



Learn Skills – Waste Less

Get creative and redesign an existing garment while exploring the impact our clothes have on the environment.

With repairwhatyouwear.com

The aim of repairwhatyouwear.com aim is to encourage mending skills so that clothes are kept for longer and therefore waste is reduced. It also aims to provide an understanding of the fibres and fabrics from which clothing is made, so that individuals become informed consumers. This project develops practical hand-sewing skills together with research on the impact that clothes have on the environment. It gives pupils the ability to make more informed choices about what they wear. It links well with Eco School, Rights Respecting Schools Awards and Learning for Sustainability 2021.

Suitable for Key Stage 3 plus England and Northern Ireland

Project brief/ Learning Intentions

There is a trend in fashion towards sustainability. This project explores the environmental reasons why this trend is growing. Learners can select the profile of a group of people who follow this trend and make a garment for them to wear to an event.

Re-purpose and restyle an old t-shirt, shirt or other cotton garment using hand sewing, dying and by adding embellishments of polyester and buttons. Give an old piece of clothing a new look whilst also learning new skills and finding out all about the impact clothes have on our world.

Skills(S) and knowledge (K) that the project will develop:

- S - Research and analysis.
- S - Thinking skills to analyse their response to research.
- S - Project concept development.
- S - Fine motor co-ordination skills.
- S/K - Hand sewing skills.
- K - Different fibres and fabric characteristics.
- K - How clothes are manufactured and their effects on the environment.
- K - Awareness of their personal clothing choices within the environmental sustainability curriculum.

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The Clothing problem - Fashion Statistics to share:

1. Fashion is responsible for 10% of global carbon emissions, more than all flights and maritime travel combined.
2. It is responsible for 17-20% of global water pollution.
3. Cotton production alone uses 16% of global pesticides and 73% of the land is irrigated in communities where water is a scarce resource.
4. Fast fashion is the growth area where prices are kept low through a combination of low quality materials and poor working conditions for those in the industry.
5. Polyester fibres now make up 60% of all clothing production. Derived from fossil fuels, they are made from a non renewable source and don't biodegrade.
6. Cellulosic fabrics, like viscose, modal, although 8% of fabric components fibres are now using 150 million trees per annum and expected to double in 10 years.
7. The UK consumes more clothing than any other country in Europe and twice that of Italy.
8. In a recent study, 98% of water samples taken from under the Arctic Ice and in the Polar region contained Micro plastics, 92% of which were fibres and 75% of which were polyester, the same width and colour as used in clothing.
9. High Street purchasing is in decline. Internet orders have a much higher rate of returned product, estimated at 30-40% and about 50% of the total returned product is not put back into stock - either burned or put in landfill as this is the cheapest way of dealing with it. This means clothes are manufactured, never worn and then pollute again.
10. Globally, 9% of fashion is recycled into other materials like insulation, wadding, cloths. It is estimated that 80% of discarded clothing ends up in landfill, if not in the country where it was originally bought, then in another country where it was exported for resale.

References to support these statements:

- 1 - 4. World Bank report overall fashion statistics: <https://www.worldbank.org/en/news/feature/2019/09/23/costo-moda-medio-ambiente>. <https://www.weforum.org/agenda/2020/01/fashion-industry-carbon-unsustainable-environment-pollution/>
5. Polyester and synthetic clothes information: <https://www.unep.org/news-and-stories/story/fashions-tiny-hidden-secret>
6. Fibres2Fashion report: <https://www.fibre2fashion.com/industry-article/7365/fashionable-fabrics-leading-to-deforestation>
7. Parliamentary report 2019, UK statistics: <https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/report-files/195207.htm>
8. Clothing Micro plastics under the Arctic Ice: <https://www.theguardian.com/environment/2021/jan/12/clothes-washing-linked-to-pervasive-plastic-pollution-in-the-arctic>
<https://www.nature.com/articles/s41467-020-20347-1>
9. <https://www.weforum.org/agenda/2020/01/fashion-industry-carbon-unsustainable-environment-pollution/>

Project brief

Given the trend towards sustainable fashion, re-purpose an old t-shirt, shirt or another cotton garment for a specific audience, using hand sewing, dying and adding embellishments of polyester and buttons.

Learning Intentions:

- Find out about the impact clothes have on our world and consider what actions should be taken to reduce this impact.
- Understanding the origins and characteristics of key fashion fibres through experimentation.
- Using this knowledge and understanding to design and make a final garment through repurposing used clothing.

Starting the project:

It is important that pupils have some background knowledge of the environmental impact of the clothing industry before they start the practical project – **fashion statistics** can be shared and discussed with the class. This information is key to the trend towards fashion sustainability.

Suggested questions below can be researched in groups or as individuals. Cotton should always be included, but students could select another 3-4 to research as well.

Research questions suggestions:

- Cotton is the seed head of a plant - how does it grow and what is the difference between ordinary cotton and organic cotton production. Why might organic cotton be better for the environment and for the people who grow it?
- What are the different ways cotton is picked and how might that affect communities?
- How is polyester made? What are its key characteristics?
- 60% of clothing contains Polyester, why might this be a concern to environmental sustainability? What options exist for a polyester garment at the end of its life?
- What is the key difference between natural and synthetic dye stuffs? What prevents all textiles being dyed with natural dyes?
- Which processes create water pollution when dying and printing textiles?
- Learning to use a needle and thread means you can mend/fix your own clothes. What benefits do you think that might have for you and for the environment?
- Which key actions do you think will most reduce the negative impact of fashion on the environment? What changes would you like to see?
- What happens to your clothes when you give them to charity shops or recycling?
- How are polyester microfibres getting into the ocean and what is the impact?

In groups or as individuals, students can discuss the answers found to the questions, analyse and decide what message, image, or style impact they want to convey with their garment. They may sketch out a profile of their consumer or an event the consumer wants to attend.

Ideas for Extension:

Explore Fashion and politics:

- Fashion has been used as a political statement. Which designers have done this and what sort of statement have they made with their clothes? Has a written statement on a T shirt been done too often? How can you be more inventive and make your audience think more deeply?

See Katherine Hamnett's protest T shirts, Alexander McQueen's "I'd rather go naked than wear fur", and the "me too" movement wearing black at the Golden Globes.

<https://www.teenvogue.com/story/18-moments-when-fashion-and-politics-merged-in-the-last-decade>.

- **Explore the characteristics of cotton and polyester fabrics.**

Compare the characteristics of these different fibres through experimentation. Instructions and chart provided in resources.

Extension Questions:

- Cotton (24%)* and polyester (50%)* are the most popular fibres in clothing. Which fibre characteristics make them so desirable in fabrics?
- Both Cotton and Polyester are bad for the environment but in different ways. Explain the benefits and negatives of each fibre.
- Why do cotton and polyester need different dye stuffs and different methods of dying?
- Why will polyester not take natural dyes well?
- Identify a small selection of polyester garments and ask why polyester is the best fibre for the function of the item?

* Statistics from 2017.

Slavery and forced labour in the fashion industry:

From picking and processing cotton to making garments in Leicester (England), the fibres, fabric and garment industry is using unregulated labour today.

Research three examples of current practice, including Uighur labour in Western China.

What do you think are the most important steps to prevent exploitation of people for fashion?

<https://www.bbc.co.uk/news/extra/nz0g306v8c/china-tainted-cotton>

Student Brief:

To reflect the trend of sustainable fashion, re-purpose an old t-shirt, shirt or another cotton garment using hand sewing, dying and by adding embellishments of manipulated polyester and buttons. Give an old piece of clothing a new look/life whilst also learning new skills and finding out all about the impact clothes have on our world.

Before you design, understand the garment you have chosen:

1. Count the number of different pattern shapes in your garment and roughly **draw them on a separate sheet**, thinking about how they shape to the body. *Note answers Q2-6 below onto this sheet.*
2. Identify the structure/s of the fabric. Is it knitted or woven? Rib? Is there any elastane/stretch?
3. Explore and explain how the structure of the cloth affects the way the garment behaves and analyse why this cloth was chosen for this garment.
4. Examine the different types of stitching and their function, e.g. overlocking on side seams to neaten and join seams together.
5. From which retailer (or type of retailer) was the garment bought and the approximate value?
6. How would you describe the original target audience for this garment?

ASSESSMENT: Technical learning, E 1, E 3, E 4.

Design challenge.

- Analyse your Eco conscious customer, the influences on their lives, the fashion choices they would make and write an appropriate brief to meet their needs. What statement would they want to make?
- Reflect on the research that you have done about the environmental impact of fashion. What message do you want your garment to make? Think of how you can use words, shape, texture, manipulated cloth to make that statement.
- Write or sketch up your ideas.
- Create an order of work with timings and sequencing.

ASSESSMENT: D 1, D 2, D 3, D4, D5.

Skills that must be demonstrated in your Cotton Garment redesign:

Fabric Dying:

- Experiment with vegetable dyes on your cotton T shirt. You can paint, dip, immerse, print, wrap. *See resources for ideas.*

ASSESSMENT: Technical knowledge, M 1, M2, D 2, D 4,.

Exploring the impact of heat on polyester fabric:

- Restyle polyester ribbon/fabric through heat manipulation and design its use as part of your new garment. Fold, gather, wrap around coins, pleat, and apply heat to create new types and samples of cloth using a vegetable steamer or hot iron (with silicon paper either side of the fabric to stop burning). *See written resource.*

ASSESSMENT: Technical Knowledge, M 1, M 2, D 2, D 4, E 2.

Hand stitching and decoration/alteration:

- Your final garment must include the following hand stitching: **Buttons, Running stitch, Backstitch and Cross stitch (or Herringbone)**. See *tutorial videos @ repairwhatyouwear.com*. Use sewing thread, embroidery threads, yarns or string if it suits your design. You could use stitches to attach your polyester decoration to your final product or use stitching to make a visual statement e.g. patching, decoration, creasing, pleating, distressing etc.

ASSESSMENT: Technical Knowledge, M 1, M 2, D 1, D 2, E 1, E 3.

Written activities:

- Using the order of work for your project, keep notes as you progress.
- What is your wish for this item when it is at the end of its life? What can be recycled and what would you keep for using again? What will go to landfill?
- Write up what you have learned about clothes and the environment and what we can do to keep wearing our clothes for longer.
- Present your project and conclusions in a visual and written format that fits with the theme “Fashion and Environment”.

ASSESSMENT: E 4, E 3, E 1, T 1.

Suggested Materials Checklist:

- A used cotton T shirt clothing item, T-shirt, shirt or similar.
- Used polyester ribbon/fabric/garment. This should be woven and fairly light.
- Natural or synthetic dyes that work with cotton cloth (*details in resources*).
- Needle, thread, scissors for hand sewing.
- Assorted buttons and other accessories from used clothing/charity shops/friends.
- An iron, ironing board and silicon paper or two Teflon sheets. Pins. For heat setting polyester ribbon and small areas of fabric.
- A vegetable steamer for heat setting larger amounts of polyester fabric.

Optional:

- Masking tape, elastic bands, string for resist dying and polyester manipulation.
- Paint brushes for writing with the dye.
- Sewing machines for reshaping the item - although this can be done with a needle and thread and simple running stitch or backstitch.

Design and technology – key stage 3 - Subject content:

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of domestic and local contexts [for example, the home, health, leisure and culture], and industrial contexts [for example, engineering, manufacturing, construction, food, energy, agriculture (including horticulture) and fashion].

When designing and making, pupils should be taught to:

Design. (D)

1. Use research and exploration, such as the study of different cultures, to identify and understand user needs
2. Identify and solve their own design problems and understand how to reformulate problems given to them
3. Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations
4. Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses
5. Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools

Make (M)

1. Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
2. Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties

Evaluate (E)

1. Analyse the work of past and present professionals and others to develop and broaden their understanding
2. Investigate new and emerging technologies
3. Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
4. Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists.

Technical knowledge (T)

1. Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
 2. Understand how more advanced mechanical systems used in their products enable changes in movement and force
 3. Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
- Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].

• Resources:

<https://repairwhatyouwear.com>

Core mending skills (all left and right handed) include:

- How to thread a needle
- Backstitch (for mending most seams)
- Herringbone (for mending hems)
- Buttons (both 2-4 hole and stemmed).

Beginners Embroidery includes Cross stitch which can be substituted for herringbone as similar.

Education section Includes:

- Cotton fibre video
- Cotton fibre written information sheet
- Polyester/synthetic fibre written information sheet.
- Videos on all construction types e.g. woven, knitted, non woven.

Additional links:

<https://www.fairtrade.org.uk/media-centre/blog/top-10-facts-about-fairtrade-cotton/>

<https://www.bbc.co.uk/bitesize/guides/z6t26yc/revision/1>

<https://eco-age.com/resources/category/sustainability-stories/page/2/>

<https://www.fashionrevolution.org>

Videos to watch

Good Ellen MacArthur Foundation video: <https://www.youtube.com/watch?v=3iKHr-JnWYA>

Water usage in clothing (SHOCKING statistics): <https://www.theconsciouschallenge.org/ecologicalfootprintbibleoverview/water-clothing>

Where does cotton come from? <https://www.youtube.com/watch?v=VkiUnV8qxsI>

Water and cotton

<https://www.worldwildlife.org/videos/how-your-t-shirt-can-make-a-difference>

Fairtrade and clothing

<https://schools.fairtrade.org.uk/teaching-resources/unravelling-the-thread/>

Dying fabric

Natural dying with food https://www.youtube.com/watch?v=p_tSuFJLZFs
leaf dying

<https://www.youtube.com/watch?v=dgaTYLhEFZY>

Cotton research:

Soil association summary of Organic Cotton benefits: <https://www.soilassociation.org/organic-living/fashion-textiles/organic-cotton/>

Extension articles:

Journal Nature on plastics in the Arctic: <https://www.nature.com/articles/s41598-019-40311-4>

Fashion and politics:

<https://www.teenvogue.com/story/18-moments-when-fashion-and-politics-merged-in-the-last-decade>.

<https://www.theguardian.com/fashion/2020/apr/07/fast-fashion-speeding-toward-environmental-disaster-report-warns>

Analysis of real impact of fashion chain's recycling policies:

<https://www.reutersevents.com/sustainability/beyond-recycling-putting-brakes-fast-fashion>

Fashion and water pollution -

<https://www.reutersevents.com/sustainability/its-time-fashion-turn-its-focus-cat-walk-cutting-water-pollution>

If you add resources please let us know: repairwhatyouwear@gmail.com.