How to design a make-a-thek space

DIGITAL KIT

Resource Overview

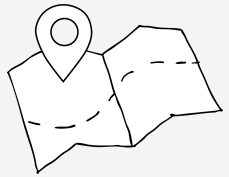
Key steps to introduce machines and help libraries to choose how to implement their make-a-thek space

01.03.2026

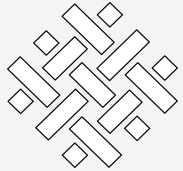
Written by Andrea Ascani, Cristina Biella, Marta Golfera (Opendot Foundation)

#spaces #theoretical #practical

Resource Goal

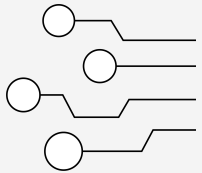


This Kit allows libraries with little or no makerspace experience understand machine constraints, costs, and technical needs. By modeling their space at scale, they can experiment with layouts and workflows to visualize possibilities and design a makerspace that fits their community and resources.



It can be used:

- Internally by librarians
- With staff teams
- With community members
- With makers or external experts



What’s inside this Kit

Machine cards

A set of cards to introduce key machines.
Each card includes: difficulty level, cost range, materials, skills needed, setup constraints, pros & cons.

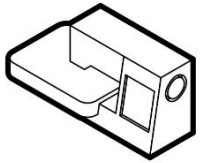
Purpose

- Familiarize with the machines
- Compare machines realistically
- Understand spatial and infrastructural impact
- Avoid purchasing before reflection

→ for a practical introduction to the machines, see also the resource 🔗 Machine Cards

MACHINES

EMBROIDERY MACHINE



Highly efficient CNC machine that creates intricate designs with precision and speed. Ideal for textiles and fashion industry.

DIFFICULTY

user friendly · trained use · expert

COST

<100€ · 500 - 1000€ · >2000€

PROS

- Detailed designs.
- High volumes in brief times.
- Consistent and uniform results.

CONS

- High initial purchase cost.
- Requires maintenance.
- Limited flexibility in design options.
- Noisy.

IN DETAIL

A laser cutter u… a highly focused light to melt or burn away a s… material, to dived the part from the rest … surface. It is one of the mo… prototype, it …

MATERIA…

It can cut a… cardboard … PVC.

SKILLS

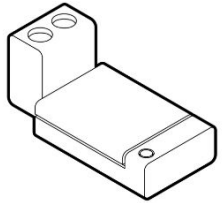
- Basic …
- New … interf… setti…
- The… can… des…

SET…

- D…
- I…

MACHINES

LASER CUTTER



It makes very very precise fretworks. It cuts and engrave not-too-thick slabs of different material.

DIFFICULTY

user friendly · trained use · expert

COST

<100€ · 500 - 1000€ · >2000€

PROS

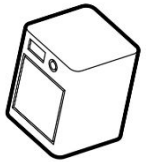
- Simple to use and fast.
- Works on different materials.
- Easy to design connections and joints.

CONS

- Limited size and thickness.
- Some materials aren't recommended because they could produce toxic smoke.

MACHINES

3D PRINTER



…s a machine that creates object stacking layers …gether, the same way a thick book is made by a … of thin pages.

DIFFICULTY

…ndly · …trained use · expert

COST

<100€ · 500 - 1000€ · >2000€

…e and learn.
…eometries.
…s.
…facts.

CONS

- Quite slow.
- Producing small parts (less than 25*25*25cm).
- Producing one color and material at a time.

What’s inside this Kit

Scenario cards

These cards present possible scenarios with different needs and goals. Each card gives you specific constraints or requirements to follow.
Example: During “Fashion Week”, you must add in your space the embroidery machine and the laser cutter to complete the challenge.

Purpose

- Design the space starting from use, not from furniture.

How to use the Scenario Cards

Scenario cards

These cards present possible scenarios with different needs and goals. Each card gives you specific constraints or requirements to follow.
Example: During “Fashion Week”, you must add in your space the embroidery machine and the laser cutter to complete the challenge.

Purpose

- Design the space starting from use, not from furniture.

SCENARIO 0

CHALLENGE: It's a regular Thursday morning at the library. The room is buzzing with curiosity — people are getting ready to experiment, create, and share ideas. Your challenge is to design the **setup of the makerspace room** so that it supports collaboration, creativity, and safe exploration.
Think about how people move, interact, and discover within the space. How can you arrange the tools, materials, and tables to make the environment both inspiring and functional?

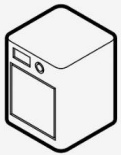
KEEP IN MIND: Accessibility is key — a wheelchair (60–70 cm wide) must be able to move freely across all areas of the room.
Consider visibility, flow, and comfort for different users — children, adults, and facilitators alike.

CONSTRAINT: Tables used during regular opening hours must stay in fixed positions.

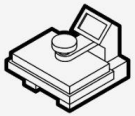
BONUS: tell us the sustainable considerations you made along the process!

SKILLS NEEDED:

3D printer

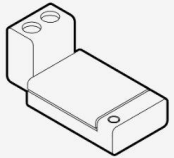


Heatpress

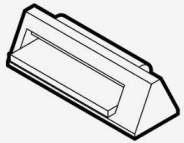


Overlocking

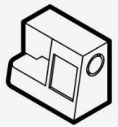
Lasercut



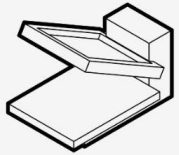
Vinyl cut



Sewing machine

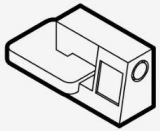


Screenprinting



Soldering station

Embroidery



Scenario Card example

SCENARIO 1

CHALLENGE: t's a special day at the library! The makerspace is alive with excitement — a class of **20 nine-year-old kids** is about to arrive for a creative workshop. Today, they'll customize their very own **t-shirts**, turning ideas into tangible creations.
Your challenge is to **design the setup of the room** to make this experience smooth, inspiring, and fun for everyone involved. The space should support both **moments of learning** and **hands-on making**.
How can you arrange the room to keep the children engaged and safe, while giving them enough space to explore, move around, and collaborate?

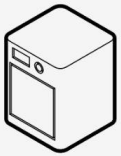
KEEP IN MIND: The workshop starts with an initial explanatory session before the kids begin their hands-on activities.

CONSTRAINT: Include at least **two different types of machines** in the setup.

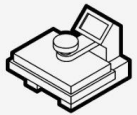
BONUS: tell us the sustainable considerations you made along the process!

SKILLS NEEDED:

3D printer

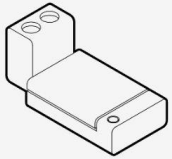


Heatpress

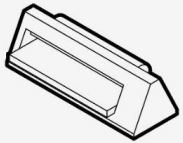


Overlocking

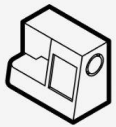
Lasercut



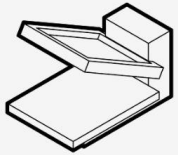
Vinyl cut



Sewing machine

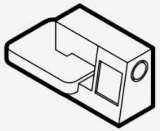


Screenprinting



Soldering station

Embroidery



Scenario Card example

SCENARIO 2

CHALLENGE: It's the first Saturday of the month, and that means one thing: it's **Fix/Repair Café day** at the library! The doors are open to everyone — from curious newcomers to experienced makers eager to give broken objects a second life. Your challenge is to **design the setup of the room** for this open-access event. The atmosphere should encourage sharing, learning, and collaboration, while keeping the space organized and safe. How can you create a layout that remains **flexible and adaptable**, ready to welcome different numbers of participants and types of repairs?

KEEP IN MIND:

The open-access nature means attendance is unpredictable — plan for flexibility and easy reconfiguration.

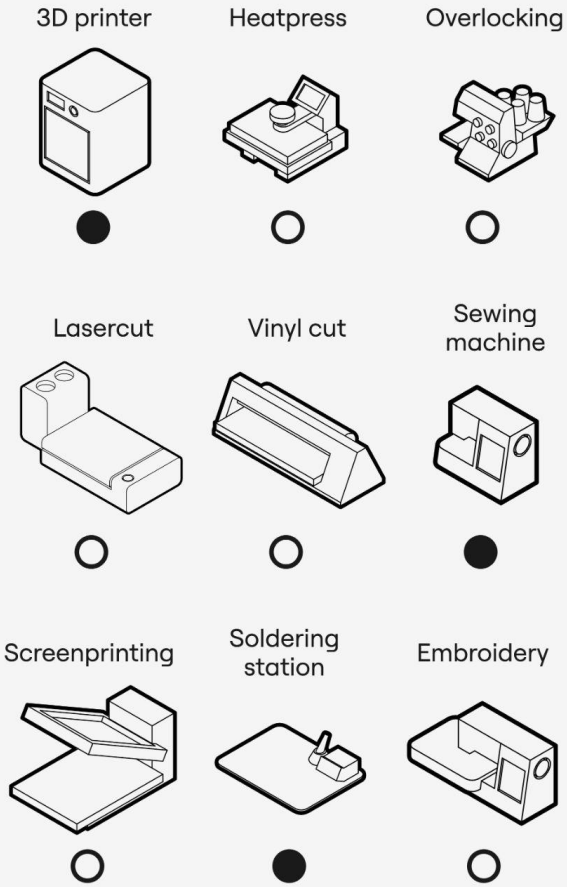
Think about how to balance work areas, social interaction, and movement around the machines.

CONSTRAINTS:

The setup must include at least: a **sewing machine, a soldering station and** a **3D printer.** (You may decide how many of each to include.)

BONUS: tell us the sustainable considerations you made along the process!

SKILLS NEEDED:



Scenario Card example

SCENARIO 3

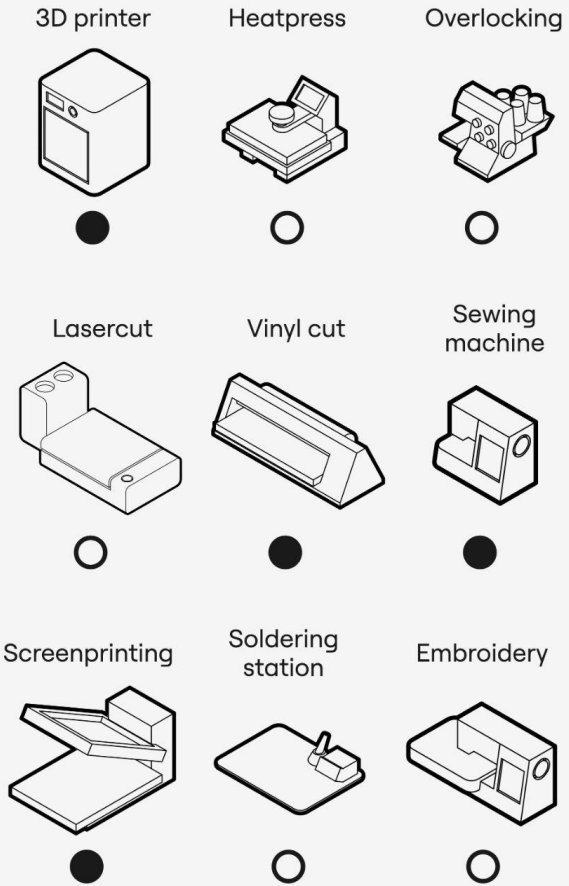
CHALLENGE: It's Fashion Month at the library! The makerspace transforms into a vibrant hub of style, creativity, and self-expression. Visitors are here to create, stage, and repair their own clothing — turning fabrics, prints, and textures into personal statements. Your challenge is to design the setup of the room to support every stage of the fashion-making journey: from materials and crafting to showcasing the final creations.

KEEP IN MIND: Consider including a changing area for participants to try on their designs. Think of a dedicated area for storing leftovers and scrap fabrics.

CONSTRAINTS: The setup must include: 3D printers, Vinyl cutter, Screen printing station, Sewing machines (you may decide the quantity)

BONUS: tell us the sustainable considerations you made along the process!

SKILLS NEEDED:



Scenario Card example

How to use the Scenario Cards

Before placing objects in the space, define a clear scenario. **A scenario is a short description of how the space could be used in a real situation. It helps you move from abstract planning to concrete decisions.**

Define the users. Describe the activity. Be concrete, precise and accurate.

List only the machines and tools that are actually needed. Think about what users need around the activity. Use the template before placing objects.

SCENARIO X

CHALLENGE:

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KEEP IN MIND:

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CONSTRAINTS:

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BONUS:

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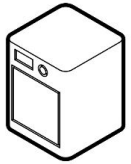
SKILLS NEEDED:

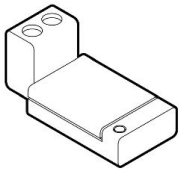
3D printer



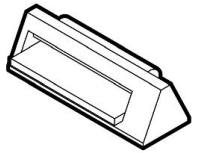
Heatpress

Overlocking

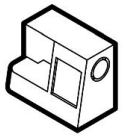
Lasercut



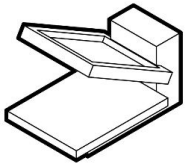
Vinyl cut



Sewing machine

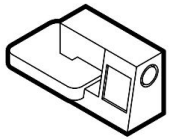


Screenprinting



Soldering station

Embroidery



Scenario Card
blank card

What’s inside this Kit

Download here!

Furniture & Objects

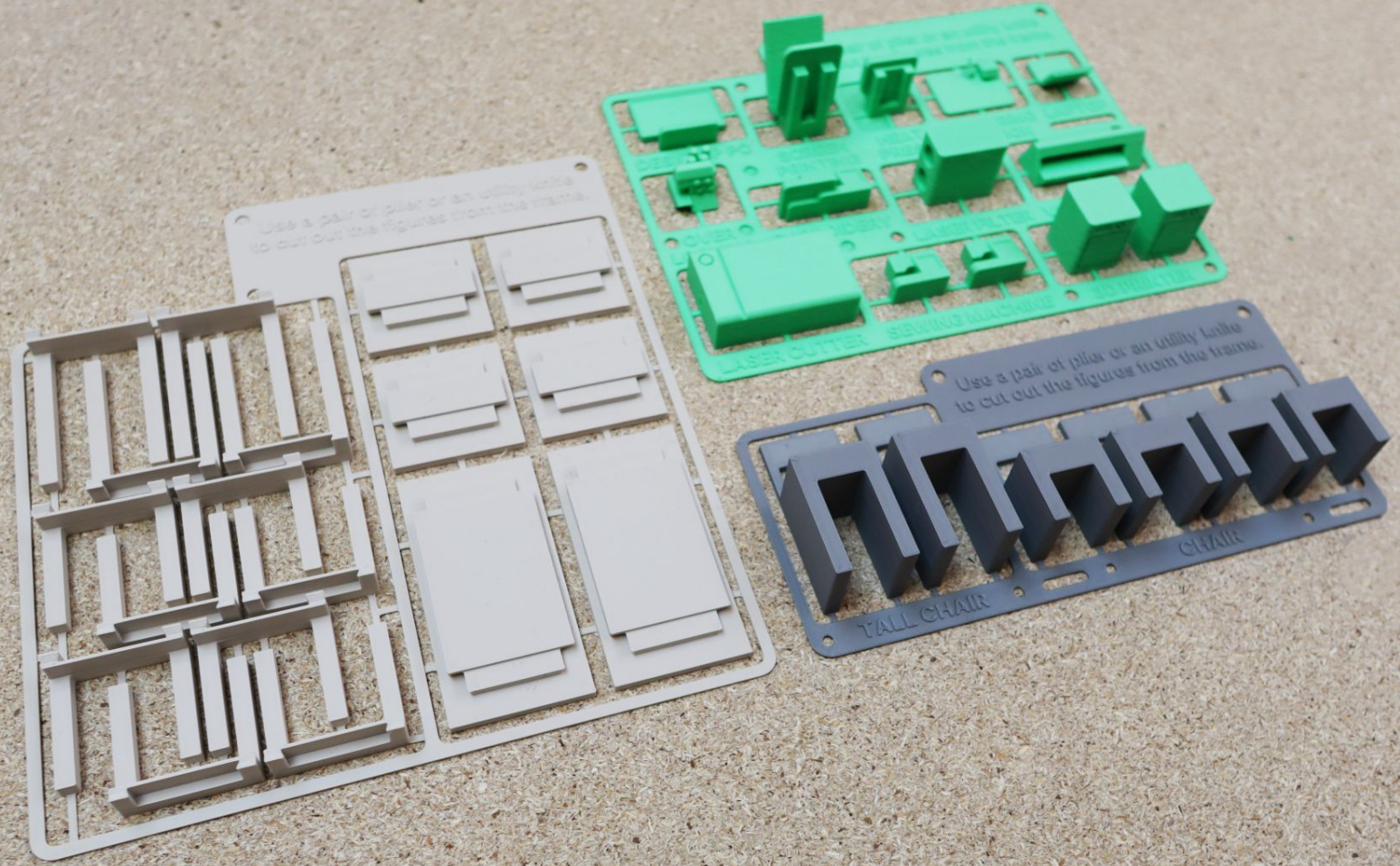
Physical machines, table, chairs, storage systems, shelves and other space elements in scale 1:20.
They can be:

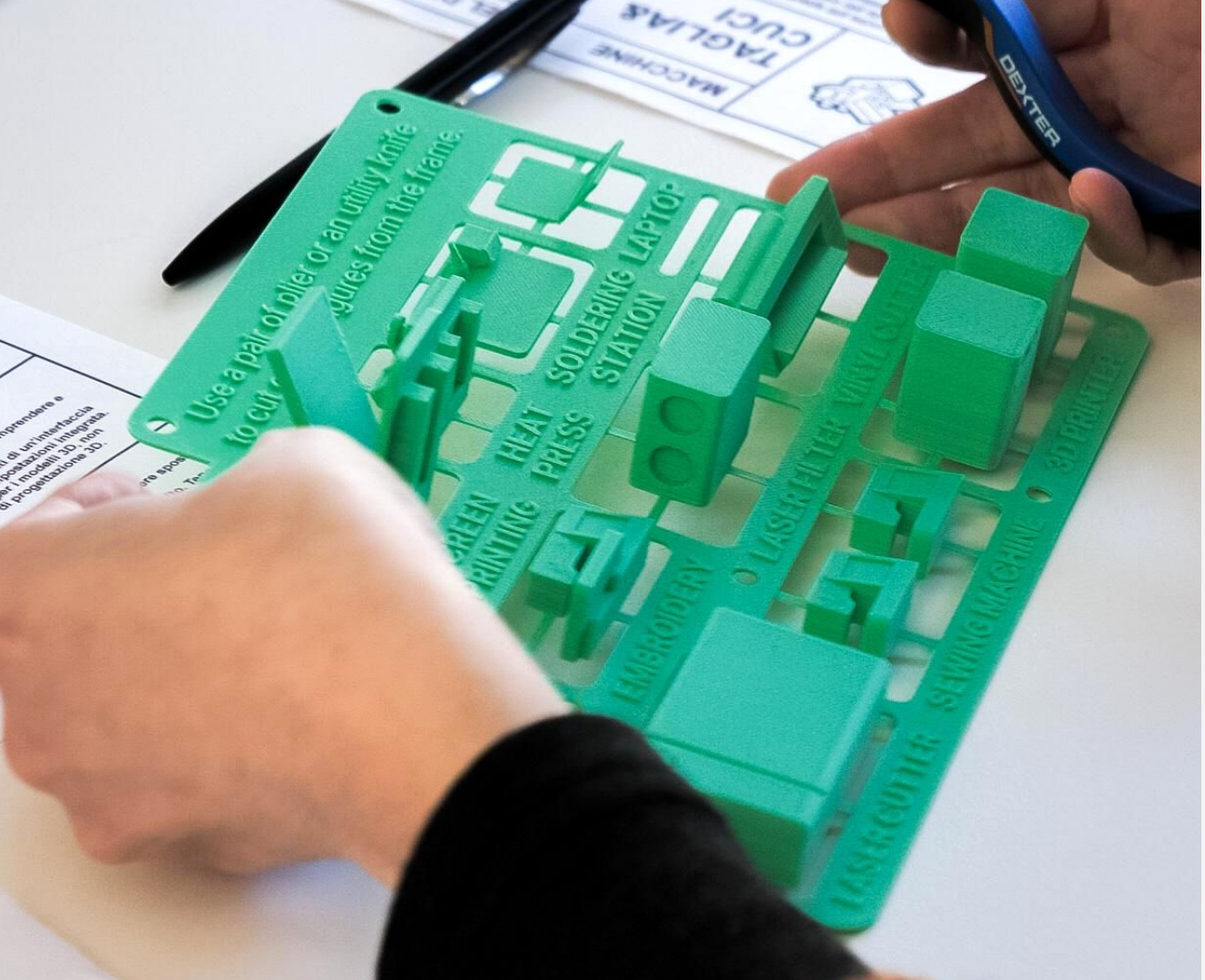
- 3D printed (machines, furnitures) and cut from acrylic (space elements)
- used in their digital version on Miro

Purpose

Design the space starting from use, not from furniture.

Important rule: All objects are in the same scale. Do not resize them.

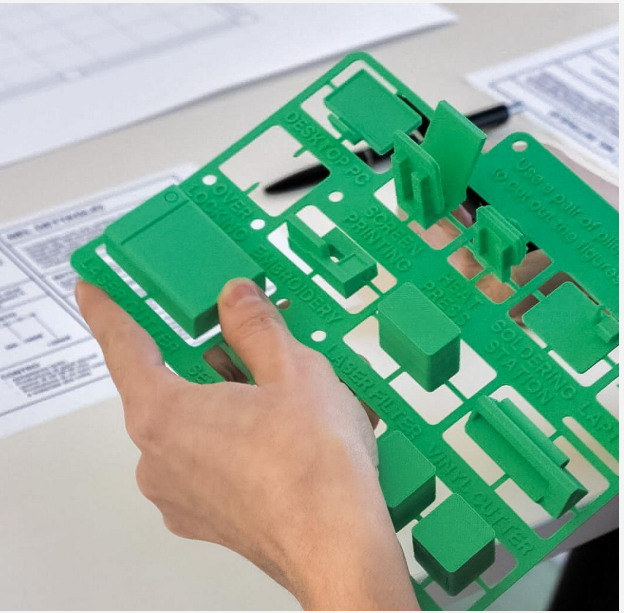

Use a pair of pliers or an utility knife
to cut out the figures from the frame.
LASER CUTTER
SEWING MACHINE
Use a pair of pliers or an utility knife
to cut out the figures from the frame.
TALL CHAIR
CHAIR

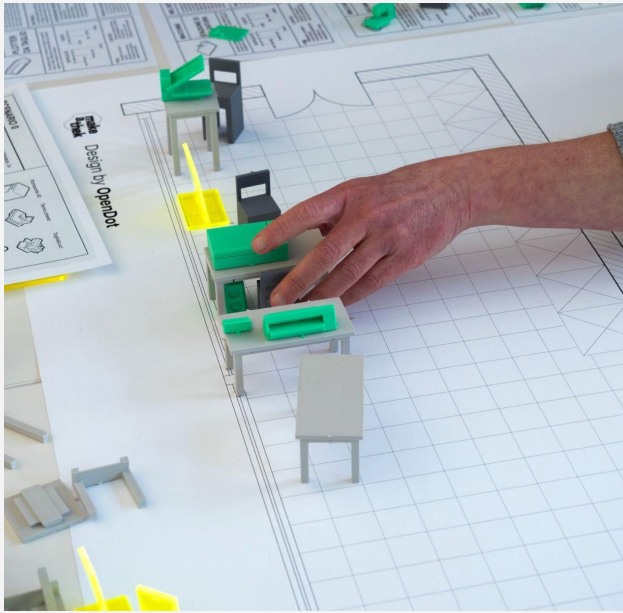


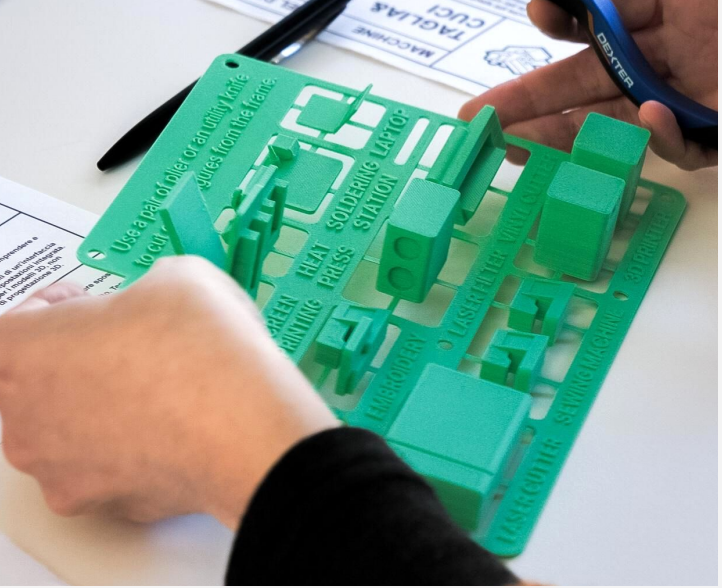
The 3D-printed space planner pieces should be carefully removed from the print structure using pliers.

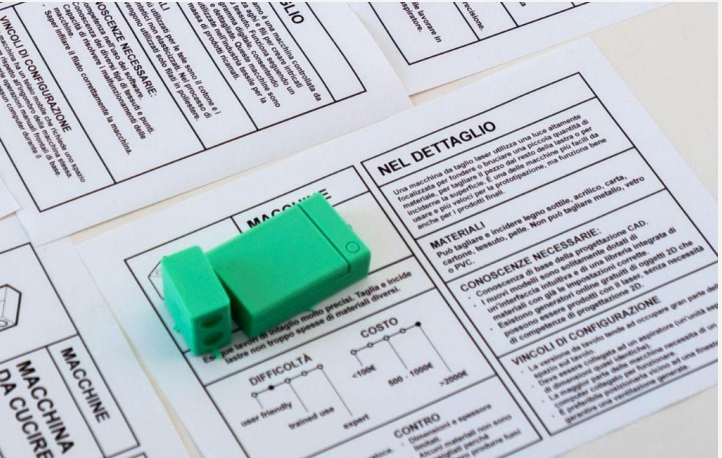
This simple preparation step can also become a **first hands-on activity** to help users become familiar with the machines, materials, and basic tool handling.

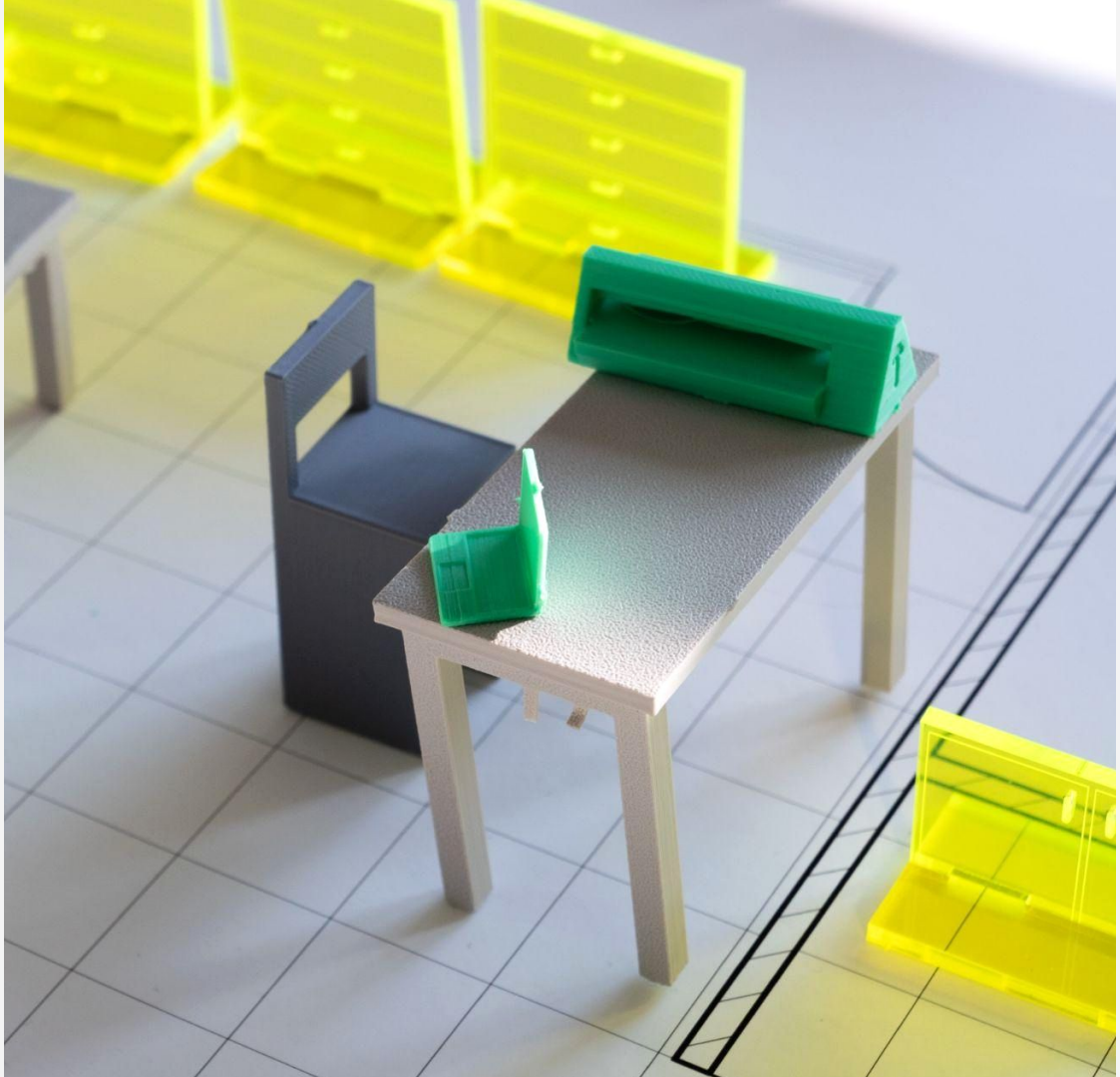
Kit preparation

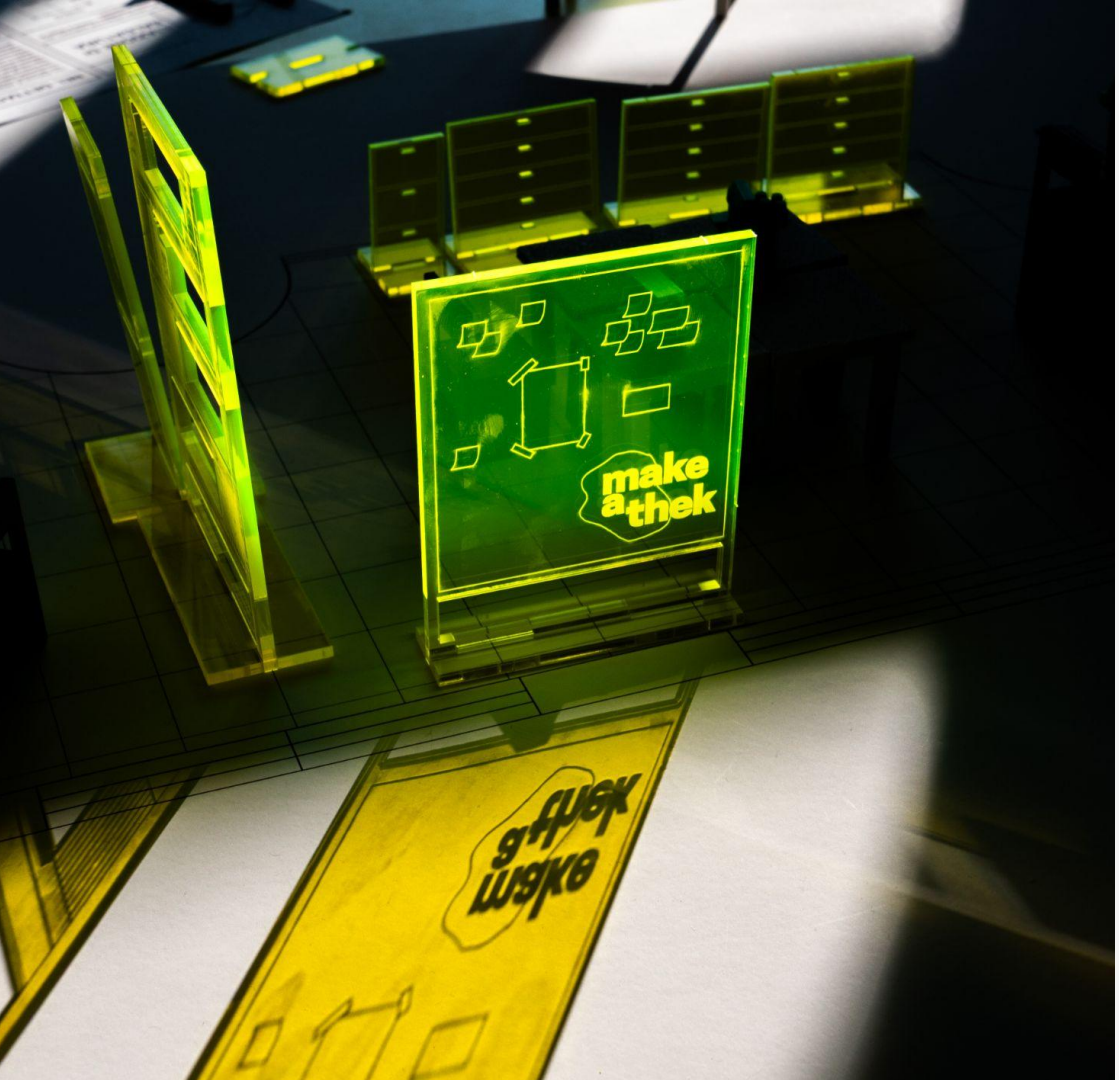


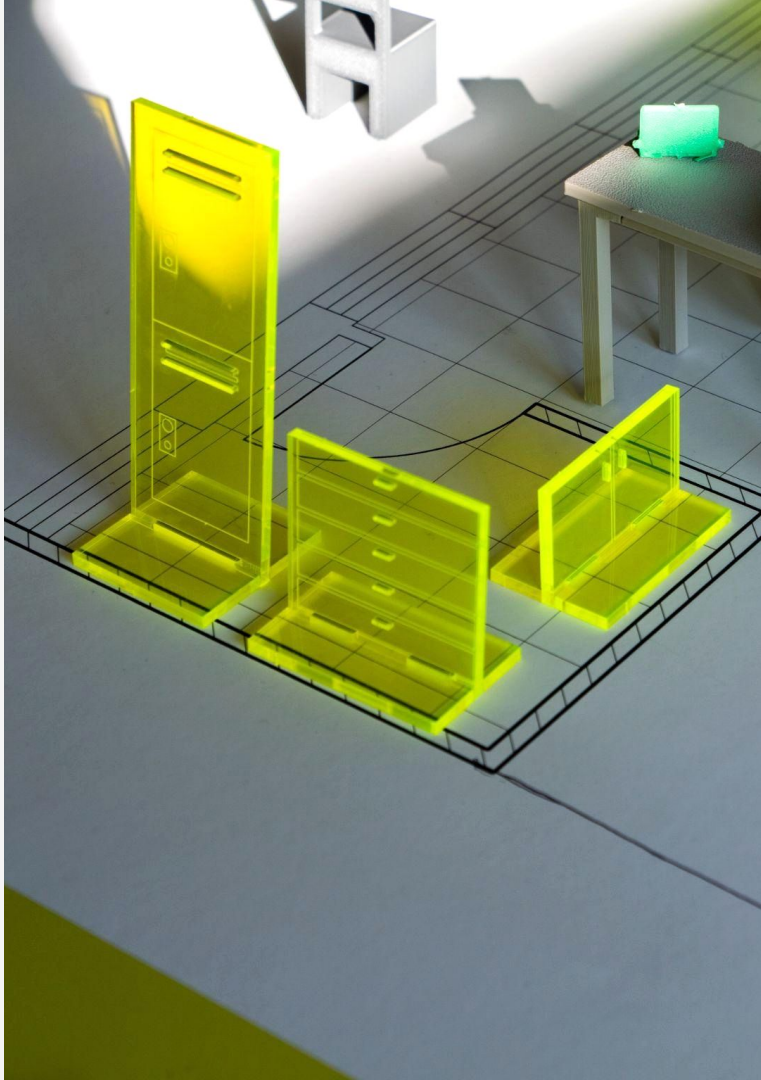



Use a pair of pliers or an utility knife
to cut
DEXTER
EMBROIDERY
PRINTING
HEAT PRESS
SOLDERING STATION
LASER CUTTER
SEWING MACHINE
3D PRINTER


NEL DETTAGLIO
MATERIALI
CONOSCENZE NECESSARIE:
VINCOLI DI CONFIGURAZIONE
DIFFICOLTÀ
COSTO
MACCHINE
MACCHINA DA CUCIRE



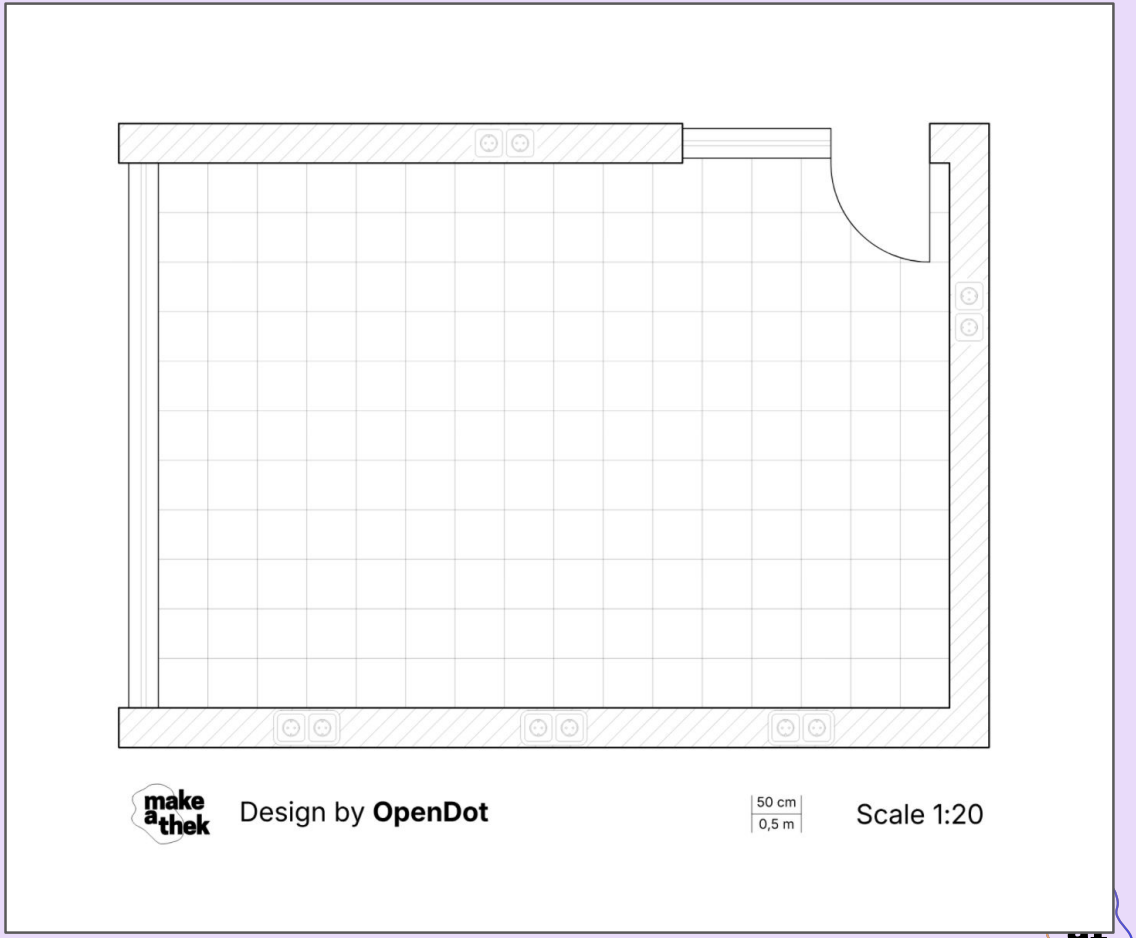

make a thek



What you have to prepare

Planimetry

A printed blank map of your space to use as a canvas for your activity in scale 1:20



How to design a make-a-thek space step by step

Step 1:
Matching Game

What do you need?

Machine Cards, Outputs Cards

→ for a practical introduction
to the machines and their use,
see also the resource 🔗 Machine Cards

How to use

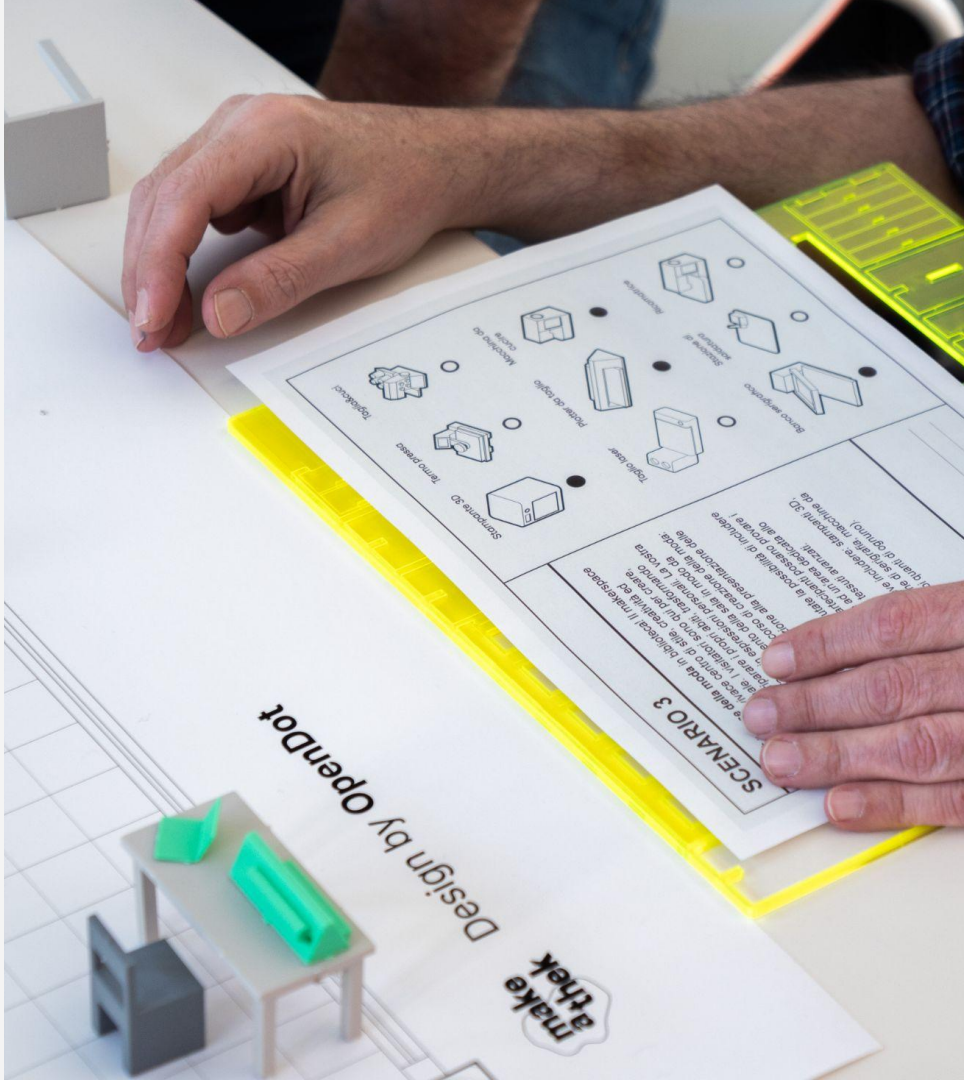
Match the "Result" to the "Tech."

Learn what these machines can actually create for your community.

Step 2: Scenarios

How to write a scenario X

Clearly define the purpose, context, and event the space is designed for. Describe the specific situation and establish any constraints or limits, such as spatial, technical, or functional requirements. Identify any compulsory machines or elements that must be included, as these will guide users in organizing the layout of the space, using the equipment, and positioning the 3D models in the planimetry.



Step 3:
Select the machines

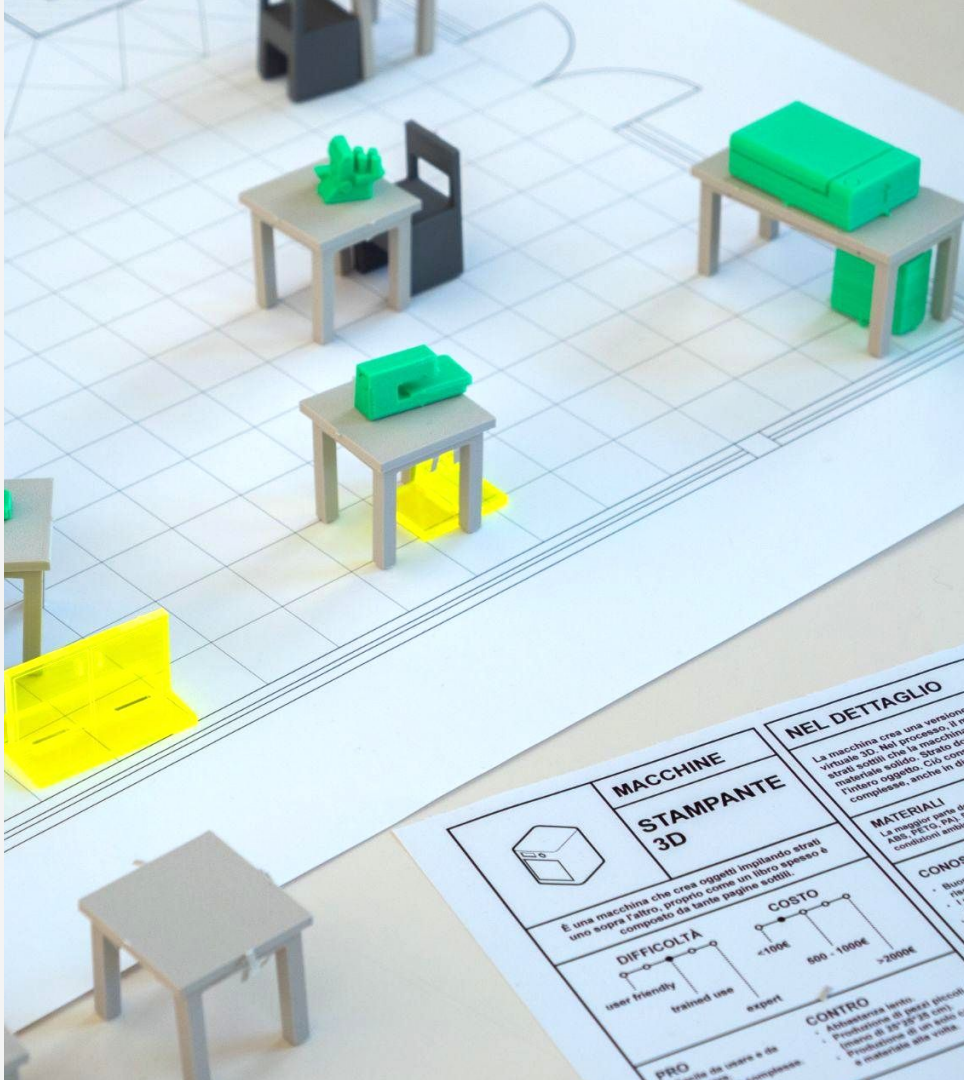
What do you need?

Machine cards, 3D machines models, 3D furniture models, Scale 1:20 planimetry

How to use

Select the machines

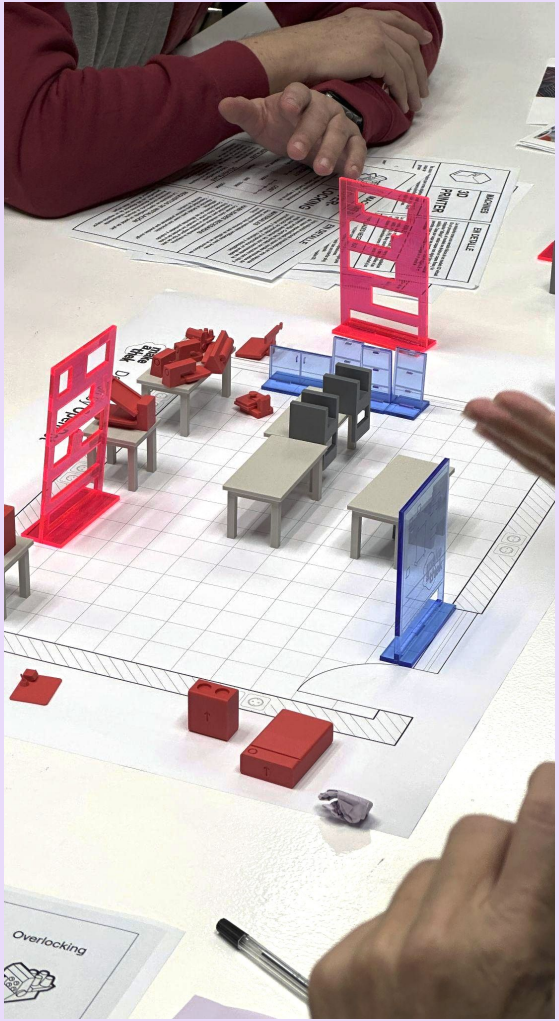
- Choose the ones you have
  or, if you are planning from zero, choose the machines You'd like to have and
- Check the Dimensions (Scale 1:20)
- Look for the constraints



Step 4: Place objects according to the scenario

Once the scenario is clear, start placing furniture, machines and objects in the floor plan.

Do not start from decoration. Start from the largest and most necessary elements.

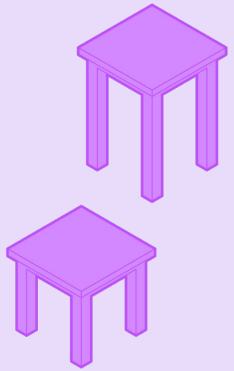


Start with tables

Tables usually occupy the most space and define how people will work. Place them first.

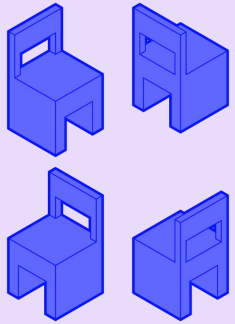
Consider:

- **how many people need to sit or stand;**
- **whether the table is for making, cutting, assembling, displaying or storing;**
- **whether users need to work around all sides;**
- **whether the facilitator needs to move between tables;**
- **whether one empty table is needed for unexpected uses.**



An empty table can be very useful in a lab setting. It can support temporary materials, unfinished work, tools, bags, documentation or last-minute activity needs.

Add chairs



Chairs are often forgotten during space planning.

Add them early.

Check:

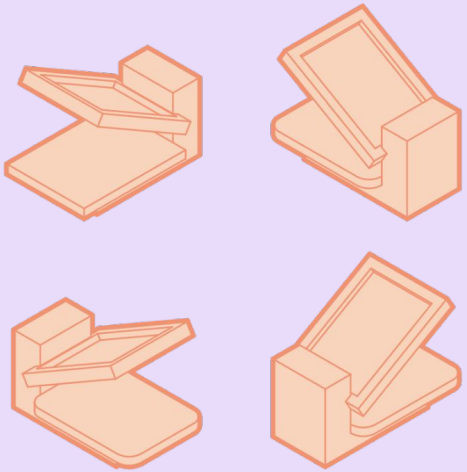
- **does every seated participant have a chair?**
- **can chairs be pulled back without blocking circulation?**
- **is there enough space between chairs and machines?**
- **can users move without disturbing others?**
- **are there chairs for facilitators, observers or waiting users?**

Place machines

Place machines according to use, safety and infrastructure.

Consider:

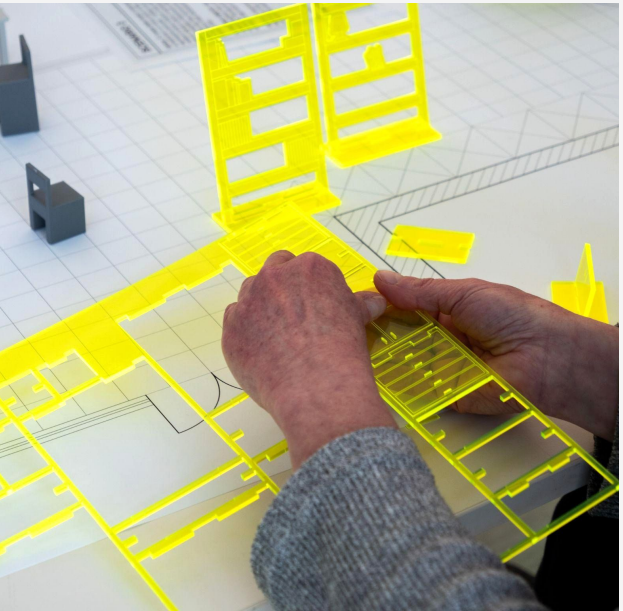
- **power supply, ventilation, heat, noise;**
- **required supervision;**
- **access to computers;**
- **table stability;**
- **space around moving parts**
- **proximity to related tools and materials.**

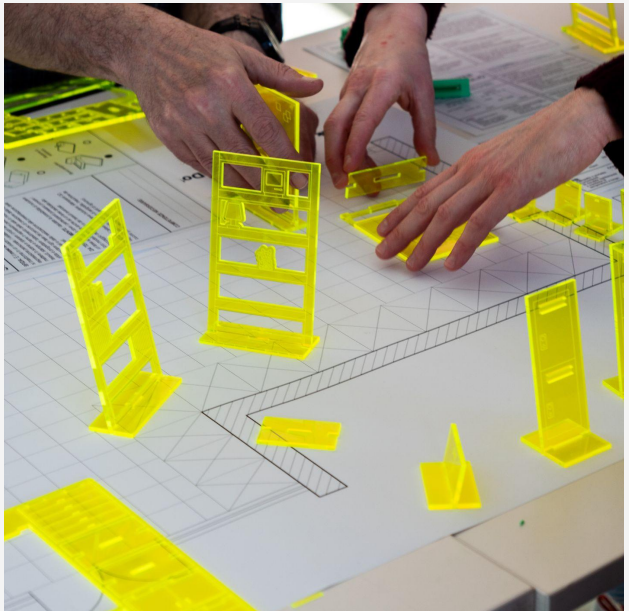


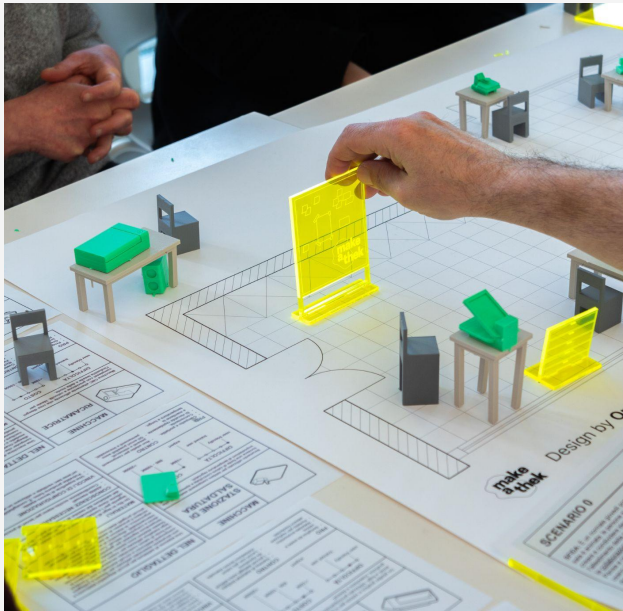
For example, a laser cutter may require ventilation and fume extraction, while a sewing machine may be more flexible and movable. A 3D printer may need a stable surface and should not be moved once a print has started.

Place the acrylics

Add storage. Storage should be planned from the beginning, not added at the end. **A make-a-thek space needs both visible and hidden storage.** Some materials should be easy to access and inspire users, while others need to be protected, sorted or used only with supervision.



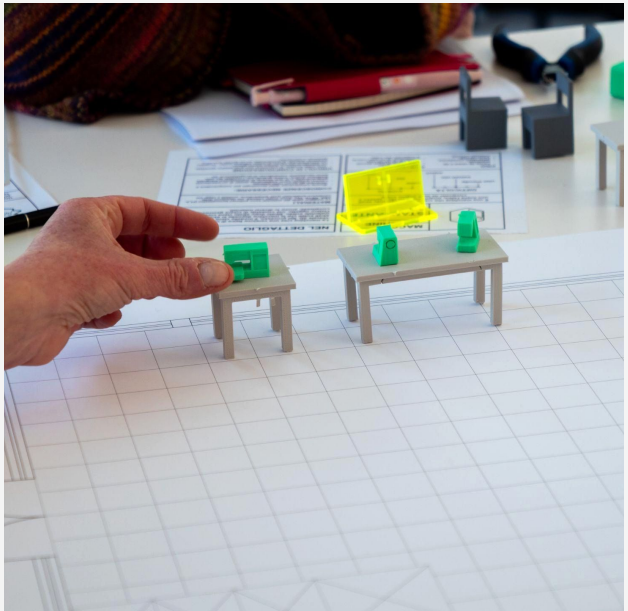


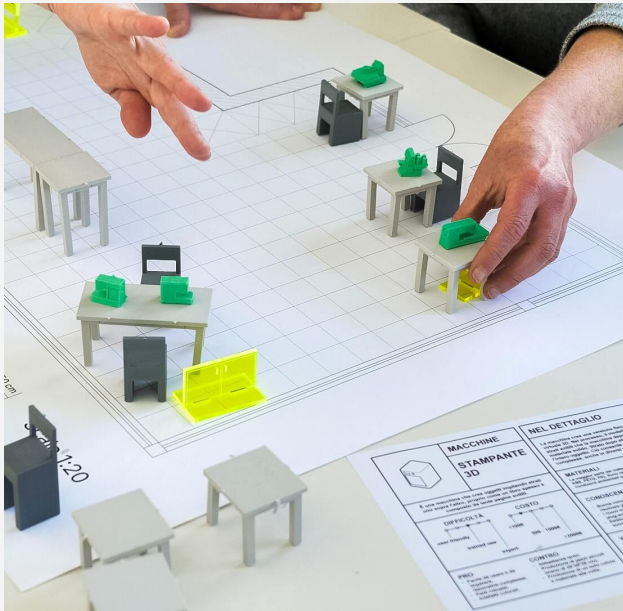


Step 5: Try different layout

Add circulation space. People need to move safely and comfortably.

Add activity and community areas. These areas help the space feel like a shared learning environment, not just a room with equipment.



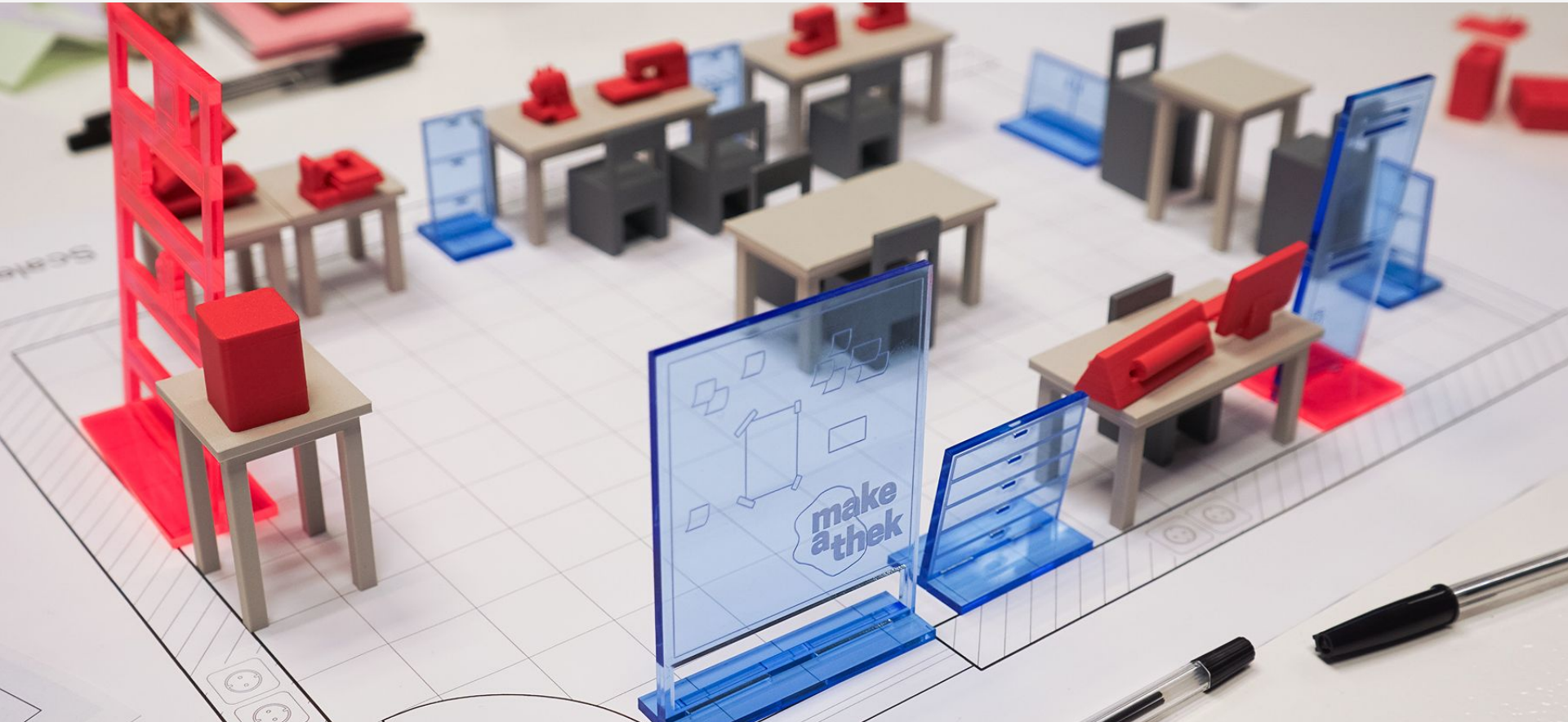


Object placement checklist

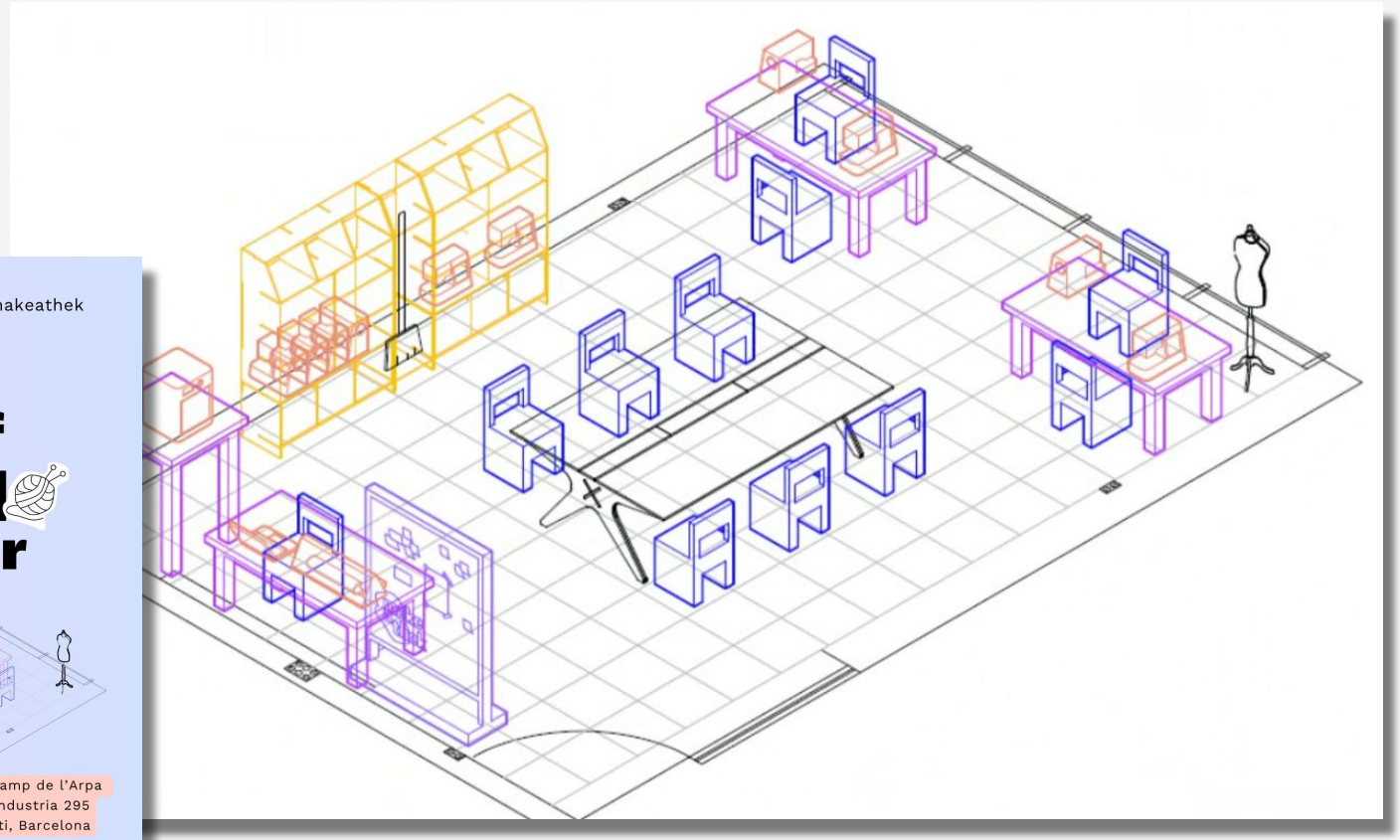
Before confirming the layout, check:

- **Are tables placed first and realistically?**
- **Are there enough chairs?**
- **Is there at least one flexible or empty surface?**
- **Are machines placed according to their infrastructure needs?**
- **Are noisy, hot or fume-producing machines positioned carefully?**
- **Are materials close to the activities that use them?**
- **Is storage visible, accessible and organized?**
- **Can users and facilitators move comfortably?**
- **Are safety distances respected?**
- **Is there space for both individual work and group activities?**
- **Can the layout change over time?**

Step 8: Results



make-a-thek library pilot Barcellona



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28th of April

Opening of L'In[visible] Espai Maker

18:00 - 20:30
Opening ceremony and guided tour :)

Biblioteca Camp de l'Arpa
C/ de la Industria 295
Santi Marti, Barcelona

Funded by the European Union

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Results

make-a-thek library pilot Barcellona

photo credits: Fab Lab Barcelona - make-a-thek space “**L’In[VISIBLE] Espai Maker**”

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"L'In[VISIBLE] Espai Maker"

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make-a-thek space "**L'In[VISIBLE] Espai Maker**"

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make-a-thek space “**L’In[VISIBLE] Espai Maker**”

make-a-thek library pilot Budapest

Final takeaway

A make-a-thek space should not be designed only around objects.
It should be designed around use.
The key question is not only: Where does this machine fit?

But also:

What happens around this machine? Who uses it?
What materials are needed? How do people move?
What activity does it support? How can the space adapt over time?

A good layout is not fixed once and for all. Even a permanent make-a-thek can iterate, change and take shape through use, community feedback and the activities that gradually emerge within it.

Discover more

makeathek.eu

Digital and physical kit designed by
Opendot Foundation
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Funded by
the European Union

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