Schools Climate ACTION

GREENER ENFIELD

ENFIELD Council

Contents

Foreword

Enfield Council has an ambitious climate action plan with a target to become a carbon neutral council by 2030 and a carbon neutral borough by 2040.

With Enfield schools making up more than a quarter of the Council's carbon emissions, we are committed to supporting schools in reducing their carbon emissions and helping to influence behaviour change beyond the school gates so that together we can become a carbon neutral borough by 2040.

Climate action can be incorporated into every aspect of school life, from the curriculum to estate management, to how schools encourage families to get to and from school in a way that maximises their health and minimises their carbon footprint.

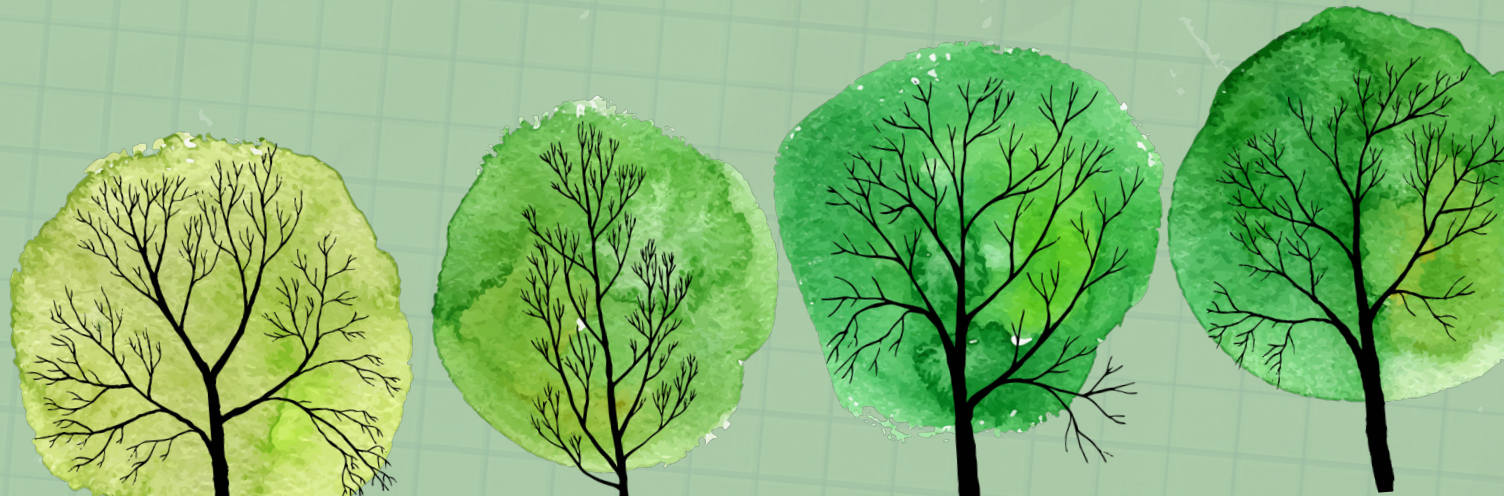
This second edition of our school climate action handbook is intended to support all Enfield schools on their climate action journey. It sets out some of the ways in which schools can take climate action and provides information about the resources available to help. The handbook is for teaching staff, leadership teams, business managers, governors or any member of the school team working to make your school a more sustainable place.

Cllr Ergin Erbil
Deputy Leader of Enfield Council
Climate Action Lead

Nature-Based Solutions:

trees, shrubs, raingardens and more

Across the borough, the Council is working with partners to re-wild landscapes and create new wetlands and rain gardens in built-up areas. There are lots of opportunities for pupils to spend time in nature, contribute to tree planting and wetlands work and learn about how this activity is helping with flood management, carbon capture, increasing biodiversity and reduce pollution in local rivers and waterbodies in their local area. We also work with partners to help schools increase planting and biodiversity on school sites and deliver outdoor teaching gardens that inspire hands-on learning and get pupils excited about growing and eating healthy food.

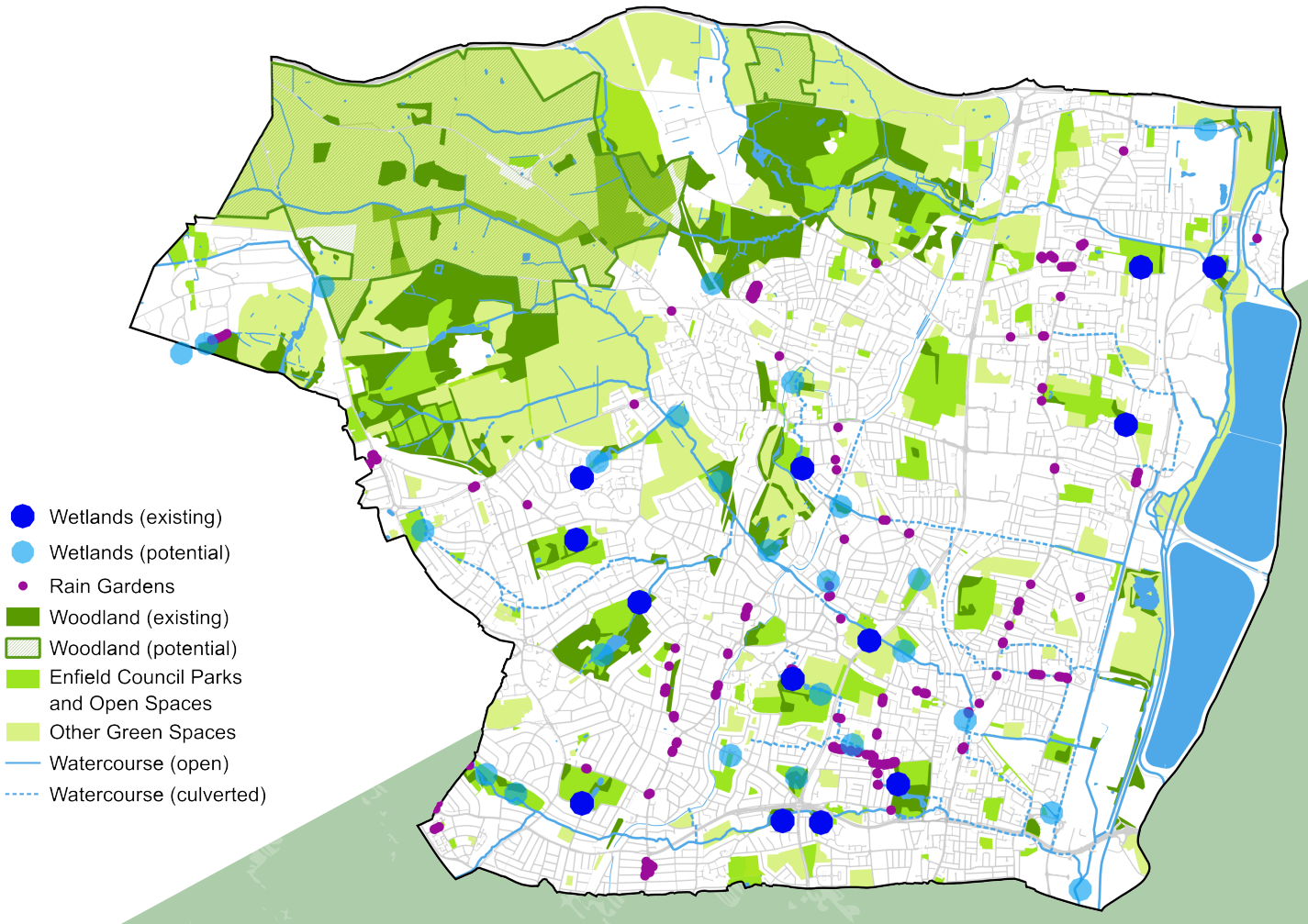


What's the Council doing?

We're improving and increasing blue and green infrastructure by protecting nature, creating new wetlands and planting more trees across the borough. This includes 80 hectares of new woodland created in Enfield Chase while developing a plan to increase this further across the north of the borough.

We're also working to increase trees and greenery in urban areas across the borough, with almost 2000 new street trees planted since 2021/22.

The map shows all the green and blue spaces in the borough, including existing and proposed woodlands, wetlands and rain gardens.

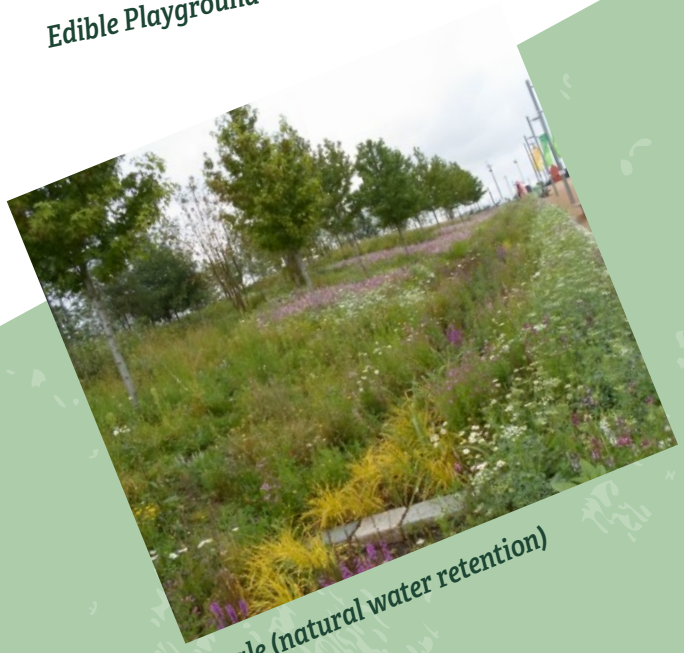


Action for schools

- Increase trees, shrubs and other plants around the school perimeter – for example, what could you plant to screen the school grounds from roads or parked cars, or on unused space on the edges of playing fields?
- Create sustainable drainage systems (also referred to as SuDS), where you have space on your school site – replace paving, tarmac, or concrete with rain gardens, or small wetlands, as well as use tree pits as SuDS and retrofit rain planters.
- Create an **Edible Playground** to inspire hands-on learning and get pupils excited about growing and eating healthy food.
- Partner with organisations such as **Thames21** or **Trees for Cities** for advice, guidance and expertise and to find ways to access funding and take part in new projects.
- Use diverse natural environments as outdoor classrooms.
- Visit, contribute to and learn from green and blue spaces across Enfield.

Edible Playground

Rain Garden



Swale (natural water retention)

Benefits

Biodiversity - water features such as ponds, wetlands and rain gardens are great spaces for wildlife including frogs, newts and dragonflies as well as many types of birds and small mammals.

Nature education - these diverse natural environments can be used as outdoor classrooms with opportunities to learn about biology, botany, geography and to develop fine motor skills.

Better water management - rainwater harvesting systems that store water can be used for things like watering plants and flushing toilets.

Reduced pollution - sustainable drainage systems (SuDS) filter out and break down pollutants helping to make our rivers cleaner.

Reduced flood risk - SuDS reduce pressure on urban drainage systems during heavy rainfall by storing water and allowing it to soak into the ground or releasing it slowly into the sewer network.

Public health – a greener school environment can be linked to improved motor skills, better learning processes and has also been shown to be associated with better behavioural outcomes and attention restoration (Improving Access to Greenspace Public Health England, 2020).

Noise reduction – dense vegetation can reduce noise pollution if sufficiently dense, high and wide. A recent study by the University of Sheffield found that a 5m-wide vegetation barrier next to a 2-lane highway reduced noise levels by 9-11decibles. Well-designed green and blue spaces can also be used to generate natural sounds, which can mask or distract attention away from unwanted sounds.

Air quality – dense vegetation can improve air quality by capturing small particulate matter.

Reduced urban heating – the evaporative cooling effect of green space significantly reduces the temperature in comparison to areas heated by direct solar radiation.

Planting additional trees on school sites also provides additional shade, and improves resilience to extreme heat.

How can we support you?

Talk to us about options for your school estate

Talk to us about how you think you could enhance biodiversity on your school estate, such as by planting new trees/ shrubs/ hedges, creating rain gardens or wetlands; and/or creating food-growing projects on your school site. We can support you with ideas on how you can access funding and develop partnerships with organisations to provide trees/ shrubs/ hedgerows at low or no cost and to support with advice on planting and maintenance. Depending on available funding, in some cases the Council will be able to create gardens, wetlands, or edible playgrounds on your school site using Council or external funding.

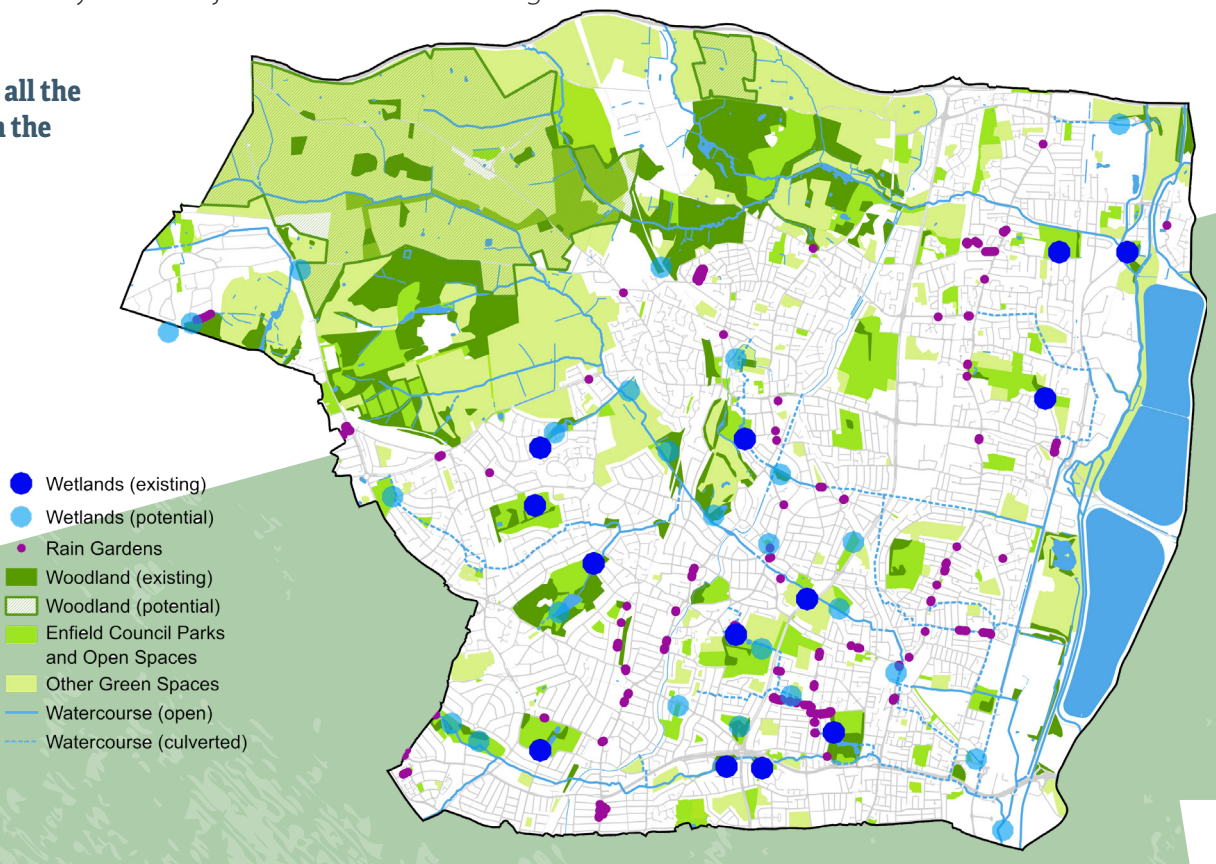
Take a school trip to one of our wetlands and get involved in local projects

If you want to know more about one of your local wetlands or want to find out how you could get involved with conservation work locally, get in touch.

Enfield's wetlands include:

- **Albany Park River Restoration and Wetlands –** Turkey Brook has been diverted out of a concrete-lined channel into the park and restored as a natural river. Wetlands have been created to help clean the water and protect nearby properties from flooding.
- **Broomfield Park Wetlands**
- **Bury Lodge Wetlands**
- **Enfield Town Wetlands**
- **Firs Farm Wetlands –** the wetland receives runoff from the Moore Brook catchment, a lost river of Enfield that was built over throughout the first half of the 20th century and had completely disappeared by 1955. Projects like this are restoring Enfield's natural streams and wetlands where possible.
- **Durants Park Wetlands**
- **Glenbrook SuDS**
- **Grovelands Park SuDS**
- **Prince of Wales Wetlands**
- **Pymmes Park Wetlands –** The wetlands clean polluted runoff from roofs and roads before it flows into Pymmes Park Lake
- **Oakwood Park**
- **Oakthorpe Primary School** - transformed by the creation of a unique sustainable drainage system (SuDS) in the playground with the students
- **Wilbury Way**

Map shows all the wetlands in the borough.



trees, shrubs, raingardens and more

Useful links

- GLA Reimagining rainwater in schools
- WWT SuDS for Schools
- BEGIN Designing Blue Green Infrastructure for Health and Wellbeing
- UDL Designing Rain Gardens
- Trees for Cities
- Schools Wild Challenge
- Learning about Forests programme
- Our Bright Future
- Transform our World
- WWF School Campaigns
- Earth Cubs

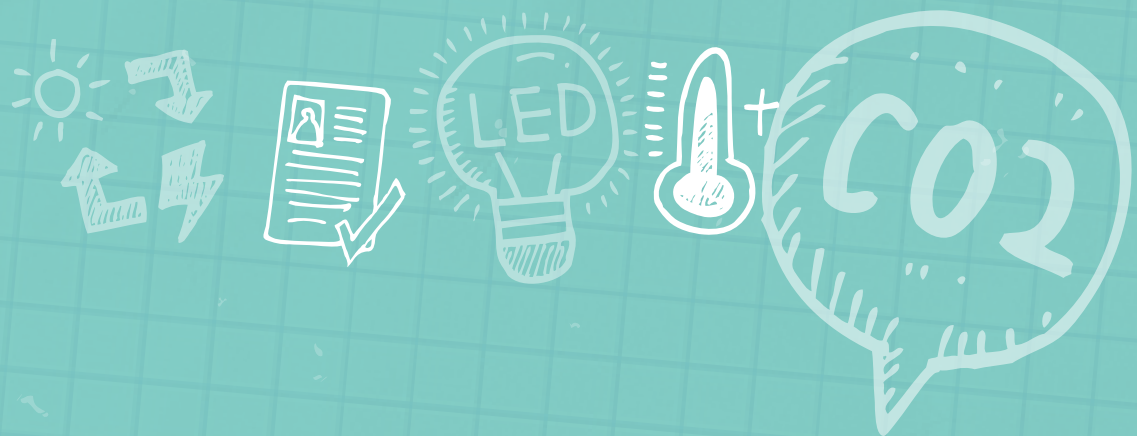
Contact us

climate.emergency@enfield.gov.uk

For information about sustainable urban drainage (SuDS) or wetlands you can also contact: **bluegreen@enfield.gov.uk**

Reducing energy and carbon

There are lots of opportunities for schools to reduce energy use and carbon emissions from their school estate. Opportunities range from day-to-day behavioural changes schools can take to reduce energy or conserve water, to accessing nationwide schemes to help educate school staff and pupils on energy reduction; and schemes to help fund retrofitting of the school to reduce energy use or decarbonise heating systems. Opportunities for reducing energy and carbon expand beyond the school estate, with opportunities to also influence action at home.



What's the Council doing?

The Council has set ambitious targets to become a carbon neutral organisation by 2030; and a carbon neutral borough by 2040.

In 2018/19 the Council emitted 21,908 tCO_2e (direct emissions) from our council buildings, maintained school buildings, streetlights and vehicle fleet, and is on a journey to reduce this to net-zero by 2030.

In 2018/19, our borough-wide emissions were 939,440 tCO_2e and alongside reducing our own emissions the Council is working with partners across Enfield and beyond so that we can also reduce these emissions to net zero by 2040.

We're taking action in a range of ways, including switching to 100% renewable electricity for Council buildings; replacing our street lights with LED bulbs, working with the council-owned energy company Energetik to connect more buildings to their low carbon heat network; reviewing our capital programmes and seeking to access new funding streams to retrofit buildings and decarbonise heat sources. We want to work with all schools to help you find ways to reduce your emissions and influence your wider school community to find ways to reduce emissions beyond the school gates too.

Action for schools

- Look at opportunities for government funding and financing to reduce energy and carbon of the school estate, available through **Salix**
- Include learning about energy and carbon emissions from buildings as part of the curriculum, involving pupils with monitoring and engagement, such as through the **Eco Schools**, and **Less CO_2** programmes
- Embed good practice in energy and water management, utilising advice and checklists provided in property handbooks and from the **Department for Education.** Schools are recommended to actively manage the operation of their building services, follow a regular maintenance programme and undertake assessments of building fabric.
- Actively monitor and measure energy and water consumption, checking the accuracy of fuel bills. Submitting regular meter readings enables accurate bills and benchmarking of performance, to highlight seasonal changes in energy consumption and opportunity for improvements.
- Produce an energy and water management plan, setting consumption and cost targets identifying areas of poor performance and opportunities for cost-effective improvements. Uphold statutory requirement to renew Display Energy Certificates (DEC), using the data provided on the DEC to identify areas for investment
- Explore opportunities for installing renewable technologies through establishing local community energy projects or utilising existing schemes such as **solar for schools.**
- Engage with heat decarbonisation and technologies such as heat pumps and heat networks – talk to us about options and consider how this can be factored into planning for future capital programmes.

Benefits

	Reduced energy bills with potential for significant cost savings
	Early identification of issues, potentially resulting in reduced maintenance costs from active management
	Educational opportunities to teach pupils and staff about energy savings and carbon, and how this can translate to action at home too
	Improved comfort and wellbeing for pupils and staff, including opportunities for improved resilience against overheating.

How can we support you?

Energy Procurement

Maintained Schools can procure their gas and electricity through Enfield Council's corporate contracts. Benefits include good value, compliance with regulation and administration support. The council is currently looking at opportunities to offer schools REGO certified renewable power through the corporate contract to schools, to green their energy supply.

Low carbon retrofit

Enfield council is developing plans to support schools with low carbon retrofit and heat decarbonisation. Where possible, options appraisals for replacement or phase-out of fossil-fuel heating, hot water and cooking will be undertaken in alignment with the capital works programme. Opportunities for whole-building retrofit for energy reduction and low-carbon system compatibility, such as heat pumps or heat network connection, will be considered and identified alongside capital works.

The council can support with signposting to financing opportunities for low-carbon retrofit such as available through **Salix** and other nationwide schemes such as the Renewable Heat Incentive.

Energy Monitoring

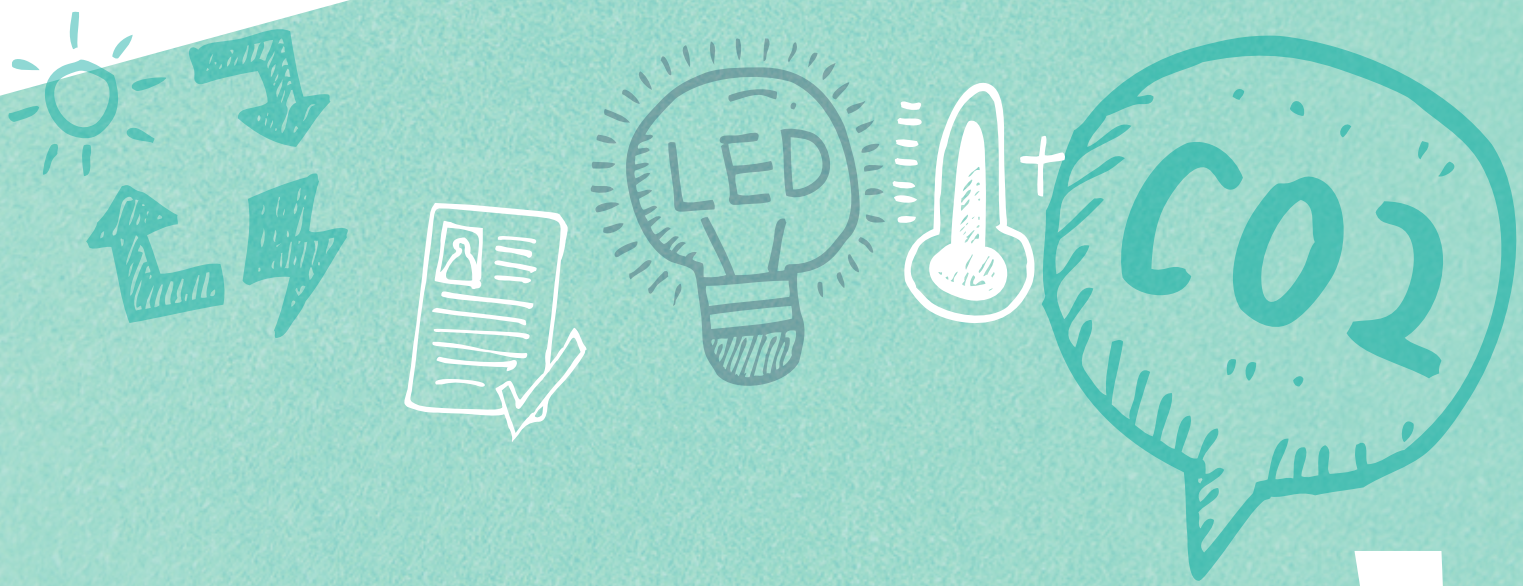
There are a number of initiatives supporting schools to reduce their energy bills while also reducing their carbon footprint, such as Energy Sparks or ECO2 Smart Schools.

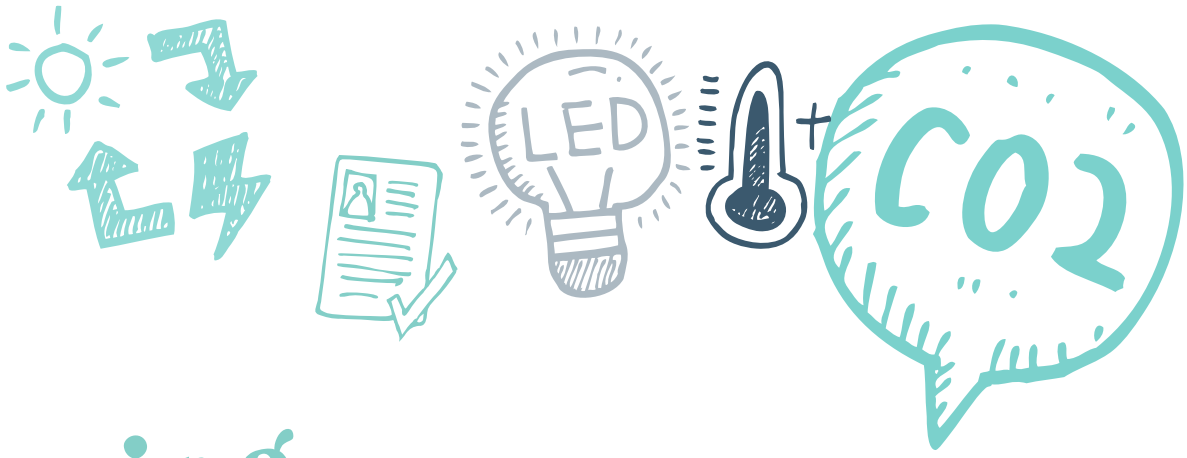
We have piloted Energy Sparks to help schools monitor and analyse energy consumption to become more energy efficient with their smart technology online analysis tool and education programme. By enrolling in Energy Sparks for schools, you will:

- Reduce direct costs and environmental impact of energy in your school
- Involve, engage and teach pupils about energy sustainability
- Encourage pupils to take action through projects at school and home
- Establish sustainability as an integral part of the curriculum

Contact us if you would like to discuss how to get involved, and/or you can register your interest directly with Energy Sparks at **https://energysparks.uk/for-schools**

Support is also offered by Oak Garden that helps schools with optimising their electricity usage and provides sustainability education to empower them to reduce their emissions.





Reducing energy and carbon

Useful links

- **Salix Financing opportunities**
- **Energy Sparks**
- **Ofgem environmental programmes**
- **Less CO_2 Campaign**
- **Eco Schools**
- **ECO_2 Smart Schools**
- **Oak Garden**
- **Solar for Schools**
- **Good estate management for schools**
- **Tips for cutting carbon and slashing energy bills**
- **Earth Cubs**

Contact us

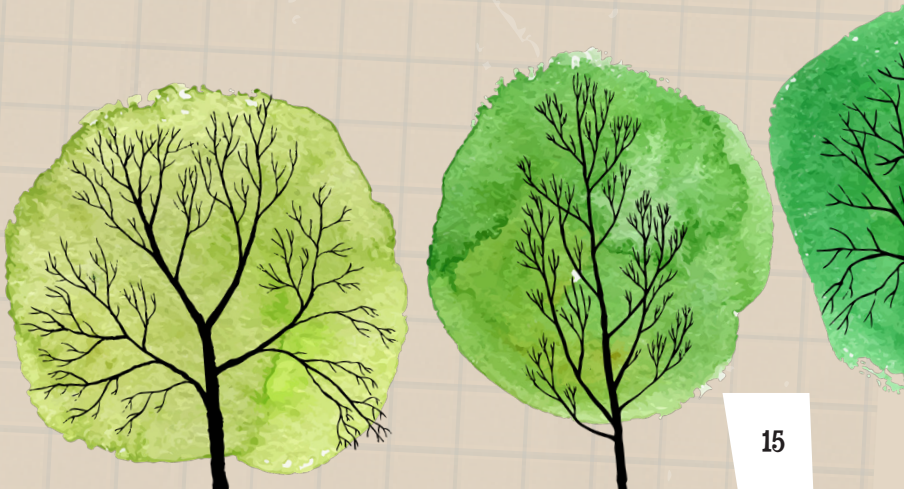
To discuss any of these initiatives for reducing energy and carbon from your school, please contact us at **climate.emergency@enfield.gov.uk**

Oakthorpe School SUDS Planting Day

Active and sustainable travel

We're working with schools across the borough to encourage and enable children, young people and their families to travel sustainably to and from school. Through the Council's Journeys and Places programme, we're making streets safer for walking, wheeling, scooting and cycling, and creating healthier residential streets for walking and cycling through initiatives like our School Streets.

Schools can play a big part in encouraging low carbon travel, with all the benefits this brings to children and young people's health and wellbeing.



What's the council doing and how can we support you?

Travel for Life

We're supporting schools to participate in Transport for London's **Travel for Life** programme. This is TfL's accreditation scheme for London schools and nurseries. The programme supports young Londoners to travel to school sustainably, actively, responsibly and safely by championing walking, scooting and cycling. Active travel such as walking, wheeling scooting and cycling improves pupils' wellbeing, helps to reduce congestion at the school gates and improves road safety and air quality.

There are over 125 inspiring activities to choose from. These are adaptable to your pupils' needs and your school's travel concerns.

TfL has also devised a home learning grid for **EYFS, KS1, KS2** and **KS3** with materials to help you to plan some exciting activities to support key aspects of the Travel for Life programme.

There are three levels of Travel for Life accreditation schools can work towards: Bronze, Silver and Gold. The level your school achieves depends on how successful you have been in reducing car use and increasing sustainable travel and how many activities you complete.

Fifty of Enfield's schools - just over half of all schools in the borough - are currently taking part in the Travel for Life programme and we're keen to support all schools to get involved.

For further information and to get involved, contact the Journeys and Places Schools Engagement Officer at **journeysandplaces@enfield.gov.uk**

School Streets

A School Street is when the road(s) immediately surrounding a school is/are closed to motor traffic. They operate Monday to Friday in term time, during set periods at drop-off and pick-up. The roads remain open to pedestrians, cyclists, permit holders and residents. School Streets bring opportunities for street greening by introducing SuDS such as rain gardens, and tree planting.

We already have School Streets in 20% of our primary schools and we have a target to introduce at least two more every year. Schools can express their interest in being considered for a School Street by completing an interest form on the School Streets project page.

In order to be considered for a School Street, schools need to be registered on Travel for Life and be actively working towards their School Travel Plan. Once this has been established and once the Council has identified funding, the Council will conduct a feasibility assessment to ensure that a proposed location is suitable for a School Street.

The Council will collaborate with schools to agree on the operating arrangements for each location. We will also seek the views of all stakeholders to ensure our proposals are communicated clearly. The Council will engage with:

- Local residents
- Local businesses
- Parents and carers
- School staff

When implementing a School street our objectives are to:

1. Make the roads around schools safer for young people getting to and from school.
2. Encourage students, parents and school staff members to travel by walking, wheeling, scooting or cycling to school. This might include combining journey types, such as using the 'park and stride' way.
3. Reduce noise pollution and improve air quality in and around schools.
4. Create healthier streets that enable more people to travel actively, leading to healthier communities.

You can find the latest information on **School Street** on the project page.

Cycling skills

There are various free, tailored courses available for riders of all ages and abilities. This includes:

- Bikeability Schools Cycle Training, available for schools to book.
- 1-to-1 Cycle Skills sessions, available to adults and young people aged 10 and over. The instructor will tailor the session to suit individual abilities and goals.
- Group Cycle Training and Half Term Training.
  Find out more and how to book **HERE**
- Transport for London also offers online cycling skills training, including cycling on the road and cycling with children. Find out more **HERE** [hyperlink: https://cycle-skillsonline.tfl.gov.uk/]
- Family Cycle Skills training for adults and young people aged 10 and over, where the instructor tailors the session to individual requirements. Places can be booked **HERE.**
- Online cycling skills training, including cycling on the road and cycling with children is available from Transport for London **HERE**

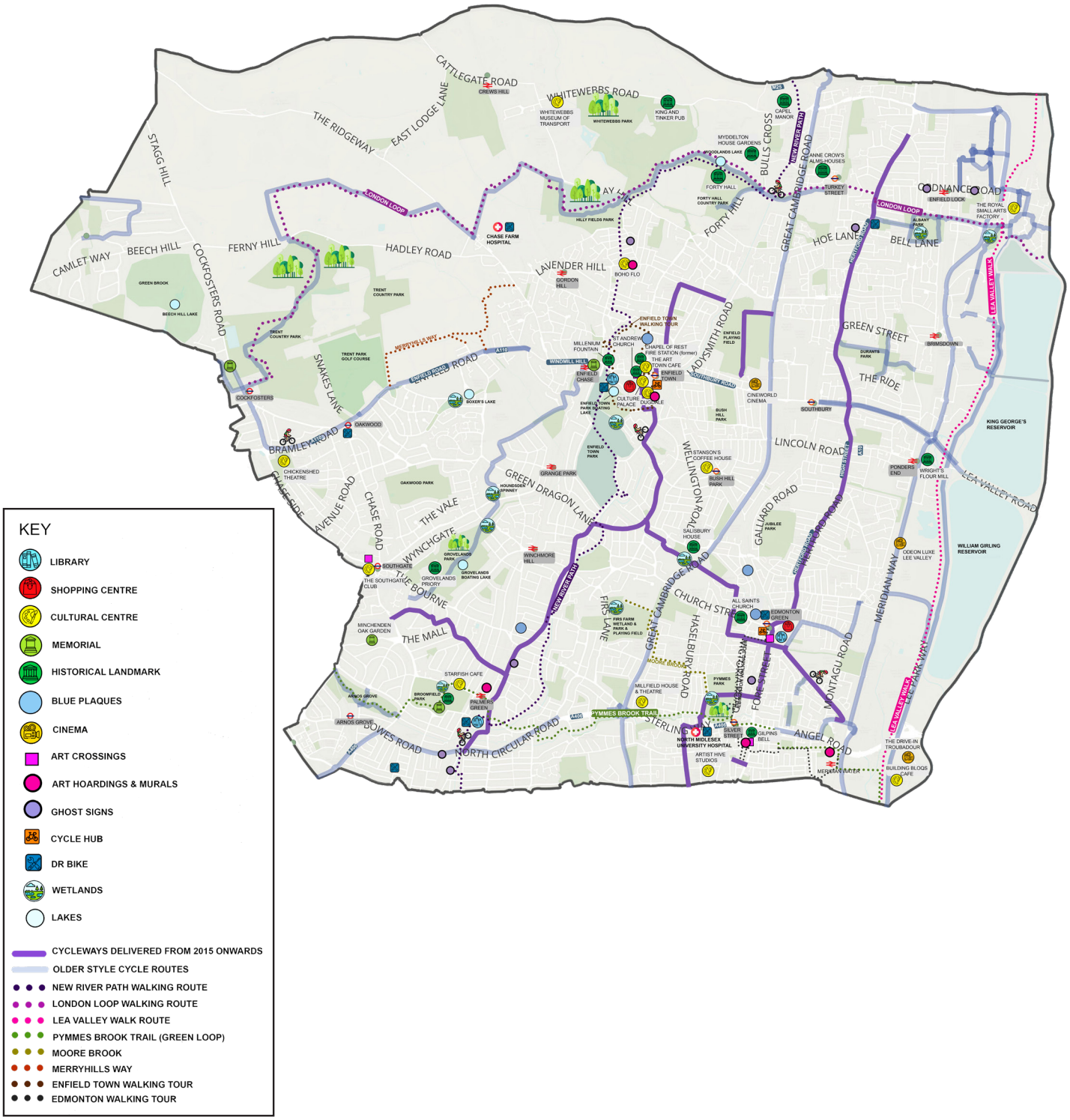
You can find out more about free activities and events on the **Journeys and Places** website.

Safer walking and cycling routes

We're increasing cycle and walking-friendly streets across the borough, with initiatives such as more cycle lanes and healthier residential streets for walking and cycle through programmes like Quieter Neighbourhoods.

The map below shows cycling and walking routes across the borough. You can also find this map and further information on cycling and walking in the borough online at **journeysandplaces.enfield.gov.uk**

Map of Walking and Cycling Routes.



Action for schools

- Participate in the **Travel for Life** programme to help your pupils travel to school sustainably, actively and responsibly.
- Work with the Council to implement a School Street to make the road safer during drop off and pick up times and encourage more people to travel actively and sustainably.
- Help your pupils learn about cycling and improve skills by booking your place at one of our cycling **courses**
- Consider whether you might want to install electric charging points if you have a car park on your site. Our main aim is to encourage carbon-free travel to and from school for staff and pupils – cycling and walking, or public transport. However, alongside this, we want to encourage any cars which remain, to transition over to electric vehicles if and when they can. Schools are eligible for the **Workplace Charging Scheme**. The school would need to provide 25% of the funding required.

Benefits

	Support pupil wellbeing through increased physical activity, helping to tackle issues such as childhood obesity and improve mental wellbeing.
	Help protect your pupils from pollution by tackling air quality issues around your school. An air quality monitoring study undertaken by TfL during 2020/21 found that closing the roads around schools to traffic at pick-up and drop-off times has reduced polluting nitrogen dioxide levels by up to 23%.
	Give your pupils essential life skills to help them travel safely and actively now and in the future.

Oakthorpe School SUDS Planting Day

Active and sustainable travel

Useful links

- **Journeys and Places**
- **TfL Travel for Life**
- **School Streets**
- **Cycle Confident**
- **Workplace Charging Scheme**
- **Enfield School Streets**

Oakthorpe School SUDS Planting Day

Contact us

To discuss any of these initiatives and for information and support on Travel for Life, you can also contact our Journeys and Places Schools Engagement Officer at **journeysandplaces@enfield.gov.uk**

Reducing Waste AND INCREASING recycling and composting

Schools can have a big impact on reducing the amount of waste we produce in the borough - both by reducing waste from the school site and by raising awareness amongst pupils who can then help influence behaviour change at home and in the wider community, focusing on the 'five Rs:' Refuse - Reduce - Reuse - Repair – Recycle.

REFUSE - REDUCE - REUSE - REPAIR - RECYCLE.

What is the Council doing and how can we support you?

We want to decrease the amount of waste produced overall and increase the proportion of waste that is recycled or composted. We have a target to increase the proportion of household waste that is recycled to 49% by 2027, from 31% in April 2022.

We have introduced a separate food recycling service to over 89,000 kerbside properties in Enfield and have adopted alternate weekly collections for refuse and recycling.

In line with the requirements of the Mayor's Environment Strategy and the Resources and Waste Strategy for England, we collect all six main recyclable items:

- **Paper**
- **Cardboard**
- **Plastic bottles, pots, tubs and trays** (we also now recycle standard plastic carrier bags)
- **Metal tins and cans**
- **Glass bottles and jars**
- **Food**

The Council also offers household electrical item collection. Free collections are available through " **Clearabee** for certain bulky items, , collection for smaller appliances can be ordered from the Council.

For more information on how to order collection, see **Bulky waste and electrical collections**

We work with the North London Waste Authority (NLWA) to campaign for and promote the reduction of waste and an increase in the proportion of waste that is recycled. The NLWA is responsible for making decisions on how waste is managed. It is made up of seven North London boroughs (Barnet, Camden, Enfield, Hackney, Haringey, Islington and Waltham Forest) and its primary function is to arrange for the transport and disposal of waste collected by these seven boroughs and to promote waste minimisation and recycling.

We want to work with the NLWA and schools to develop services to help you reduce your waste overall and recycle and compost more and will be developing our approach through the new Climate Action Network.

Action for schools

Waste disposal

- Recycle or compost a wide range of waste from your school estate. Find out about local hubs for recycling products that cannot be disposed of via your 'main' school recycling collection, such as pens and batteries, through schemes such as TerraCycle. If there isn't a local hub, consider whether you could set up your school as a community recycling schemes location such as those facilitated by TerraCycle.
- Involve catering and cleaning staff into sessions with pupils on reducing waste and increasing recycling or introducing composting, as they are a vital group whose decisions have a big impact on a school's management and reduction of waste.

Education

- Incorporate information on local recycling and composting into the school curriculum. If you need information on local arrangements for waste, recycling and composting please contact us so that we can provide you with the information to incorporate into your lesson plans.
- Plan events around the environmental awareness calendar including running assemblies and class-group activities on waste, reuse, recycling and composting. We can provide advice on what local support is available for lesson plans; assemblies or group work with pupils.

Procurement

- Buy certified recycled paper and use paper wisely by only printing when necessary and printing on both sides. Replace paper communications with e-mail where appropriate and make sure that any remaining wastepaper is recycled.

- Ensure you meet the minimum Government Buying Standards (GBS) for items you buy, which includes the following:
  - Cleaning products are cruelty-free and not tested on animals.
  - Timber products which are certified by the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest. If independently certified timber proves to be unavailable, as a second resort, use timber that is supplied with 'category B' evidence as detailed under the UK Government Timber Procurement Policy.
  - Waste electrical and electronic equipment Suppliers meet their obligations under the Waste Electrical and Electronic Equipment (WEEE) Regulations (2013).

- Aim to meet the best practice Government Buying Standards (GBS) for items you purchase, which includes the following:
  - Single-use plastic packaging is eliminated through reusable packaging solutions or schemes.
  - Hard to recycle waste is diverted from landfills or incineration through specific recycling partnerships.
  - Products you purchase:
    - have ISO 14024 (type I) compliant ecolabel certification
    - have ISO 14025 (type III) compliant ecolabel certification (Environmental Product Declaration) have nationally recognised

ethical/responsible sourcing third party certification
- generate less waste during use/installation
- after use on the asset, are more readily reusable
- are accepted by local recycling collection services
- can be sourced locally
- are from reused (preferred) or recycled sources
- are made from bio-based materials
- utilise circular economy principles, e.g. servitisation, manufacturer take-back, material passports.

Benefits

	An understanding of recycling benefits pupils as they can take this information home to parents and establish 'green' behaviours that will last a lifetime.
	Educating pupils about the importance of minimising waste, recycling more and the impact of composting will help them to think about how their personal actions affect the planet and their future environment.
	Positive school image - by instilling a sense of environmental awareness amongst your pupils, your school can inspire children to get involved in other environmentally friendly practices. This can be an attractive factor for the parents of prospective students.
	Recycling and waste reduction can help your school to save money. You may also develop a small income for the school if you choose to send some of your existing waste to local recycling schemes, such as those offered by TerraCycle.
	Composting is a great way to convert a school's food waste into a valuable, natural fertilizer that can then be added to school gardens and lawns.

Reducing Waste AND INCREASING recycling and composting

Useful links

- **Recycle More**
- **Wastebuster**
- **WRAP**
- **RecycleZone**
- **Recycle now**
- **TerraCycle**
- **Uniform reuse**
- **Environmenstrual products in schools**

Oakthorpe School SUDS Planting Day

Contact us

To find out more about Enfield's waste. recycling and composting initiatives, and discuss options for your schools, please contact: **waste.enquiries@enfield.gov.uk**

JOIN THE SCHOOL climate action network

Officers from across the council have come together with schools to create a Schools Climate Action Network.

The purpose of the network is to:

- Facilitate discussion and collaboration between schools – there is already lots of fantastic work being done by schools in Enfield and the network is a place to share ideas and support one another
- Support schools to take practical action, address challenges and come together to access funding opportunities
- Share views on how the council can develop our 'offer' to schools
- Help share and disseminate information on national initiatives and resources.

The network aims to meet at least once each term. Meetings are advertised via the School Hub, and you can book your place at a network meeting on Enfield Council's **Professional Learning Portal**.

If you would like more information on the network, including information on other schools who have joined and their contact details for sharing ideas, please contact: **climate.emergency@enfield.gov.uk**

CLIMATE ACTION AND THE CURRICULUM

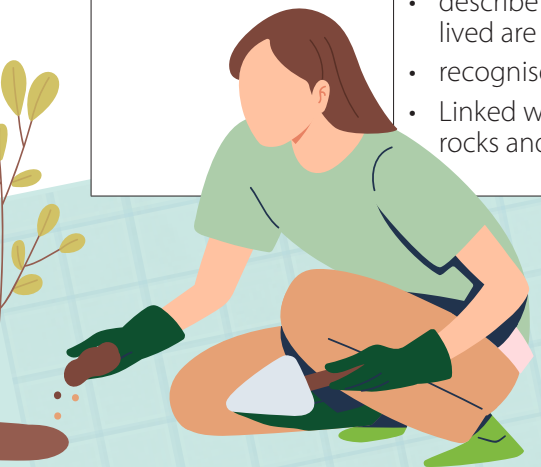
NATURE BASED SOLUTIONS

KEY STAGE YEAR	SUBJECT	CURRICULUM ALIGNMENT
EARLY YEARS FOUNDATION STAGE (EYFS)		
UNDERSTANDING THE WORLD	**Early learning goal** *Relevant aspects marked in italics* Children know about similarities and differences with *places, objects, materials and living things.* They talk about the features of their immediate environment and *how environments might vary from one another.* They *make observations of animals and plants and explain why some things occur and talk about changes.*	Visits to rewilding areas or outdoor classrooms provide the opportunity to discuss similarities and differences between environments and to observe animals and plants; this could also be done through the creation of SuDs or planting projects on your school site.
	From the *Development Matters* non-statutory guidance. **30-50 months** • Pupils comment and ask questions about aspects of their familiar world such as the place where they live or the natural world. • Can talk about some of the things they have observed such as plants, animals, natural and found objects. • Talks about why things happen and how things work. • Developing an understanding of growth, decay and changes over time. • Shows care and concern for living things and the environment. • Use the local area for exploring both the built and the natural environment. Provide opportunities to observe things closely through a variety of means, including magnifiers and photographs.	Visits to rewilding areas or outdoor classrooms can provide a stimulus for questions and observations and as a place to use magnifiers and take photos. Multiple visits to these areas or repeated experience of observing SuDs or planting projects on site will help develop an understanding over time of growth, decay and changes and to encourage attitudes of care and concern.

	40-60 months • Examine change over time, for example, growing plants. • Help children to find out about the environment by talking to people, examining photographs and simple maps and visiting local places. • Encourage children to express opinions on natural and built environments and give opportunities for them to hear different points of view on the quality of the environment. • Encourage the use of words that help children to express opinions, e.g. 'busy', 'quiet' and 'pollution'. • Use correct terms so that, e.g. children will enjoy naming a chrysalis if the practitioner uses its correct name. • Pose carefully framed open-ended questions, such as "How can we…?" or "What would happen if…?". • Give opportunities to design practical, attractive environments, for example, taking care of the flowerbeds or organising equipment outdoors.	Partnering with the suggested organisations will give access to expertise and allow children to hear different points of view, find out more by talking to people and enjoy learning correct terms (related to plants and habitats). Involvement in on-site or off-site projects may provide opportunities to design or alter outdoor environments. Activities in this area could also provide a context for the development of skills in the Communication and Language learning area, as well as for Personal, Social and Emotional Development, particularly in terms of understanding what is appropriate and safe behaviour in outdoor environments.
KEY STAGE 1		
SCIENCE	**Y1 Plants** Statutory requirements Pupils should be taught to: • identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees.	The non-statutory guidance for this area focuses heavily on using the local environment throughout the year; developing relationships with local organisations and/or embarking on activities on-site provide opportunities for multiple visits over time; allowing for *working* scientifically practices of close observation (e.g. using magnifying glasses) and *keeping records of changes over time.* These organisations can provide expertise in, and opportunities for, plant identification and description. The guidance also states that where possible students should observe the growth of plants and flowers which they have planted.
	Y1 Seasonal Changes Pupils should be taught to: • observe changes across the four seasons	As suggested above, there are opportunities here for observing and recording changes over time through multiple visits or access to on-site environments.

	Y2 Living things and their habitats Pupils should be taught to: • identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	Local green and blue spaces provide opportunities for students to directly observe and interact with a range of habitats and micro-habitats, allowing them to raise and answer questions about these, identify and name the plants and animals within them and observe how they depend on each other. Different habitats and micro-habitats can be compared and contrasted; developing these understandings through direct experience with familiar habits will prepare students for the more abstract task of investigating and exploring less familiar or accessible habitats such as the ocean or rainforest through the use of secondary sources. Access to these local areas, or to habitats that have been created on-site provides opportunities for students to work scientifically, e.g. by conducting a count to explore how conditions in different habitats and microhabitats affect the number and type of plants and animals living there.
	Y2 Plants Pupils should be taught to: • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	The non-statutory notes and guidance here suggest that where possible students should use the local environment throughout the year to directly observe how different plants grow. Understanding the requirements of plants for germination, growth and survival, as well as the processes of reproduction and growth in plants can also lead to a discussion about potential threats to these requirements, and an understanding of why rewilding projects are needed, and what factors need to be considered to ensure they are successful.
DESIGN AND TECHNOLOGY	**Design and Technology (Food and Nutrition)** Understand where food comes from.	Non-statutory guidance for Key Stage 1 Design and Technology suggests students should work on projects in a range of relevant contexts which could involve gardens, the school playground, or blue and green spaces in the local community.
		On-site growing projects could include fruit, vegetables or other edible plants.

GEOGRAPHY	**Physical and Human Geography** Students should learn to use basic geographical vocabulary to refer to: • key physical features, including: beach, cliff, coast, forest, hill, mountain, sea, ocean, river, soil, valley, vegetation, season and weather	Visits to local green and blue areas give the opportunity to use this vocabulary in a meaningful context and make real-life connections.
	Geographic skills and fieldwork Students should use simple fieldwork and observational skills to study the geography of their school and its grounds and the key human and physical features of its surrounding environment.	Students can use these fieldwork and observational skills to identify local green and blue areas, and while visiting these spaces, on-site projects also can provide an opportunity to identify physical features of their immediate environment.
KEY STAGE 2		
SCIENCE	**Y3 plants** Pupils should be taught to: • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from the soil, and room to grow) and how they vary from plant to plant • investigate how water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	Local green spaces and on-site projects provide opportunities for real-life observation and experimentation, allowing pupils to explore the relationship between structure and function, and to help them understand the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. Pupils could compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser, or conduct multiple observations over time to discover, for example, how seeds are formed and dispersed.
	Y3 Rocks Pupils should be taught to: • compare and group together different kinds of rocks based on their appearance and simple physical properties • describe in simple terms how fossils are formed when things that have lived are trapped within rock • recognise that soils are made from rocks and organic matter. • Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.	Visits to local green spaces could provide opportunities to observe rocks in naturally occurring situations (as well as those used in buildings and monuments or gravestones) and consider how and why they might have changed over time; hand lenses could be used to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. SuDs provide a context and purpose for exploring different soils and identifying similarities and differences between them, investigating what changes occur when they are in water and exploring the link between soil composition and drainage.



	Y4 living things and their habitats Pupils should be taught to: • recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things.	Visits to green and blue spaces or on-site projects will provide students with the opportunity to group, identify, classify and name living things in their local environment. Repeated visits will enable them to observe how habitats change throughout the year. Non-statutory guidance in this area highlights the importance of exploring examples of human impact (both positive and negative) on environments, including the positive effects of nature reserves, ecologically planned parks, or garden ponds (as well as the negative effects of population and development, litter or deforestation.) Pupils could use or make simple guides or keys to help others explore and identify local plants and animals.
	Y5 Living things and their habitats Pupils should be taught to: • describe the life process of reproduction in some plants and animals.	Pupils could explore these life-cycle changes by observing the local environment. The non-statutory curriculum guidance suggests this can be done with plants in a vegetable garden or flower border; repeat visits to local green or blue spaces also provide this opportunity. Pupils could work scientifically by observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times) and suggesting reasons for similarities and differences. They could also try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs.
	Y6 living things and their habitats Pupils should be taught to: • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics.	Building on their work in year 4, pupils could use classification systems and keys to identify some animals and plants in the immediate environment, before going on to research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

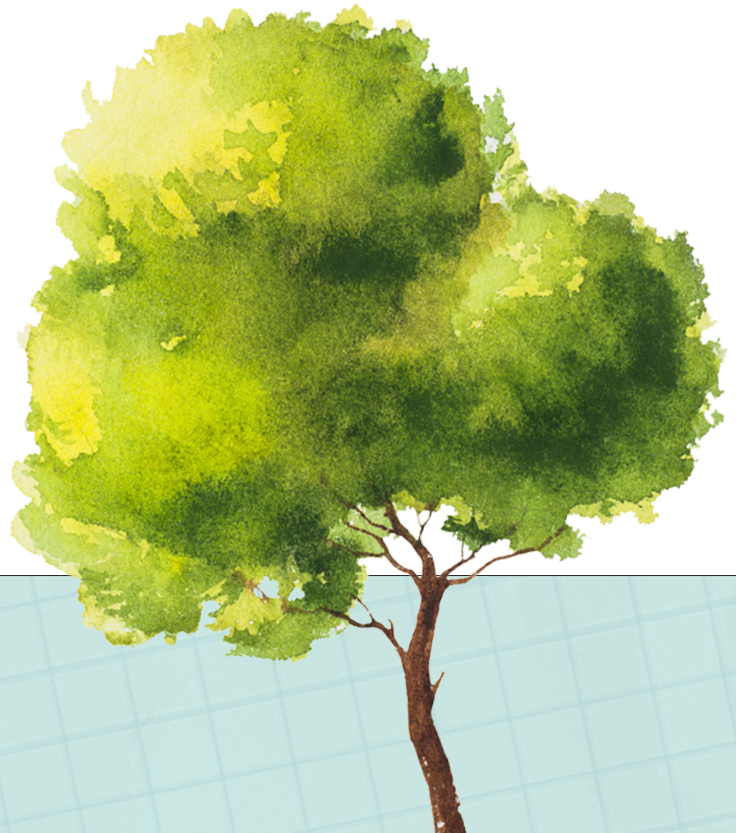
	Y6 evolution and inheritance Pupils should be taught to: • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	Local green spaces might provide hands-on opportunities for exploring fossils. Pupils might work scientifically by: observing and raising questions about local plants and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses. They might analyse the advantages and disadvantages of specific adaptations, such as tendrils on climbing plants, brightly coloured and scented flowers.
LITERACY	Non-statutory guidance for KS2 literacy emphasises the importance of pupils having opportunities to write for a range of real purposes and audiences as part of their work across the curriculum, including the development of subject-specific vocabulary. At upper KS2, these purposes and audiences should underpin the decisions about the form the writing should take.	Involvement in planting, re-wilding, and similar projects can provide these authentic purposes and audiences and to use organisational devices to structure the text and guide the reader (For example headings, bullet points, underlining). It is also an opportunity to consider how language, structure, and presentation contribute to meaning. Students could create informational texts and guides to local areas or write persuasively to influence the local community and effect change. When researching and collecting information about biodiversity, students will need to retrieve records and present information from non-fiction and distinguish between statements of fact and opinion.
DESIGN AND TECHNOLOGY	**Cooking and nutrition** • understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	On-site growing projects could include fruit, vegetables or other edible plants; having access all year round will help students to develop ideas of seasonality and what might be grown when.
KEY STAGE 3		
SCIENCE	**Working Scientifically – Experimental skills and investigations** Through the content across all three disciplines, pupils should be taught to: • ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience • use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety • make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements • apply sampling techniques	SuDs and similar projects can provide a context for these enquiries and a reason for conducting fieldwork and observations – for example evaluating the impact of these solutions and using sampling techniques to apply findings to larger populations.

BIOLOGY	**Structure and function of living organisms:** **Cells and organisation:** • the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts • the similarities and differences between plant and animal cells **Nutrition and digestion:** • plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots **Gas exchange systems:** • the role of leaf stomata in gas exchange in plants. **Reproduction** • reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. **Material cycles and energy** **Photosynthesis:** • the reactants in, and products of, photosynthesis, and a word summary for photosynthesis • the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere • the adaptations of leaves for photosynthesis.	On-site projects or direct involvement with local green and blue areas will put this learning into context; for instance, determining soil quality or understanding the importance of attracting pollinators, and the positioning of plants for access to sunlight for photosynthesis.
	Subject content – Biology (Interactions and interdependencies) • the interdependence of organisms in an ecosystem, including food webs and insect-pollinated crops • the importance of plant reproduction through insect pollination in human food security • how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.	Direct experiences and observations of ecosystems, whether those created onsite or in local green or blue areas, will enable students to deepen their understanding and appreciate the impact – both positive and negative -of the environment, and their own actions in relation to this - on the organisms in them.

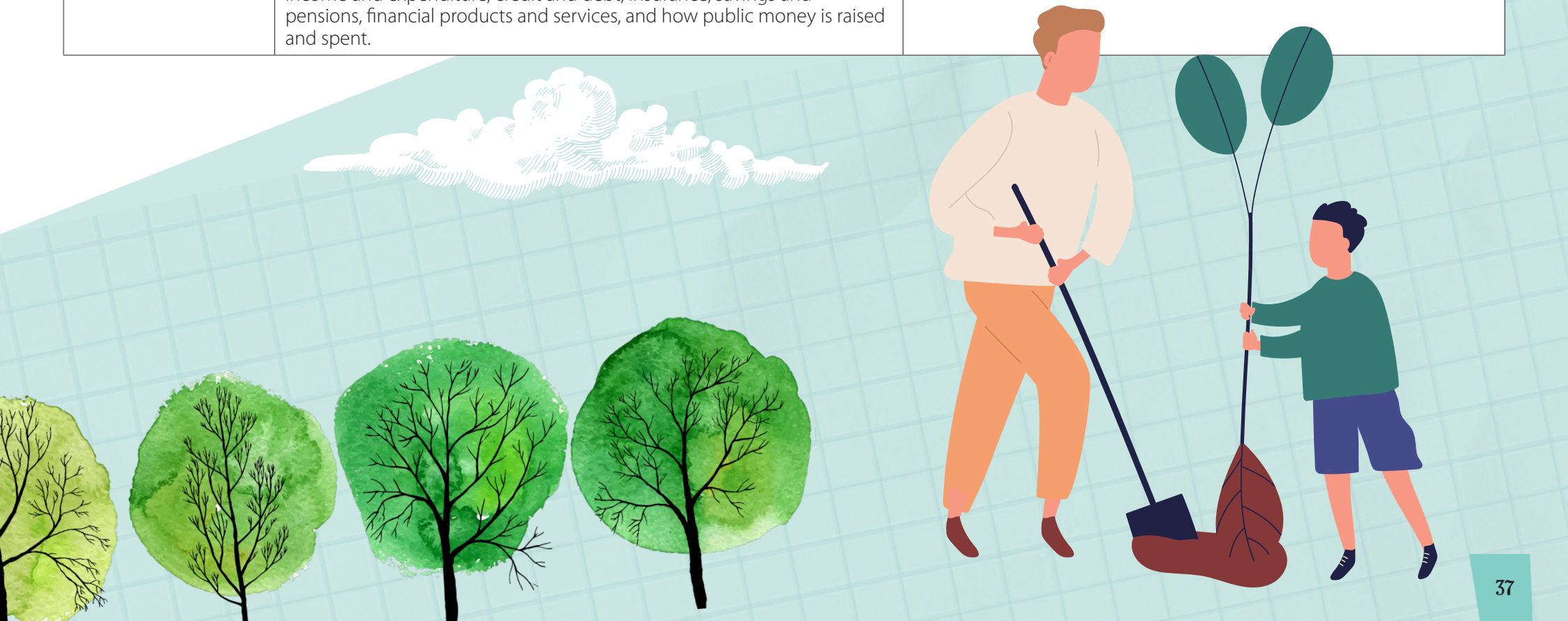
	Subject content – Biology (genetics and evolution) • changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction • the importance of maintaining biodiversity	Tasking pupils with maintaining biodiversity in their local area provides purposeful and powerful connections.
CHEMISTRY	**Subject content – Chemistry (Earth and atmosphere)** • the rock cycle and the formation of igneous, sedimentary and metamorphic rocks	Visits to local green and blue spaces may offer practical experiences in this area.
CITIZENSHIP	• the roles played by public institutions and voluntary groups in society, and how citizens work together to improve their communities, including opportunities to participate in school-based activities	Students could investigate the role of volunteers in maintaining local green and blue spaces; they could also plan and carry out improvement projects related to planting and rewilding.
DESIGN AND TECHNOLOGY	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: Evaluate: understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	There may be scope for design and making as part of rewilding, planting or similar projects, providing local contexts and the opportunity to explore ideas linked to the agricultural, horticulture and food industries. When evaluating outdoor design projects students could focus specifically on environmental impact.
DESIGN AND TECHNOLOGY	**Cooking and nutrition** Pupils should be taught to: understand the source, seasonality and characteristics of a broad range of ingredients.	On-site growing projects could include fruit, vegetables or other edible plants; having access all year round will help students to develop ideas of seasonality and what might be grown when.

GEOGRAPHY	**Human and physical geography:** Understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in: • physical geography relating to: geological timescales and plate tectonics; rocks, weathering and soils; weather and climate, including the change in climate from the Ice Age to the present; and glaciation, hydrology and coasts • human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors; and the use of natural resources • understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on the effective functioning of natural systems	Opportunities exist for practical fieldwork in relation to local landscapes and how both physical and human processes have changed them.
KEY STAGE 4		
WORKING SCIENTIFICALLY (the development of scientific thinking)	Through the content across all three disciplines, students should be taught so that they develop understanding and first-hand experience of: • appreciating the power and limitations of science and considering ethical issues which may arise • explaining every day and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments • evaluating risks both in practical science and the wider societal context, including the perception of risk	SuDs and similar projects can provide a context for these enquiries and a reason for conducting fieldwork and observations – for example evaluating the impact of these solutions, and using sampling techniques to apply findings to larger populations
WORKING SCIENTIFICALLY (experimental skills and strategies)	• applying knowledge of a range of techniques, apparatus, and materials to select those appropriate both for fieldwork and for experiments • recognising when to apply knowledge of sampling techniques to ensure any samples collected are representative • making and recording observations and measurements using a range of apparatus and methods • evaluating methods and suggesting possible improvements and further investigations.	

BIOLOGY	• living organisms may form populations of single species, communities of many species and ecosystems, interacting with each other, with the environment and with humans in many different ways • living organisms are interdependent and show adaptations to their environment • life on Earth is dependent on photosynthesis in which green plants and algae trap light from the Sun to fix carbon dioxide and combine it with hydrogen from water to make organic compounds and oxygen • the chemicals in ecosystems are continually cycling through the natural world • the characteristics of a living organism are influenced by its genome and its interaction with the environment • evolution occurs by the process of natural selection and accounts both for biodiversity and how organisms are all related to varying degrees. **Photosynthesis:** • photosynthesis is the key process for food production and therefore biomass for life • the process of photosynthesis • factors affecting the rate of photosynthesis. **Ecosystems:** • levels of organisation within an ecosystem • some abiotic and biotic factors which affect communities; the importance of interactions between organisms in a community • how materials cycle through abiotic and biotic components of ecosystems • the role of microorganisms (decomposers) in the cycling of materials through an ecosystem • organisms are interdependent and are adapted to their environment • the importance of biodiversity • methods of identifying species and measuring distribution, frequency and abundance of species within a habitat • positive and negative human interactions with ecosystems.	Concepts and interdependence and adaptation are essential for understanding local ecosystems and the factors which affect them; direct involvement with local projects will provide purpose and context for pupils learning in this area.



CHEMISTRY	Pupils should be taught about • Evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change • potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources • the Earth's water resources and obtaining potable water	The role of plants in terms of mitigating the effects of pollutants could be explored; Similarly, SuDs provide a context and purpose to explore water pollution.
CITIZENSHIP	They should experience and evaluate different ways that citizens can act together to solve problems and contribute to society. Pupils should be taught: the different ways in which a citizen can contribute to the improvement of his or her community, to include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity income and expenditure, credit and debt, insurance, savings and pensions, financial products and services, and how public money is raised and spent.	Students could investigate the role of volunteers in maintaining local green and blue spaces; they could also plan and carry out improvement projects related to planting and rewilding. How local projects such as rewilding are funded could also be explored, with students considering how this type of work is funded, including the use of public funds, and how decisions are made around this.



REDUCING ENERGY AND CARBON

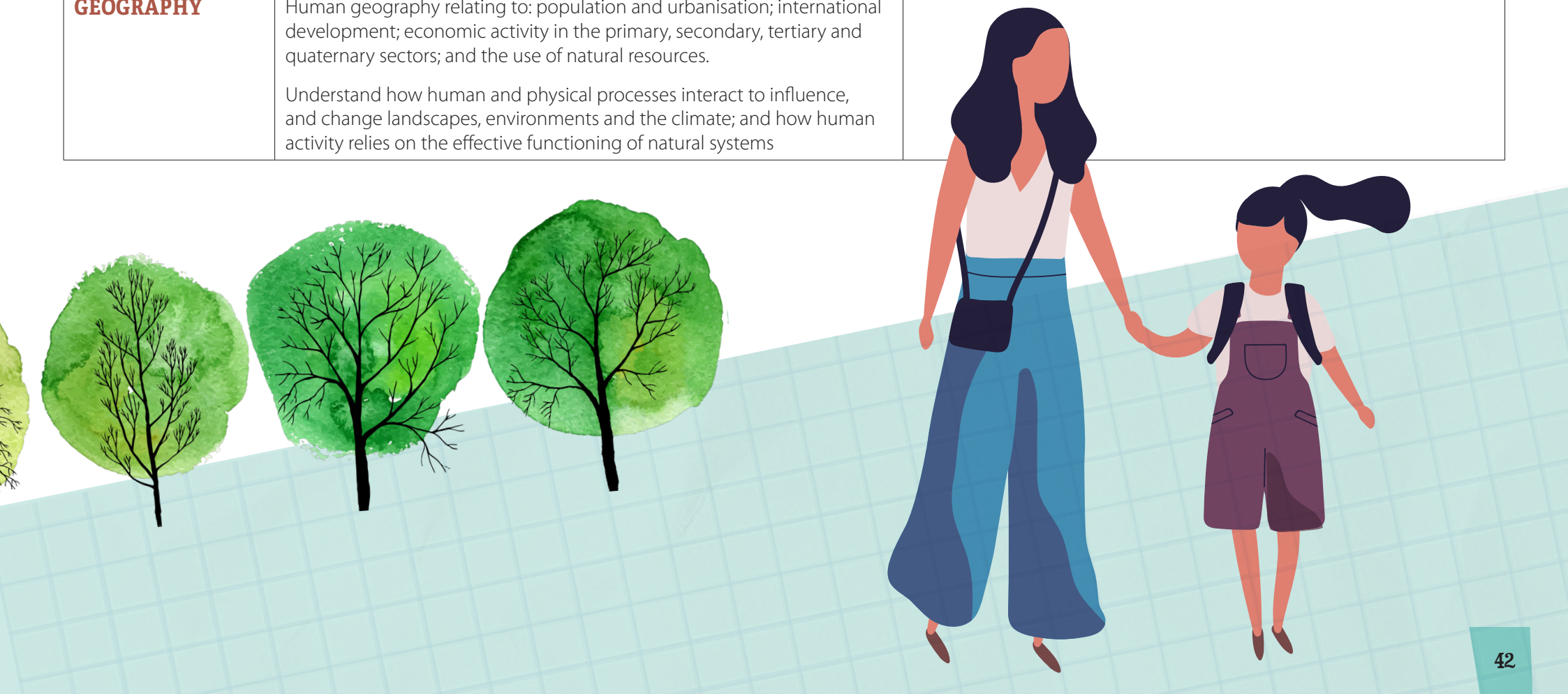
KEY STAGE YEAR	SUBJECT	CLIMATE CHANGE INCORPORATION IDEAS
EARLY YEARS FOUNDATION STAGE (EYFS)		
UNDERSTANDING THE WORLD (THE WORLD):	**Early learning goal:** Children know about similarities and differences in relation to places, objects, materials and living things. ***They talk about the features of their own immediate environment and how environments might vary from one another.*** They make observations of animals and plants and explain why some things occur and talk about changes. **30-50 months** Talks about why things happen and how things work.	Attention could be drawn to electricity and water in built environments; children could talk about what happens when lights or taps are switched on and off and why this occurs.
UNDERSTANDING THE WORLD (TECHNOLOGY):	Early learning goal: ***children recognise that a range of technology is used in places such as homes and schools.*** They select and use technology for particular purposes. **30 – 50 months** Draw young children's attention to pieces of ICT apparatus they see or that they use with adult supervision. **40 – 60 months** Encourage children to speculate on the reasons why things happen or how things work.	Attention could be drawn to sensors, monitors or other equipment in the school

KEY STAGE 1		
MATHS	**Measurement, Number**	Depending on the numbers used, energy monitoring data provided by HOPE could be used in mathematics e.g. performing simple calculations or comparing and ordering values. Students could practice recording and telling time and calculating intervals of time e.g. determining how long the school day is, and how long break times are when considering, for example, when lights or other equipment which uses power are turned off and on. Considering good practice in water management could lead to measurement work involving capacity; children could work out how much water would be saved by turning a tap of while they brush their teeth.
KEY STAGE 2		
MATHS	**Measurement, number (including fractions), statistics**	Depending on the numbers used, energy monitoring data provided by HOPE could be used in mathematics - e.g. performing simple calculations or comparing and ordering values, interpreting data from graphs (e.g. to compare seasonal differences between consumption levels). Students could practice recording and telling time and calculating intervals of time – e.g. determining how long the school day is, and how long break times are – when considering, for example, when lights or other equipment which uses power are turned off and on. Considering good practice in water management could lead to measurement work involving capacity; children could, for example, work out how much water would be saved by turning a tap off while they brush their teeth.

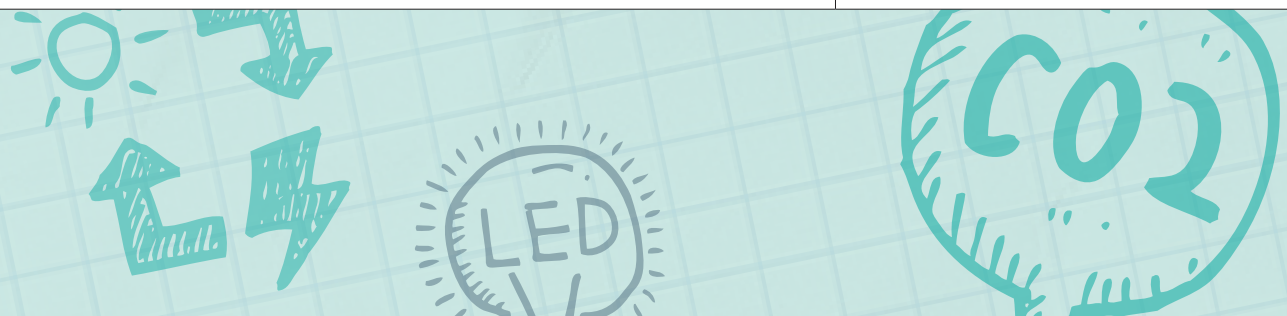
SCIENCE	**Year 3 - light** **Pupils should be taught to:** • recognise that they need light in order to see things and that dark is the absence of light • Notice that light is reflected from surfaces • Recognise that shadows are formed when the light from a light source is blocked by an opaque object • Find patterns in the way that the size of shadows changes	During work on light in science students could consider the light sources used at school and home and how these are powered.
	Year 4 – electricity **Pupils should be taught to:** • Identify common appliances that run on electricity • Recognise some common conductors and insulators, and associate metals with being good conductors.	Pupils could be asked to identify the appliances at school and at home that use electricity, consider how often these are used and whether energy consumption could be reduced. Work on insulators and conductors could be linked to energy use, e.g. by exploring the importance of insulators for conserving heat and reducing the need for electricity use.
	Year 6 -light **Pupils should be taught to:** • Recognise that light appears to travel in straight lines • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	As in year 4, during work on light in science students could consider the light sources used at school and home and how these are powered.
	Year 6 electricity Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches	Considering energy consumption and how it can be reduced can provide a context for learning about electricity – for instance when discussing the brightness of bulbs.
COMPUTING	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Energy monitoring equipment could provide context for real-life examples of computers controlling physical systems. For instance, the use of movement sensors to trigger lights so that they are only turned on when needed.

GEOGRAPHY	Human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water	Involvement with HOPE or similar projects can help students make the link between their own (or their family's) behaviour and the distribution and use of natural materials such as energy and water.
KEY STAGE 3		
MATHS	**Number, ratio and proportion, statistics**	Depending on the numbers used, energy monitoring data provided by HOPE could be used in mathematics - e.g. performing simple calculations or comparing and ordering values, interpreting data from graphs (e.g. to compare seasonal differences between consumption levels) and calculating/predicting costs.
SCIENCE CHEMISTRY	**Earth and atmosphere** • Earth as a source of limited resources and the efficacy of recycling • the carbon cycle • the composition of the atmosphere • the production of carbon dioxide by human activity and the impact on climate.	Working with the school's energy data and considering ways of reducing and mitigating the effects of energy use provides a context for learning in this area.
SCIENCE PHYSICS	**Energy** • Energy Calculation of fuel uses and costs in the domestic context • comparing power ratings of appliances in watts (W, kW) • comparing amounts of energy transferred (J, kJ, kW hour) • domestic fuel bills, fuel use and costs fuels and energy resources.	Students could work with real data in order to calculate and compare costs
	Working scientifically - analysis and evaluation • apply mathematical concepts and calculate results • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements, and data to draw conclusions • present reasoned explanations, including explaining data about predictions and hypotheses • evaluate data, showing awareness of potential sources of random and systematic error • identify further questions arising from their results. **Working scientifically - measurement** undertake basic data analysis including simple statistical techniques.	Access to real-life data around energy use and costs provides a valuable opportunity to develop skills in analysing and drawing conclusions from data by observing patterns (e.g. seasonal differences in energy consumption) and forming hypotheses.

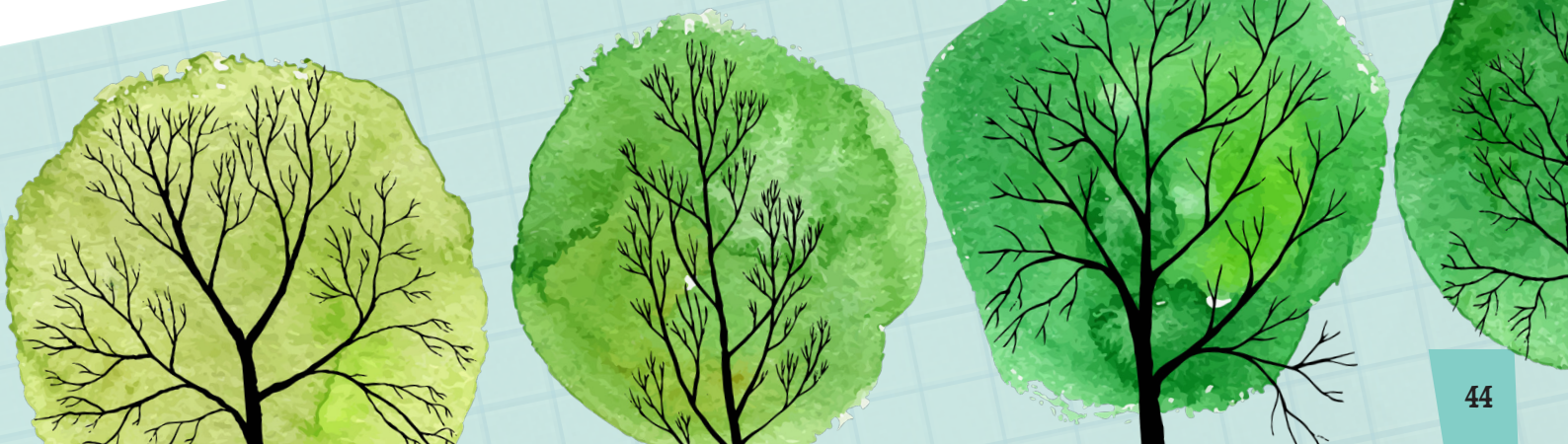
CITIZENSHIP	The roles played by public institutions and voluntary groups in society, how citizens work together to improve their communities, including opportunities to participate in school-based activities. The functions and uses of money, the importance and practice of budgeting, and managing risk.	Engaging in energy monitoring/reduction projects allows students to consider ways of working together to improve their community and ideas around budgeting / cost-reduction.
COMPUTING	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems. Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.	Energy monitoring equipment could provide real-life examples of components of computer systems; students could be tasked with creating programs that model the effects of changing specific behaviours on energy consumption.
GEOGRAPHY	Human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors; and the use of natural resources. Understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on the effective functioning of natural systems	



KEY STAGE 4		
MATHS	Number, Ratio, proportion and rates of change, statistics	Depending on the numbers used, energy monitoring data provided by HOPE could be used in mathematics - e.g. performing simple calculations or comparing and ordering values, interpreting data from graphs (e.g. to compare seasonal differences between consumption levels) and calculating/predicting costs.
SCIENCE	**Working scientifically:** applying the cycle of collecting, presenting and analysing data, including: • presenting observations and other data using appropriate methods • translating data from one form to another • carrying out and representing mathematical and statistical analysis Science 71 • representing distributions of results and making estimations of uncertainty interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions • presenting reasoned explanations, including relating data to hypotheses • being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error • communicating the scientific rationale for investigations, including the methods used, the findings and reasoned conclusions, using paper-based and electronic reports and presentations.	Access to real-life data around energy use and costs provides a valuable opportunity to develop skills in analysing and drawing conclusions from data by observing patterns (e.g. seasonal differences in energy consumption) and forming hypotheses.
CHEMISTRY	**Earth and atmospheric science:** • evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change • potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate	Climate change and the effect of increased levels of carbon dioxide and methane can provide purpose and motivation for some of the suggested activities, helping students make links between these issues and their own lives.



PHYSICS	**Energy** • Energy changes in a system involving heating, doing work using forces, or doing work using an electric current; calculating the stored energies and energy changes involved • Power as the rate of transfer of energy • conservation of energy in a closed system; dissipation • calculating energy efficiency for any energy transfers • renewable and non-renewable energy sources used on Earth; changes in how these are used. **Electricity** • measuring resistance using p.d. and current measurements • exploring current, resistance and voltage relationships for different circuit elements, including their graphical representations • quantity of charge flowing as the product of current and time • the domestic a.c. supply; live, neutral and earth mains wires; safety measures power transfer related to p.d. and current, or current and resistance.	There is potential for students to explore energy changes in real-life systems, supported, for example, by data from ECO Schools or similar projects, and to apply their understanding of electricity in a real-life context.
CITIZENSHIP	The different ways in which a citizen can contribute to the improvement of his or her community, include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity - income and expenditure, credit and debt, insurance, savings and pensions, financial products and services, and how public money is raised and spent.	Engaging in energy monitoring/reduction projects allows students to consider ways of working together to improve their community and ideas around budgeting/cost-reduction.



ACTIVE AND SUSTAINABLE TRAVEL

SUBJECT	COURSE CONTENT	CURRICULUM ALIGNMENT
EARLY YEARS FOUNDATION STAGE (EYFS)		
PHYSICAL DEVELOPMENT	Early Learning Goal: Children know the importance of good health from physical exercise, and a healthy diet, and will talk about ways to keep healthy and safe **30 – 50 months** • Observes the effects of activity on their bodies. • Promote health awareness by talking with children about exercise, its effect on their bodies and the positive contribution it can make to their health. • Plan opportunities, particularly after exercise, for children to talk about how their bodies feel. • Find ways to involve children so that they are all able to be active in ways that interest them and match their health and ability **40 – 60 months** • Shows some understanding that good practices concerning exercise, eating, sleeping and hygiene can contribute to good health. • Shows understanding of the need for safety when tackling new challenges and considers and manages some risks. • Promote health awareness by talking with children about exercise, its effect on their bodies and the positive contribution it can make to their health • Plan opportunities, particularly after exercise, for children to talk about how their bodies feel. • Find ways to involve children so that they are all able to be active in ways that interest them and match their health and ability	Taking part in the Travel for Life programme and becoming involved with sustainable travel projects which champion walking, scooting and cycling could provide opportunities to observe, explore and discuss physical exercise the effects it has, and how it contributes to good health. 

THE WORLD	Early learning goal: Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their immediate environment and how environments might vary from one another. **30 – 50 months** • Shows care and concern for living things and the environment. • Talks about why things happen and how things work • Arouse awareness of features of the environment in the setting and immediate local area, e.g. make visits to shops or a park. • Introduce vocabulary to enable children to talk about their observations and to ask questions. **40 – 60+ months** • Help children to find out about the environment by talking to people, examining photographs and simple maps and visiting local places. Encourage children to express opinions on natural and built environments and give opportunities for them to hear different points of view on the quality of the environment. • Encourage the use of words that help children to express opinions, e.g. 'busy', 'quiet' and 'pollution'.	When exploring features of the local environment, particular attention could be paid to footpaths, cycle lanes, speed bumps (or other traffic control devices) and why they are needed. Children could be encouraged to notice traffic levels and compare this at different times of the day or in different locations, as well as observing the effects of this (e.g. the amount of noise and the visible presence of exhaust fumes.)
KEY STAGE 1 AND 2		
HEALTH EDUCATION (from the RSE and Health Education Statutory Guidance)	**Mental Well Being** By the end of primary school, pupils should: • know the benefits of physical exercise, time outdoors, community participation, voluntary and service-based activity on mental wellbeing and happiness.	Sustainable travel projects which champion walking, scooting and cycling could provide opportunities to observe, explore and discuss physical exercise the effects it has, including how it contributes to mental wellbeing. Involvement in a school street initiative provides an opportunity for community involvement and the chance to discuss the benefits of this.
	Physical Health and Fitness By the end of primary school, pupils should know: • the characteristics and mental and physical benefits of an active lifestyle. • the importance of building regular exercise into daily and weekly routines and how to achieve this; for example, walking or cycling to school, a daily active mile or other forms of regular, vigorous exercise. • the risks associated with an inactive lifestyle (including obesity).	Sustainable travel projects which champion walking, scooting and cycling could provide opportunities to observe, explore and discuss physical exercise the effects it has, and how it contributes to good health. When planning regular exercise routines students could consider how their journey to school (or to other significant places) could play a part in this; they could also plan safe walking and cycling routes that make use of Quieter Neighbourhoods, walking paths and other local initiatives.

KEY STAGE 1		
PE	• Pupils should be taught to master basic movements including running, jumping, throwing and catching, as well as developing balance, agility and co-ordination, and begin to apply these in a range of activities	Cycling proficiency lessons could help to develop balance and co-ordination.
SCIENCE	**Year 1 – Animals including humans** • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Cycling proficiency lessons and sustainable travel projects which champion walking, scooting and cycling could provide opportunities to observe, explore and discuss the importance of physical exercise
GEOGRAPHY	**Geographical skills and fieldwork** • use simple compass directions (North, South, East and West) and locational and directional language [for example, near and far; left and right], to describe the location of features and routes on a map • use aerial photographs and plan perspectives to recognise landmarks and basic human and physical features; devise a simple map; and use and construct basic symbols in a key • use simple fieldwork and observational skills to study the geography of their school and its grounds and the key human and physical features of its surrounding environment.	A range of the suggested activities could involve geographical skills and fieldwork; students could, for example, consult maps or aerial photos to identify safe walking and cycling routes, or when considering traffic flow in the local area as part of a School Streets campaign; they could observe traffic in the local area at different times of day to provide data to support these campaigns.
KEY STAGE 2		
PE	Pupils should be taught to: • develop flexibility, strength, technique, control and balance [for example, through athletics and gymnastics] • compare their performances with previous ones and demonstrate improvement to achieve their personal best.	Cycling proficiency lessons could help to develop balance and co-ordination; pupils could be encouraged to record and keep track of their progress to demonstrate improvement.

SCIENCE	**Year 3 - Animals including humans** • identify that humans and some other animals have skeletons and muscles for support, protection and movement **Year 5 - forces** • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect **Year 6 - Animals including humans** • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	When taking part in physical activity such as cycling proficiency lessons or walking, scooting or cycling to school, students could consider which muscles they are using and how these aid movement. Cycling proficiency lessons may give an opportunity to explore gears on bicycles and the effect these have. Physical activity such as cycling, scooting or walking provides a context for learning about the circulatory system and a chance to observe first hand, for example, how their heart rate changes during exercise. Involvement in a school street or a similar campaign could involve students considering the impact of traffic on air pollution and how this affects their bodies.
GEOGRAPHY	**Geographical skills and fieldwork** • use fieldwork to observe, measure, record and present the human and physical features in the local area using a range of methods, including sketch maps, plans and graphs, and digital technologies.	As for KS1, a range of the suggested activities could involve geographical skills and fieldwork; students could, for example, consult maps or aerial photos to identify safe walking and cycling routes, or when considering traffic flow in the local area as part of a School Streets campaign; they could observe traffic in the local area at different times of day to provide data to support these campaigns.
KEY STAGE 3 AND 4		
HEALTH EDUCATION (from the RSE and Health Education Statutory Guidance)	**Mental Wellbeing** **By the end of secondary school students should know:** • the benefits and importance of physical exercise, time outdoors, community participation and voluntary and service-based activities on mental wellbeing and happiness.	Sustainable travel projects which champion walking, scooting and cycling could provide opportunities to observe, explore and discuss physical exercise the effects it has, including how it contributes to mental wellbeing. Involvement in a school street initiative provides an opportunity for community involvement and the chance to discuss the benefits of this.
PHYSICAL HEALTH AND FITNESS	**By the end of secondary school students should know:** • the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress. • the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill health, including cancer and cardiovascular ill-health.	Sustainable travel projects which champion walking, scooting and cycling could provide opportunities to observe, explore and discuss physical exercise the effects it has, and how it contributes to good health. When planning regular exercise routines students could consider how their journey to school (or to other significant places) could play a part in this; they could also plan safe walking and cycling routes that make use of Quieter Neighbourhoods, walking paths and other local initiatives.

KEY STAGE 3		
SCIENCE	**Working scientifically:** Experimental skills and investigations • ask questions and develop a line of inquiry-based on observations of the real world, alongside prior knowledge and experience • make predictions using scientific knowledge and understanding • select, plan and carry out the most appropriate types of scientific inquiries to test predictions, including identifying independent, dependent, and control variables • use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety • make and record observations and measurements using a range of methods for different investigations, and evaluate the reliability of methods and suggest possible improvements • apply sampling techniques **Analysis and evaluation** • present observations and data using appropriate methods, including tables and graphs • interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions • present reasoned explanations, including explaining data in relation to predictions and hypotheses • evaluate data, showing awareness of potential sources of random and systematic error • identify further questions arising from their results	Students could conduct investigations to measure air quality near the school and present this information to support a School Streets or similar campaign; using (e.g.) surface wipes, diffusion tubs or ozone badges to collect and compare data in different locations
BIOLOGY	• biomechanics – the interaction between skeleton and muscles, including the measurement of the force exerted by different muscles	Cycling activities could provide a context for exploring biomechanics

CHEMISTRY	**Pure and impure substances** • simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography **Earth and atmosphere** • the composition of the atmosphere • the production of carbon dioxide by human activity and the impact on climate	Exploring air quality near the school could provide opportunities for investigating filtration techniques The extent to which transport is responsible for CO2 emissions and the impact of this could be explored
PHYSICS	**Energy – Calculation of fuel uses and costs in the domestic context** • fuels and energy resources • energy changes and transfers • other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels **Motion and forces (forces)** • forces as pushes or pulls, arising from the interaction between 2 objects • using force arrows in diagrams, adding forces in 1 dimension, balanced and unbalanced forces • moment as the turning effect of a force **Matter - particle model** • the differences in arrangements, in motion and the closeness of particles explaining changes of state, shape and density; the anomaly of ice-water transition • atoms and molecules as particles **Energy in matter** • changes with temperature in motion and spacing of particles • internal energy stored in materials	Pupils could investigate the difference in costs between electric and petrol-based cars or explore energy changes and transfers in the context of electric cars and how they work. Cycling activities could provide context for exploring forces and moment, e.g. students could use force arrows to indicate what happens when they ride a bike Exploring the idea of air quality, and the presence of particulates, could provide a context for learning about particle models, and how this is affected by temperature – e.g. pollutants may be more visible in colder weather.

CITIZENSHIP	The roles played by public institutions and voluntary groups in society, and how to work together to improve their communities, including opportunities to participate in school-based activities	Involvement in a School Streets or similar campaign could help develop an understanding of how local citizens can work together to improve their communities.
GEOGRAPHY	• Understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in physical geography relating to • weather and climate, including the change in climate from the Ice Age to the present; • Human geography relating to: population and urbanisation and the use of natural resources • Understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on the effective functioning of natural systems • Use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information	Links can be made between key processes in physical geography related to weather and climate and the effect of human behaviour (i.e. the presence of high-density traffic) on this. Students could use fieldwork skills to collect, analyse and draw conclusions from data, e.g. traffic volumes of different times of day, or surveying people to find out how they travel to school and other key locations.

KEY STAGE 4

SCIENCE

Working scientifically

The development of scientific thinking

- explaining the everyday and technological applications of science; evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments
- evaluating risks both in practical science and the wider societal context, including the perception of risk

Experimental skills and strategies

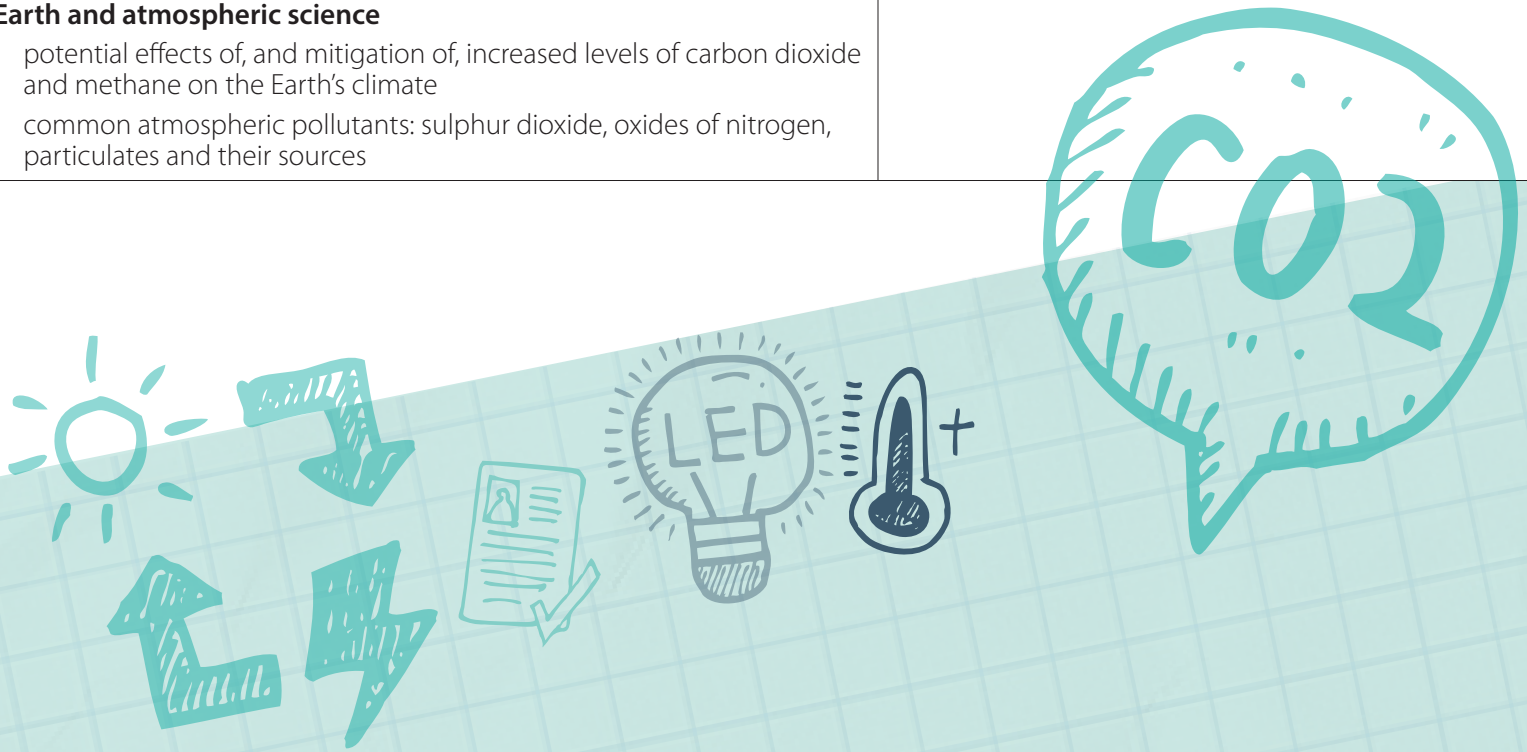
- recognising when to apply knowledge of sampling techniques to ensure any samples collected are representative
- making and recording observations and measurements using a range of apparatus and methods
- evaluating methods and suggesting possible improvements and further investigations

Analysis and evaluation

- applying the cycle of collecting, presenting and analysing data, including:
  - presenting observations and other data using appropriate methods
  - translating data from one form to another
  - carrying out and representing mathematical and statistical analysis
  - representing distributions of results and making estimations of uncertainty
  - interpreting observations and other data, including identifying patterns and trends, making inferences and drawing conclusions
  - presenting reasoned explanations, including relating data to hypotheses
  - being objective, evaluating data in terms of accuracy, precision, repeatability and reproducibility and identifying potential sources of random and systematic error
  - communicating the scientific rationale for investigations, including the methods used, the findings and reasoned conclusions, using paper-based and electronic reports and presentations

Students could conduct investigations to measure air quality near the school and present this information to support a School Streets or similar campaign; using (e.g.) surface wipes, diffusion tubs or ozone badges to collect and compare data in different locations

BIOLOGY	• Cell biology • the importance of cellular respiration; the processes of aerobic and anaerobic respiration • Transport systems • the relationship between the structure and functions of the human circulatory system	Physical exercise could provide a context for understanding the structure and function of the circulatory system and how this relates to cellular respiration.
CHEMISTRY	**Chemical and allied industries** • life cycle assessment and recycling to assess environmental impacts associated with all the stages of a product's life • the viability of recycling of certain materials • carbon compounds, both as fuels and feedstock, and the competing demands for limited resources • fractional distillation of crude oil and cracking to make more useful materials • extraction and purification of metals related to the position of carbon in a reactivity series **Earth and atmospheric science** • potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate • common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources	When considering the benefits of electric cars students could consider the environmental impact of using other fuels, the processes by which oil for these fuels are extracted and the impact of this. Work on air quality could involve developing an understanding of the effects of, and mitigation of C02 and methane levels in the environment and other common pollutants such as particulates.



PHYSICS	**Energy** • renewable and non-renewable energy sources used on Earth, changes in how these are used **Forces and motion** • decelerations and braking distances involved on roads, safety	Students could make direct comparisons between electric and fuel-powered vehicles; when considering the impact of traffic in the local environment (e.g. as part of a School Streets campaign or similar), speed controls and the relationship between speed and braking distances could be considered.
CITIZENSHIP	• local, regional and international governance and the United Kingdom's relations with the rest of Europe, the Commonwealth, the United Nations and the wider world • parliamentary democracy and the key elements of the constitution of the United Kingdom, including the power of government, the role of citizens and Parliament in holding those in power to account, and the different roles of the executive, legislature and judiciary and a free press • the different ways in which a citizen can contribute to the improvement of his or her community, to include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity	Involvement in a School Street or similar campaign could help develop an understanding of how local citizens work together to improve their communities; students will need to understand local, regional and international governance to understand who makes decisions about what happens in their local area and the processes by which they, as citizens, can effect change.

REDUCING WASTE AND INCREASING RECYCLING AND COMPOSTING

EYFS		
UNDERSTANDING THE WORLD (The world)	**Early Learning Goal** Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.	When discussing similarities and differences between materials, this could include simple ideas about whether or not materials can be recycled – e.g. you might have a separate bin for paper rubbish, and encourage children to use this. Recycling food into compost may offer opportunities for observing and exploring changes in plants.
EXPRESSIVE ARTS AND DESIGN (Exploring and using media and materials)	Exploring and using media and materials: children sing songs, make music and dance, and experiment with ways of changing them. ***They safely use and explore a variety of materials***, tools and techniques, experimenting with colour, design, texture, form and function.	This could include a range of recycled/reused materials.
EXPRESSIVE ARTS AND DESIGN (being imaginative)	**Early learning goal** Being imaginative: children use what they have learned about media and materials in original ways, thinking about uses and purposes.	Children could be challenged to think about ways everyday materials (e.g. empty milk cartons) could be repurposed and re-used.

KEY STAGE 1		
SCIENCE		
YEAR 1 – EVERYDAY MATERIALS	• distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • describe the simple physical properties of a variety of everyday materials • compare and group together a variety of everyday materials based on their simple physical properties.	When naming and classifying materials, a distinction could be made between those which can be recycled and those which can't. Recycling bins in the classroom or around the school could provide a reason to classify and sort items according to their properties
YEAR 2 – USES OF EVERYDAY MATERIALS	• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	Building on work in year 1, students could be encouraged to consider how objects made of different materials should be disposed of; they could also start to consider appropriate ways in which objects might be re-used, paying attention to the material it is made of, what this is suitable for, and how it can be changed.
DESIGN AND TECHNOLOGY	**Make:** select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	When selecting materials for DT projects students could be asked to consider how items that otherwise might be disposed of could be re-used or re-purposed.
	Evaluate: explore and evaluate a range of existing products	When evaluating existing projects, attention could be paid to how the product will be disposed of at the end of its life, or whether it is made of sustainable or recyclable materials
	Cooking and nutrition - understand where food comes from.	When considering where food comes from, students could also learn about food waste and the importance of minimising this

KEY STAGE 2		
SCIENCE YEAR 3 – ROCKS	Recognise that soils are made from rocks and organic matter.	Composting activities can provide practical, hands-on experience and the chance to observe how soil is formed from organic matter.
YEAR 4 – LIVING THINGS AND THEIR HABITATS	Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.	Students could investigate the impact of litter on their local environment
YEAR 6 – LIVING THINGS AND THEIR HABITATS	describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals	Composting activities could provide a context for studying microorganisms
DESIGN AND TECHNOLOGY	**Materials:** select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	When selecting materials for DT projects students could be asked to consider how items that otherwise might be disposed of could be re-used or re-purposed; they could also be encouraged to select materials which are sustainable or recyclable
	Evaluate: • Investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world	When evaluating existing projects, attention could be paid to how the product will be disposed of at the end of its life, or whether it is made of sustainable or recyclable materials Students could study key individuals and events related to the development of recycled or sustainable products.
	Cooking and Nutrition – understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.	This could include exploring the idea of composting to make use of food waste

KEY STAGE 3		
SCIENCE	**Biology – Nutrition and digestion** • plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots.	Students could become involved in projects that involve composting food waste, as a context for exploring how plants gain nutrients from the soil
	Biology – Cellular respiration • aerobic and anaerobic respiration in living organisms, including the breakdown of organic molecules to enable all the other chemical processes necessary for life	Composting projects could provide a practical context for developing knowledge in this area
	Biology – interactions and interdependencies • how organisms affect, and are affected by, their environment, including the accumulation of toxic materials	Students could explore the impact of litter on the local environment in terms of the accumulation of toxic materials
	Genetics and evolution (Inheritance, chromosomes, DNA and genes) • changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction	Students could explore the impact of litter on the environment in terms of changes to the environment and the effect this can have on adaptation and reproduction.

SCIENCE – CHEMISTRY	**Earth and Atmosphere** • Earth as a source of limited resources and the efficacy of recycling	Knowledge of local recycling projects and initiatives will help provide real life, practical context to help students develop their understanding.
DESIGN AND TECHNOLOGY	**Make -** select from and use a wider, more complex range of materials, components and ingredients, considering their properties	When selecting materials for DT projects students could be asked to consider how items that otherwise might be disposed of could be re-used or re-purposed; they could also be encouraged to select materials that are sustainable or recyclable
	Evaluate • investigate new and emerging technologies • test, evaluate and refine their ideas and products against a specification, considering the views of intended users and other interested groups • understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	When evaluating existing projects, specifications could include how the product will be disposed of at the end of its life, or whether it is made of sustainable or recyclable materials Students could study key individuals and events related to the development of recycled or sustainable products, and the impact of this.
	Cooking and nutrition understand the source, seasonality and characteristics of a broad range of ingredients.	When considering where ingredients come from, students could also learn about food waste and the importance of minimising this
GEOGRAPHY	**Human and physical geography** • understand how human and physical processes interact to influence, and change landscapes, environments and the climate; and how human activity relies on the effective functioning of natural systems	Students could investigate how human processes produce waste and litter, how this is managed and the impact of this on landscape and environment.
CITIZENSHIP	• the roles played by public institutions and voluntary groups in society, and how citizens work together to improve their communities, including opportunities to participate in school-based activities	By becoming involved in campaigns to reduce litter and/or to encourage recycling students can directly experience how citizens can work together to improve the community

KEY STAGE 4		
CITIZENSHIP	The different ways in which a citizen can contribute to the improvement of his or her community, to include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity	By becoming involved in campaigns to reduce litter and/or to encourage recycling students can directly experience how citizens can work together to improve he community; students could also consider the responsibility of local citizens to ensure they dispose of waste and litter correctly, and why this is important.
	local, regional and international governance and the United Kingdom's relations with the rest of Europe, the Commonwealth, the United Nations and the wider world	Students could explore the rules and laws which govern waste disposal and who is responsible for these.
SCIENCE - BIOLOGY	**levels of organisation within an ecosystem** • some abiotic and biotic factors which affect communities • the importance of interactions between organisms in a community • how materials cycle through abiotic and biotic components of ecosystems • the role of microorganisms (decomposers) in the cycling of materials through an ecosystem • positive and negative human interactions with ecosystems.	Composting projects could provide a practical context for developing knowledge in this area.
CHEMISTRY	**Chemical and allied industries** • life cycle assessment and recycling to assess environmental impacts associated with all the stages of a product's life • the viability of recycling of certain materials	Local recycling projects and facilities can help provide relevant information and a practical context for understanding in this area.
	Earth and atmospheric science • potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate • common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources • the Earth's water resources and obtaining potable water.	Students could explore the link between litter and the responsible management of waste in relation to these issues.

PHYSICS	**Energy** • renewable and non-renewable energy sources used on Earth, changes in how these are used.	When considering differences between renewable and non-renewable energy, students could consider what the waste products are and how these are disposed of.
	Atomic structure • radioactive materials, half-life, irradiation, contamination and their associated hazardous effects, waste disposal	Links could be made with the disposal of hazardous materials and why this is so important.

GLOSSARY

Air Quality	How polluted the air we breathe is. When air quality is poor, pollutants in the air may be hazardous to people, particularly those with lung or heart conditions.
Biodiversity	A variety of plant and animal life in the world or in a particular habitat.
Car Idling	The act of leaving a vehicle's engine running while it is stationary.
Carbon Capture	The storing of carbon dioxide before it is released into the atmosphere.
Carbon Dioxide	A colourless, odourless gas produced by burning carbon and organic compounds and by respiration. It is naturally present in air and is absorbed by plants in photosynthesis. Human activities have increased the concentration of carbon dioxide in our atmosphere.
Carbon Retrofit	Upgrading the existing domestic (and non-domestic) housing stock to reduce the amount of carbon emitted. This also includes improving energy efficiency.
Flood Management	Methods used to reduce the risk of floods or prevent floods.
Flood Risk	The combination of probability of a flood happening and the consequences if it occurred.
Heat Pump	A device that provides heat energy that is transferred from a source of heat or warmth, effectively 'pumping' warmth from one place to another.
Heat Networks	Heat Networks (also known as district heating) supply heat from a central source to consumers, via a network of underground pipes carrying hot water.
Nitrogen dioxide	A gaseous air pollutant composed of nitrogen and oxygen which forms when fossil fuels such as coal, oil, gas or diesel are burned at high temperatures.
Pollution	The introduction of harmful materials into the environment.
Rain Gardens	A garden that lies below the level of its surroundings, designed to absorb rainwater that runs off from a surface such as pavements.
Sustainable Urban Drainage System (SuDs)	Systems designed to efficiently manage the drainage of surface water in an urban environment.
Urban Heating	When a city experiences much warmer temperatures than nearby rural areas. Structures such as buildings, roads and other infrastructures absorb and re-emit the sun's heat more than natural landscapes such as forests and areas of water.
Wetlands	Areas where water covers the soil or is present at or near the surface of the soil all year or for varying periods of time during the year. Wetlands support both aquatic and terrestrial species.