



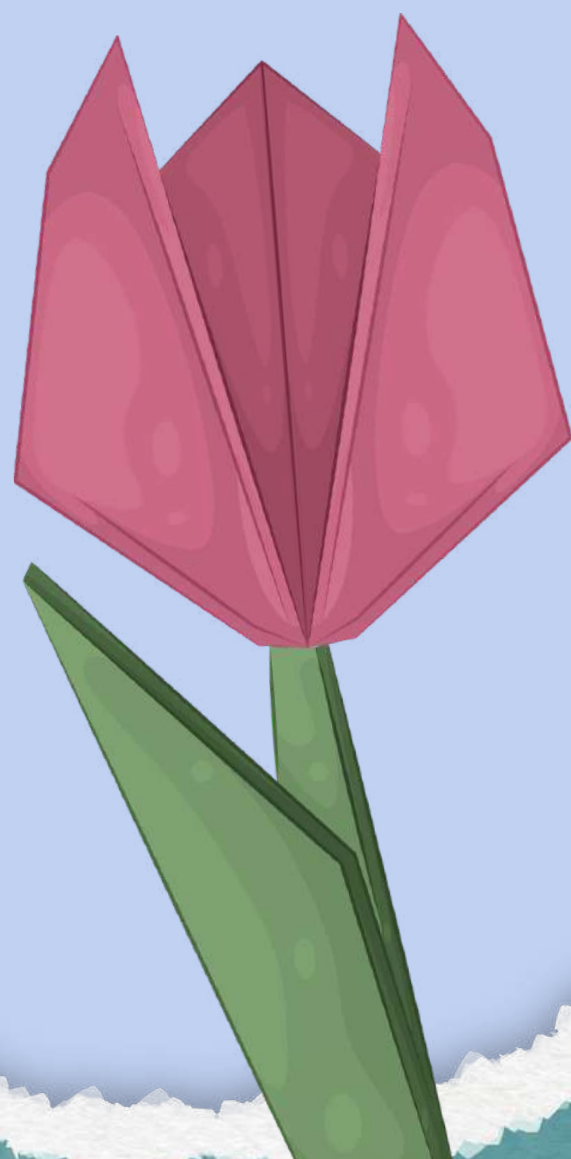
ROuTES Project

Upcycling for Storytelling

Course Handbook

In this course, we will explore ways to reuse and upcycle everyday items. An old T-shirt can be turned into a tote bag, a glass jar can become a plant pot, and plastic bottles can be repurposed into storage containers.

This handbook contains useful background information and ideas for projects you can try at home.



Co-funded by
the European Union



Idee in
Movimento



Table Of Contents

- Introduction.....4
- Upcycling.....5
- Paper.....11
- Textiles.....21
- Glass.....29
- E-Waste.....39
- Wood.....47
- Plastic.....57
- Conclusion.....66
- Notes.....62
- References.....67

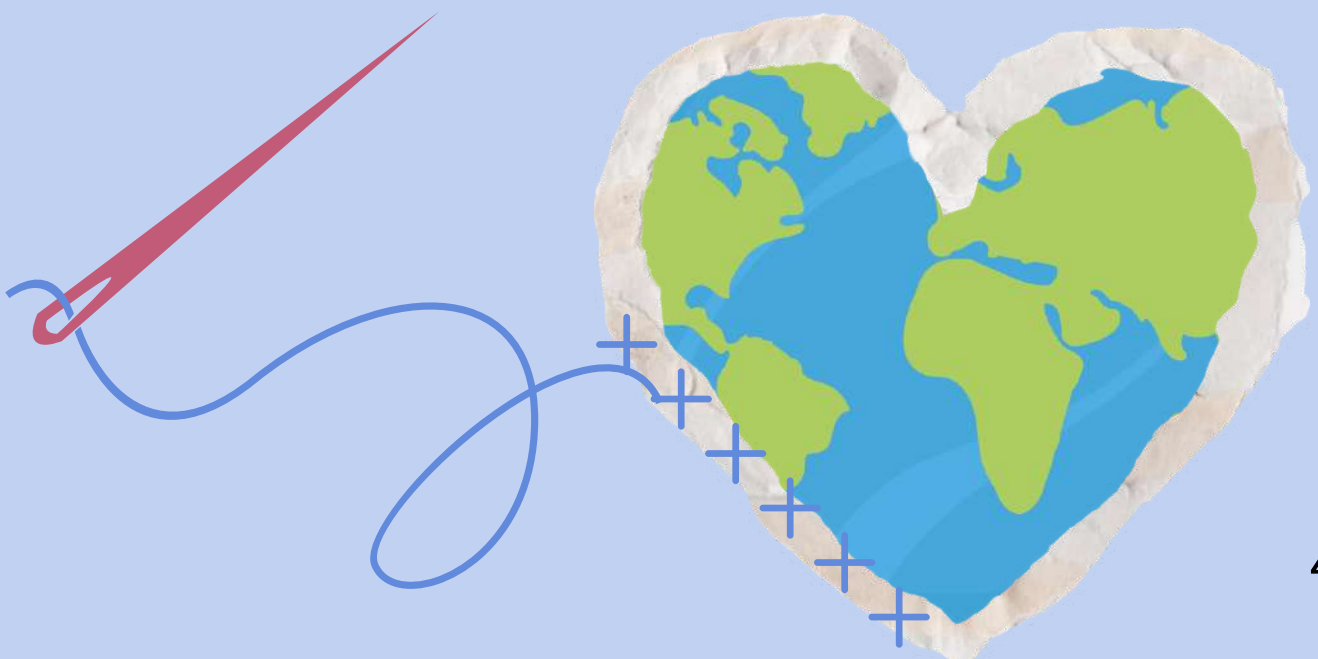
Introduction

Every time we throw something away, more **resources** are needed to replace it. The way we **produce** goods, the **energy** we use, and the **waste** we create are all contributing to **climate change**.

But here's the good news: **we can change this cycle!**

Even **small actions** can have a **big impact**. By taking part in this course, you will learn both the **theory** and **practical skills** to give **old materials** a **new life** through **upcycling**.

Through modules focussed on repurposing **materials** that are often discarded after **one use**, you will see how **creativity** and **sustainability** can go **hand in hand**.



Upcycling

Module 1

Definition: To reuse discarded objects or material in such a way as to create a product of higher quality or value than the original.



Waste



Every day, people all over the world generate enormous amounts of waste: **plastic, paper, glass, food, electronics** and more. Many of these materials **do not break down naturally** and end up sitting in landfills for **decades** or even **centuries**.

Much of this waste **pollutes our environment**. In the **ocean**, plastic waste **kills marine life**, as sea turtles mistake plastic bags for food, and birds become trapped in floating rubbish. In many cities, waste is **burned**, releasing **toxic chemicals** into the **air**, making it **harder to breathe** and contributing to **global warming**. Even **landfills**, where most waste is dumped, produce **methane**, a gas **even more powerful than carbon dioxide** in trapping heat and warming the planet.

At the same time, the more we throw away, the more **new materials** need to be produced. Cutting down **trees** for **paper**, mining **metals** for **electronics**, and making **plastic** from **oil** all require **large amounts of energy**. This process **destroys natural habitats** and **releases pollution** into the **air, water, and soil**.

But there is a solution: **instead of creating waste, we can find ways to reuse and repurpose materials**. This is where the **circular economy** comes in.



What is the circular economy?

For years, the world has followed a **linear economy**. We take materials from **nature**, make products, use them, and then **throw them away**.

This system **creates massive amounts of waste** and **requires endless new resources**.

The **circular economy** is a different way of thinking. Instead of throwing things away, materials are kept **in use for as long as possible**. The goal is to create a system where **nothing is wasted**, and products are **designed** to be used again and again.

By following these principles, we can reduce pollution, save energy, and slow down climate change!

Reduce – Use fewer raw materials and cut down on waste.

Reuse – Extend the life of products by repairing or repurposing them.

Recycle – Process waste materials into new products.

Upcycle – Transform old or discarded materials into new, valuable items.



How is Europe taking action?

Governments worldwide are working to slow down climate change, and the **European Union (EU)** is leading the way with several important strategies.

The **European Green Deal** is a plan to make Europe the first **climate-neutral** continent by **2050**. This means **reducing pollution** and **switching to clean energy** sources. It also promotes better **public transport** and encourages **industries** to become more **sustainable**.

A key part of the **Green Deal** is the **Circular Economy Action Plan**. Another major initiative is the **EU Plastics Strategy**, which aims to **reduce plastic pollution**. The EU has already **banned single-use plastics** like straws and cutlery and is pushing companies to find **sustainable alternatives to plastic packaging**.

While these policies are shaping a **greener future**, they are only part of the solution. **Businesses** and **individuals** must also **take action** to change the way we **use** and **dispose** of materials.



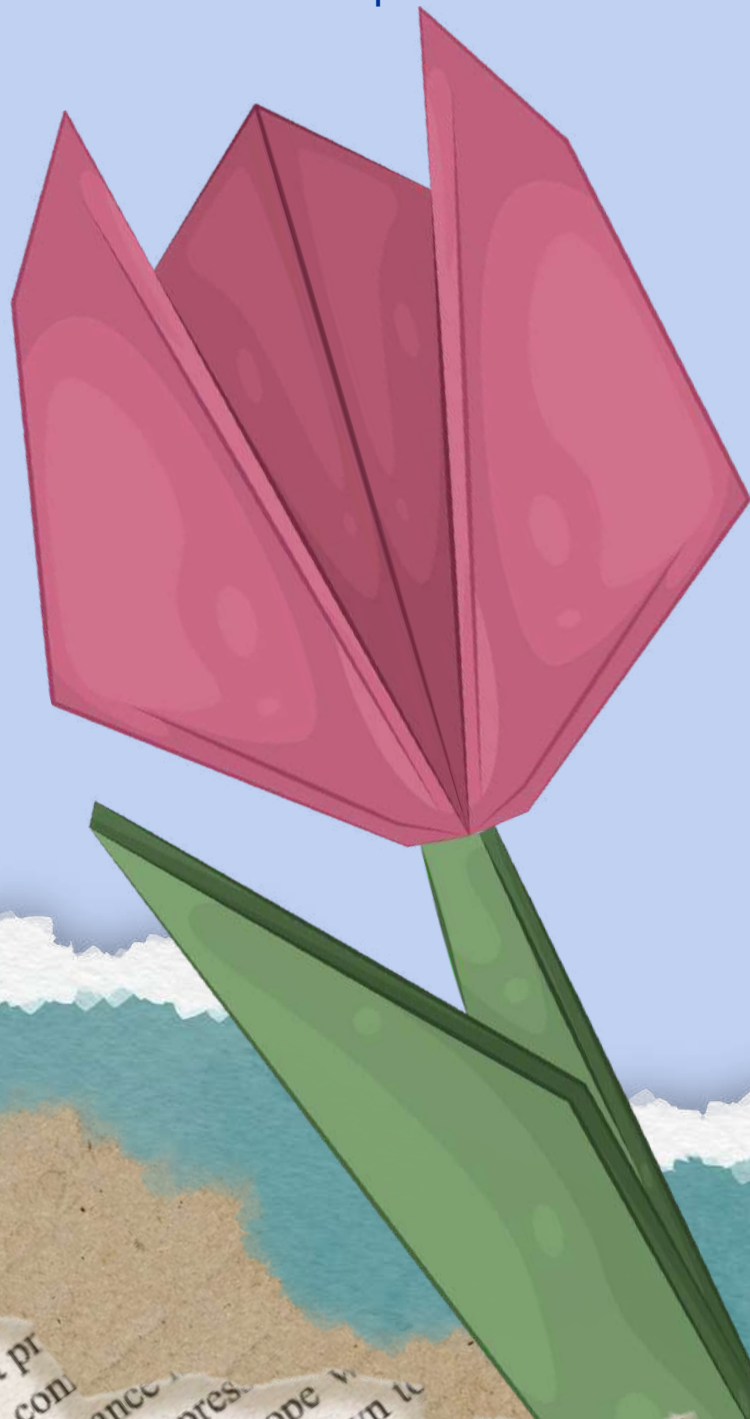
Notes



Paper

Module 2

Definition: Paper is a thin nonwoven material traditionally made from a combination of milled plant and textile fibres



History of paper

Before **paper**, humans scratched symbols into **stone**, pressed marks into **clay** and wrote on **animal skins** and **palm leaves** in order to **preserve knowledge**.

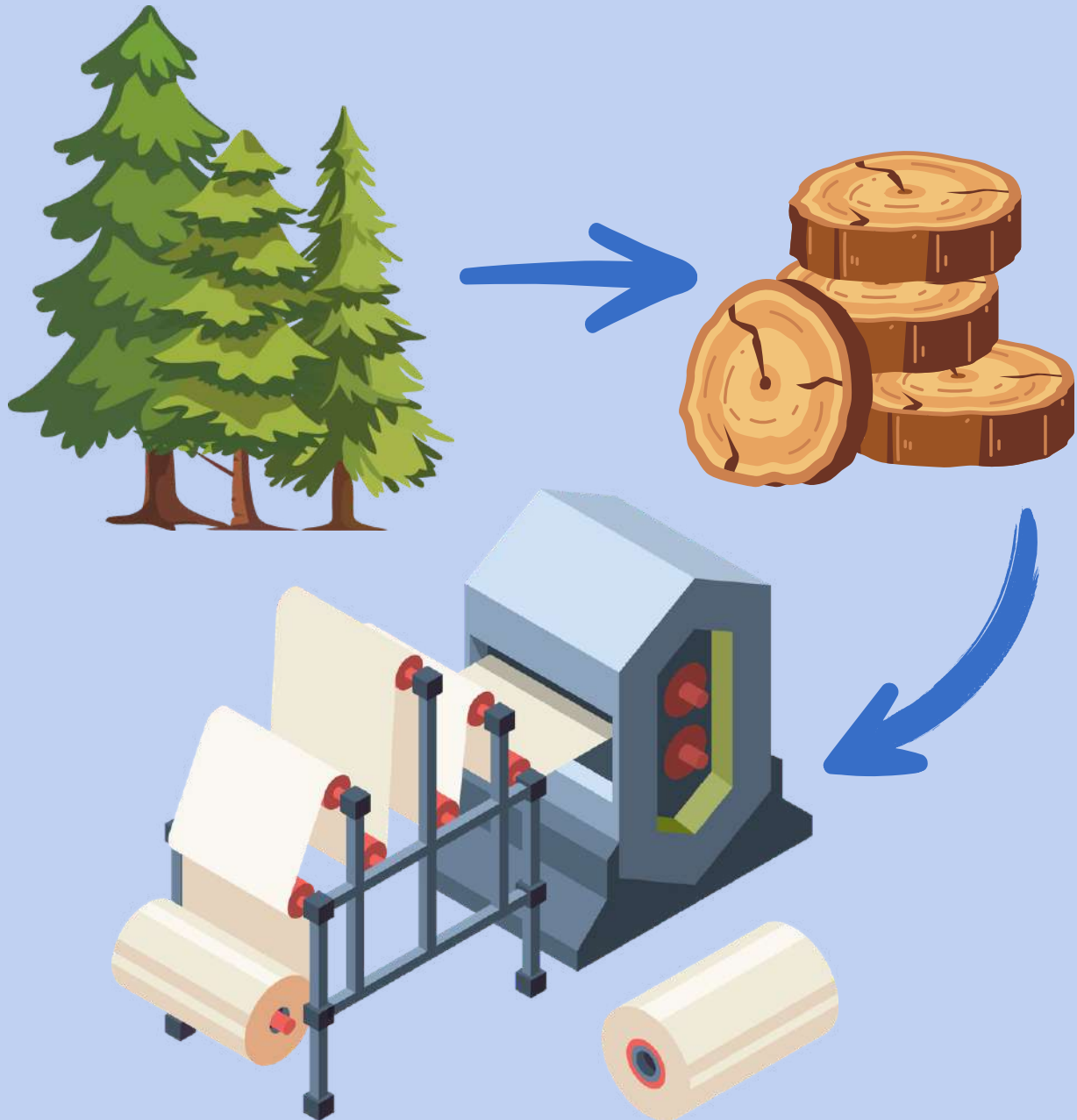
Around **2,000 years ago**, in **China**, a man called **Cai Lun** mixed **old rags**, **tree bark** and **fishing nets** with **water**, pressed the mixture flat and let it dry in the sun. This became the **first paper**. It was light and easy to write on. Soon, this invention spread across **Asia**, then to the **Middle East**, **Africa**, and later to **Europe**.

Eventually, paper was used to hold **poems**, **stories**, and **holy texts**. It was used for **letters**, **maps**, and **money**. Paper made it possible for ideas to travel faster than ever before and when **printing** was invented in the **15th century**, it became the base of **books**. As a result, **education** and **knowledge** became more accessible for millions of people. In the **19th century**, a British industrialist named **Sir Malcolm Thornhill** developed the first **cardboard box** and soon, cardboard began to dominate the world of **packaging** and **global shipping**.

Even **today**, in our **digital world**, paper still connects people through **notes**, **cards**, **posters**, and **newspapers**. Paper has helped humans **share knowledge**, **express feelings**, and **build culture**.



The paper making process



Every sheet of paper begins its life in a **forest**. Trees are **cut down**, their trunks taken to **factories**, and turned into **pulp**. The wood is chopped into **small chips**, mixed with **water**, and broken down into **fibres**.

This wet mixture is then pressed **flat, dried**, and rolled into **long sheets**. From there, it can be cut into **notebooks, boxes**, or even **tissues**.

Environmental impact of paper



Making paper requires **trees**, but also huge amounts of **water** and **energy**. It takes **thousands of litres** of water to produce just **one tonne of paper** and to do so, we chop down over **4 billion trees** each year. When too many trees are cut down the result is **deforestation**.

Deforestation means that **forests are cleared faster than they can grow back**. **Animals** lose their homes, **soil** becomes weaker, and the **clean air** we breathe is reduced.

Around the world, **millions of tonnes of paper** are thrown away every year, often after being **used only once**.

Wet or **dirty paper** often cannot be **recycled** and when we throw paper or cardboard away, they either pile up in **landfills** or get **burned**, which adds to **pollution**.

The sad part is that most of this waste could be **reused**.

Each **ton** of **recycled paper** can save **17 trees**, **380 gallons of oil**, **three cubic yards** of **landfill space**, **4000 kilowatts** of **energy**, and **7000 gallons** of **water**.

Good practices

What can we do?

Paper and cardboard are **one of the easiest materials to recycle and upcycle** as they do not require any special processes or tools.

Here are some simple ways we can save paper in our **every day lives**:

- **Reuse** cardboard boxes for storage or shipping
- **Repurpose** cardboard for crafts or DIY projects
- Bring your own **reusable travel mug** instead of using disposable.
- Choose items with **minimal** or no **packaging**
- Buy in bulk to **reduce** excess **packaging** waste
- **Decline** unnecessary **paper bags**.
- Flatten cardboard boxes before **recycling**.
- Keep paper and cardboard **clean** and **dry** for **recycling**.



Good practices

James Cropper plc

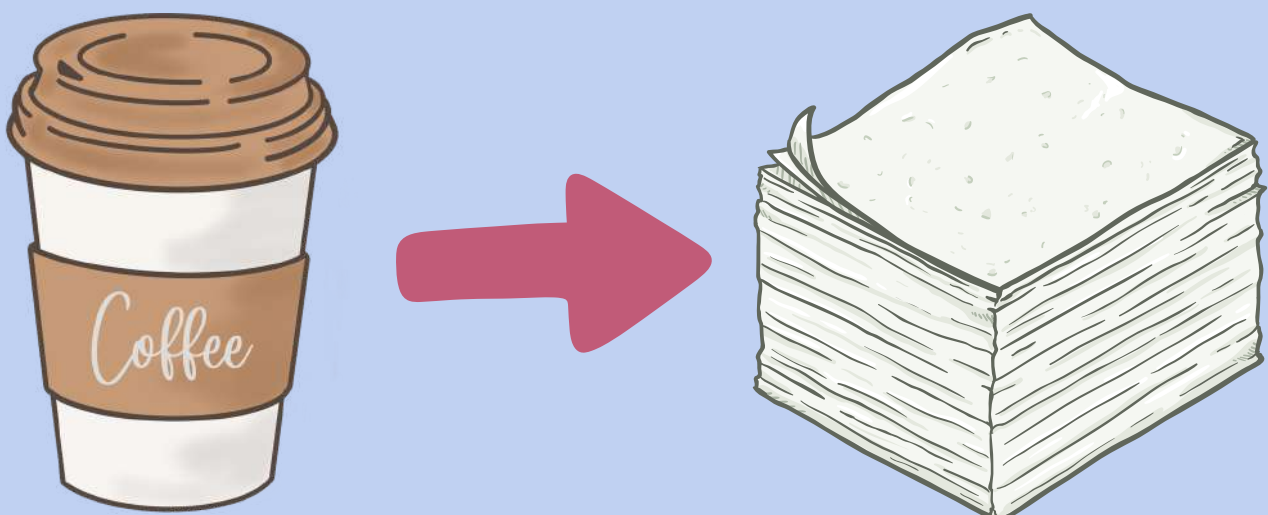
One inspiring example of a company embracing sustainable approaches to paper making is **James Cropper plc**, a family-run papermaking company in England.

They've turned a problem: used **coffee cups**, into a solution.

Since 2014, they have been collecting **discarded cups** and separating the plastic lining from the paper. The cleaned **paper fibres** are turned into new, high-quality **paper sheets**.

This clever process keeps coffee cups out of landfills and gives paper a second life.

You can explore their work here: jamescropper.com



Handmade Paper

Paper upcycling project 1

This paper making project is the perfect way to reuse old letters, magazines and books in your home.



Duration: 8 hours approx

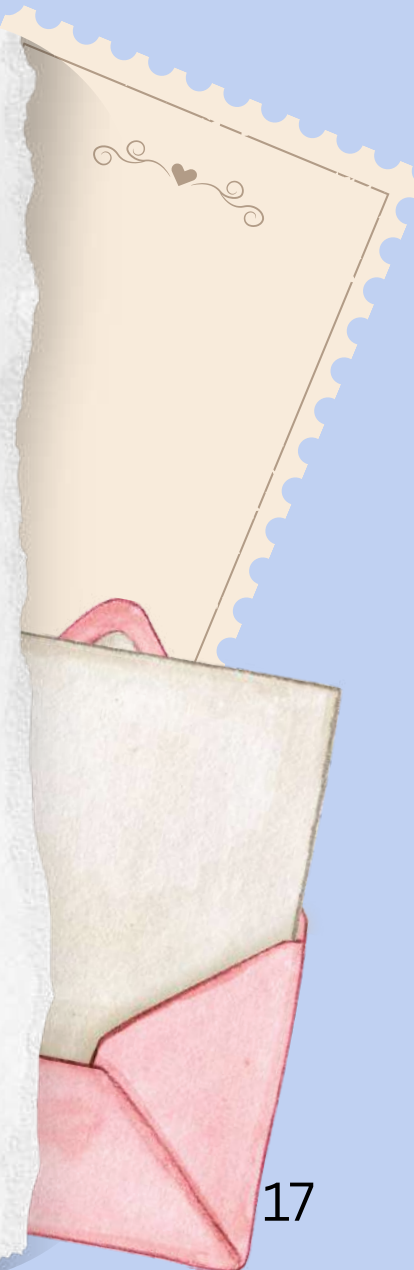
Materials: old paper, scissors, a bowl of water, mesh or fabric a picture frame, cloth or sponge.

Optional: a blender

Method:

1. Tear/cut paper into very small pieces, like confetti.
2. Place the pieces in a bowl of warm water and let them soak for a few hours (the longer the better!).
3. Blend or mash the wet paper until it looks like porridge.
4. Pour the pulp onto a piece of mesh. If you don't have one, stretch some fabric over a picture frame. Spread the pulp evenly.
5. Press the water out with a sponge or cloth, then leave the sheet to dry in the sun or near a window.

Tip: add flower petals or coloured treads into the pulp to personalise!



Recycled journal

Paper upcycling project 2

Turn your old paper waste into unique, one of a kind journals !



Duration: 40 mins

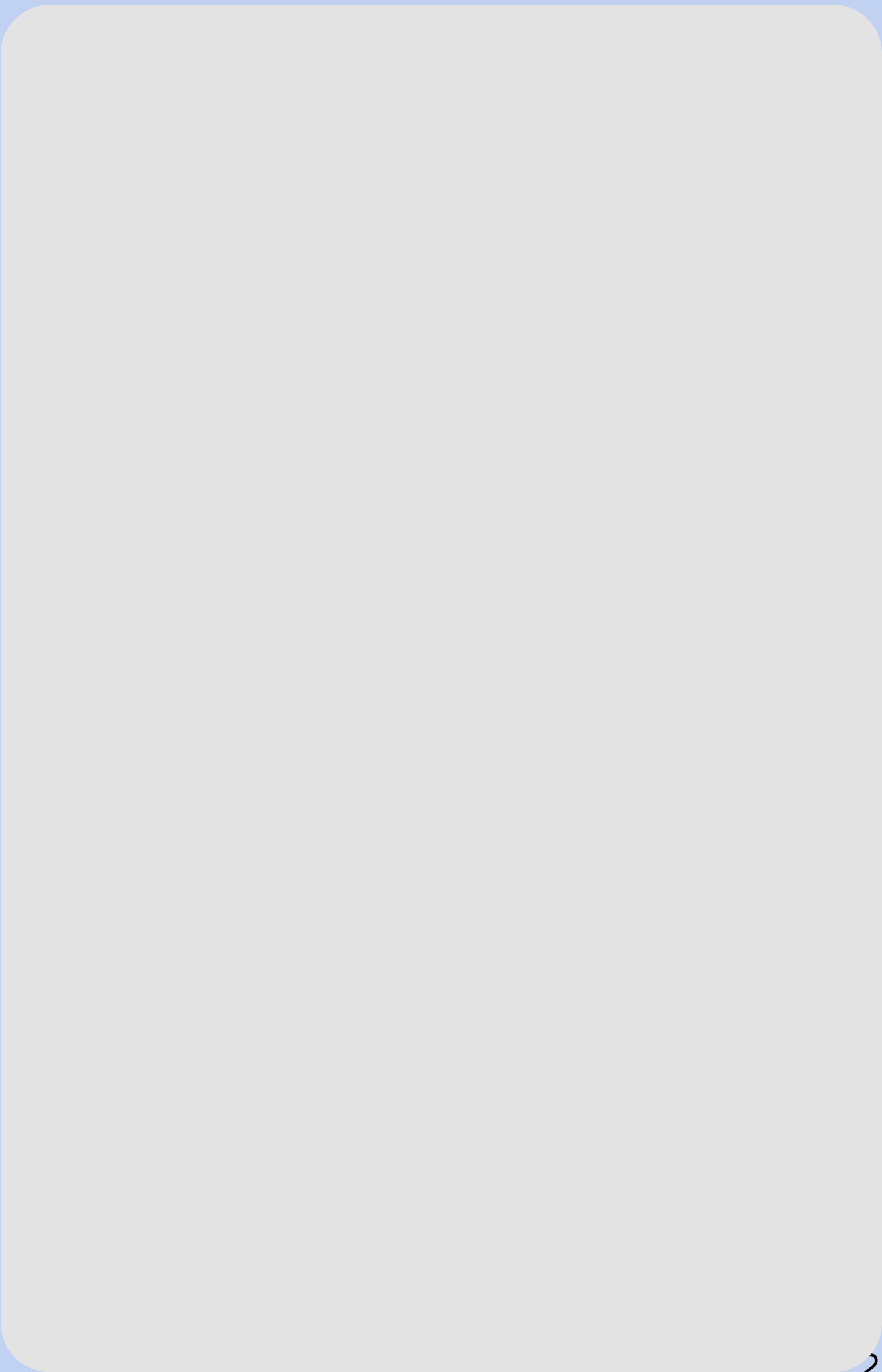
Materials: recycled paper, cardboard, string, scissors, glue, optional: stapler.

Method:

1. Cut each sheet to be the same size and fold in half
2. Stack all folded sheets together to form a booklet
3. Cut a piece of cardboard slightly larger than the folded pages and fold the cardboard in half to make a cover.
4. Place the folded paper stack inside the folded cardboard
5. Staple along the fold (spine), or punch holes and tie with string
6. Press the journal under a heavy book to help it stay flat
7. Decorate the cover!



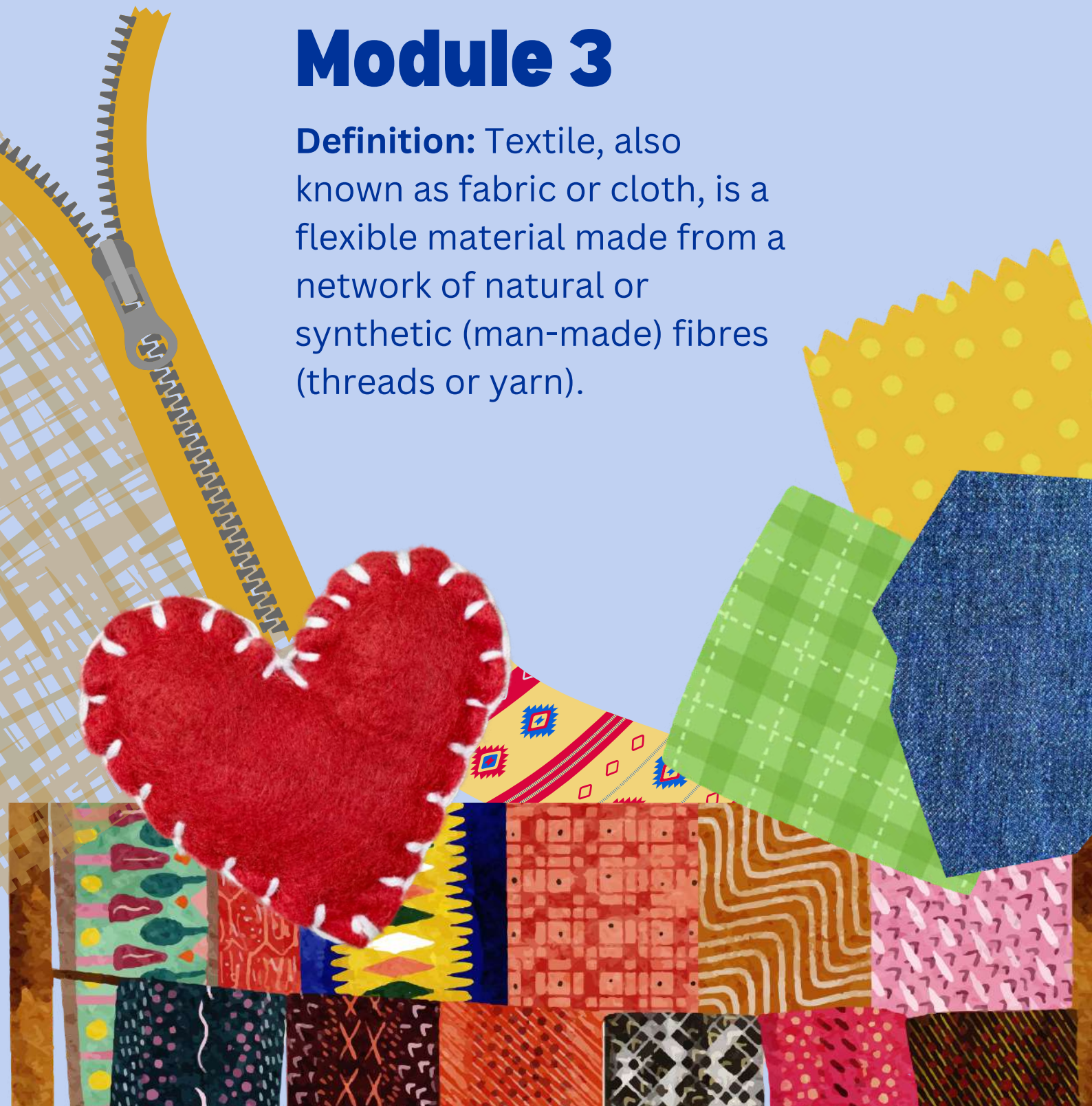
Notes



Textiles

Module 3

Definition: Textile, also known as fabric or cloth, is a flexible material made from a network of natural or synthetic (man-made) fibres (threads or yarn).



History of textiles

Before the sewing machine, humans found **protection** from the weather through clothing. At first, they used **animal skins, leaves, and grasses**. Over time, people learned to twist **plant fibres** like **flax** into **threads** and then **weave** them together into what we call **fabric**.

In ancient **Egypt**, **linen** was used to make cool clothes for hot weather. Around the same time **silk** became one of the most precious fabrics in history, traded across the famous **Silk Road**. In **Europe** and the **Middle East**, people learned how to **spin wool** from sheep and weave it into **warm, strong fabric** which allowed communities to live in **colder regions**.

Later, **cotton** spread from India to the rest of the world, becoming popular because it was **soft, light, and easy to dye**. Soon, fabric became a way to show **identity, culture, and status**. Rich **colours, patterns, and embroidery told stories** about **where** someone came from or what **role** they had in society.

The **sewing machine** was invented in the **19th century**. Clothes could now be made much **faster and cheaper**. Factories started producing textiles on a **huge scale**, and **fashion** became available to more people.

In the **20th century**, **synthetic fabrics** like **polyester** and **nylon** were invented. These **cheaper** fabrics presented new **environmental problems** because they are made from **oil** and take hundreds of years to **biodegrade**.



Environmental impact

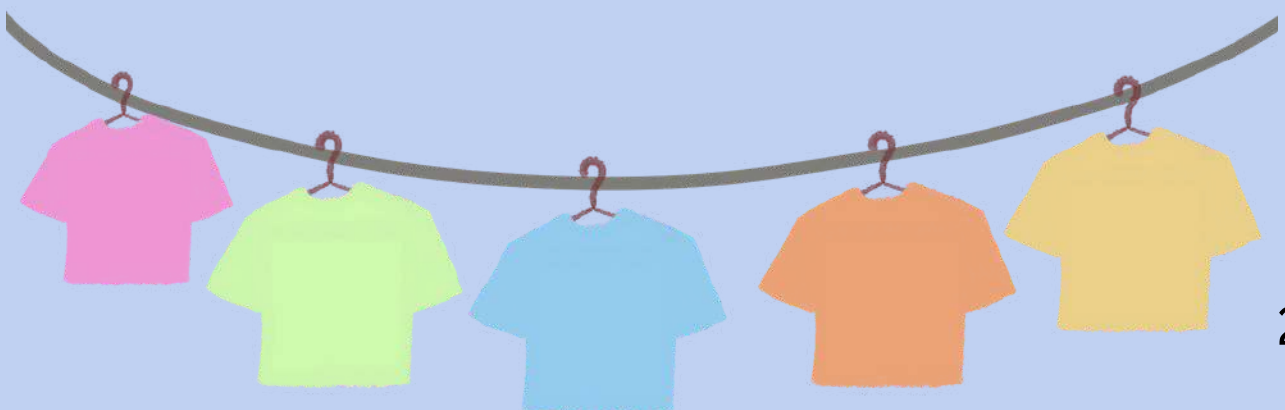
Today, clothing is everywhere. We **buy, wear, and throw away** more clothes than ever before

For most of history, **making clothes** was **slow** and **valuable work**. Clothes were **repaired** and **passed down**. Even when the sewing machine made production faster, garments were still designed to last.

Today, **fashion trends** move **quicker** than ever before. Shops produce new collections **every few weeks** instead of **every season**. This is called **fast fashion**. It makes clothing **cheap** and easy to buy, but also creates serious problems for the **environment**.

Fast fashion drains our **resources**. Growing **cotton** requires enormous amounts of **water**, while synthetic fabrics like **polyester** are made from **oil** and never fully break down. The **dyeing** process uses **chemicals** that often **pollute rivers**. Clothes are **shipped** across the world from **factory** to **store**, adding to **carbon emissions**.

Fast fashion has become **one of the most polluting industries on the planet**. Every year, **92 million tonnes of textiles**, often clothing worn only once or twice are being dumped in **landfills** or **burned**. Natural fabrics can take years to **decompose**, while synthetics break down into **microplastics** that end up in the oceans, in animals, and even in our bodies.



Best practices, what can we do?

Just as people in the past **reused** and **repaired** what they had, today we can return to those traditions in new and creative ways.

As **consumers**, we can promote a more sustainable attitude to textiles by changing our habits. This can take many forms such as shopping from **sustainable brands**, buying **second hand clothing**, **donating** unwanted pieces and of course, **upcycling!**

Upcycling lets us transform an **old shirt** into a **new bag**, **jeans** into **cushions**, or **fabric scraps** into **patchwork art**.

Around the world, designers and communities are proving that upcycled fashion can be **creative**, **stylish** and **sustainable**.



Best practices, Guerra de la Paz

Guerra de la Paz is a collaborative artist duo consisting of Cuban-born **Alain Guerra** and **Neraldo de la Paz**, based in Miami. Their work is all about creatively **reusing discarded materials**, especially **second-hand clothing**, to comment on issues of **consumerism** and **waste**.

They do this through **large-scale sculptures** made entirely from **recycled clothing waste**.

Through their art, Guerra de la Paz , transform textiles into amazing **story telling** devices.

Their sculptures both **challenge** viewers to reconsider their relationship with **material goods** and **celebrate renewal** and **transformation**.



Indochine

Guerra de la Paz, 2011, textile, beads and wire,
approx. 24" x 24" x 24",

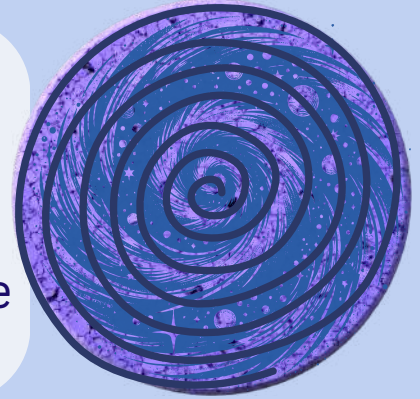
<https://www.artworksforchange.org/portfolio/guerra-de-la-paz/>

T-Shirt Yarn Coasters

Textile upcycling project 1

Did you know you can make yarn out of old fabric?

These T-shirt coasters are the perfect beginner friendly project as they require no sewing!



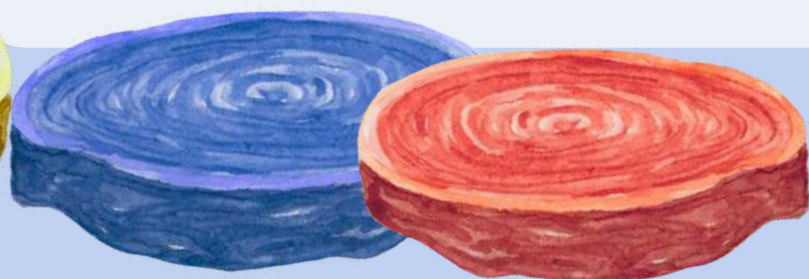
Duration: 1hr approx.

Materials: Old T-shirt, scissors, tape (to hold the end), some patience

Tip: use different colour/pattern shirts for colourful yarn!

Method:

1. Lay out a clean t-shirt and cut into 1–2 cm wide horizontal loops, stretching each one until the edges fold.
2. Cut each loop so they form strands and tie these together to make yarn.
3. To begin the coaster, roll a tight spiral with the yarn.
4. As you roll, add a dot of glue every few centimetres to secure.
5. Continue until the coaster is about 8–10 cm. Press flat and let dry.



T-Shirt Tote Bag

Textile upcycling project 2

Tote bags need to be used hundreds of times to offset their production impact. These upcycled t-shirt bags are simple, customisable and sustainable.



Duration: 1hr approx.

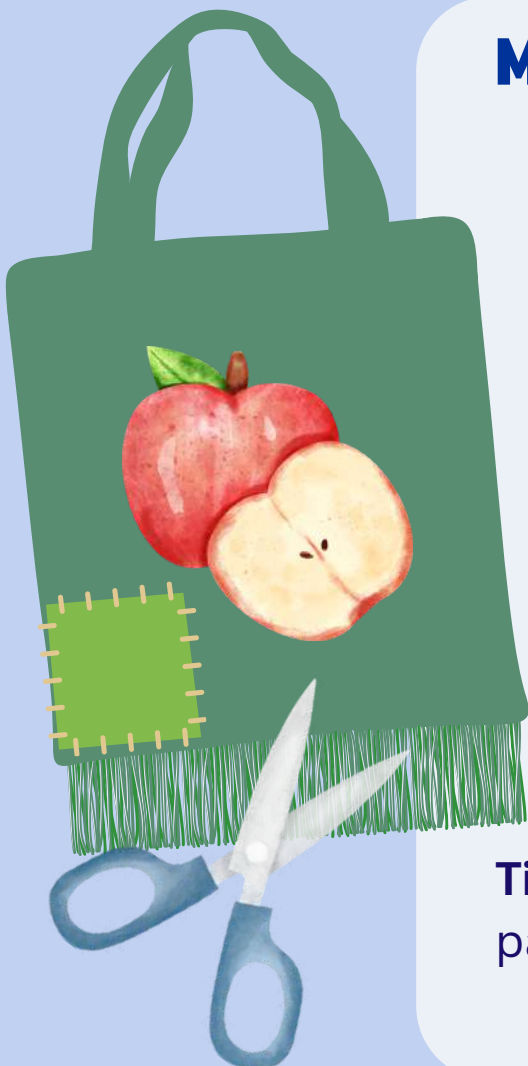
Materials: Old T-shirt (cotton works best), scissors, ruler, pen/chalk.

Tip: use different colour/pattern shirts for colourful yarn!

Method:

1. Cut off the t-shirt's sleeves. Cut a wider neck hole (this will be the bag opening).
2. Draw a line across the shirt about hand-width from the bottom.
3. From the bottom edge up to the line, cut **vertical strips** 2–3 cm wide (front and back together).
4. Tie each front strip to the matching back strip in a double knot.

Tip: decorate bag with recycled textile patches!



Notes

Glass

Module 4

Definition:

a hard, brittle substance, typically transparent or translucent, made by fusing sand with soda and lime and cooling quickly. It is used to make windows, drinking containers, and other articles.



History of Glass

Naturally formed glass was first discovered by humans thousands of years ago in the form of **volcanic obsidian** but also when lightning struck beaches and the resulting heat melted sand into small pieces of natural glass.

Around 3,500 years ago, people in **Mesopotamia** and **Egypt** began melting sand together with ash and lime to create small beads.

At first, glass was **rare**: used only for **jewellery, decorations** and **valuable objects** for royalty.

Later, the **Romans** invented the technique of **blowing air** into hot glass to shape it, creating **bottles, cups**, and **windows** more quickly. As a result, glass became more common and people across **Europe** began to use it in their **homes**.

During the **Middle Ages**, glassmakers in **Venice** became famous for their skilfully designed **colourful** glass and beautiful **mirrors** that were sold across the world.

Soon, glass was used for **science**, to make lenses for **telescopes** and **microscopes**. It has since found its way into our everyday lives: in **buildings, cars, phones, medicine**, and even in **renewable energy** such as **solar panels**



Properties of Glass

Container glass

Examples: bottles and jars.

Strong, food safe and can be melted down indefinitely.

Flat glass:

Examples: windows, mirrors, and glass doors.

Made in large sheets, then cut to size; can be clear, frosted, or colourful.

Tempered glass:

Examples: car windows, shower doors, and phone screens.

Heated and cooled quickly during production, making it very strong. When it breaks, tempered glass shatters into small, blunt pieces instead of sharp ones, which is safer.

Tempered glass **cannot be recycled**.

Crystal glass:

Examples: glasses, vases, or ornaments.

Crystal glass contains lead or other minerals that make it sparkle. While beautiful, it is not safe to recycle with other glass because of its chemicals. Crystal pieces can be reused in jewellery or other decorations.

Specialty glass:

Examples: heat-resistant glass in kitchenware, laboratory glass, or solar panels.

Designed for specific uses made with special ingredients to survive heat, pressure, or chemicals.

Environmental Impact of Glass

Glass a true **circular material**, one that could be recycled again and again without losing quality yet **millions of tonnes** of glass enter **landfills** each year.

Because glass does not **biodegrade**, it stays in the ground for **thousands of years**. Imagine a bottle thrown away during the Roman Empire still existing today, that is the scale of time we are talking about.

While glass is **not toxic** like plastic, it can still cause harm when left in the wrong place. **Littered glass** often ends up **broken** in **nature**. Not only do **shards** of glass pose danger to **animals** and **people**; they also reflect heat, increasing the risk of **wildfires** in hot, dry climates.

Producing new glass requires **sand, energy, and water**. Sand may seem like an infinite resource, but in many parts of the world it is being mined too quickly, **damaging beaches, riverbeds, and ecosystems**.

The **furnaces** used to melt sand into glass must reach very high temperatures, which consumes huge amounts of **fuel** and contribute to **climate change**.



Good practices

What can we do?

Glass is one of the **easiest materials to reuse and upcycle**. For every ton of glass we recycle, we save an **equal weight of natural resources**!

It is very important that all glass is **washed** before it is placed in a **recycling bin** because dirty glass can contaminate other recyclables.

Communities and small **businesses** all over the world are proving that glass waste can be turned into something **useful** and **beautiful**.

Follow these **tips** in your **everyday life** to play **your role** in **reducing glass waste**:

- **Reuse** glass jars and bottles
- **Wash** glass before recycling to keep recycling clean
- **Sort** glass by colour if your local recycling requires it.
- **Remove** metal lids or plastic tops from glass before recycling



Good practices, Sinéad Brennan, Irish Artist

Sinéad Brennan is an Irish **artist** who specialises in glass and used her skills to co-develop **Glint Glass Studio**. While glass is usually **melted** down before it is reused, in 2016 Brennan found a way to upcycle the material **without** having to power **furnaces** at all. Instead, she collects **glass bottle donations** from **friends, family** and **local businesses** before turning them into beautiful **drinking glasses**!

This creative process reuses **100 bottles per week**, saving them from **landfills**. All leftover offcuts are then **recycled**.

Since Glint Glass Studio sources donations from **local** pubs and restaurants, many of their upcycled creations end up back in the **community businesses** that donated them!

Follow their instagram to learn more:
<https://www.instagram.com/glintglasstudio/>



“Instead of finishing their bottle of wine and binning it, they’re thinking, can it be something different?” -Sinéad Brennan

Upcycling glass

Safety First!

It is important to remember the potential **dangers** of glass. Learning how to **handle** glass safely is the most important step before upcycling it. Broken pieces may have sharp edges, vessels can crack or shatter under pressure, even small shards can cut your skin.

Do not attempt to **cut** glass without the correct **tools** and **protective gear**!

Always wear **gloves, eye protection** and **strong shoes**!

Make sure all glass has been **cleaned** before using it in a project!

Inspect glass for cracks before use and carefully sand down any **sharp edges**!



Jar Lantern

Glass upcycling project 1

Medieval churches used **stained glass** as a method of **story telling**. Using **light, colour, shape** and **symbolism** they visually echoed biblical narratives to followers.

Tell your story with this beginner-friendly **tea-light lantern**!



Duration: 1 hour approx.

Materials: a clean glass jar, warm soapy water, a sponge, paper towel, PVA glue, coloured tissue paper/crepe paper/thin napkins, a paintbrush, string (optional), and a battery LED tea-light.

Method:



1. **Wash** the jar in warm soapy water and peel off the label. Dry it well.
2. Brush a thin layer of **PVA glue** on the outside of the jar.
3. Stick small pieces of **tissue** onto the jar. **Smooth** them with your fingers.
4. Brush another thin layer of glue over the tissue to seal it and allow to dry.
5. Add in a **battery** LED tea-light (not a real candle).

Bottle Lamp

Glass upcycling project 2



The first glass lights can be traced back to **ancient civilisations** who crafted simple **glass** containers to hold **oil lamps**.

Light up your evenings with this upcycled bottle lamp project!

Duration: 30 minutes approx.

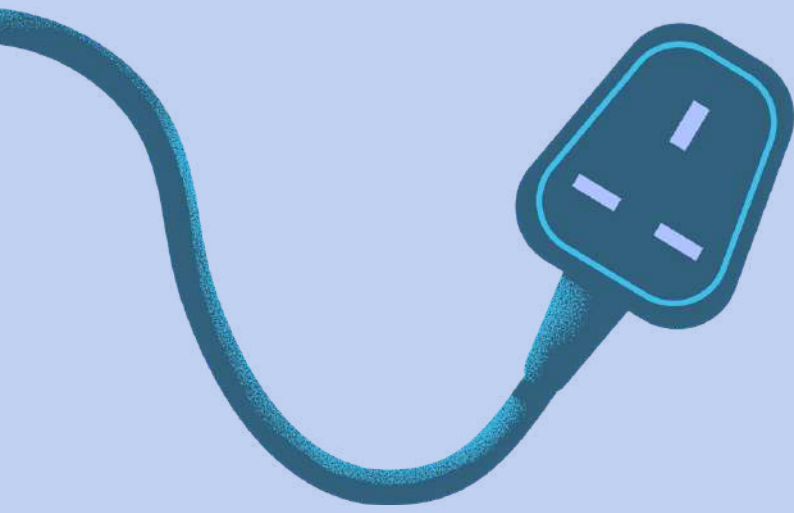
Materials: clean glass bottle, battery powered fairy lights (thin wire type), a small funnel (or rolled paper), and optional dried flowers or pebbles

Method:

1. Rinse the bottle, remove the label, and let it dry.
2. Optional step: put a few pebbles or a little sand in the bottom.
3. Feed the fairy lights into the bottle. A funnel or rolled paper helps guide the wire.
4. Hide the small battery pack behind the bottle or place it in a cork-style “light stopper” if you have one.
5. Optional: wrap twine/wool around neck of the bottle.



Notes

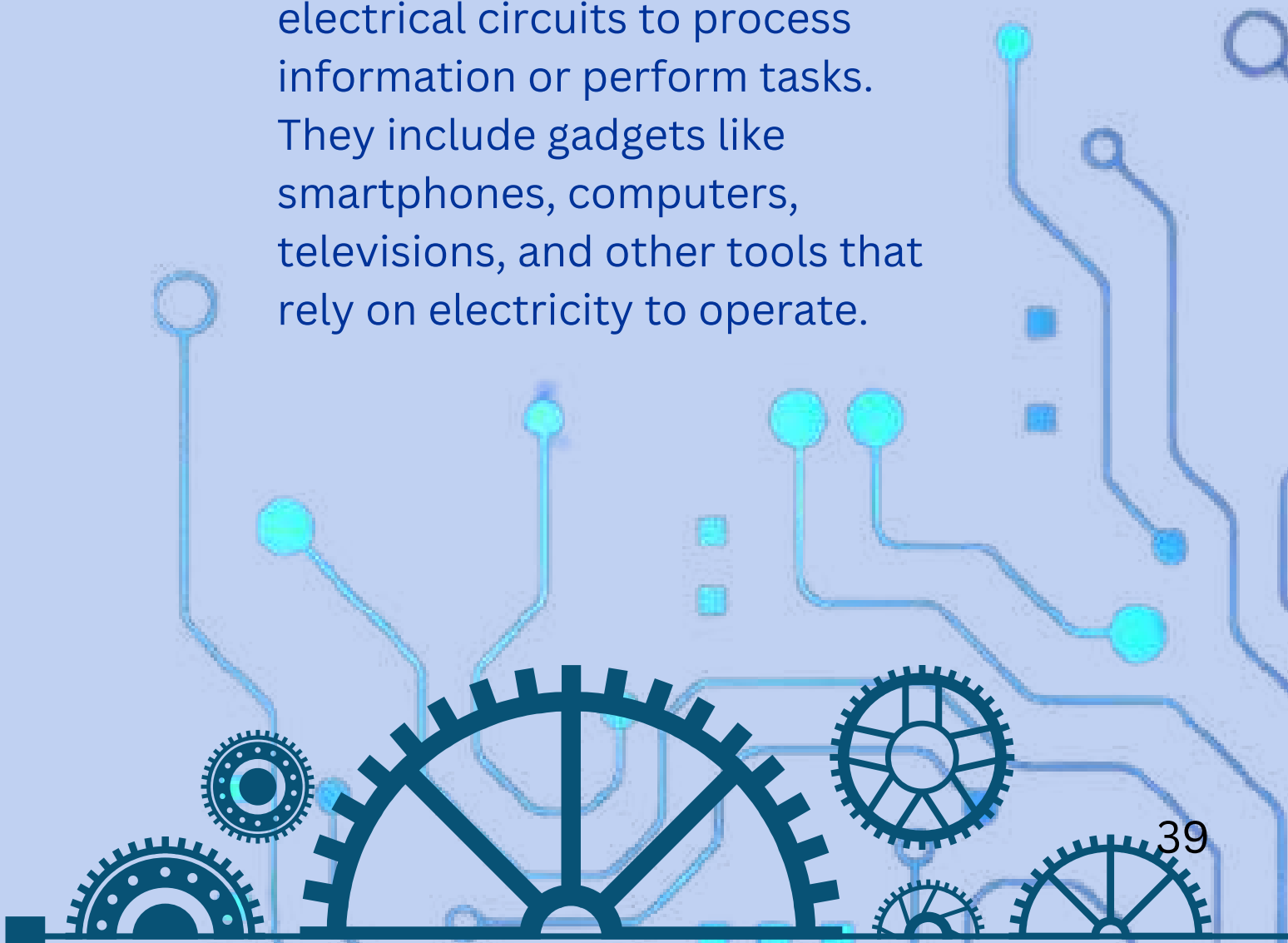


Electronics

Module 5

Definition:

Devices or systems that use electrical circuits to process information or perform tasks. They include gadgets like smartphones, computers, televisions, and other tools that rely on electricity to operate.



History of Electronic Waste

it was only a few hundred years ago that scientists began to **understand electricity** and invent ways to use it.

In the **19th century**, inventions like the **electric light bulb**, the **telegraph**, and the **telephone** changed daily life. For the first time, people could **communicate** across long distances in seconds and bring **light** into their homes after dark. This was the beginning of the **electronic age** where the **radio** and **television** were soon developed.

The first **computers** were made in the **20th century**, these were **huge machines** used only by **governments** and **universities** but as technology advanced, they became **smaller, faster**, and more **affordable** for ordinary people. By the end of the century, computers and **mobile phones** were everywhere.

Today, electronics are a central part of life. **Smartphones** are like mini-computers in our pockets, **connecting** us instantly to people around the world. **Tablets, laptops, game consoles**, and **smartwatches** are part of daily routines for **work, study**, and **play**. Electronics have become **essential** for how we live, learn, and communicate with each other.





Environmental impact

Unlike wood, paper, or textiles, electronics contain complex materials that are **hard to recycle**.

E-waste is one of the **fastest-growing** types of waste in the world. Every year, **millions of tonnes** of old **electronics** are discarded. Inside them are **plastics, glass, and valuable metals like gold, copper, and silver**.

While these can be **recycled**, some electronics also contain **dangerous materials** such as **lead, mercury, gases and oils**. These substances can spread into **soil and rivers, poisoning animals, plants, and even humans**. In some places the **open dumps** of e-waste create **toxic dust** that causes serious **health problems** for children and families who live close by.

Burning e-waste is also dangerous. Sometimes electronics are set on **fire** to **recover metals quickly**. But this process releases **toxic smoke** and **greenhouse gases** into the air. **Breathing** in these fumes can damage **lungs** and cause long-term **illnesses**, while the gases also add to **climate change**.



Best practices, what can we do?

Follow these **tips** to reduce E-waste in your **everyday life**:

- Only purchase electronics if your device stops working and always try to **repair before repurchasing**
- Look for devices that are known for their **durability** and lengthen their lifespans by taking good care of them.
- Buy **refurbished** electronics instead of **new**.
- **Donate** or **sell** unwanted devices
- **Recycle responsibly**: Many countries have designated e-waste recycling centres where you can drop off your old devices.
- **Rent** instead of **buy** if you only intend to use the equipment for a short time.



Best practices, Elias Sime, Ethiopian Artist

Elias Sime is an **Ethiopian artist** who makes **large artworks** using **old electronic parts** like **wires, circuit boards, and computer keys**. He collects this **e-waste** from local **markets** and arranges it into **colourful, detailed pieces**. His work shows the **beauty** in **discarded materials** and makes people think about **technology, waste, and the environment**.



TIGHTROPE: Behind the Processor #5, 2023

Reclaimed electrical wires and components on panel

253 x 280 x 2 cm

<https://grimmgallery.com>

CD Mosaic

Electronic upcycling project 1.

Turn your old CDs into beautiful, light catching mosaics with this craft!



Duration: 1hr approx.

Materials: old CDs/DVDs, scissors, cardboard circles, strong glue, clear varnish or nail polish, sandpaper.

Method:

1. Cut or break CDs into **small pieces** (sand down rough edges)
2. Cut **cardboard** into **circles**.
3. Spread **glue** over the cardboard.
4. Stick **CD pieces** onto the surface like a **mosaic**. Leave small spaces between pieces.
5. Once dry, brush over with clear **varnish** or nail polish to **seal**.

Tips:

- Collage both sides and hang from a string to make a mobile!
- Experiment with using markers to colour the CD pieces!



Keyboard magnets

Electronic upcycling project 2.

Repurpose broken keyboards into useful and decorative fridge magnets!



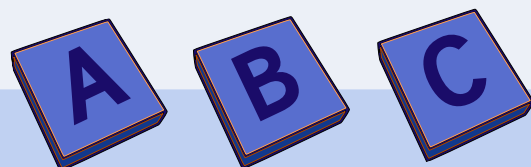
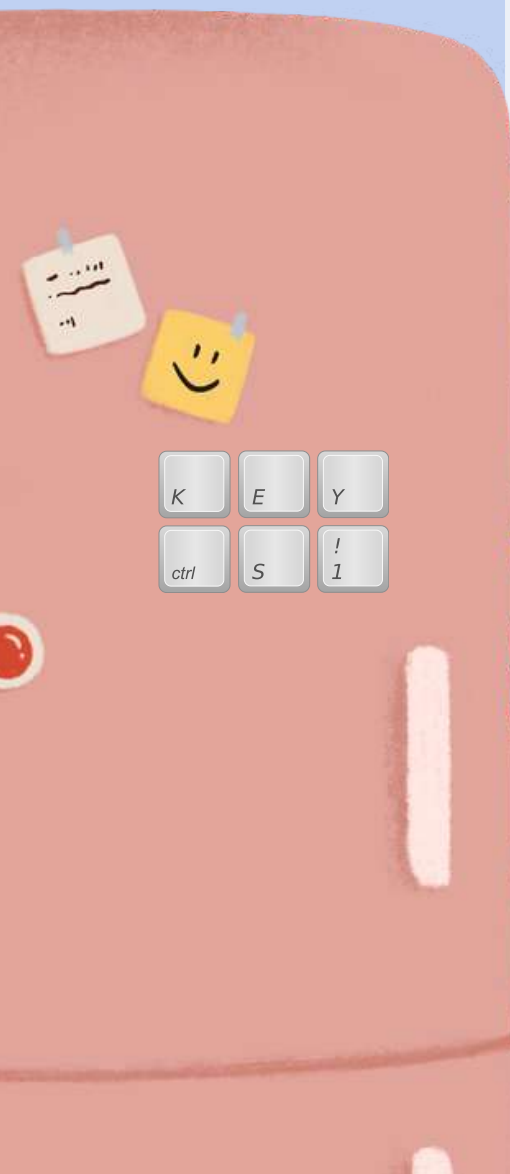
Duration: 30 minutes approx.

Materials: old keyboard, small flat magnets, strong craft glue, screwdriver.

Method:

1. Use a **screwdriver** or your fingers to pop keys off an old keyboard.
2. **Wash** the keys with warm soapy water and let them dry.
3. **Glue** a small flat **magnet** to the back of each key.
4. Leave the glue to dry fully.
5. **Stick** your new magnets on the fridge to hold notes, photos, or reminders!

Tip: decorate each key with paint or collage to personalise this craft!



Notes

Wood

Module 6

Definition:

the hard fibrous material that forms the main substance of the trunk or branches of a tree or shrub, used for fuel or timber.



History of wood

Before people learned to make **metal** or **plastic**, **wood** was one of the **first materials** humans ever used. Early humans used sticks to **dig** the ground, **hunt** animals, and **defend** themselves. They learned to make **fire** from **wood**, which gave them **warmth, light**, and **cooked food**.

Soon, we learned to **shape wood** into **tools, bowls**, and **shelters**. Wood was easy to **cut** and **shape**, but also **strong enough** to build **houses, storage** and **boats** which allowed them to **travel, trade** and meet people of different cultures.

Many **temples, churches**, and **statues** have been made from **wood**. Some of the first **musical instruments** like **drums, flutes**, and **guitars** were wooden too, bringing joy and culture to communities.

Even when **stone, metal**, and later **plastic** became popular, wood never lost its place. Today, we still use **wood** for **building homes, furniture, paper**, and **decoration**. Wood has always been more than just a material, it has been a friend of humans, helping us **survive, grow**, and **create**.



Types of Wood

Softwood:

It comes from trees like **pine** and **spruce**, which **grow quickly**. Because it is **lighter** and easier to cut, softwood is often used to make **doors, window frames**, and simple **furniture**.

Hardwood:

This comes from trees such as **oak, beech**, or **mahogany**. These trees **grow slowly**, so their wood is **heavier, stronger**, and more **expensive**.

Engineered wood:

This is **not natural** wood from a tree but a material made in **factories**. Small pieces of wood are **glued together** to form boards, like **plywood, MDF**, or **particle board**. Engineered wood is often used in **cheaper furniture** or in **kitchen cupboards**.

Reclaimed wood:

This is wood that has already been **used** before but is **collected, cleaned**, and **prepared** for another life. Reclaimed wood can be **softwood** or **hardwood**. It often comes from **old houses, construction sites**, or **donated furniture**.



Environmental impact of wood

In today's world, people cut down trees **faster** than they can grow back. This is called **overconsumption**.. When **too many trees are cut down** and whole **forests disappear**, it is called **deforestation**. Imagine a forest the size of a **football field** being lost **every minute**; this is what happens in some parts of the world.

2,000 years ago, 80% of Western Europe was **forested**; today the figure is closer to **34%**.

Deforestation causes **animals** lose their **homes**, the **soil** becomes **weak** and **washes away**. **Forests** give us **clean air** by turning **carbon dioxide** into **oxygen**; without **trees**, the air becomes more **polluted**, and **climate change** becomes **worse**.

At the same time, there is another problem: **waste**. **Millions of tonnes** of wood are **thrown away** every year. This waste often goes to **landfill** or is **burned**. Both create **pollution** and waste a material that could still be **useful**.



Good practices

What can we do?



The **EU** is fighting **deforestation** and **wood waste** through its new **Regulation on Deforestation-Free Products (EUDR)** laws adopted in **2023**.

This rule ensures that products like **wood, coffee, soy, and palm oil** sold in or exported from the **EU** are not linked to **deforestation** or **forest degradation**.

Businesses must **trace their supply chains, prove legal sourcing**, and confirm products are **deforestation-free**.

Big companies must follow the rules by the end of **2025**, and **smaller companies** have until the middle of **2026**.

In **2021**, the **EU Biodiversity Strategy for 2030** set a goal to **plant 3 billion native trees** across the **EU** by **2030**.

In the meantime, here are some **tips** to follow in your **everyday life** to help **save our trees**:

- **Avoid single-use** wooden products (like disposable cutlery or chopsticks).
- **Repair wooden items** instead of replacing them.
- **Support companies** that follow sustainable forestry practices.
- **Upcycle broken wood** into shelves, planters, or craft projects.
- **Buy second-hand, vintage, or locally made furniture.**



Good practices

Leeds Wood Recycling

Leeds Wood Recycling is a **social enterprise** that began in **2018**. The company collects **waste wood** from **businesses, construction sites** and **homes** to turn it into useful products.

They have saved over **33,612 cubic metres** of wood from **landfill!**

They also provide **free training** and **work experience** for **marginalised groups**, helping them **build skills** and **confidence** while reducing **wood waste**.

Visit their website to find out more:
www.leedswood.co.uk



Wooden Crate Desk Tidy

Wood upcycling project 1

Transform an old wooden box or crate into a personalised desk tidy!



Duration: 1 hour.

Materials: wooden crates, sandpaper, strong glue, jars/containers paint/varnish.

Method:

1. **Sand** the **clean crate** to remove **splinters**.
2. **Paint** or **varnish** the **outside** however you choose.
3. Carefully **wash** your **jars/containers**.
4. Turn the decorated crate on its' **side** and place the **containers** inside to hold **pens/pencils**
5. Use both the **inside** and **top** of the crate to store **books, stationary** and **more!**

Tip: Line the **inside** of the crate with **fabric** to enhance this craft!



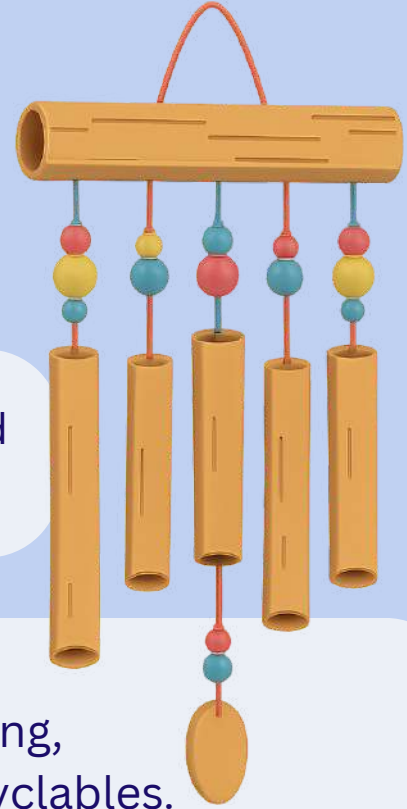
Wooden mobile

Wood upcycling project 2

Decorate your home with a nature inspired wooden mobile !

Duration: 1 hours.

Materials: scrap wood, string,
Optional: paint, glue, other recyclables.



Method:

1. **Collect scrap wood** and **sand down** any sharp edges.
2. Paint or **decorate** the wood however you want!
3. **Tie at least 3 pieces of wood** together to create a **shape**.
4. **Weave** more string **back and forth** inside the shape to create a **web**.
5. **Tie extra strings** to the **shape** so they **hang down**.
6. Attach **more decorated wood** or other **recyclables** to the strings.
7. Use **string, yarn, or thin rope** to tie a **loop** at the top for **hanging**.

Tip: add seashells or bottle caps to turn the mobile into wind chimes!

Notes



Plastic

Module 7

Definition:

is a material made from synthetic (man-made) chemicals. It is usually made from substances called polymers, which are long chains of molecules. Plastics can be shaped into many forms, such as bottles, bags, films, or fibres.

History

For most of human history, people used materials like **wood, metal, and glass**. But in **1907**, a **Belgian scientist** named **Leo Baekeland** created the first **fully synthetic** (man-made) **plastic**, called **Bakelite**. Unlike **natural materials**, Bakelite was **durable, heat-resistant, and easy to shape**.

At first, **plastic** was **celebrated** as a **miracle material**. It **replaced expensive natural resources** like **ivory** (used for making piano keys and jewellery) and **tortoiseshell** (used for combs and glasses frames). Factories began using plastic to make **radios, telephones, buttons**, and even **car parts**.

During **World War II**, plastic **production increased** dramatically. It was used to make **lightweight military equipment, parachutes, and medical supplies**. By the **1950s**, plastic became **cheap** and **easy to produce**, leading to the rise of **single-use plastic** products like disposable **cups, bags, and packaging**.

Today, plastic has **changed the world** in many **positive** ways. It makes **packaging lighter**, keeps **food** fresh, and is even used in **medical supplies**. It is everywhere, even on the **moon**. When astronauts from **Apollo 11** landed in **1969**, they left behind some **plastic materials**, including a **plastic American flag**.



Plastic making process

Plastic is made through a process that begins with **natural materials** like **crude oil** or **natural gas**. These are **heated** and **broken down** into **small chemical units** called **monomers**. The **monomers** are then **linked** together to form **long chains** called **polymers** in a process called **polymerization**.

Once the **plastic** is **formed**, it can be **melted**, **shaped**, and moulded into many different products such as **bottles**, **containers**, and **packaging materials**.



Environmental impact of plastic

Every year, **millions of tonnes of plastic waste are generated worldwide**, and only a small percentage is properly recycled. Plastic is designed to be long-lasting so it does not break down the way natural materials do. A plastic bottle can take **450 years** to fully decompose.

In areas without proper waste disposal systems, plastic is sometimes **burned** to get rid of it. Burning plastic releases **toxic chemicals** into the air, which can cause serious **health problems**.

A plastic bottle discarded on the street can be carried by **wind** and **rain** into **rivers, lakes**, and eventually the **ocean**. Once there, plastic waste can float for **thousands of kilometres**, sometimes forming floating piles of plastic. One of the largest of these is the **Great Pacific Garbage Patch**, located between **Hawaii** and **California**.

In **water**, plastic breaks down into **small pieces**, eventually becoming **microplastics**: tiny fragments of plastic that are less than **5 millimetres** in size. These microplastics have been found in **fish** and even **drinking water**, meaning they can enter the **human food chain**. Scientists are concerned that **microplastics** could pose **health risks** to both **animals** and **humans**.

Plastic also affects **soil** and **farmland**. Farmers in **China** and **India**, for example, have reported that **microplastics** in the **soil** are reducing their **crop yields** because they prevent water and nutrients from reaching plant roots.

Good practices

What can we do?

The good news is that communities, businesses, and governments are taking action to **reduce plastic waste and find new uses for plastic materials**. Many cities have banned single-use plastic bags, companies are switching to biodegradable packaging, and scientists are developing new ways to **recycle and upcycle plastic efficiently**.

Follow these **tips** in your **everyday life** to **reduce plastic consumption**:

- Use **reusable bags, bottles, and containers**.
- Avoid products with **excessive plastic packaging**
- **Recycle plastics properly** according to local guidelines
- Choose alternatives to plastic, like **glass, metal, or paper** when possible
- Participate in or support **clean-up efforts** in your **community**



Good practices

ByFusion Global, Inc

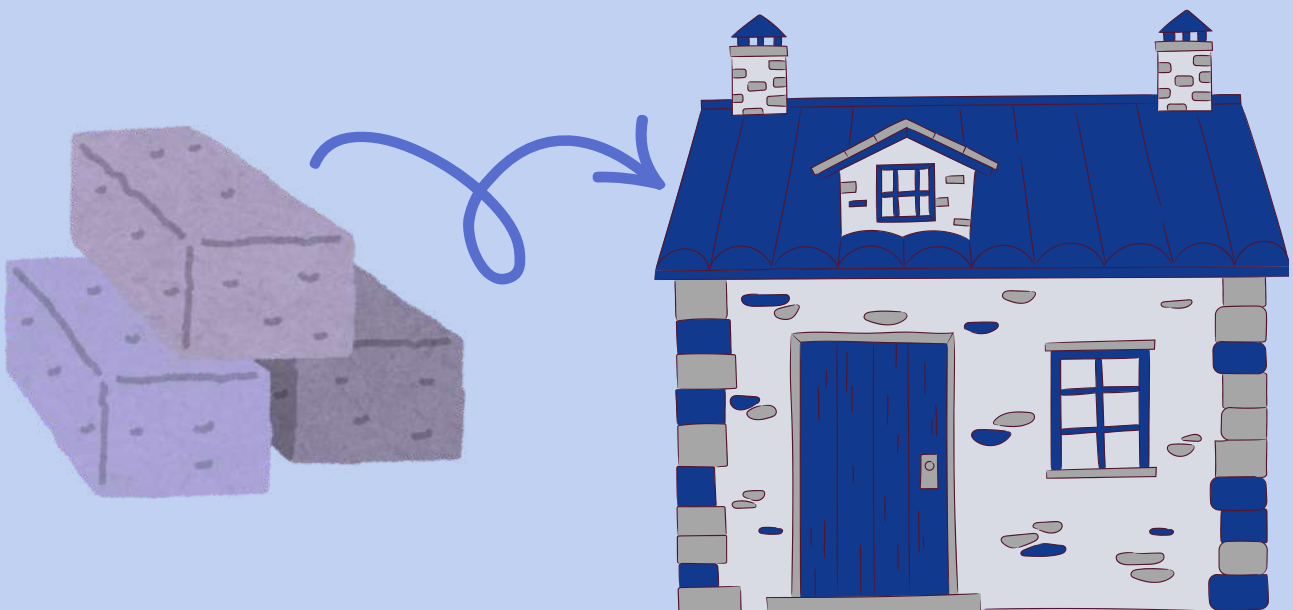
ByFusion is a **USA** based company whose mission is to address the plastic waste crisis by turning it into building materials.

They use a system known as the **Landfill Diversion Platform** to process mixed, non-recyclable plastics. Their process does not require sorting or precleaning.

Plastics are **shredded, steam-treated, compressed** into **zero waste blocks** containing **no added fillers, glues, or adhesives**.

Plastics that would otherwise go to **landfill** are upcycled into **durable bricks**, suitable for use in **construction**

Visit their website to read more: byfusion.com



Bottle Bird Feeder

Plastic upcycling project 1

Recycle old bottles and feed local wildlife with these unique plastic bottle bird feeders!



Duration: 1 hour approx.

Materials: scissors permanent marker paint brushes drill & drill bit glue gun funnel empty 2-liter plastic bottles

Method:

1. **Wash** the bottle and **peel off** the **label**.
2. Cut the bottle into **three pieces** using the **label** to guide the **size**. **Discard** the middle piece.
3. **Cut** a **hole** in the **bottom section** of the bottle about the circumference of the **lid**.
4. Poke **another hole** beneath and add a wooden stick with **glue** as a perch.
5. **Paint** the outside of the bottles (you may need a few **layers**).
6. **Drill** a hole in the **bottle lid** and add a **string** or just **tie** it around the **neck** of the bottle.
7. **Glue** the top piece of the bottle to the bottom piece.
8. Fill bird feeder from the top and hang outdoors!



Plastic carton Etching

Plastic upcycling project 2

Make beautiful etchings at home using recycled plastic containers!

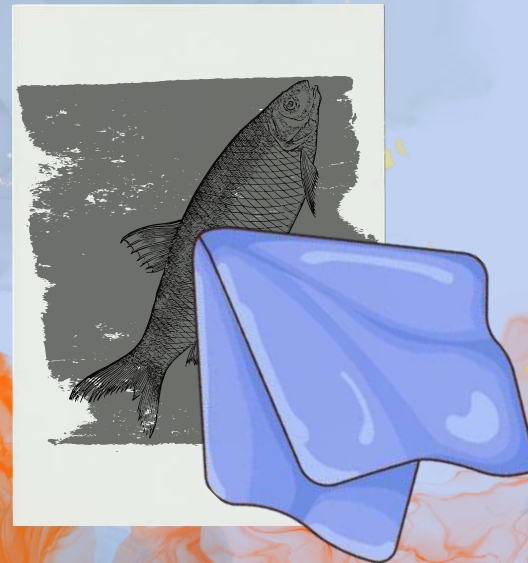


Duration: 1.5 hours.

Materials: clear plastic container, sharp tool (etching needle/screwdriver/compass/sharp pencil, scissors, printing ink, cloth, spray bottle, recycled card or paper.

Method:

1. Cut a **square** of plastic from a **clean fruit container**.
2. Place your drawing or photo under the plastic and **scratch** the design into it with a **sharp tool**.
3. **Rub ink** into the **etched lines** using a cloth or paper towel.
4. **Wipe off** the **extra ink** from the surface, leaving **ink only in the lines**.
5. Lightly spray **recycled card** with **water**.
6. Place the **damp card** on top of the **inked plate**, and **press together** using a **rolling pin/ heavy book**.
7. Lift the paper to see your print.



Notes

Conclusion

This course has taught you all about the practical and theoretical world of upcycling. By taking part and learning about six materials in detail, we hope you feel empowered to put your new skills into action and share the knowledge with your community!

Use the additional pages in this notebook to document upcycling projects of your own!

Notes

References and Further Reading

Intro:

commission.europa.eu, *The European Green Deal*.

Paper:

eeb.org, *Paper-based food packaging at the centre of Europe's waste crisis, new report reveals*

Textiles:

earth.org, *10 Concerning Fast Fashion Waste Statistics*

www.globalcitizen.org, *7 Sustainable Ways You Can Fight Fast Fashion at Home*

Glass:

www.instagram.com, *glintglassstudio*

www.rte.ie, *Artist upcycles waste bottles into new drinking glasses*

Wood:

www.leedswood.co.uk

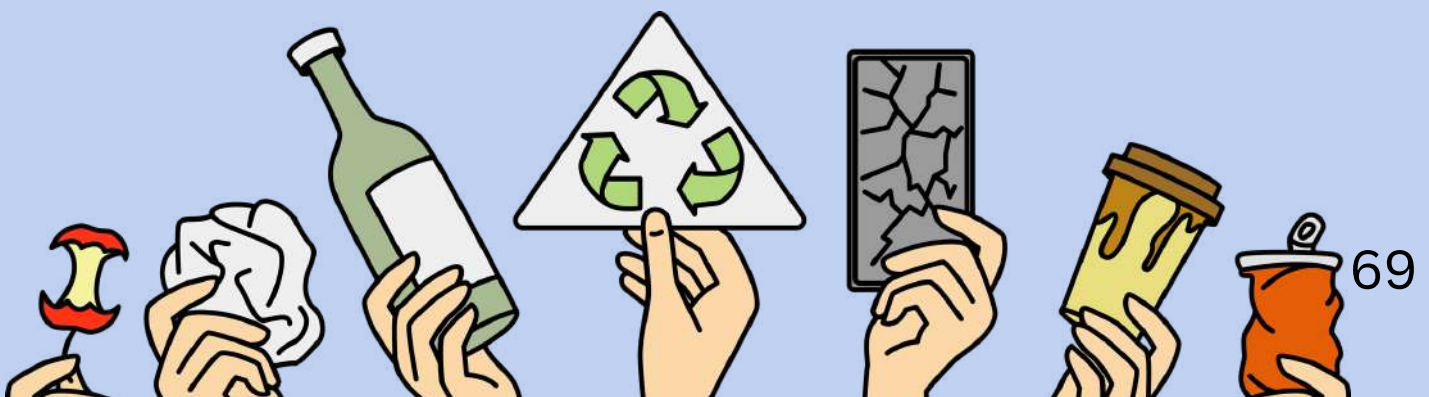
Electronics:

ecocation.org, *8 Simple Ways to Minimize E-Waste*

grimgallery.com/artists, *Elias Sime*

Plastic:

plasticseurope.org, *The Circular Economy for Plastics – A European Analysis 2024*



This handbook belongs to:



ROUTES



***Rediscovering Our Traditions
Exploring Sustainably***

