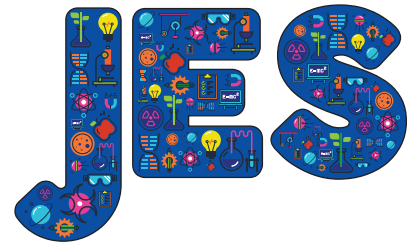


Recycling+: Helping learners understand fast fashion and how clothing choices can help address the climate emergency



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Abstract

Every item of clothing we wear contributes to climate change, but how do we raise this with primary school students? This article describes Recycling+, a unit of work on the topic of clothing.

The New Curriculum for Wales provides a unique opportunity to develop new units of work to deliver high quality climate change education. This article describes a collaboration between academics from science, geography and modern languages and classroom teachers at a Welsh primary school to develop a unit of work on clothing choices and the climate emergency. The unit of work encourages students to think about their clothing – where it comes from, how it is looked after and where it goes after disposal. Students learn technical language such as 'biodegradable' and 'sustainable', and are encouraged to be creative by upcycling clothing and engaged in activism, writing letters to politicians about sustainable clothing.

Keywords: STEAM Education, primary curriculum, sustainability, climate change education, fast fashion

Introduction

The climate emergency is a key global challenge faced by all of us, but especially future generations. Effective climate education has the capacity to help young people make choices that can reduce emissions and keep the climate below 2 degrees of warming (Cordero, Centeno & Todd, 2020). Through curricula specifically designed to inform and empower, it is possible to develop learners who are inspired to act on climate change, rather than just passively learn about it.

The Welsh Government has recognised the critical role that education plays in helping pupils learn about real world problems in a New Curriculum, which was launched in Welsh schools in September 2022. One of the aims of the New Curriculum is to develop '*ethical, informed citizens [...] of Wales and the world*' (Welsh Government, 2020, p.24).

This provides a unique opportunity to create units of work that address the climate emergency by making cross-curricular connections between different subject disciplines. Enabling teachers to deliver such learning requires partnerships between educators and academic experts in the fields of climate change, communication and climate change education (Civinini, 2021; National Climate Education Action Plan, 2021). Research-informed teaching resources can enable teachers to meet the needs of the New Curriculum and feel confident to deliver them, whilst also addressing one of the Four Purposes of the New Curriculum, namely supporting learners to become '*ethical, informed citizens of Wales and the world*' (Welsh Government, 2020).

Given that the climate emergency affects the entire planet, however, the imperative of sustainable behaviour goes beyond Wales, and any resources created in line with the New Curriculum are also applicable in educational settings across the world. Recognising the key role that education has to play, UNESCO has identified 'Teachers & Educators' and 'Youth' as two of the five priority action areas set out in its *Education for Sustainable Development 2030*. This is in keeping with the global needs set out in the United Nations Sustainable Development Goals. Encouraging learners to be mindful of the impact of their actions on the planet is key to achieving sustainable cities and communities (SDG 11), fostering responsible consumption and production (SDG 12), and promoting climate action (SDG 13). By virtue of our chosen topic, the unit of work that we created may also contribute to having a global impact on



reducing poverty (SDG 1), promoting decent work and economic growth (SDG 8) and building resilient infrastructure, advancing inclusive and sustainable industrialisation and fostering innovation (SDG 9).

Why create a unit of work around clothing?

Uniforms are mandatory at most primary and secondary schools across the UK, including within Wales. These uniforms come at a financial cost to parents/carers and have planetary costs associated as well, in terms of their carbon and water footprint. Indeed, currently over 5% of the UK's total annual carbon and water footprints result from clothing consumption (Love Your Clothes, n.d.). Although Wales is currently ranked third in the world in domestic recycling, it certainly contributes to the 1.13 million tonnes of unwanted clothing thrown out every year in the UK, 38% of which is neither reused nor recycled (My Recycling Wales, 2018). In addition, many of the clothes that we wear are sourced from fossil fuels, which is a resource that we need to use more sparingly to meet worldwide climate change reduction targets.

Schools can inadvertently add to the problem through designating a 'Christmas jumper day' or through 'World Book Day', leading to parents purchasing additional garments that are worn a limited number of times. In addition, pupils require non-uniform clothes that they can wear outside school, and the use of these clothes is limited to evenings (for some children) and weekends. As children grow rapidly, their high wardrobe turnover is seen as an inevitable development turned social norm, rather than an opportunity to use and re-use clothes by purchasing second-hand, handing on from siblings or cousins, or creating community clothes swap events.

A unit of work around clothing therefore provides an opportunity to start discussions with young learners in a positive way, with a view to placing science in a relevant context and effecting behavioural change. Moreover, since children play an important role in school and family dynamics, such changes in behaviour can hopefully permeate the school culture and the lives of the parents/carers in the longer term. Clothing is a topic that allows pupils to explore their role as citizens of Wales and the world. Through research, observation and discussion, they may understand that small changes in their daily habits, and those of their local communities, can have a positive impact on the environment globally, which goes well beyond just recycling.

How does learning about clothes achieve the goals of the New Curriculum for Wales?

This unit of work developed aims to support primary schools' efforts to embed the local, national and international cross-cutting themes set out in the Curriculum for Wales 2020. In particular, the unit may help schools to create opportunities envisaged in the Curriculum, whereby learners are encouraged to:

- recognise and engage with factors, influences and impacts (including economic, social and environmental impacts) locally, nationally and internationally;
- understand their role as citizens and the structures of government that affect them in each context;
- explore, critically analyse and respond to contemporary issues and challenges affecting their lives and the lives of others through each context;
- understand sustainable development, the challenges that the environment and society face and how they can engage with and make a difference to these issues supporting sustainable citizenship; and
- recognise the links between local, national and international contexts, understanding how they constantly influence each other.

Cross-curricular content and team

The New Curriculum for Wales favours an integrated approach to learning and teaching by working across six Areas of Learning and Experiences (AoLEs):

- Languages, Literacy and Communication
- Mathematics and Numeracy
- Science and Technology



- Humanities
- Health and Wellbeing
- Expressive Arts

(Welsh Government, 2020).

The cross-curricular character of the New Curriculum blends well with recent research around STEAM education (Science, Technology, Engineering, Arts and Mathematics). STEAM curricula have been shown to be multidisciplinary, relevant and societally engaged, and bridge the classroom and the wider world (Colucci-Gray *et al*, 2017).

The topic of clothing is, by nature, cross-curricular and therefore lends itself well to the holistic ethos of the New Curriculum. The team developing the unit was itself multidisciplinary, consisting of two primary school teachers (one of whom is the International Languages Lead for a cluster of Welsh primary schools) and academics from Swansea University in the areas of modern languages, geography and climate change education. The modern languages expertise is unusual for a climate change project as, traditionally, climate change education is thought of as being predominantly geography- and science-based. However, modern languages experts, Dr. Lublin and Ms Saez Lecue, drew the team's attention to the Atacama Desert clothes disposal area as a striking example of how global inequalities and the climate crisis were closely interrelated (for example, see Batt, 2022). Through researching where clothes were disposed of around the world, the whole team became acutely aware of both clothes' contribution to the climate emergency and how unequal the distribution of the burden is, as those who have least contributed to the climate emergency tend to be the most vulnerable to its effects. Not only do clothes have a high carbon and water footprint, but their disposal also exacerbates local problems, leading to a build-up of methane (a very potent greenhouse gas) in Accra, Ghana, and worsening desertification in Atacama, Chile (Chancel, 2022).

The team felt that it was important for pupils to come away from the week of learning with an understanding of the words 'sustainable' and 'biodegradable'. There is, however, no clear definition of 'sustainable', nor is 'biodegradable' a straightforward concept. Facilitating understanding of these terms for a target audience aged 4-11 required the team member with a chemistry PhD and a research associate with a Modern Languages Masters to work together to design a number of activities where the nuanced layers of meaning were unravelled.


What is in the unit of work?

We set out to develop a unit of work that focused on a different area of learning and experience (AoLE) each day for a week, ensuring that all six AoLEs are covered.

Tuesday focuses on Science and Technology (S&T), Wednesday on the Humanities, and Friday's Fashion Day focuses on the Expressive Arts (EA). The other AoLEs, Languages, Literacy and Communication (LLC), Maths and Numeracy (M&N) and Health and Wellbeing (H&W) are spread over Monday and Thursday. Different PowerPoint presentations for each of the days provide stimuli and engaging activities so that, throughout the week, pupils are encouraged to engage with their clothes and reflect on how their clothing choices have an impact on Wales and the wider world. Whilst the materials are set out over a week, we understand and expect that teachers will have to adapt the unit to their students and school curriculum. Therefore, some schools may trial it as a whole school week-long topic and others may engage one year group with a few activities. We are interested to see how it will be adapted once a number of schools have trialled the resource.



Figure 1. Overview of the Recycling+ unit of work

Primary School - Short Term Planning 
Topic: The Life Cycle of Clothes

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Immersion Day Bring your favourite clothes to school day	Detectives Day Materials: what are my clothes made of? Why?	Here and There Day The journeys that clothes make	Drama Day Perspectives in the world of the fashion industry: what role do we play?	Fashion Day Trends: fast and slow fashion
LLC Exhibit our clothes and express our opinion Spider Diagram: what do I know about my clothes?	S&T Investigation of fabric properties Discuss: Are "sustainable" and "biodegradable" properties? How do we measure this?	Humanities Quiz: Can you guess where X is made? Double sided cards (Clothes on one side, Country of origin in the other)	LLC Set up a class discussion about how to make the fashion industry more sustainable (in role, include multitude ideas and perspectives)	EA Discuss how to make your clothes last longer (How to look after my clothes) What is refashion & upcycling?
M&N Data Handling: looking at labels, collect data of origin and composition, and show results in bar charts/pie charts	S&T Rank fabrics' properties from most to least important when choosing what to buy (diamond ranking activity)	Humanities Atacama Desert Clothes Disposal Area (map journey) Comparing the life cycle of two different items: map their journeys from beginning to end	LLC Use these perspectives to inspire a piece of writing: persuasion text or poster	EA Design "The perfect uniform for a happy world". Chn to make decisions on the origin and fabrics used to create an ethical sustainable uniform.
M&W Discuss results and log their opinions on the spider diagram: what have I learnt so far?	S&T What makes a piece of clothing the best buy and why?	Humanities Woollen Mills in Wales (Virtual) Trip to Woollen Mill	M&W Arrange interview with expert What can we do to improve our impact on the planet? Discuss ideas and list benefits linked to their wellbeing	EA Design project: use their own old clothes to make something new

A caveat

There is significant complexity in the creation, use and disposal of items of clothing, including the use of alternative and 'more sustainable' materials, such as the shedding of microfibres. We have not found it possible to communicate that level of complexity to primary-age students and instead tried to focus on a simple and actionable message – to significantly reduce the purchase of brand new clothing to re-use clothing as much as possible.

Immersion Monday

The week starts with all learners bringing or wearing their favourite clothes to school and discussing what they know about them – Where do they come from? Who might have made them? How do the clothes get to a shop? In this way, pupils start the week by thinking differently about an everyday item. For older learners (aged 7+), the discussion can be deepened to include questions around social justice (e.g. labour costs of making the garments and human rights).

Children then learn how to read the labels on their clothes, including washing instructions, origin and fabric composition. They are taught how to log this information numerically using tally charts, bar graphs, or frequency tables (as appropriate for their age and stage).

The day finishes with pupils reflecting on what they have learnt.

Detectives Tuesday

Next is a science and technology-dominated day to ensure that pupils come away with an understanding of the words 'sustainable' and 'biodegradable'. They start gently by thinking about what properties they need from their clothing – e.g. waterproof for rain. Older learners (aged 7+) design a coat for rainy or snowy weather. Younger students (aged 4-6) choose appropriate clothing from a given selection for rainy/snowy/sunny weather.

Pupils then move on to a science investigation, with older groups looking at thermal insulators and younger ones looking at waterproof materials.



To understand what clothing is 'more sustainable' and 'less sustainable', children read a custom-written fiction called *Sam's Clothes*. This follows the story of Sam, who is in class learning about how children's clothing choices can help the planet. Sam has never had new clothes because they are always passed down from siblings or cousins, and Sam has always felt embarrassed about that. The children in the story learn about different materials for making clothes. They learn where wool comes from and how it is turned into knitted items, such as jumpers. They are told that, when composted, clothes break down into soil, meaning that they are biodegradable (see Figure 2, left).

Figure 2. Excerpts from *Sam's Clothes* (story designed using *Twinkl Create*).



The children in the story then learn about polyester, how it is made from oil and that it is a type of plastic. The children are sad because they know that plastic is bad for the environment. They learn that plastic to make clothes can come from recycled plastic bottles and are thus introduced to the concept of sustainability (see Figure 2, right).

The children in the story then learn about cotton and the amount of water required to grow it. They realise that many of their clothes are not helping the planet. The teacher tells them that they need to look after their clothes, mend them when they are broken, pass them on to siblings, cousins and friends, and buy second-hand or from charity shops when new clothes are needed. Sam finishes the story feeling proud, instead of embarrassed, by the mended, gifted and woollen clothes that he wears on a daily basis.

The story enables complex vocabulary to be introduced to very young learners (aged 4+) without seeming overwhelming. Its use also enables them to get a sense of what the words 'sustainable' and 'biodegradable' mean in the context of their lives, rather than learning them as abstract scientific terms. Simplifications have been made – for example, the dyeing process of wool can be chemically intensive and affect the biodegradability of the final product – but this discussion could be instigated by older pupils (or their teacher) as a stretch activity.

Pupils finish the day by further exploring ten properties of clothing, such as durability, warmth, or waterproof capability, using double-sided vocabulary cards (Figure 3).

'Biodegradable' and 'sustainable' are also revisited in this activity.

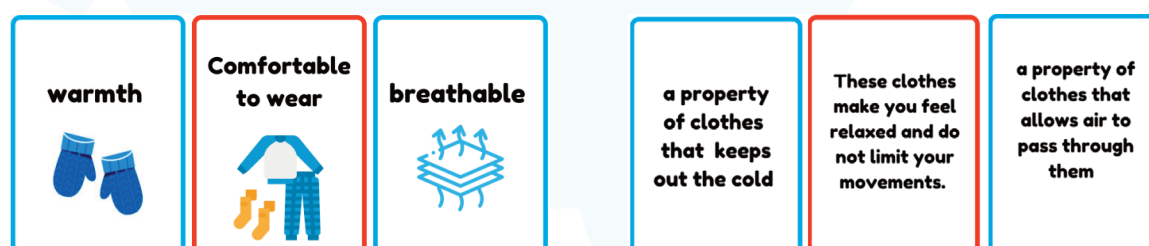


Figure 3. Examples of the double-sided 'Properties of Clothing Cards' (double-sided cards were created using *Canva*).

Here and there Wednesday

The aim of Wednesday's activities is to use the Humanities to understand where clothes come from. Pupils learn about the geography of the world through being challenged to find countries on a map, but also gain an understanding of how far and by what mode of transport their clothes travel to reach them in Wales.

A game was created using double-sided cards with an item of clothing on one side and the country of origin on the other (Figure 4). Pupils are asked to look at the item of clothing and guess where it comes from. The country of origin on the other side shows the shape of the country, its flag and its name. A discussion is prompted via questions such as: What is the furthest country that we import clothes from? What are they made of? How 'sustainable' are they?

Learners are then asked to watch a video about the clothes disposal area in the Atacama Desert in Chile. They are also taught about the clothes market in Accra, Ghana, and the clothes landfill just outside the city. An opportunity is given to reflect on what they have learnt and how it makes them feel. They are then asked to plot the journey of two items of clothing on a world map – one item made locally that has been used over a long period of time, and an item that was produced in a certain country, used once and then disposed of in another country. Through this activity, pupils understand that many clothes end up in landfill in other countries, where they have a negative impact on the local communities. They will also understand that we can make choices about where to source our clothes in order to decrease that negative impact on communities and, ultimately, the planet.

Figure 4. A selection of the double-sided cards used for the 'Where do my clothes come from?' game (double-sided cards were created using Canva).

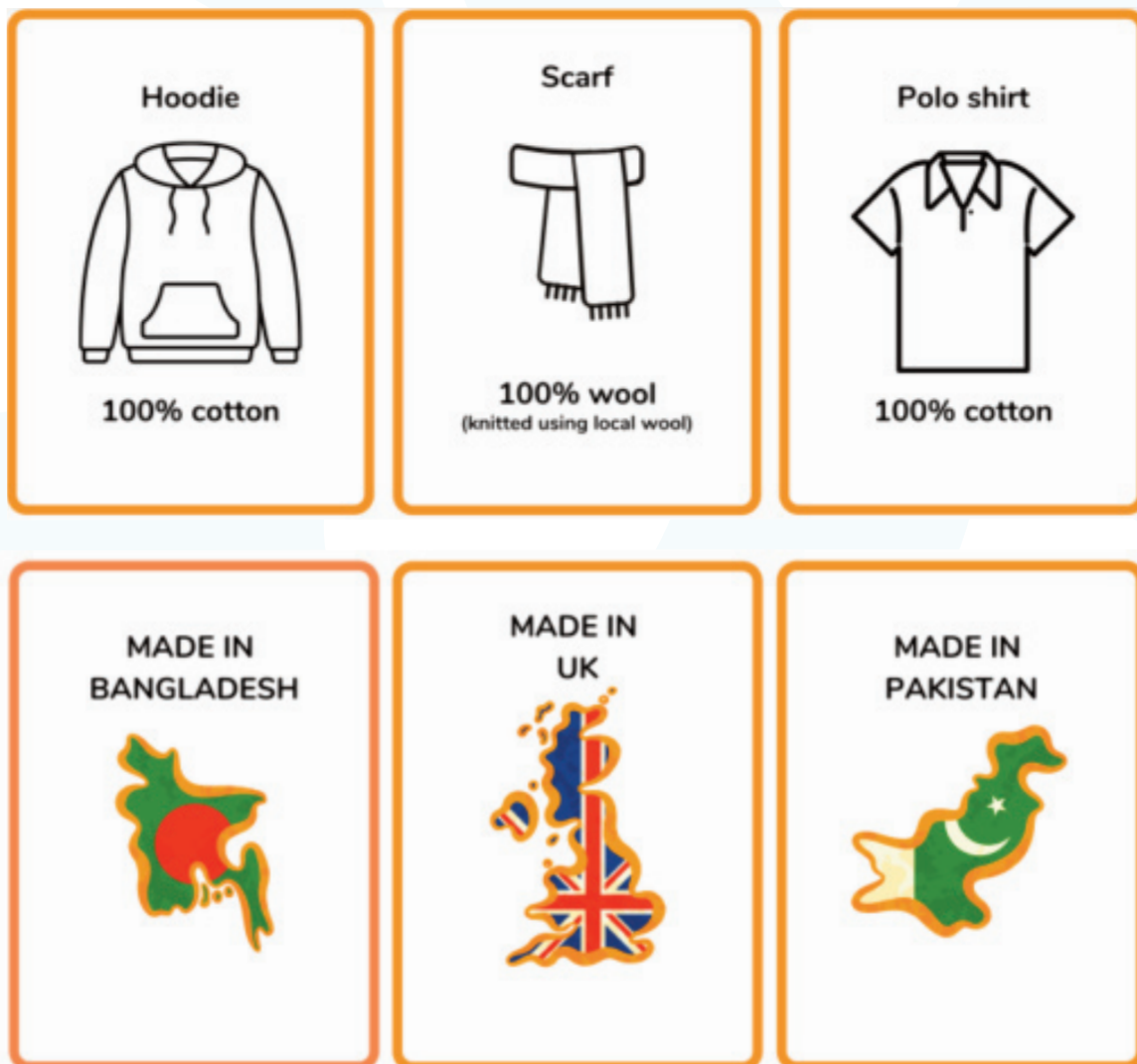


Figure 5. Example letter that learners can adapt and send.

Lower KS2

From

To

Date

Dear

I am a pupil at

I have been learning about clothes at school this week. We have learnt about what materials we wear and how we can look after them.

I am really worried that lots of my clothes aren't sustainable. I am also sad that we send our clothes away to countries like Chile and Ghana where they end up in landfill. I wouldn't want to live with a pile of dirty old clothes in my back garden, so why should they?

Please can you make sure that the people who make clothes start caring more about how many clothes they make and where clothes are sent away to? We also need to talk a lot more about repairing our clothes and wearing them for longer, as well as not buying so many clothes.

I think we should all look after our planet. I'm going to do my bit; please can you make sure everyone else does too?

Kind regards,

Drama Thursday

On the Thursday, pupils start by reflecting on what they have learnt about clothes so far. The teacher then provokes discussion about the impact of fast fashion, global chains, popular demand and overproduction of clothing – tailoring it to be age- and vocabulary-appropriate. Technical vocabulary, linked to the fashion industry, is then introduced as a way to bring in different points of view and enhance students' understanding of the roles that each sector plays in the creation and disposal of clothing.

This leads into how the fashion industry can help the Welsh Government's agenda to be Net Zero Carbon by 2050 and culminates with pupils writing a piece of persuasive text. They can choose to write to a politician, their favourite shop, or a celebrity. An example text is given in Figure 5 for use with younger learners, or those who find writing particularly challenging.

Through writing those letters, pupils will understand that even though they are young and not yet able to vote, they can still make their point of view heard. This will empower them to understand that they can act on climate-relevant topics rather than just passively learn about them.

The last activity of the day is to interview an expert or watch a video on slow fashion. Pupils will have the opportunity to learn what they can do to lessen their negative impact on the planet and on others, again reinforcing the message that everyone can *act* as well as learn.

Fashion Friday

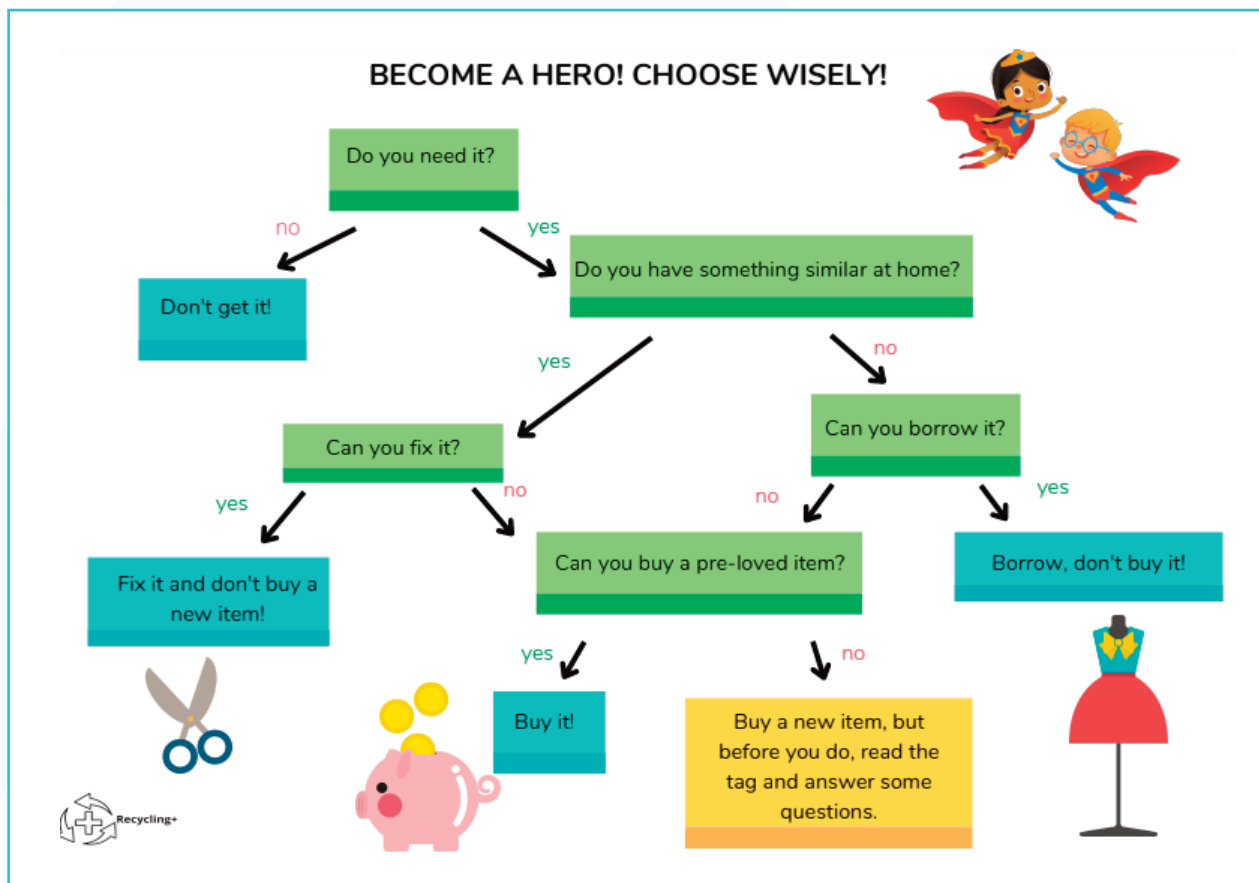
Friday's activities are taught through the Expressive Arts AoLE. Pupils start by mind-mapping how to make their clothes last longer. They are then asked to design 'the perfect uniform for a happier world', choosing items with more sustainable properties such as 'from a charity shop', 'made of recycled plastic', etc. They should explain the reasons behind their choices, such as 'My jumper makes the world a cleaner place because it's biodegradable'. They can show the class their designs or set up a gallery in the school corridor to spread the message more widely.

The final activity of the week is for learners to use their own old clothes to make something new, e.g. upcycling an old item, creating finger puppets from odd socks, making aprons or baby bibs from old towels.

As a reminder of the week's activities and the lessons that they have learnt, each pupil is given a printout of a decision tree to put on their wardrobe. It details the decisions that they should make when contemplating the purchase of a new item of clothing (Figure 6).



Figure 6. The decision tree printout given to each student at the end of the unit of work (this has been made using *Canva*).



Conclusion

Working on the Recycling+ project has stretched and inspired the whole team to find the best ways of drawing on our diverse specialist expertise in order to produce classroom-ready materials. Whilst the unit of work has been designed to meet the needs of the New Curriculum for Wales, the emphasis on fun activities, engaging experiential learning and the real-life context means that this resource is adaptable to primary teaching across the UK and beyond. Our experience has been that the deeper understanding of the planetary impact of familiar objects, which are often overlooked or taken for granted, helps children to realise that everyone can make positive choices. Teachers who trialled the unit of work said that this learning led on to further pupil-led actions, such as litter picks around the school. It also resulted in teachers swapping clothes with one another! Feedback also included teachers’ concerns about climate change and how they wanted to teach pupils about climate change without scaring them. It was encouraging to hear that this unit of work enabled them to do just that.

Feedback also demonstrated the different interests that the students had. Whilst older students (aged 7-11) particularly enjoyed sorting their clothes into countries of origin, the younger students (aged 4-6) enjoyed testing the properties of clothes materials.

As authors, we hope that sharing the decision tree with the students in the final session helps to reinforce this sense of empowerment and fosters commitment by showing that we are all able to make choices to reduce our carbon footprint. We will continue to work with teachers to consider how the resources are used in schools and whether they need to be further adapted for widespread use.

In the meantime, we are looking forward to hearing from teachers who have used the resources. They are free to download from: https://docs.google.com/forms/d/1u2t_-tuDF5kOvBLwWmj6VAKvaM6P21oIBhiCgyCDIh8/viewform?edit_requested=true



Funding

This research was funded by NERC through the discipline-hopping grant, and UK AHRC through the Impact Acceleration Account grant, both administered by Swansea University.

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For further resources on teaching sustainable fashion, visit:

- <https://sustfashwales.org/ks3-education/>
<https://www.teachingenglish.org.uk/article/fast-fashion>
<https://www.futurelearn.com/courses/who-made-my-clothes>

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