

HIAS MOODLE OPEN RESOURCE

Design and Technology

Sustainability

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February 2025
Final version

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Overview

This document contains guidance to support further embedding climate education in the design and technology curriculum.

Points to consider when using this resource

It was created during February 2025 and all website links were active at this time. The organisations signposted are national ones that teachers are likely to be familiar with, but it is always recommended to quality assure any online sources you use in the classroom with your colleagues.

Sustainability in Design and Technology

Sustainability in Schools

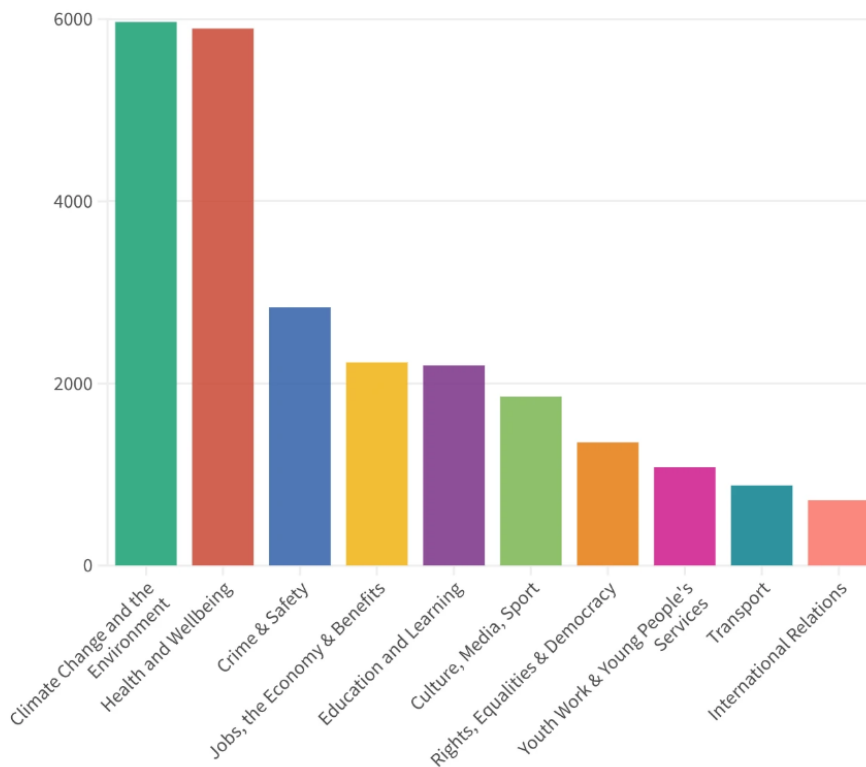
Climate change has emerged as a critical issue in recent years, with its effects becoming more apparent through extreme weather events such as heatwaves, wildfires, rising sea levels, and severe storms. According to the [Peoples' Climate Vote 2024](#), conducted by the [United Nations Development Programme](#), 80 percent of people worldwide are calling for stronger governmental action to address the climate crisis.



This growing awareness extends beyond scientists and environmentalists, reaching into all sectors, including education. School leaders and students are increasingly recognising the importance of climate education and the need to reduce the environmental impact of school buildings and communities. Earlier this year, young people in Hampshire identified climate change and the environment as their top concern, with over 25,000 participants in the ['Make Your Mark'](#) youth consultation, the largest of its kind in the UK.

The Make Your Mark 2024 Hampshire Survey Results

Source: [Make Your Mark
| Hampshire Youth
Parliament
\(hampshireyp.org\)](https://makeyourmark.hampshireyp.org/)



DFE Sustainability and Climate Change for Schools Guidance

The [2022 policy paper from the Department for Education](#) (DfE) set an ambitious vision of the UK becoming the world's leading education sector in sustainability and climate change by 2030 (DfE, 2022) as outlined below:

Vision: the United Kingdom is the world-leading education sector in sustainability and climate change by 2030.

In England, we will achieve this through the following strategic aims:

- 1. Excellence in education and skills for a changing world: preparing all young people for a world impacted by climate change through learning and practical experience.*
- 2. Net zero: reducing direct and indirect emissions from education and care buildings, driving innovation to meet legislative targets and providing opportunities for children and young people to engage practically in the transition to net zero.*
- 3. Resilience to climate change: adapting our education and care buildings and system to prepare for the effects of climate change.*
- 4. A better environment for future generations: enhancing biodiversity, improving air quality and increasing access to, and connection with, nature in and around education and care settings.*

Source: *Sustainability and climate change: a strategy for the education and children's services systems* - GOV.UK (www.gov.uk)

This guidance is not statutory. Instead, it set out a key initiative for all schools to have a **nominated sustainability lead and a climate action plan in place for 2025**. The guidance breaks down the vision to provide **five areas** where schools and educators should focus:

1. **Climate education**
2. Green skills and careers
3. Educational estate and digital infrastructure
4. Operation and supply chains
5. International

Design and technology

The concept of sustainable development, as defined by the World Commission on Environment and Development, is about creating progress that satisfies current needs without hindering future generations from meeting their own needs. This principle emphasises the importance of halting the relentless exploitation of Earth's resources and encourages the exploration of alternative designs and production methods for new products. Adopting this mindset is crucial for designers, not only for environmental reasons but also for commercial viability.

Today, there is widespread awareness of environmental issues, and the consequences of ignoring sustainable design are evident. For instance, the vast amounts of plastic waste in our oceans highlight the detrimental effects of non-degradable materials and poor product design. As a result, sustainable design is increasingly seen as a key aspect of global corporate responsibility. Consumers are becoming more conscious of the environmental impact of their purchases, prompting manufacturers to rethink their product development and marketing strategies.

Global Goals for sustainable development



Climate education in design and technology

Climate education is a vital component of design and technology. Whether it's exploring sustainable design practices at the GCSE level or addressing environmental issues like waste reduction in school projects, this subject is well-suited to help students grasp climate-related concepts and actions. To begin, it's advisable to conduct an audit to determine where and how climate education is incorporated throughout the curriculum.

Consider if sustainability is a central theme in your curriculum and if it is reflected in each topic or project. Given the strong connections between design and technology and sustainability, subject leaders will likely find that many parts of the curriculum engage students with environmental issues. It's essential to ensure this content is evenly spread across different year groups and throughout the school year.

Next, think about progression: are there opportunities for students to build on their climate knowledge from Key Stage 3 to Key Stage 4? Have you planned for continuity into Key Stage 5, linking to sustainable design and technology at A Level?

As part of this audit, engage with students to understand their perspective on climate education in design and technology. For example, can they see the connection between studying sustainable materials and learning about broader environmental impacts?

Key Stage 3 curriculum

Here is an example of a Key Stage 3 curriculum map (created on Co-pilot) for Design and Technology with sustainability as a central theme across Years 7, 8, and 9:

Year 7	
Term 1: Introduction to Design and Technology	• Topics: Basic principles of design, introduction to materials. • Sustainability Focus: Understanding the environmental impact of different materials, introduction to the concept of sustainable design.
Term 2: Sustainable Materials and Their Uses	• Topics: Properties and uses of sustainable materials. • Sustainability Focus: Exploring renewable and recyclable materials, life cycle analysis of products.
Term 3: Simple Sustainable Projects	• Topics: Designing and making simple products. • Sustainability Focus: Emphasizing the use of sustainable materials and processes, reducing waste in projects.

Year 8	
Term 1: Advanced Sustainable Design	• Topics: More complex design principles, introduction to CAD (Computer-Aided Design). • Sustainability Focus: Designing for disassembly, reducing environmental impact through design.
Term 2: Energy and Efficiency in Design	• Topics: Energy use in manufacturing, efficient design. • Sustainability Focus: Exploring energy-efficient design practices, renewable energy sources in manufacturing.
Term 3: Sustainable Product Development	• Topics: Developing and prototyping products. • Sustainability Focus: Life cycle assessment, considering the entire product life cycle from design to disposal.
Year 9	
Term 1: Innovative Sustainable Solutions	• Topics: Innovation in design, advanced CAD techniques. • Sustainability Focus: Creating innovative solutions to environmental problems, using technology to enhance sustainability.
Term 2: Sustainable Manufacturing Processes	• Topics: Manufacturing techniques, production planning. • Sustainability Focus: Sustainable manufacturing processes, minimizing waste and energy use.
Term 3: Capstone Project	• Topics: Comprehensive design and make project. • Sustainability Focus: Students design and create a product with a strong emphasis on sustainability, presenting their projects with a focus on environmental impact.
Cross-Year Activities	
• Sustainability Workshops: Regular workshops on sustainability topics. • Field Trips: Visits to sustainable manufacturing facilities or recycling plants. • Guest Speakers: Inviting industry experts to talk about sustainable design and technology.	

Year 7	
Project 1: Eco-Friendly Pencil Holder • Objective: Design and create a pencil holder using recycled materials. • Sustainability Focus: Emphasize the use of recyclable and upcycled materials, reducing waste.	Project 2: Solar-Powered Toy Car • Objective: Build a simple toy car powered by a small solar panel. • Sustainability Focus: Introduce renewable energy concepts and the benefits of solar power.
Year 8	
Project 1: Sustainable Packaging Design • Objective: Design and create packaging for a product using sustainable materials. • Sustainability Focus: Explore biodegradable and recyclable packaging options, reducing environmental impact.	Project 2: Energy-Efficient Lamp • Objective: Design and construct a lamp that uses energy-efficient LED bulbs. • Sustainability Focus: Highlight the importance of energy efficiency and the use of sustainable materials in product design.
Year 9	
Project 1: Upcycled Furniture • Objective: Design and build a piece of furniture using upcycled materials. • Sustainability Focus: Encourage creativity in repurposing materials, reducing waste, and promoting sustainable living.	Project 2: Sustainable Fashion Design • Objective: Create a piece of clothing or an accessory using sustainable fabrics and materials. • Sustainability Focus: Discuss the environmental impact of the fashion industry and the importance of sustainable fashion choices.
Cross-Year Activities	
• Sustainability Challenge: A school-wide competition where students design and create products with a strong emphasis on sustainability. • Eco-Club Projects: Encourage students to join or form an eco-club to work on various sustainability projects throughout the year, such as a school garden or recycling programme.	

The wealth of climate education resources:

After completing your audit and pinpointing opportunities to incorporate climate education and enhance knowledge progression over time, you might find the vast number of organizations offering teaching resources overwhelming. Here are some recommended organizations to begin with, particularly those that blend climate inquiry with design and technology.

The D&T Association

The D&T Association's free resource [Sustainability in Product Design](#) offers students a wide-ranging look at sustainability in product design at an appropriate level for GCSE and A-Level students. It looks at the role of the product designer and the many factors they should be aware of when designing.



Practical Action

[Practical Action](#) has a number of resources for teachers and students that aim to engage with and help understand the Global Goals.

One of the resources is Farmers' Footsteps. Based on Practical Action's 'Farming that works' programme, it enables pupils to learn how farmers in Nepal are increasingly having to adapt their practice to cope with climate change.

FARMERS' FOOTSTEPS

How are farmers turning the tables on climate change?

Practical
ACTION





Water for crops

The installation of water pipes to remote mountainous areas in Nepal has been good news for farmers!

It has meant that farmers whose crops were previously failing are now producing enough to feed their families and to sell at markets.

The Ellen MacArthur Foundation

The [Ellen MacArthur Foundation](#) works to accelerate the transition to a circular economy. They develop and promote the idea of a circular economy, and work with business, academia, policymakers, and institutions to mobilise systems solutions at scale, globally.

They provide Interactive resources for curriculum development – designed to encourage discussion, clarification, and reflection within the context of a circular economy and lesson plans for educators to use.



REDESIGNING PLASTICS

The Ellen MacArthur Foundation works with business, governments and academia to accelerate the transition to an economy that is restorative and regenerative by design: a circular economy. Our education resources are designed to actively engage students in thinking about the economy and exploring alternative models for the future.

Subjects: Design and Technology, Biology, Chemistry, Environmental Sciences, Business

Age range: 12+

Total time: 2x 45 minutes (90 minutes total)

Skills: Communication & teamwork, problem solving, creativity & imagination, presenting, scientific inquiry

Learning intentions: To deepen awareness of the systemic challenges around plastics packaging and how these might be overcome through redesign.

Preparation: Read additional teacher information, [print design sheet](#), test [powerpoint presentation](#), load videos and sound check.

Prototyping materials: It's useful to have some items that students can explore their ideas with. E.g. paper, tape, newspaper, blu tack, old card boxes, scissors, colour pens, etc.

2014



1:5

2050



>1:1

RATIO OF PLASTICS TO FISH IN THE OCEAN* (BY WEIGHT)

Plastics in the environment can lead to reduced productivity of vital natural systems such as oceans. Plastics can clog urban infrastructure, thus creating huge economic costs (i.e. negative externalities) for everyone.

Is anyone doing anything about this? Yes. Governments, cities and communities have activated various investments, schemes and collaborations.



People doing large scale clean-ups



Re-use bottle banks and return schemes



Collection and recycling schemes



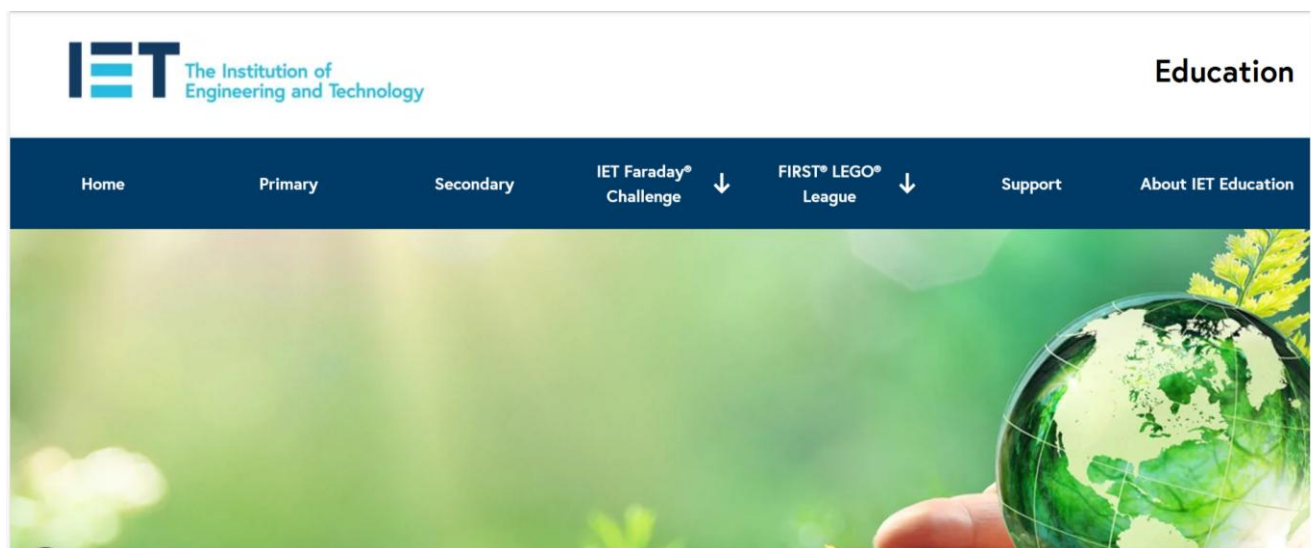
Renewable resources, design for degradability



Intelligent sorting machines

The Institute of Engineering and Technology

They support teachers by providing a range of resources linked to the UK curriculum/sustainability and partnering with organisations to create experiences that inspire teachers and students alike.



Food a fact of life

Here you will find resources about sustainable healthy food. There are a wide range of resources to support teaching and learning around sustainability in context, helping pupils learn through everyday experiences.

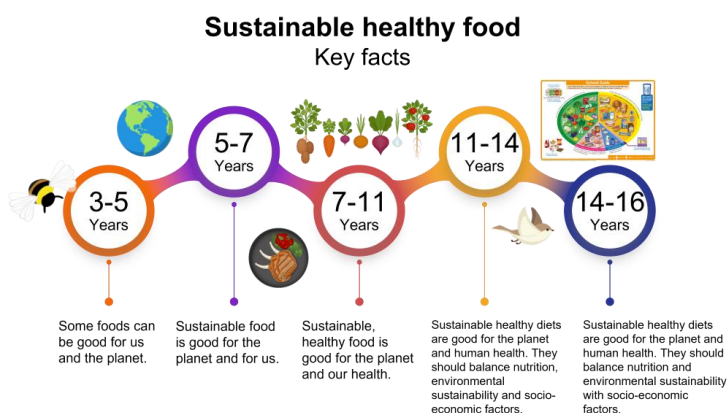
The government's [sustainability and climate change strategy](#) (updated December 2023) states that all children and young people should learn about the natural environment, including the importance of sustainability. Food and nutrition, particularly at GCSE or equivalent level, has been identified as providing opportunities for pupils to be taught about the environment and sustainability, in context.

Educating children and young people about sustainability through the context of food and nutrition helps them understand the environmental impact of food production while encouraging actions like reducing waste and eating seasonally. It equips them with life skills, including meal planning and critical thinking, to make informed, ethical, and health-conscious decisions that support both local and global communities. This knowledge prepares students to address future challenges, contribute to sustainable practices, and act as responsible citizens.

Sustainable, healthy diets Key facts

Each section is based on one of the *Food – a fact of life* Key facts, which progress through the age phases.

The Key facts cover the core competences for children and young people aged 5 -16 years and indicate what a pupil should know at each stage of their learning journey.



See our [Curriculum roadmaps](#) to find out more about the Key facts

www.foodafactoflife.org.uk © Food – a fact of life 2025

Food loss and food waste

About one third of all food is lost or wasted.

This waste also contributes to greenhouse gases being released.

In the UK:

- About 70% of food is wasted at home;
- About 30% is lost on farms or in supermarkets.

The average household spends £470 on food that ends up in the bin every year!

Farmers and retailers are trying to find ways to reduce food that is lost and wasted, e.g. selling 'wonky veg' that would otherwise be thrown away and turning waste into food for animals.



Food loss is food that is lost before it makes it to stores. **Food waste** is food we waste at home or in stores.



Source: [Food Waste – 2024 Facts & Statistics](#)

www.foodafactoflife.org.uk © Food – a fact of life 2025

HIAS resources:

Don't forget to take a look on the HIAS Moodle pages for further guidance and lesson inspiration. There is a dedicated page called Climate Unity where you can find further links to resources as well as access all the previous Hampshire wide climate themed events for students such as the annual conference. [Course: Climate Unity](#)



"Another world is not only possible, she is on her way. On a quiet day, I can hear her breathing."

Arundhati Roy (Indian Author and Man Booker Prize winner)

In this area you can find resources to support your teaching about the Climate Crisis. Materials will be added to over time here and are especially suitable for KS2 and KS3, but many will also be adaptable for younger children as well as for older young people.

You will also find bespoke resources on the Design and Technology Moodle which will be added to over 2025.

Sustainable Clothing – the issue with fashion

Introduction

The textiles we use, and wear have many environmental impacts. Making the way we produce and use our textiles sustainable is vital to meet consumer needs, whilst protecting our environment. As a set, this group of resources covers the following important themes concerning clothing sustainability:

- 1 Where do our clothes come from?
- 2 Environmental impacts and waste production
- 3 How can we reduce our Fashion Environmental Impact?
- 4 Waste reduction project 1
- 5 Waste reduction project 2
- 6 Waste reduction project 3

Sustainable clothing – Key Learning Objectives

- Where do our clothes come from?
- What are the environmental impacts of producing textiles?
- What can we do to reduce these impacts?

Note to Teachers/Educators

These notes are intended to provide key information and facts to support teacher/educators delivering the topic. They are accompanied by a PowerPoint presentation with plenty of visuals to aid students' learning (all slides are referred to in the notes). Please feel free to modify the presentation by adding your own slides or deleting those you do not need.

Design and Technology

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For further details on the full range of services available please contact us using the following email:

htlcdev@hants.gov.uk

Upcoming Courses

Keep up-to-date with our learning opportunities for each subject through our Upcoming Course pages linked below. To browse the full catalogue of learning offers, visit our new Learning Zone. Full details of how to access the site to make a booking are provided [here](#).

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