



What You can do with Machines and Materials

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Summary

A practical guide to match machines, materials and activity ideas for circular fashion, craft and creative prototyping.

A make-a-thek space is not only defined by the machines it contains. It becomes meaningful when machines, materials and people are connected through clear, accessible and relevant activities.

This resource helps understand **what can be made with different machines and materials**, and how to choose simple activities that match their equipment, skills, space and community interests.

It is designed for **beginner users**: libraries that are starting to work with machines and materials, or teams that already have little experience and want to better connect their equipment to circular fashion, craft, repair, reuse and creative experimentation.

The aim is not to provide a full technical manual. Instead, this guide gives a practical overview of:

- **what each machine can do;**
- **which materials it can work with;**
- **what outputs it can produce;**
- **what skills and space conditions are needed;**
- **how machines and materials can become activities for users.**

The examples are intended as **activity ideas**, not as complete technical instructions. Each machine must be used according to its manual, local safety rules, material compatibility charts, and with supervision by trained staff or facilitators where required. This is especially important for machines involving heat, fumes, sharp blades, moving parts, electronics, or textile-specific settings.

1. How to start: choose the right combination

Before planning an activity, start with three simple questions.

1. What machine or tool do you have?

Examples: sewing machine; overlocker; embroidery machine; vinyl cutter; heat press; laser cutter; 3D printer; screen printing set-up; soldering station; analogue tools such as needles, scissors, pots, jars and hand tools.

2. What materials are available?

Examples: fabric scraps; second-hand garments; cotton, linen, denim or felt; paper, cardboard or thin wood; acrylic or other laser-safe sheets; PLA or flexible filament; heat transfer vinyl; embroidery thread; natural dye materials; electronic components; inks, screens and stencils.

3. What should users learn or make?

Examples:

- repair a garment;
- customise a tote bag;
- create a textile sample;
- test natural colours;
- make a stencil;
- produce a lace-like pattern;
- prototype a small object;
- create an embroidered patch;
- build a simple soft circuit;
- document a material experiment.

A good first activity is usually small, clear and achievable. Participants should be able to **understand the process, test the material and leave with a visible result.**

2. Machines and materials overview

2.1 Laser cutter

What it does

A laser cutter uses a focused beam of light to cut or engrave flat materials. It is useful for precise shapes, repeated parts, surface decoration, labels, stencils, patterns and structural components.

It can be used with materials such as paper, cardboard, thin wood, acrylic and selected textiles, but only when the material is confirmed as laser-safe. A laser cutter should never be used with PVC, unknown plastics, artificial leather, chromium-treated leather or any material that may release toxic fumes.



Materials to use

Possible materials include:

- paper;
- cardboard;
- plywood;
- MDF;
- acrylic;
- felt;
- cotton or linen fabric, after testing;
- other laser-safe sheet materials approved by the machine operator.

Natural fabrics such as cotton or linen can be tested. Synthetic fabrics must be checked carefully because they may melt, burn or release fumes.

What users can make

Users can create:

- textile lace patterns;
- stencils for printing;
- modular pieces;
- jewellery components;
- signage, labels;
- garment embellishments;
- material samples;
- exhibition elements;
- small structures or connectors.

Good activity idea

Laser-cut textile patterns

Participants design or adapt a simple vector pattern and test it on fabric, felt, paper or cardboard. They observe how the material changes depending on pattern density, cutting speed, spacing and material type.

Skills needed

- basic 2D design or use of prepared files;
- understanding of vector graphics;
- attention to safety;
- willingness to test materials before producing the final piece.

For beginners, use pre-prepared files and let participants focus on material behaviour and possible applications.

Set-up considerations

A laser cutter needs:

- a stable location;
- an attached computer;
- fume extraction;
- air assist and ventilation;
- supervision during use.

Never leave the laser cutter unattended while it is operating.

Best for

Intermediate users, or beginners with prepared files and facilitation.

2.2 3D printer

What it does

A 3D printer creates physical objects by adding material layer by layer from a digital 3D model. In makerspaces, the most common type is FDM printing, which uses thermoplastic filaments such as PLA, PETG, ABS or TPU.

A 3D printer is useful for small objects, prototypes, connectors, accessories, repair parts and experimental material samples. In textile contexts, it can also be used to test hybrid surfaces by printing directly onto fabric.



Materials to use

Common materials include:

- PLA filament;
- PETG filament;
- TPU flexible filament;
- textile substrates, if printing directly on fabric;
- stabiliser or backing materials for textile experiments.

PLA is often a good starting point because it is widely available and relatively easy to print. Flexible filament can be useful for textile-related experiments, but it may be more difficult to print and usually requires more experience.

What users can make

Users can create:

- small objects;
- buttons;
- accessories;

- repair parts;
- connectors;
- textile embellishments;
- flexible samples;
- experimental surfaces;
- tools for workshops;
- components for displays or material libraries.

Good activity idea

3D printing on textiles

Participants print small patterns or components directly onto fabric. They test how filament adheres to cotton, linen, mesh or other textile surfaces.

Adhesion depends on fabric structure, filament type, bed temperature, print settings and how the textile is fixed to the print bed. This activity should always be facilitated by someone with prior 3D printing experience.

Skills needed

- basic understanding of 3D printing;
- ability to use or modify a prepared 3D file;
- basic slicing knowledge;
- patience, as prints can take time;
- troubleshooting support from a facilitator.

Set-up considerations

A 3D printer needs:

- a stable surface;
- computer and slicing software;
- filament storage;
- time for test prints;
- monitoring of the first layers;
- enough space to avoid moving the machine during printing.

The machine can be slow, and prints may fail. This should be presented as part of the learning process.

Best for

Intermediate users. Beginners can participate if the facilitator prepares the files and settings in advance.

2.3 Vinyl cutter

What it does

A vinyl cutter uses a small blade to cut thin sheet materials following vector paths. It is fast, relatively accessible and useful for stickers, textile graphics, masks, stencils, signage and simple customisation.

It works best with thin films and sheet-like materials. It should not be presented as a general fabric-cutting machine unless the specific machine, blade and material are suitable.



Materials to use

Suitable materials include:

- adhesive vinyl;
- heat transfer vinyl;
- stencil film;
- paper;
- thin flexible sheets;
- copper tape or copper foil for simple circuits.

What users can make

Users can create:

- stickers;
- signs;
- labels;
- textile graphics;
- tote bag decorations;
- stencils for screen printing;
- simple visual identity elements for the make-a-thek space;
- copper traces for basic electronic experiments.

Good activity idea

Cut and transfer a textile graphic

Participants create or choose a simple vector design, cut it in heat transfer vinyl, remove excess material and apply it to a tote bag or T-shirt using a heat press.

Skills needed

- basic 2D vector design, or use of prepared files;
- manual precision for weeding;
- ability to understand positive and negative shapes;
- attention to scale and material limits.

Set-up considerations

A vinyl cutter needs:

- a table or desk, and space for long sheets;
- an attached computer;
- weeding tools;
- transfer tape or heat transfer materials.

Very small details can be difficult to cut and weed. Start with bold, simple shapes.

Best for

Beginners and intermediate users.

2.4 Heat press

What it does



A heat press transfers graphics onto textiles using heat, pressure and time. It is commonly used with heat transfer vinyl, sublimation prints or transfer papers. It can support fast customisation of garments, bags and textile samples.

Materials to use

Suitable materials include:

- cotton textiles;
- polyester textiles, with care;
- tote bags;
- T-shirts;
- heat transfer vinyl;
- transfer paper;
- textile samples.

Always follow the technical datasheet of the transfer material. Different heat transfer vinyls, transfer papers and fabrics require different temperature, pressure, time and peeling conditions.

Polyester can be used, but it is more heat-sensitive than cotton and may scorch, shrink, shine or deform if the temperature is too high.

What users can make

Users can create:

- customised T-shirts;
- tote bags;
- patches;
- textile labels;
- workshop merchandise;
- visual identity items;
- graphic statements;
- layered textile experiments.

Good activity idea

Make a custom tote bag

Participants cut a simple design with a vinyl cutter and transfer it onto a tote bag using the heat press. This provides a complete design-to-object process in one session.

Skills needed

- very basic machine operation;

- understanding of heat, time and pressure;
- ability to position graphics on fabric;
- careful handling of hot surfaces.

Set-up considerations

A heat press needs:

- a stable table;
- clear space around the machine;
- heat-resistant gloves;
- supervision;
- enough ventilation and safety distance.

The machine gets very hot. Children should only use it under close supervision.

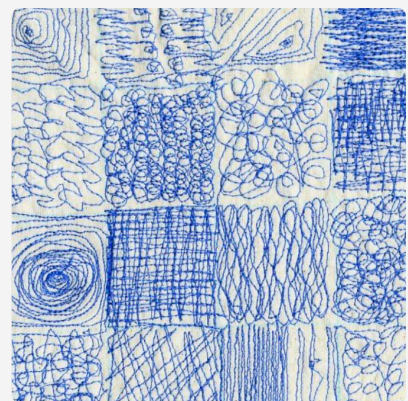
Best for

Beginners and intermediate users.

2.5 Sewing machine

What it does

A sewing machine stitches fabric using thread. It is one of the most useful tools for repair, textile construction, soft prototyping and fashion-related activities. It can support both basic learning and more structured garment work.



Materials to use

Suitable materials include: cotton; linen; light or medium-weight denim; polyester; second-hand garments; fabric scraps; thread; elastic; ribbons; buttons; patches.

Standard sewing machines work well with many light and medium-weight fabrics. Heavy denim, thick layers, leather-like materials or technical textiles may require specific needles, thread, settings or a stronger machine.

What users can make

Users can create:

- repaired garments;
- tote bags;
- simple accessories;
- textile samples;
- patches;
- soft prototypes;
- seams and hems;
- customised clothing;
- upcycled fashion pieces.

Good activity idea

Repair and customisation workshop

Participants bring garments from home and learn basic repair or customisation techniques, such as patching, hemming, visible repair, adding fabric details or adapting an existing item. This type of activity supports sustainable fashion through repair and upcycling.

Skills needed

- basic sewing knowledge;
- hand-eye coordination;
- understanding of threading and stitch settings;
- ability to troubleshoot common problems such as tangled thread or skipped stitches.

Set-up considerations

A sewing machine needs:

- a table with good lighting, space around the machine for fabric movement;
- a foot pedal;
- basic maintenance and cleaning;
- facilitator support for beginners.

Best for

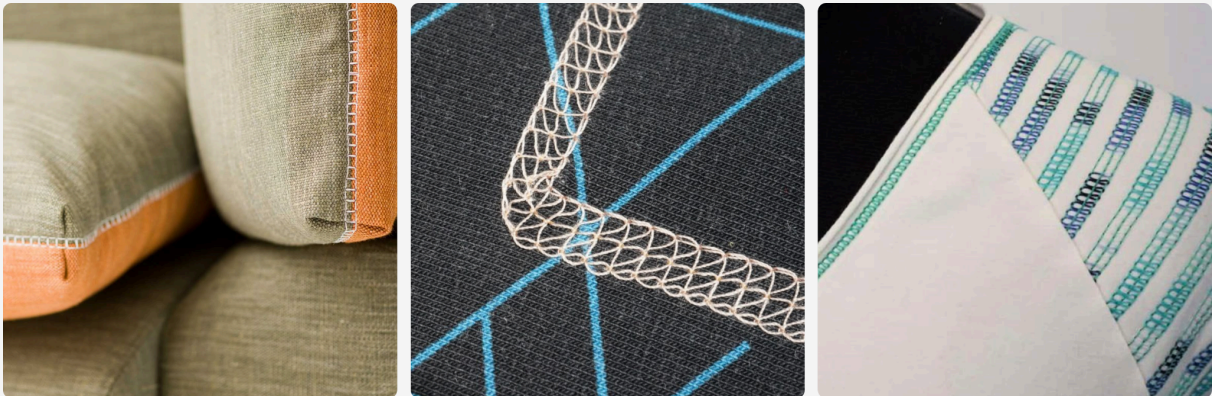
Beginners and intermediate users.

2.6 Overlocker

What it does

An overlocker is a specialised sewing machine used to trim, stitch and finish fabric edges in one step. It creates clean, professional seams and helps prevent fabric from fraying.

Overlockers are especially useful for knit and stretch fabrics, but they can also finish edges on many woven fabrics.



Materials to use

Suitable materials include: woven fabrics; jersey; stretch fabrics; garment pieces; fabric scraps for testing; suitable overlocker thread.

What users can make

Users can create:

- finished seams;
- clean hems;
- garment edges;
- stretchwear samples;
- repaired seams;
- professional-looking textile prototypes.

Good activity idea

From rough edge to finished seam

Participants compare raw fabric edges, regular sewing seams and overlocked edges. They test how different fabrics behave and understand why finishing matters in garment construction.

Skills needed

- basic sewing experience;
- ability to thread the machine correctly;
- understanding of tension settings;
- attention to fabric handling;
- facilitator support for troubleshooting.

Set-up considerations

An overlocker can be more difficult to set up than a regular sewing machine. It needs:

- a stable table;
- space for fabric movement;
- foot pedal access;
- regular maintenance;
- enough time for demonstration and practice.

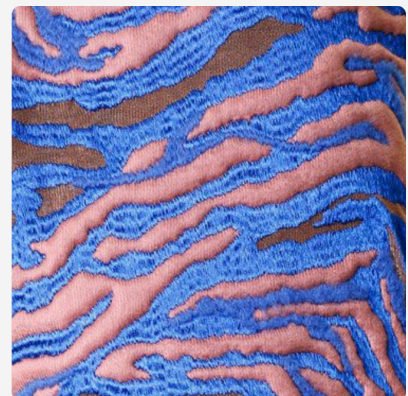
Best for

Intermediate users, or beginners who already have some sewing experience.

2.7 Embroidery machine

What it does

An embroidery machine is a computer-controlled machine that stitches digital patterns onto fabric. It can create detailed, repeated and consistent designs with thread.



Materials to use

Suitable materials include:

- cotton (ex. t-shirts, tote bags);
- stable woven fabrics;
- denim;
- patches;
- embroidery thread;
- and prepared embroidery files.

Polyester embroidery thread is commonly used because it is strong and durable, but other embroidery threads may be used depending on the machine, fabric and desired effect.

Stable woven fabrics are easier for beginners. Stretch fabrics can be embroidered, but they usually require appropriate stabiliser and more experience.

What users can make

Users can create:

- embroidered patches;
- garment customisation;
- textile labels;
- decorative motifs;
- logos;
- community symbols;
- repair patches;
- textile storytelling samples.

Good activity idea

Embroidered identity patch

Participants choose or adapt a simple motif and embroider it onto a patch or textile sample. The patch can later be sewn onto a garment or displayed as part of a community textile archive.

Skills needed

- basic computer use;
- understanding of embroidery files;
- knowledge of fabric and stabiliser;
- ability to thread the machine;
- patience during machine set-up;
- troubleshooting support.

Set-up considerations

An embroidery machine needs:

- enough space for the moving frame;
- a stable surface;
- good access to the front of the machine;
- prepared digital files;
- thread and stabiliser;
- supervision during operation.

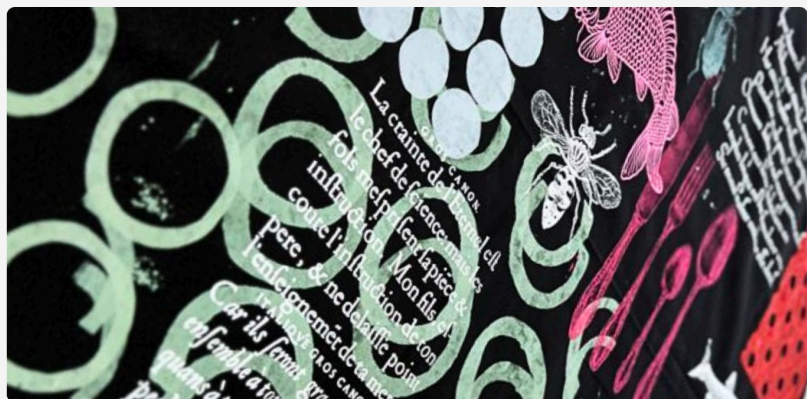
Best for

Intermediate users. Beginners can participate if the digital file and machine set-up are prepared in advance.

2.8 Screen printing

What it does

Screen printing transfers ink through a mesh screen onto fabric or another surface. It is useful for bold, graphic and repeatable designs, especially when producing several copies.



Materials to use

Suitable materials include:

- textile ink; screens; squeegees; emulsion; stencils;
- cotton textiles, tote bags, T-shirts or paper;
- drying racks.

Textile inks usually need drying and, depending on the ink, heat curing or fixing to become wash-resistant.

What users can make

Users can create:

- printed tote bags, T-shirts, posters;
- textile graphics;
- campaign materials;
- repeated patterns;
- collaborative printed pieces.

Good activity idea

Print a shared make-a-thek message

Participants create a simple collective graphic or slogan linked to circularity, repair or community making. The same screen can be used to print on tote bags, patches or paper. For beginners, it is easier to start with pre-prepared screens or simple stencils rather than exposing and preparing screens from scratch.

Skills needed

- manual precision;
- understanding of stencil or screen preparation;
- basic graphic design;
- ability to manage ink and cleaning.

Set-up considerations

Screen printing needs:

- a sturdy and level surface;
- space for drying;
- access to water for cleaning;
- storage for screens and inks;
- time for preparation and clean-up.

It can be more labour-intensive than heat press or vinyl cutting, but it works well for group activities.

Best for

Intermediate users, or beginners in a well-prepared workshop.

2.9 Soldering station

What it does

A soldering station uses controlled heat to join electronic components with solder. It is useful for small electronics, repairs, simple circuits and e-textile experiments.

When combining electronics and textiles, solder components separately where possible, then integrate them into the textile using conductive thread, sewable components, snaps or protected connections.



Materials to use

Suitable materials include:

- solder;
- wires;
- LEDs;
- resistors;
- small circuit boards;
- conductive thread;
- conductive fabric;
- copper tape;
- textile samples for e-textiles;
- basic electronic components.

Lead-free solder is recommended in educational settings.

What users can make

Users can create:

- simple circuits;
- LED badges;
- wearable light elements;

- interactive textile samples;
- repaired wires;
- basic electronic prototypes;
- conductive textile experiments.

Good activity idea

Soft circuit sample

Participants create a simple circuit using conductive thread, LEDs and a small battery holder. The sample can be attached to fabric to introduce the relationship between textiles and electronics.

Skills needed

- manual precision;
- hand-eye coordination;
- basic understanding of circuits;
- patience;
- safety awareness.

Set-up considerations

A soldering station needs:

- a stable desk;
- ventilation or fume extraction;
- heat-safe surface;
- safety instructions;
- careful supervision;
- storage for small components.

Avoid direct soldering close to delicate textiles unless the process is specifically designed and safely managed.

Best for

Intermediate users, or beginners with close facilitation.

3. Material families and what they can become

3.1 Reused textiles and garments

Examples

- old shirts;
- damaged jeans;
- second-hand clothes;
- textile scraps;
- donated garments;
- tote bags;
- curtains or household textiles.

Machines and tools that work well

- sewing machine;
- overlocker;
- embroidery machine;
- heat press;
- vinyl cutter;
- laser cutter, only with safe and tested fabrics;
- hand tools.

Possible outputs

- repaired garments;
- customised clothing;
- tote bags;
- patches;
- textile samples;
- embroidered details;
- printed graphics;
- laser-cut patterns;
- upcycled accessories.

Good first activity

Repair and customisation workshop.

3.2 Paper, cardboard and thin sheet materials

Examples

- recycled paper;
- cardboard;
- stencil film;
- thin wood;
- acrylic;
- adhesive vinyl;
- copper tape.

Machines and tools that work well

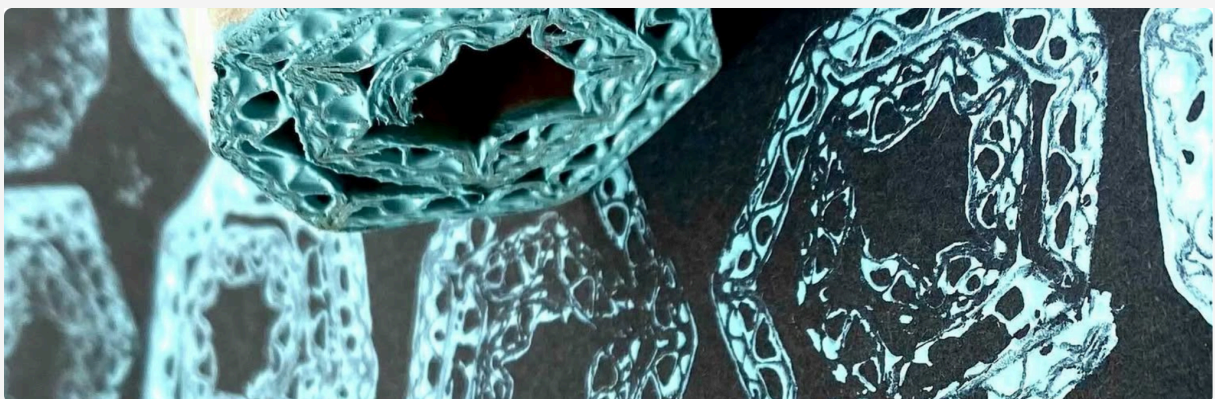
- laser cutter;
- vinyl cutter;
- screen printing tools;
- hand cutting tools;
- soldering station, for copper tape circuits.

Possible outputs

- stencils;
- labels;
- signs;
- stickers;
- packaging prototypes;
- display elements;
- exhibition materials.

Good first activity

Make labels, signs or stencils for the make-a-thek space.



3.3 Natural and waste-based dye materials

Examples

- onion skins;
- avocado pits and skins; pomegranate skins; walnut husks;
- coffee grounds, tea leaves;
- oak leaves; flowers; garden waste;
- berries;
- safe local plants.

The natural dyes material list suggests paper, recycled paper, fabric scraps, cotton, linen, wool, ribbons and cords as possible substrates, together with jars, pots, strainers, labels and drying tools.

Machines and tools that work well

No digital machine is required.

Useful tools include:

pots; kettles; jars; strainers; drying racks; labels; gloves; aprons.

Possible outputs

- dyed fabric samples;
- paper colour tests;
- local colour palettes;
- workshop archives;
- community dye logbooks;
- material samples;
- eco-print experiments.

Important note

Natural dye results may not be wash-fast or light-fast unless appropriate mordanting and fixing processes are used. For beginner workshops, samples can be treated as exploratory or decorative material tests.

Good first activity

Natural dyes and local colour palette.

3.4 Digital fabrication materials

Examples

- PLA filament;
- TPU flexible filament;
- PETG;
- acrylic;
- plywood;
- MDF;
- laser-safe textile;
- heat transfer / adhesive vinyl.

Machines and tools

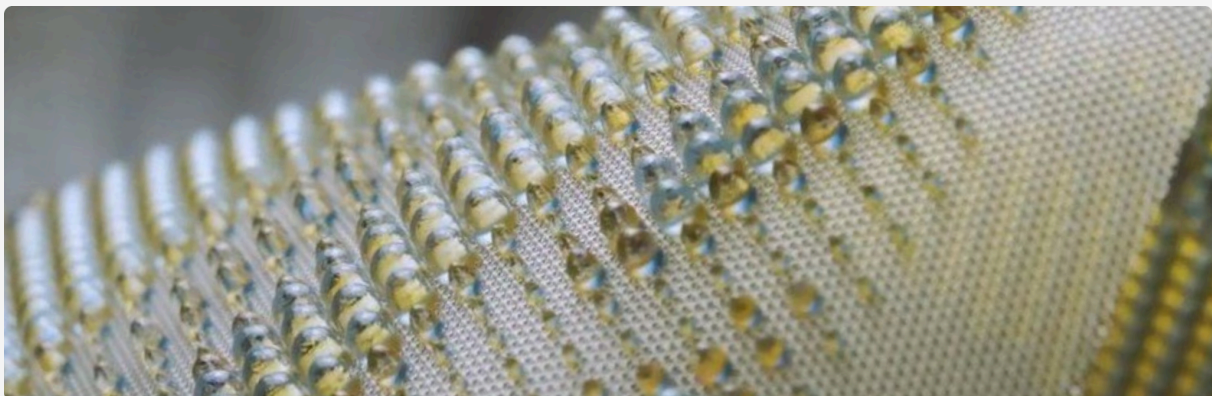
- 3D printer;
- laser cutter;
- vinyl cutter;
- heat press.

Possible outputs

- 3D printed accessories;
- textile embellishments;
- flexible samples;
- laser-cut lace;
- stickers;
- heat-pressed graphics, stencils

Good first activity

Vinyl cutter and heat press customisation. For more experienced groups, 3D printing on textiles or laser-cut textile samples can be introduced as intermediate activities.



3.5 Threads, yarns and stitching materials

Examples

- thread (cotton, polyester, embroidery thread)
- wool; yarn; ribbons;
- cords;
- beads.

Machines and tools

- sewing machine;
- embroidery machine;
- overlocker;
- hand sewing tools;

Possible outputs

- embroidered samples;
- visible repair;
- patches;
- textile stories;
- decorative seams;
- finished edges.

Good first activity

Basic embroidery machine workshop

Participants use a pre-prepared digital embroidery file to create a simple patch, label, or small decorative sample on stable fabric. The facilitator prepares the machine, hoop, stabiliser, thread, and file in advance, so participants can focus on understanding the process: how the fabric is hooped, how the machine reads the design, how stitching builds the image, and how different fabrics and threads affect the final result.



Choosing the right machine for your activity

Summary table

If you want to...	Use this machine	Materials	Level of expertise
Repair or alter garments	Sewing machine	Reused textiles, thread, patches	Beginner
Explore local colour	Analogue dye tools	Plants, waste, fabric, paper	Beginner
Prototype small objects	3D printer	PLA, PETG, TPU	Beginner
Create graphic textile designs	Vinyl cutter + heat press	HTV, cotton, tote bags	Beginner and Intermediate
Add detailed textile decoration	Embroidery machine	Fabric, stabiliser, thread	Beginner and Intermediate
Finish textile edges	Overlocker	Fabric, thread	Beginner and Intermediate
Produce repeated graphic prints	Screen printing	Ink, screens, textiles	Beginner and Intermediate
Create precise patterns or stencils	Laser cutter	Paper, cardboard, felt, wood	Beginner and Intermediate
Experiment with hybrid textiles	3D printer	Fabric + filament	Intermediate
Add simple electronics	Soldering station	LEDs, wires, conductive thread	Intermediate

Final checklist for facilitators

Before the activity

- Choose one machine or process.
- Select safe, available, second-hand materials.
- Test the machine settings.
- Prepare samples and examples.
- Prepare beginner-friendly files if needed.
- Check space, ventilation and safety.
- Define one clear output.
- Prepare labels for documentation.

During the activity

- Explain what the machine does.
- Show the material before and after the process.
- Demonstrate each step slowly, and start with a small test.
- Encourage participants to observe material behaviour.
- Support different skill levels.
- Keep safety rules visible.

After the activity

- Collect samples.
- Photograph outcomes, with consent.
- Note what worked and what failed.
- Save useful settings.
- Ask participants what they would like to try next.
- Use the results to plan the next activity.

Key Takeaway

Machines are not the starting point by themselves. The real starting point is the relationship between: **machine + material + user need + learning objective.**

A sewing machine becomes meaningful when it helps someone repair a garment. A laser cutter becomes meaningful when it helps users explore pattern, structure or reuse. A 3D printer becomes meaningful when it supports a useful prototype or a material experiment. **The role of the make-a-thek is to make these connections visible, accessible and open to experimentation.**