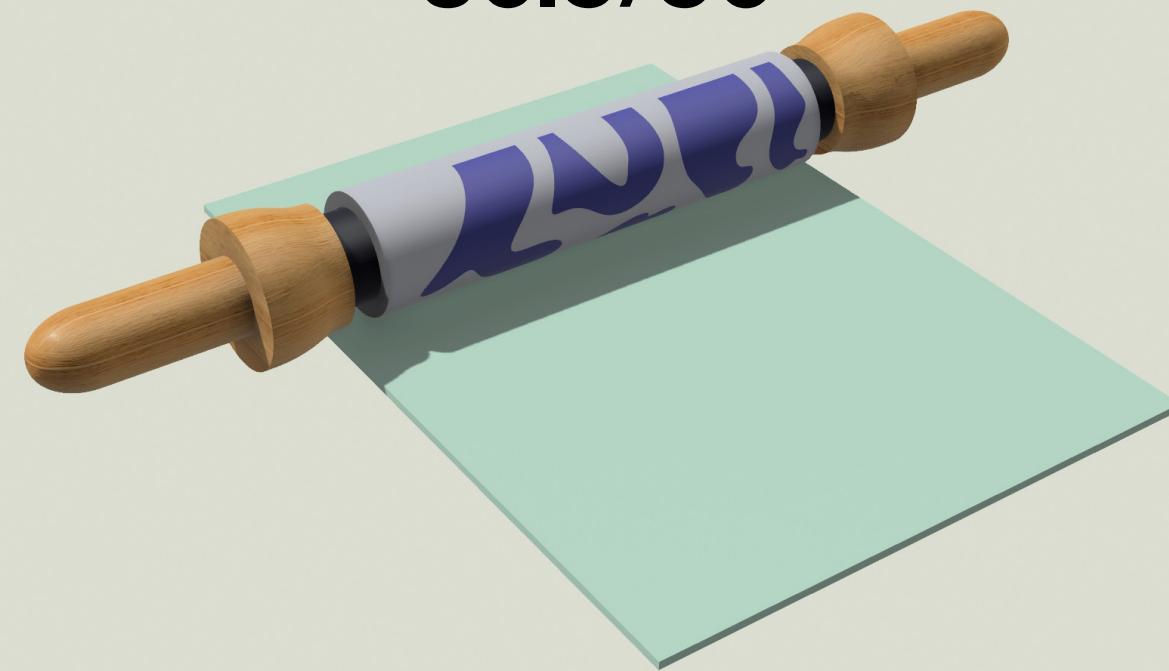
This concept prioritises **customisation** of the document, letting you create any design with a block of lino, and helps you print it without misplacement or uneven pressure.

Life Cycle Assessment Score: +78
Score Against Requirements: 41.5/50



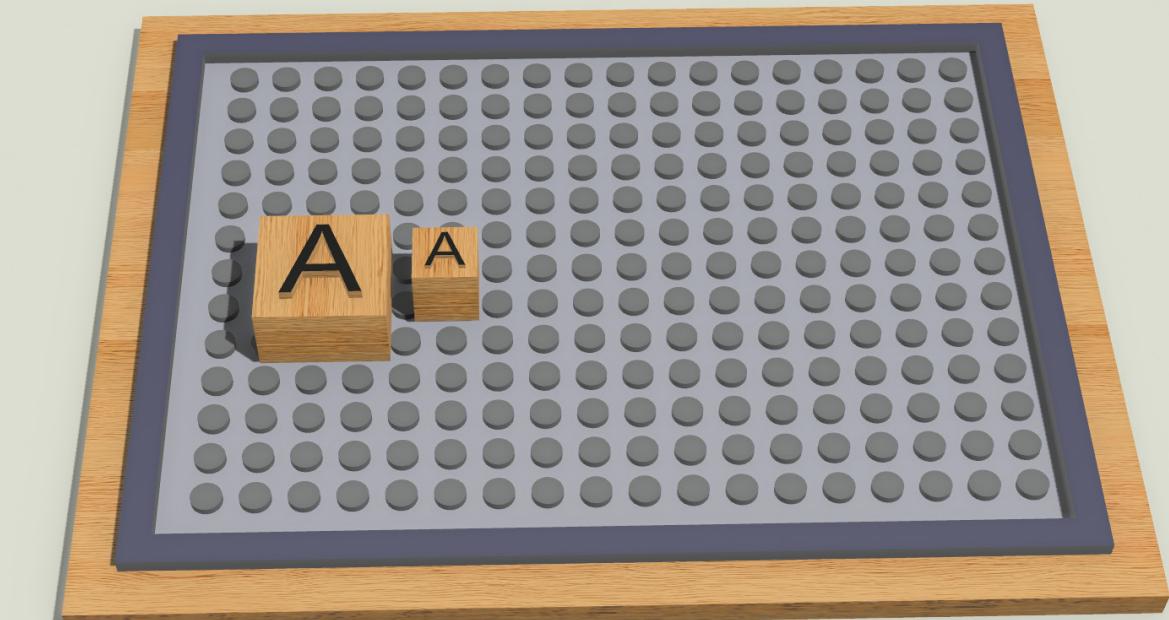
This concept emphasises **intuitive setup**, letting users essentially write a document from left to right with a grid

Life Cycle Assessment Score:
+54
Score Against Requirements:
36.5/50



This concept emphasises **portability**, and storage. It also targets the more creative needs of a printer

Life Cycle Assessment Score: +63
Score Against Requirements: 38/50



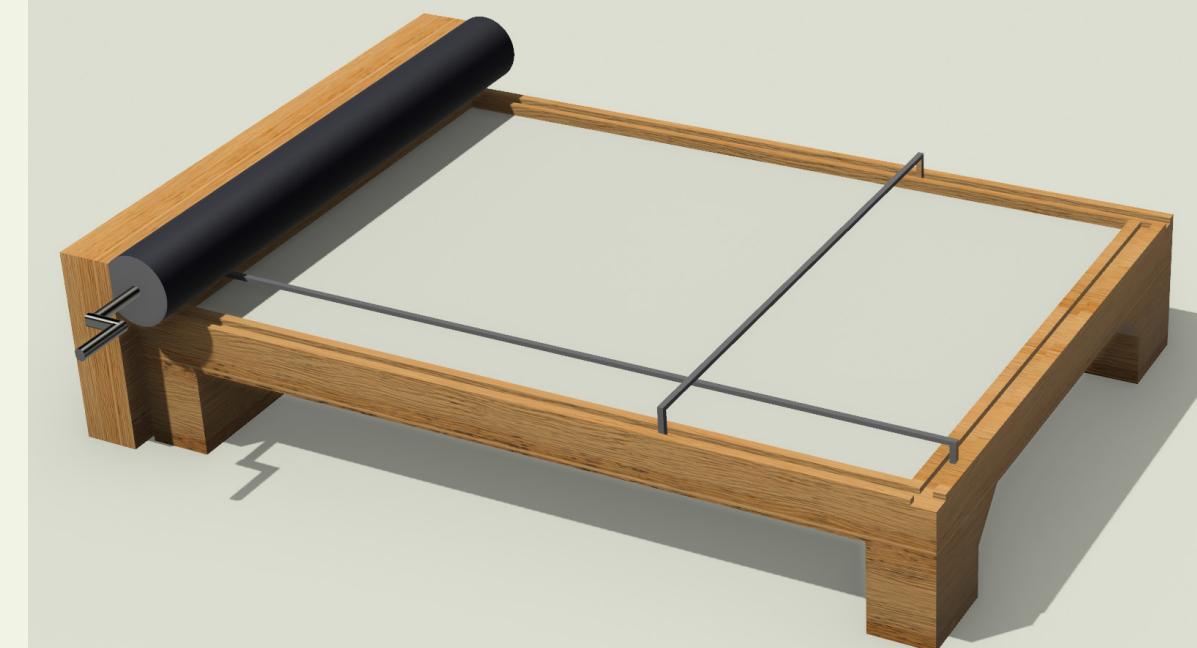
This concept highlights **modular** stamping, benefiting the user by making the process of stamping letters and designs onto a page easier and more intuitive.

Life Cycle Assessment Score:
+73
Score Against Requirements:
35.5/50



This concept excels in **printing words quickly**, offering way to forms words and stamp them on a page in seconds

Life Cycle Assessment Score: +54
Score Against Requirements: 36/50



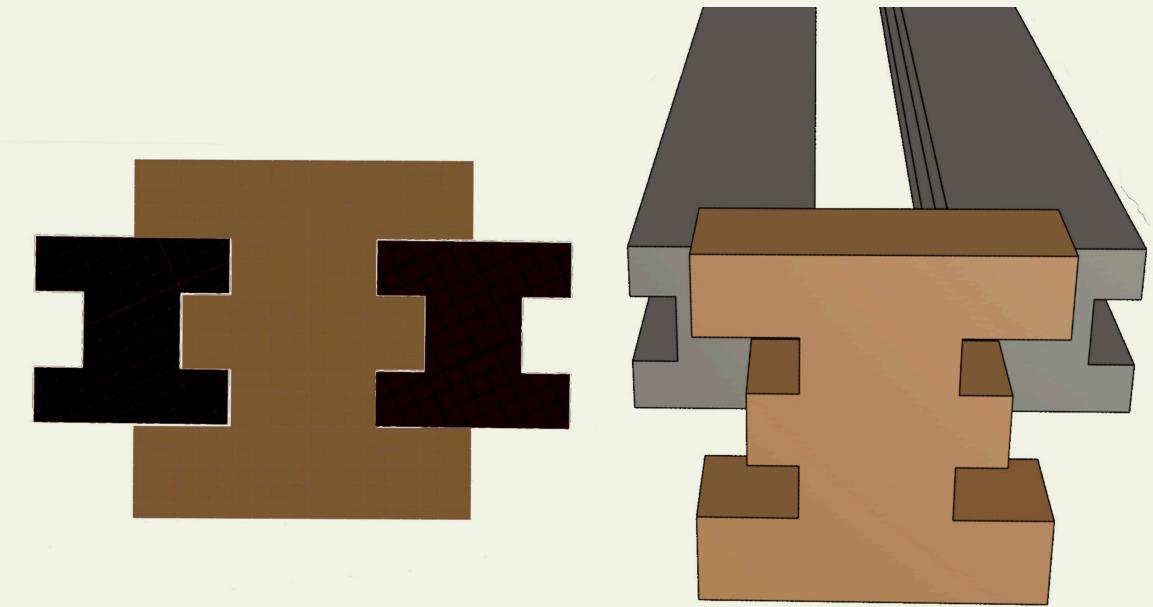
This concept prioritises **reusability**, letting users re-use the templates that they make for future printing

This is the chosen concept. See Appendix Page 2 for the details about each score.

Detailed Design Development: Abacus grid

Chosen Concept Refinement:

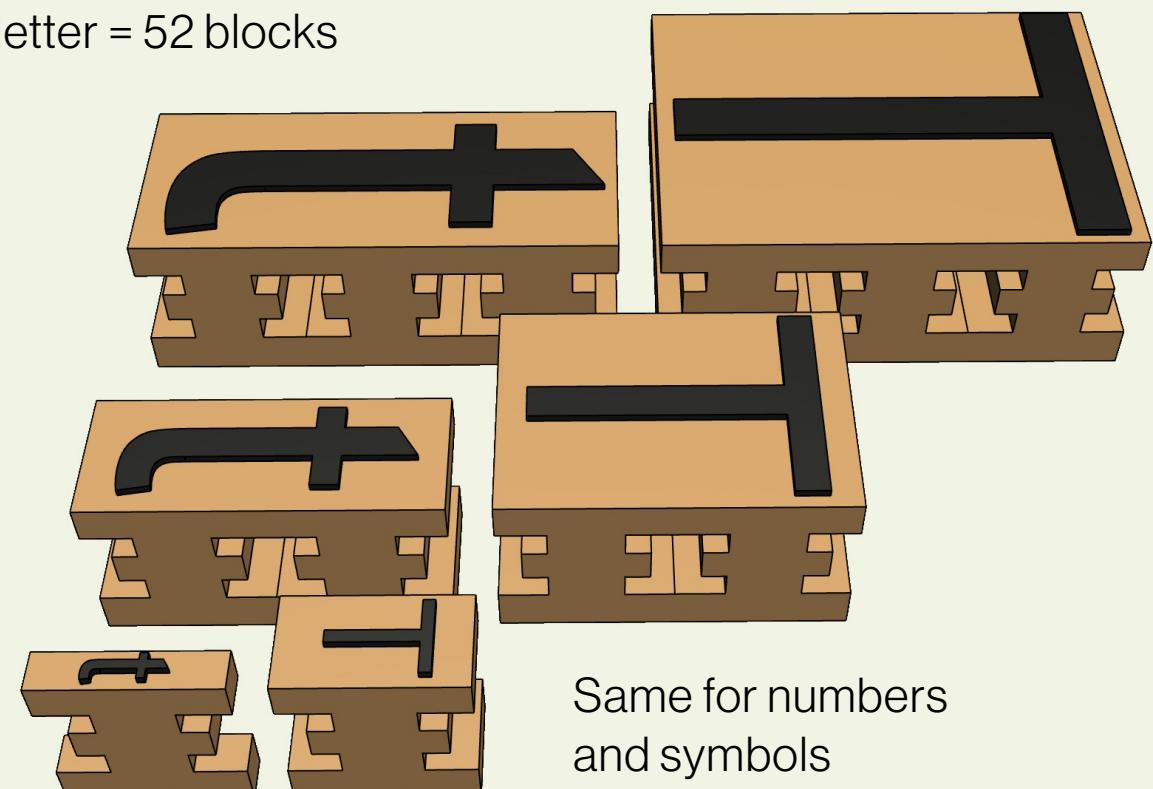
Abacus inspired grid to slide on pre-made stamps with letters/numbers/symbols. This grid can be rotated to apply ink to the stamps and then pressed down onto paper.



Different size fonts/graphics

Wooden blocks of different heights:
for Title, Subtitle and Body

Capital and minuscule for each
letter = 52 blocks



Size guide on the frame



Material Selection:

To remain suitable and cheap in a resource depleted world:

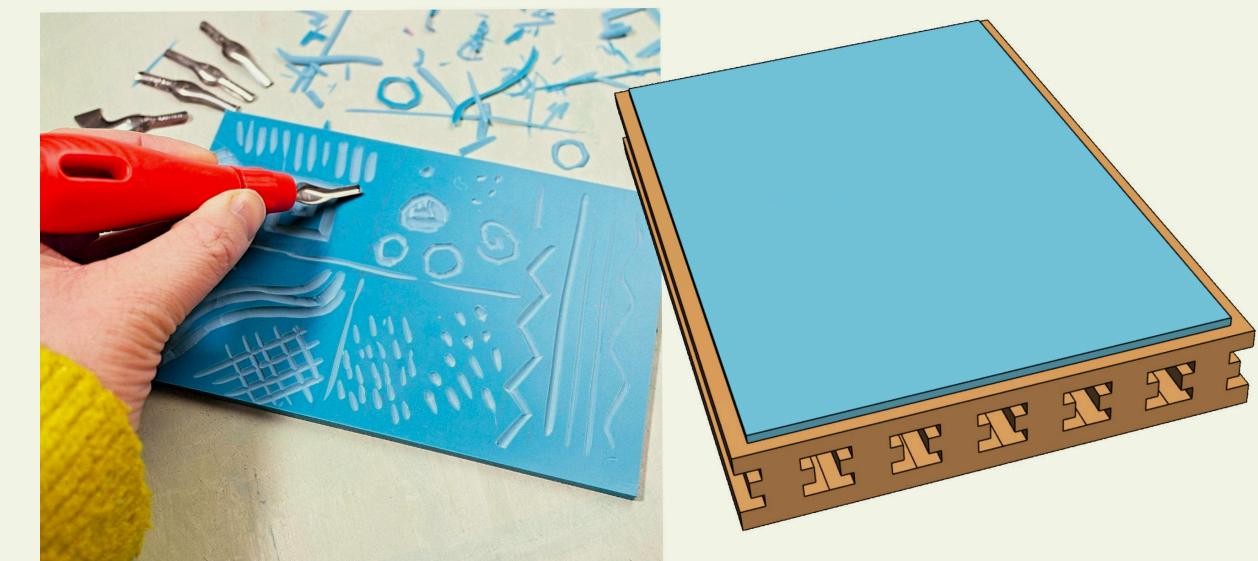
- The main frame and the stamp pieces are made from **bamboo**.
- The grid section is made from **recycled scrap metal** for strength and durability.
- Lino is actually already made from very renewable sources
- Ink roller: Bamboo and Natural rubber (harvested from rubber trees)

See Appendix for more details about the material choices



Custom stamp designs:

This design allows for custom graphics to be printed:
Using blank wooden stamps of various sizes, the user can attach their own lino carvings onto them.
This can be used for illustrations, graphics or custom letters/symbols.

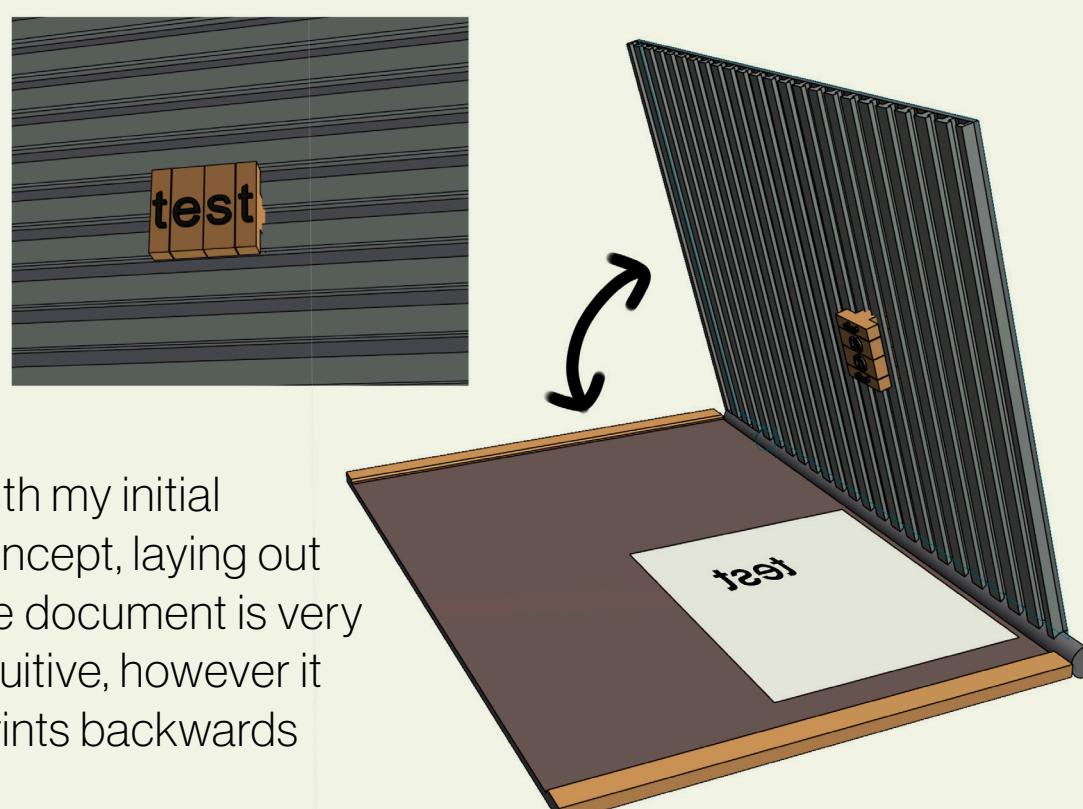


+ Reusability

Can be used for Signatures or Logos

Solving the printing mechanism

The initial problem:

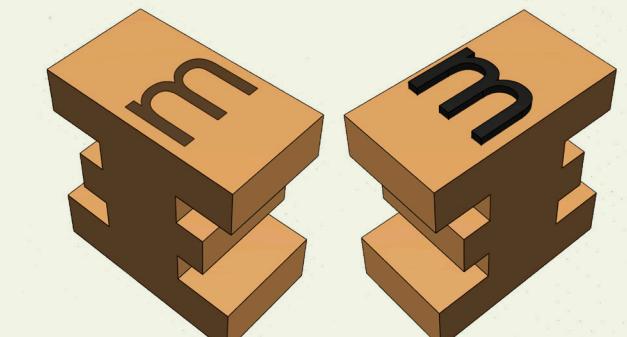


With my initial concept, laying out the document is very intuitive, however it prints backwards

The solution:

Double sided stamps :

- One side to preview the document
- Other side for the actual printing

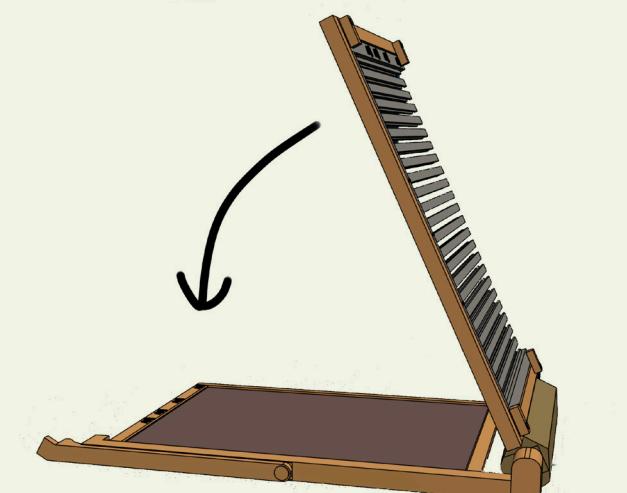


“Press down” mechanism

(Rather than folding in)

Much more intuitive:

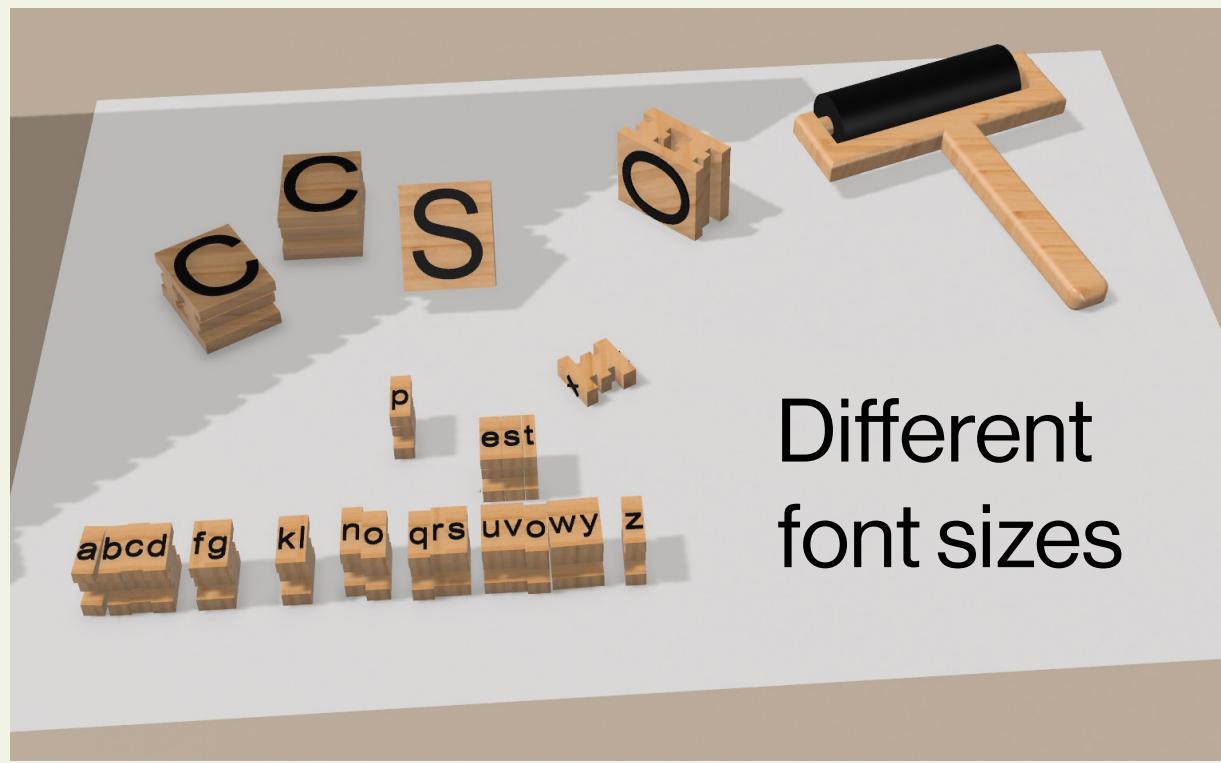
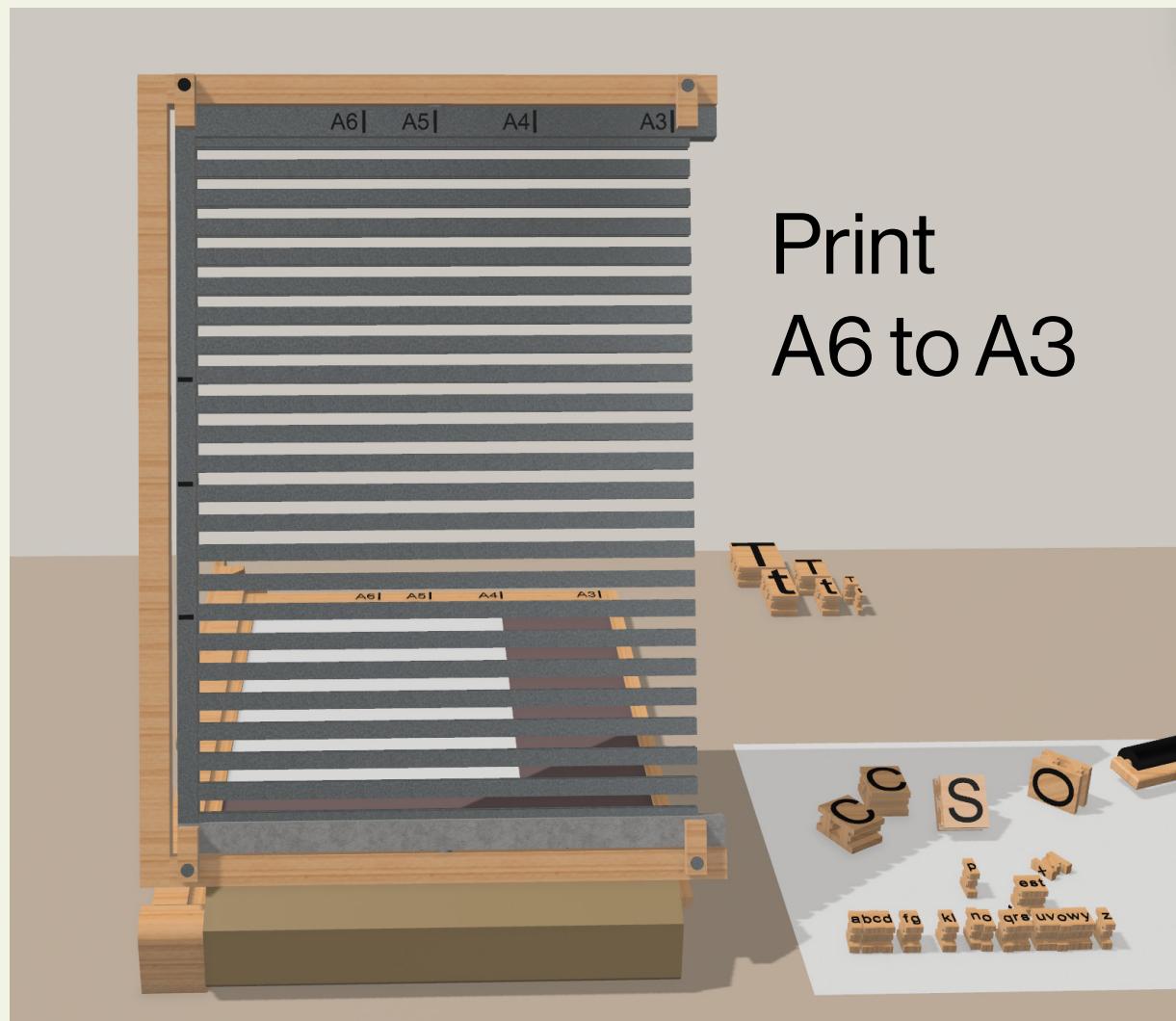
- Set up words from start to end
- Prints in exact position



Final Design

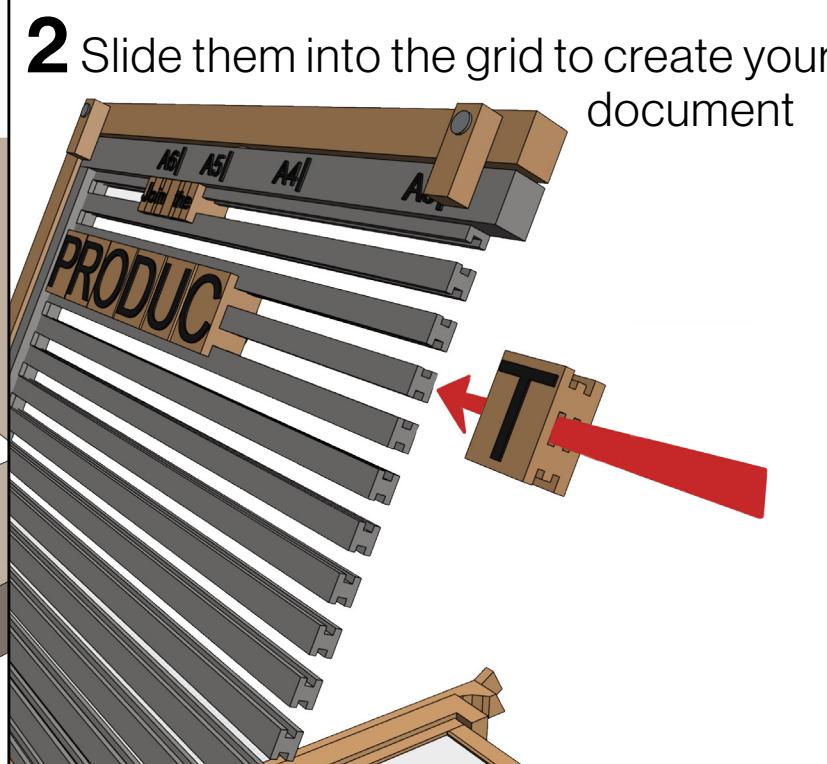
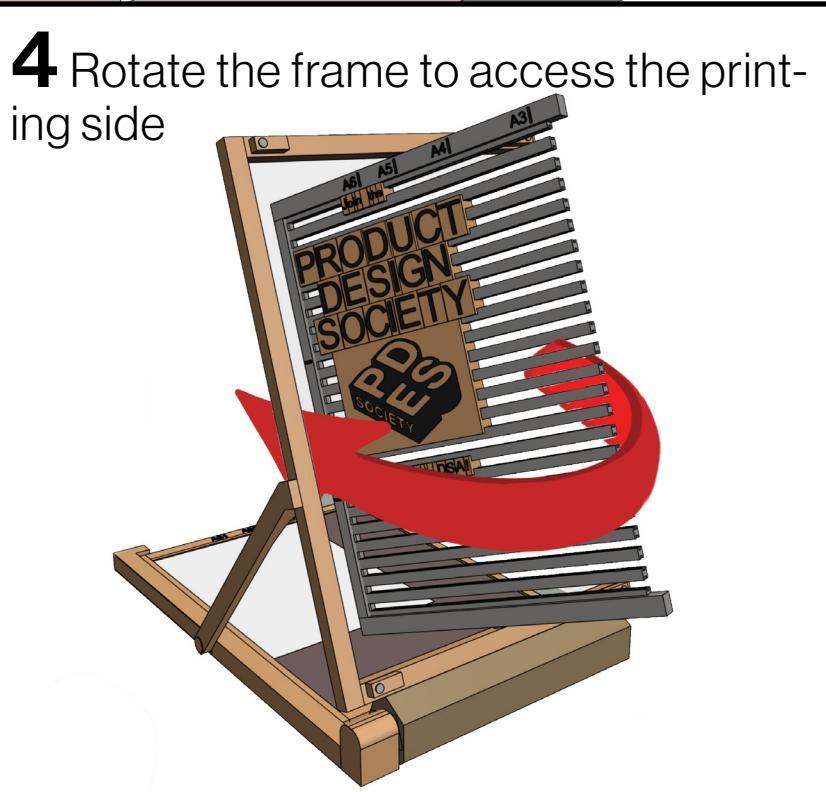
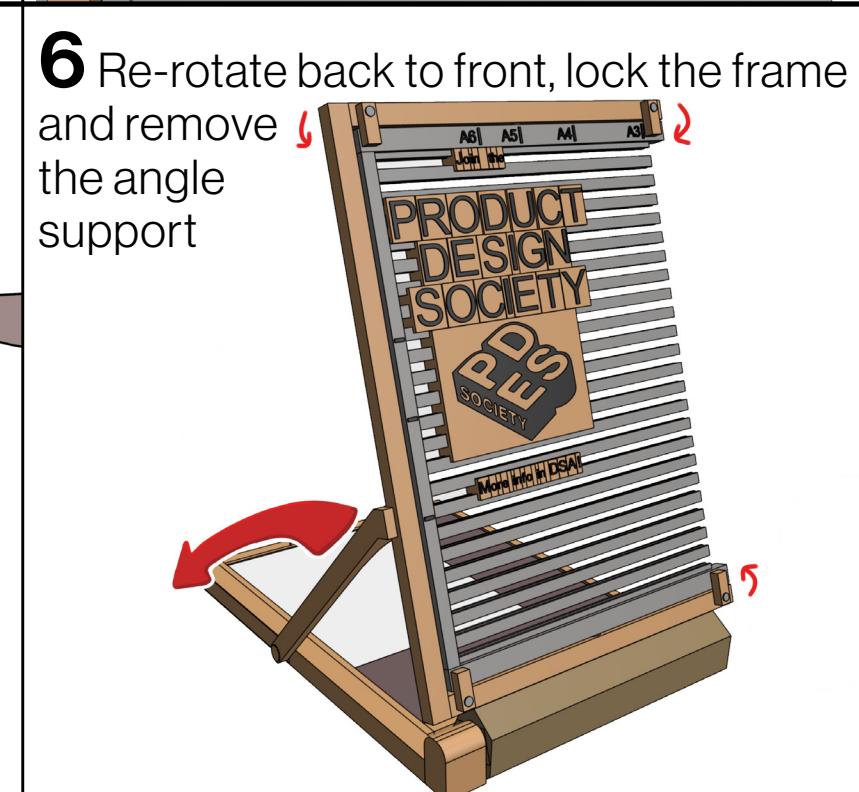
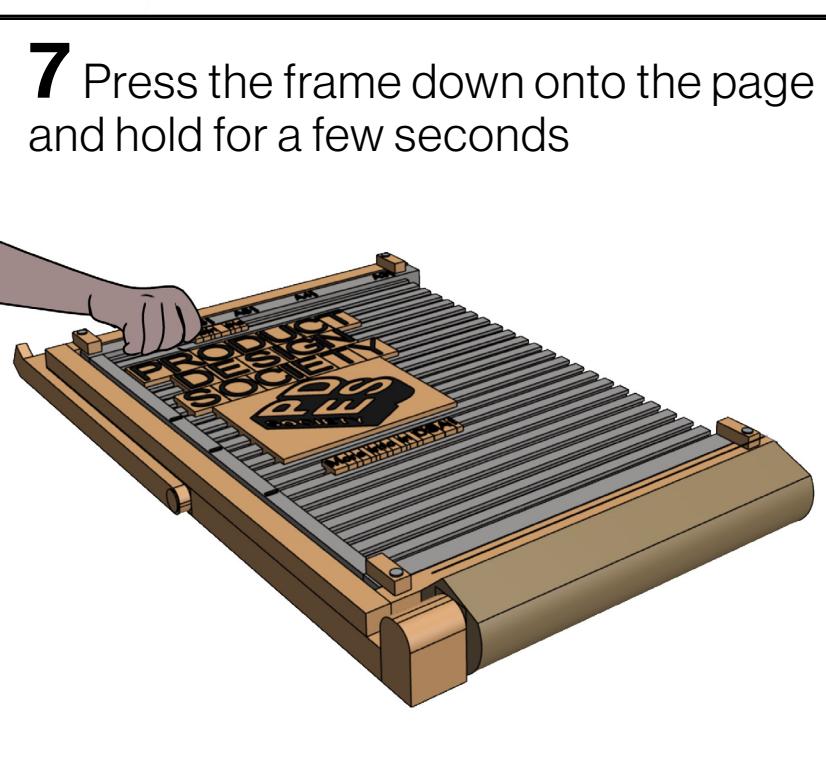
Sustainable printing from your home, office or studio!

- Create your document in minutes using the letters, numbers and symbols.
- Use your own logos and graphics with lino
- Make as many copies as desired



See Appendix for exact product dimensions

How to use:

<p>1 Get your letters, numbers and custom stamps ready</p> 	<p>2 Slide them into the grid to create your document</p> 	<p>3 Finish the layout of your document</p> 
<p>4 Rotate the frame to access the printing side</p> 	<p>5 Use the roller to apply ink to pieces (use multiple colours for sections if required)</p> 	<p>6 Re-rotate back to front, lock the frame and remove the angle support</p> 
<p>7 Press the frame down onto the page and hold for a few seconds</p> 	<p>8 Gently release and lift the frame</p> 	<p>9 Check your print! (Repeat steps 5 to 8 to make copies)</p> 

Appendix & References

Research Sources:

How printer work:

<https://www.printerbase.co.uk/news/how-does-a-printer-work/#:~:text=At%20a%20basic%20level%2C%20printers,a%20series%20of%20minuscule%20dots>

Printer timeline:

https://en.wikipedia.org/wiki/History_of_printing

Natural dyes:

<https://naturaldyes.ca/instructions>

Using bamboo for products:

<https://www.goodstartpackaging.com/guide-to-bamboo-packaging/#:~:text=It's%20an%20eco%2Dfriendly%20replacement,has%20become%20a%20hot%20commodity>

Images Sources:

Inside of printer image:

[https://www.youtube.com/watch?v=mMcTFUJYMG&themeRrefresh=1](https://www.youtube.com/watch?v=mMcTFUJYMG&themeRfresh=1)

Printer timeline images:

https://en.wikipedia.org/wiki/History_of_printing

Teacher:

https://pikbest.com/png-images/qiantu-drawing-teacher's-day-a-male-teacher-teaching_2654993.html

Business owner:

[https://frvecteezy.com/art-vectoriel/46573179-jeune-sur-de-soi-homme-d'affaire-dans-costume-et-attacher-ressentir-reussi-et-motive](https://frvecteezy.com/art-vectoriel/46573179-jeune-sur-de-soi-homme-d-affaire-dans-costume-et-attacher-ressentir-reussi-et-motive)

Artist:

<https://dribbble.com/shots/9331410-Girl-with-an-easel>

Electronic wasteland:

<https://www.fastcompany.com/40443695/who-will-clean-up-silicon-valleys-e-wasteland>

Pantograph image:

<https://pbs.twimg.com/media/CwrdIWjVEAAgHV.jpg>

Typewriter image:

<https://www.barnebys.co.uk/blog/the-transformer-of-type-the-history-of-the-typewriter>

Colourful graphics:

<https://uk.pinterest.com/pin/423268065001687454/>

More detailed implications for the resource depleted world:

1. Energy & Materials:

- No traditional power grids (must use mechanical, solar, or bio-based energy.)
- No petroleum (biodegradable, plant-based, or fully recycled materials are needed.)
- No rare earth minerals (electronics are severely limited, requiring mechanical or analog alternatives.)

2. Manufacturing & Supply Chain:

- Only recycled metals (affects strength, durability, and production methods.)
- Closed-loop material use (strict recycling and repurposing are essential.)

3. Food:

- Limited land (competition between food, material production, and energy sources.)

4. Environmental Adaptation:

- Products must withstand higher temperatures, extreme weather, and possible flooding.

Material selection further explanation:

Bamboo is an ideal resource due to its rapid growth rate, low water requirements, and ability to thrive in degraded soils. Meaning it would be highly resistant to climate change and cheap. Additionally it is very strong and its use in consumer products is extensive.

Recycled scrap metal ensures the use of existing metals, aligning with the absence of fossil fuels and rare earth minerals.

Linoleum, is made from renewable materials (linseed oil, sawdust, and natural pigments). It is biodegradable and free from petrochemical inputs.

Design Requirement table Additional Details:

Similar printing preferences:

Quantification: Printing on sizes from A6 to at least A3, ability to replicate the print identically as many times as desired, and ability to print in multiple colours on the same page (minimum 3 different colours)

Efficiency & Simplicity:

Quantification: Easy to learn and execute: ability to use core functions of the printer without extensive artistic talent or complex craftsmanship. Easy to use tools that can be operated by a singular person.

Recycled or readily available materials:

Quantification: The materials used should be cheap and easy to acquire for the average person (if repair is required) therefore no materials with potential high demand.

Produces clear prints:

Quantification: Text sizes from 1cm to 10cm is easily readable, with little to no inaccuracy or smudging

Size:

Quantification: max size of 38cm x 51cm x 20cm (when not in use), this is considering the size of A3 (29.7 × 42.0 cm)

Cost:

Quantification: Difficult to quantify 'expensive' and 'cheap' in this resource depleted world, however the price should be competitive with devices of similar material and size.

Appendix & References

Evaluation scores

Score against requirements:

(Medium requirement is weighted x 0.5)

Lino Printing station:

- Similar printing preferences: Possibility of many sizes and colours
- Efficiency & Simplicity: Not very efficient due to having to carve out a new piece of lino every time. Can be complex for user not familiar with lino.
- Recycle / Available Materials: Lino and station can be made from readily available materials
- Produces clear prints: Dependant on the quality of the lino carving. Generally handwritten text isn't as clear as could be.
- Size: Fits on a desk
- Cost: Low cost compared to intricate mechanical systems

$8 + 3 + 8 + 3 + 7(0.5) + 7(0.5)$

Overall: 29/50

Ink Roller:

- Similar printing preferences: Can print on any size and colour
- Efficiency & Simplicity: More efficient than lino as you can print patterns quick. However not for letters or numbers
- Recycle / Available Materials: Can easily be made from readily available materials
- Produces clear prints: Medium, possible calibration errors
- Size: Small, fit in a drawer
- Cost: Low cost

$9 + 5 + 8 + 6 + 9(0.5) + 8(0.5)$

Overall: 36.5/50

Modular Stamping station:

- Similar printing preferences: Can print on various sizes and in colour
- Efficiency & Simplicity: Fast document setup and fast making of copies
- Recycle / Available Materials: Most likely
- Produces clear prints: Yes, pre-made precise stamps
- Size: Fits on a desk
- Cost: Medium cost (due to need for many stamps)

$8 + 8 + 7 + 8 + 7(0.5) + 7(0.5)$

Overall: 38/50

Abacus inspired grid:

- Similar printing preferences: Can print on various size and in colour
- Efficiency & Simplicity: Very efficient document setup and for making copies. The most simple design for intuitiveness.
- Recycle / Available Materials: Can easily be made from readily available materials
- Produces clear prints: Yes, pre-made precise letters
- Size: Fits on a desk
- Cost: Medium cost (need for many pieces)

Overall: 41.5/50

All in one stamp:

- Similar printing preferences: Can print on any size and colour
- Efficiency & Simplicity: Slightly more efficient than lino as you can make words quickly. However for custom prints and graphics will be the same issue.

- Recycle / Available Materials: Can easily be made from readily available materials
- Produces clear prints: Yes, pre-made precise letters
- Size: Small, fit in a drawer
- Cost: Low cost

$8 + 4 + 8 + 7 + 9(0.5) + 8(0.5)$

Overall: 35.5/50

Direct Drawing on wax:

- Similar printing preferences: Can print on various sizes and colours
- Efficiency & Simplicity: Intuitive and relatively fast setup. Main benefit is the ability to keep the prints template after printing

- Recycle / Available Materials: Can be made from available materials and recycling wax is easy
- Produces clear prints: Dependant on the wax carving, generally less precise than stamps

- Size: Fits on a desk
- Cost: Medium cost

$8 + 9 + 8 + 5 + 7(0.5) + 5(0.5)$

Overall: 36/50

Scores from Life Cycle Assessment:

Metrics:

Economic: ROI, cost savings, number of jobs created, etc.

Social: Quality of life, social capital measures, health.

Environmental: Carbon footprint, resource use, pollution reduction.

Scale: -5 to +5: to rate both benefits and costs

Lino Printing station:

Stakeholder	Product			Material Extract			Manufacture			Distribution			Use			Disposal		
				Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental
Customers	Cost	x	x	2	1	x	1	x	x	2	2	2	2	x	2	2	3	
	Benefits	x	x	2	x	x	1	x	x	1	2	2	x	x	2	2	2	
Future Generations	Cost	2	x	2	x	x	x	x	x	x	1	1	x	2	x	x	x	
	Benefits	x	x	3	1	1	2	1	1	x	2	x	x	x	x	x	x	
Local Community	Cost	x	x	x	2	x	x	x	x	x	x	x	x	x	x	x	x	
	Benefits	x	x	2	1	x	x	x	x	1	x	x	1	2	x	x	1	
Suppliers	Cost	-1	x	x	1	x	1	x	x	x	x	x	x	x	1	x	x	
	Benefits	1	x	2	1	x	x	x	x	x	x	x	x	x	x	x	x	
Government/ Regulators	Cost	x	x	x	1	x	-1	x	x	x	x	1	x	x	x	x	-1	
	Benefits	x	1	1	x	x	1	x	1	x	1	1	1	x	x	x	x	

Overall: 66

Ink Roller:

Stakeholder	Product			Material Extract			Manufacture			Distribution			Use			Disposal		
				Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental
Customers	Cost	x	x	1	1	x	1	x	x	x	x	x	x	-2	x	2	2	1
	Benefits	x	x	1	x	x	1	x	x	x	x	x	x	1	2	2	x	2
Future Generations	Cost	2	x	2	x	x	x	x	x	x	x	x	x	1	x	x	x	x
	Benefits	x	x	3	1	1	2	1	1	x	2	x	x	x	x	x	x	x
Local Community	Cost	x	x	x	2	x	x	x	x	x	x	x	x	1	2	x	x	1
	Benefits	x	x	2	-1	x	x	x	x	1	x	x	1	2	x	x	1	
Suppliers	Cost	x	x	x	1	x	1	x	x	x	x	x	x	x	x	1	x	x
	Benefits	1	x	2	1	x	x	x	x	x	x	x	x	x	x	x	x	
Government/ Regulators	Cost	x	x	x	1	x	-1	x	x	x	x	1	x	1	1	1	x	x
	Benefits	x	1	1	x	x	1	x	1	x	1	1	1	x	x	x	x	

Overall: 54

Modular Stamping station

Stakeholder	Product			Material Extract			Manufacture			Distribution			Use			Disposal		
				Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental
Customers	Cost	x	x	1	1	x	1	x	x	x	x	x	x	-2	2	2	2	1
	Benefits	x	x	1	x	x	1	x	x	x	x	x	x	-2	2	2	x	

Appendix & References

03.

Continued...

Abacus inspired grid:

Product		Material Extract			Manufacture			Distribution			Use			Disposal			
		Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	
Stakeholder																	
Customers	Cost	1 x	1	1	1 x	1 x	1 x	x x	x x	-1	2	2	2 x	1			
	Benefits	2	1	1 x	x x	1 x	1 x	-1	2	2 x	x x	x x	x x	2			
Future Generations	Cost	2 x	2 x	x x	2 x	x x	x x	x x	x x	x	1 x	x x	x x	x x	1		
	Benefits	x x	3	1	1	2	1	1 x	1 x	2 x	x x	x x	x x	x x	1		
Local Community	Cost	x x x	2	2 x	x x	x x	x x	1 x	x x	x x	x x	x x	x x	x x	1		
	Benefits	x x	2	-1	2 x	x x	1 x	x x	x x	1	2 x	x x	x x	x x	1		
Suppliers	Cost	-2 x	1	1	1 x	1 x	1 x	x x	x x	x x	x x	x x	x x	1 x	1	1	
	Benefits	1	1	2	1 x	x x	1 x	1 x	1 x	3 x	1	1 x	1 x	1 x	1 x	1	
Government/ Regulators	Cost	x x x	1 x	x x	1 x	x x	1 x	x x	x x	x x	1 x	x x	x x	x x	1 x		
	Benefits	x	1	1 x	x x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	

Overall: 78

All in one stamp

Product		Material Extract			Manufacture			Distribution			Use			Disposal			
		Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	
Stakeholder																	
Customers	Cost	1 x	1	1	1 x	1 x	1 x	x x	x x	1	2	2	2 x	1			
	Benefits	2	1	1 x	x x	1 x	1 x	1 x	2	2 x	x x	x x	x x	2			
Future Generations	Cost	2 x	2 x	x x	x x	x x	x x	x x	x x	x	1 x	x x	x x	x x	x x		
	Benefits	x x	1	1	1 x	1 x	1 x	1 x	1 x	2 x	x x	x x	x x	x x	x x		
Local Community	Cost	x x x	2	-1	2 x	x x	x x	1 x	x x	x x	x x	x x	x x	x x	x x		
	Benefits	x x	2	-1	2 x	x x	x x	1 x	x x	1	2 x	x x	x x	x x	x x		
Suppliers	Cost	x x x	1	1 x	1 x	1 x	1 x	x x	x x	x x	x x	x x	x x	1 x	1 x		
	Benefits	1	1	2	1 x	x x	1 x	1 x	1 x	3 x	1	1 x	1 x	1 x	1 x		
Government/ Regulators	Cost	x x x	1 x	x x	1 x	x x	x x	x x	x x	x x	1 x	x x	x x	x x	1 x		
	Benefits	x	1	1 x	x x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	

Overall: 73

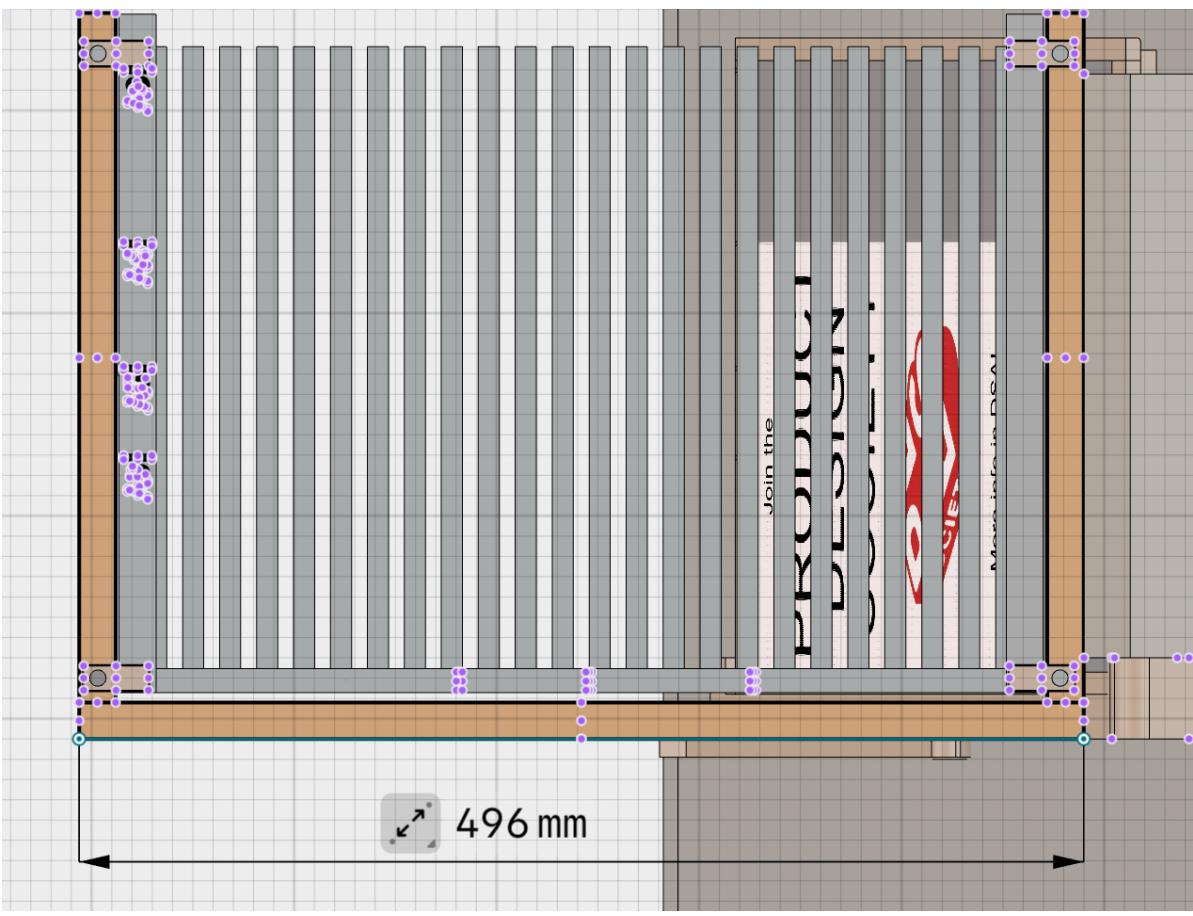
Direct drawing on wax

Product		Material Extract			Manufacture			Distribution			Use			Disposal			
		Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	Economic	Social	Environmental	
Stakeholder																	
Customers	Cost	1 x	1	1	1 x	1 x	1 x	x x	x x	-1 x	1	2	2 x	1			
	Benefits	2	1	1 x	x x	1 x	1 x	1 x	1 x	1 x	1 x	x x	x x	2			
Future Generations	Cost	2 x	x x	x x	x x	x x	x x	x x	x x	x x	1 x	x x	x x	x x	x x		
	Benefits	x x	-1	1	1 x	1 x	1 x	1 x	1 x	2 x	x x	x x	x x	x x	x x		
Local Community	Cost	x x x	2	-1	2 x	x x	x x	1 x	x x	x x	1	2 x	x x	x x	x x		
	Benefits	x x	-1	-1	2 x	x x	x x	1 x	x x	1	2 x	x x	x x	x x	x x		
Suppliers	Cost	x x x	1	1 x	1 x	1 x	1 x	x x	x x	x x	x x	x x	x x	1 x	1 x		
	Benefits	1	1	2	1 x	x x	1 x	1 x	1 x	3 x	1	1 x	1 x	1 x	1 x		
Government/ Regulators	Cost	x x x	1 x	x x	1 x	x x	x x	x x	x x	x x	1 x	x x	x x	x x	x x		
	Benefits	x	1	1 x	x x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	1 x	

Overall: 54

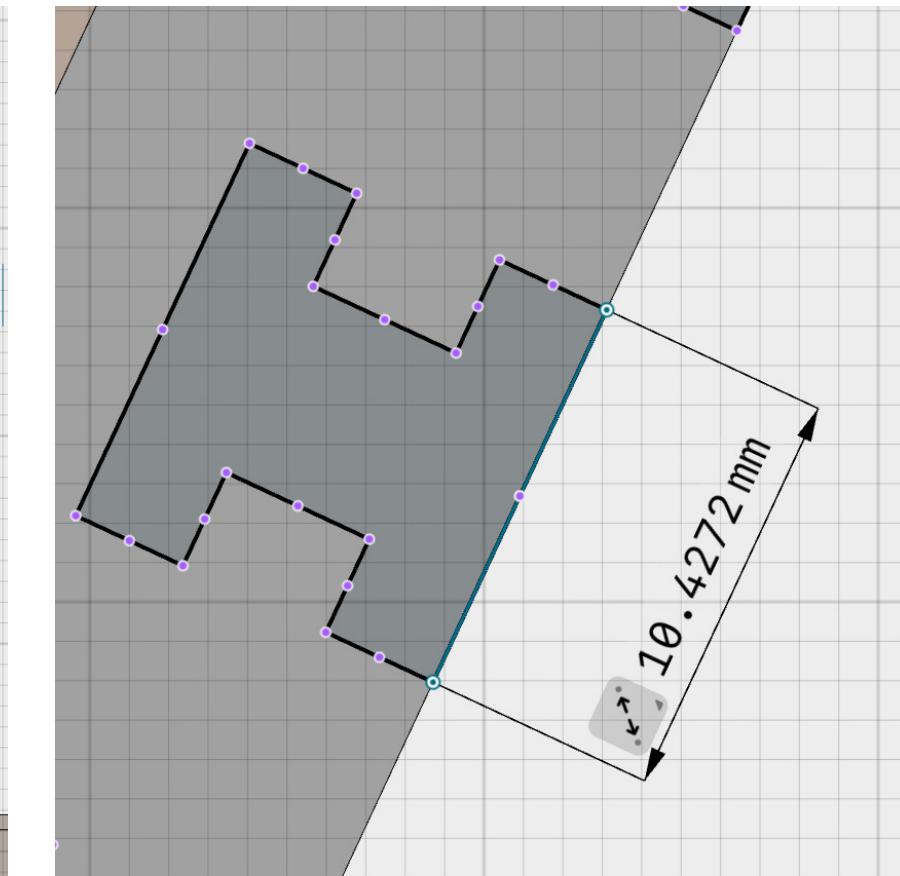
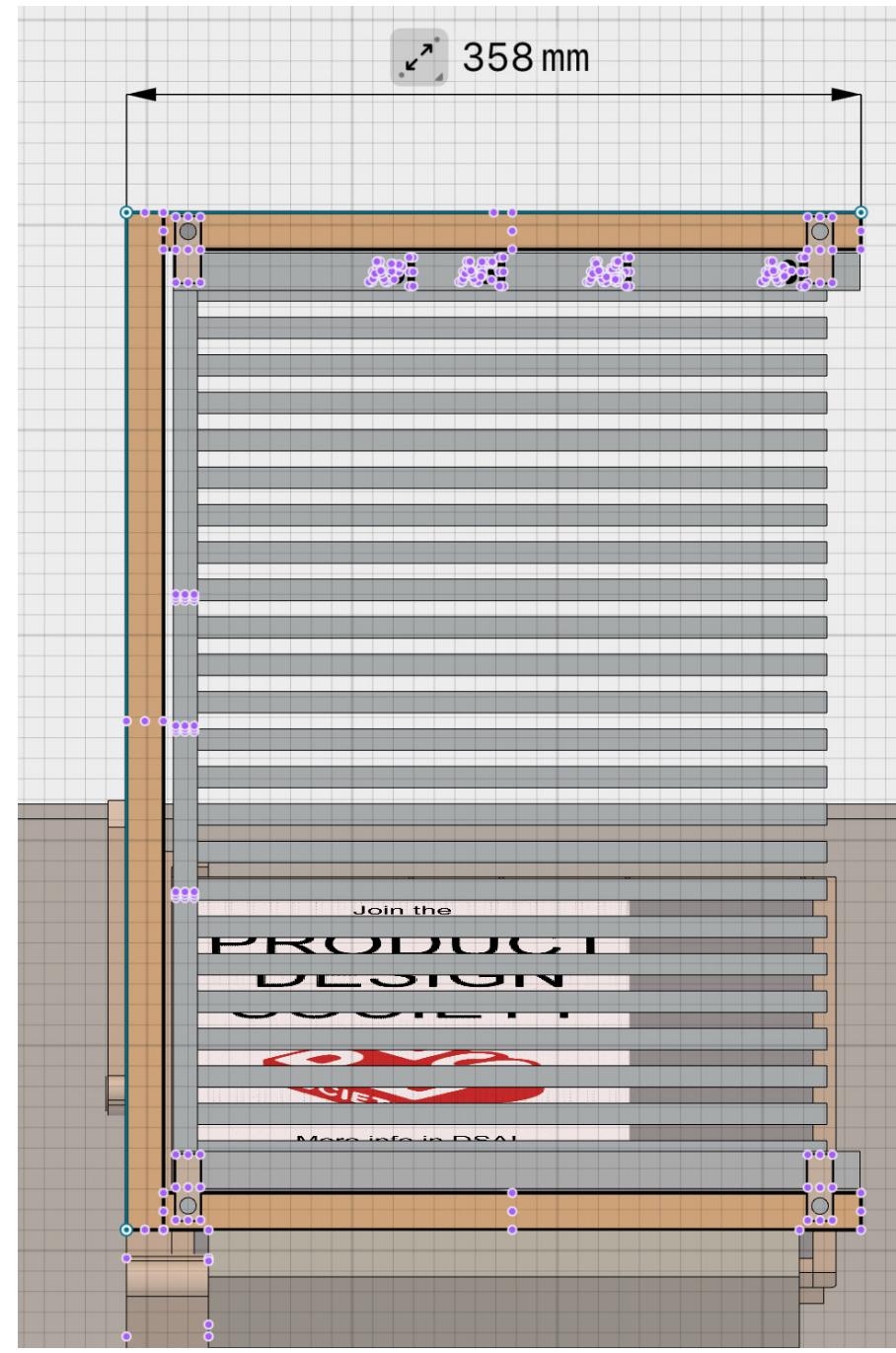
x means either not applicable or no significant benefit or drawback identified

Final Product exact dimensions



3 different size standard stamps:

- 54mm x (variable width) x 19.5mm
- 36.5mm x (variable) x 19.5mm
- 18mm x (variable) x 19.5mm



When not in use:

The printer is : 496mm x 258mm 53mm

Proforma for Ethics Review of design research activities in PDES1510

Researcher: Zachary Stephens Project: Radical Design Part 2

Question	Response					
What kind of research are you going to carry out? <i>Please tick all options that apply</i>	Survey using paper or web-based questionnaires			yes		
	Interviews using a questionnaire			yes		
	Observational study			x		
	Focus group			x		
What information will you collect? <i>Please tick all options that apply</i>	Written or typed responses or records of the research			yes		
	Audio recordings			x		
	Still photographs			x		
	Video recordings			x		
Why do you require this information?	Research for a Project					
Where will you carry out the research? NOTE: We do not have Ethics approval for students to approach passers-by in public places such as the street.	Online					
How many participants will be recruited? <i>Please circle the nearest answer</i>	less than 5	5 - 10	10 - 30	30-50	50-75	75 - 100 ¹
How will participants be identified, recruited and approached?	Sent a message asking if they would like to answer my survey					
Who are the participants and why have you selected these participants?	Friends and friends of friends. Easy access					
Will you be excluding any groups of people? If so, why?	No					
Will informed consent be obtained from research participants and, if so, what consent form will you use?	No					
How long will participants have to decide whether to participate or not? <i>Please circle the nearest answer</i>	less than 1 hour	less than 24 hours	1-3 days	3-7 days	1-2 weeks	over 2 weeks
How you will store the data and how the data will be used?	In my Assignment presentation, only used for research					
How you will ensure any photos, video & audio recordings are anonymous?	x					
What are the participants going to be expected to do?	Answer the multiple choice questions					
Do you foresee any disadvantages or risks to the participants as a result of taking part?	x					

Please attach details of the questions you will be asking in any questionnaires and interviews.

¹ NOTE: The ethical approval does not cover research involving over 100 participants

- **Have you used a printer before?**
- **If yes, How often do you use a printer?**
- **What do you mainly use a printer for?**
- **What paper size have you previously used?**