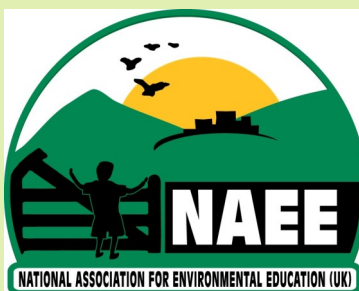


The Environmental Curriculum



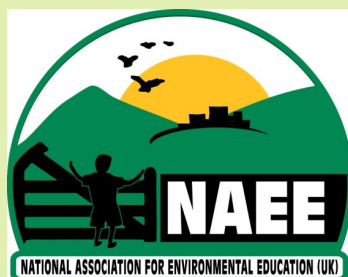
Opportunities for Environmental Education across the National Curriculum for England

Early Years Foundation Stage & Primary



Charity number 313049

National Association for Environmental Education (UK)



NAEE (UK) is a charity registered in England: 313049

The National Association for Environmental Education is an independent charitable organisation that supports and promotes teaching and learning about the environment in the formal education sector.

The mission of NAEE is to restore the role of environmental education across the school curriculum. We seek to enrich the local and global environmental awareness of young people by encouraging interaction with their environments, in order to lead future generations towards a better understanding of their role to conserve the Earth's finite resources through a more sustainable lifestyle.

For more information about NAEE, or to become a member, visit our website www.naee.org.uk.

About the author

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Cover image: Pupils from St James' Catholic Primary School, Birmingham with vegetables grown in their school allotment.

Back cover: Environmental education engages the **heart, hands** and **mind**.

Photography: Heatha Gregory (with additional photographs supplied by schools)



Foreword

As I read the official account of the World Conference at the end of the UN Decade for Education for Sustainable Development (DESD) in Aichi-Nagoya, Japan last November, I was struck by how much stress there was on the need for environmental education. Here's the Crown Prince of Japan:

"On our earth today, along with economic growth and increasing populations, we are also witnessing the advancing change of climate, loss of biodiversity, depletion of natural resources, increases in poverty and other problems. For our children and theirs, we have three important tasks: protecting the Earth's environment, which is the wellspring for ensuring lives abundant with blessings, treasuring the Earth's limited resources, and achieving sustainable development."

And here is Princess Lalla Hasnaa of Morocco:

"To think and act for the sake of the environment – in the broadest sense of the term – means to be fully aware that the planet is not only a precious legacy, but that it also implies a tremendous responsibility for us in terms of preserving the interests of future generations."

These issues have been at the heart of environmental education for 60 years. It is ironic, therefore, to look back to the start of the Decade, in 2005, when so many people thought that it might bring environmental education as we knew it to an end. The UK's National Association of Environmental Education never accepted this, thinking that as the Earth's problems became more acute, environmental education would become more necessary, not less.

And so it has proved. While commentators bemoan the lack of a national curriculum emphasis on sustainability and ESD, as this valuable document illustrates, the curriculum actually provides numerous opportunities for schools, teachers and children to explore a wide range of the world's most pressing issues. The power of this handbook lies not just in its careful analysis of what the curriculum says, but also in its excellent exemplification of how teachers are seizing opportunities to explore these issues with their students. The beautifully illustrated case studies of actual practice are particularly helpful in helping us see what's possible in today's schools.

There is something here for everyone: for experienced practitioners there will be insights from other people's work; and for those just starting out, a wide range of teaching and learning opportunities are carefully set out for scrutiny, evaluation and adaptation.

Environmental education has a key role in helping us address the challenge we all now face:

How can we all live well, without compromising the planet's continuing ability to enable us all to live well?

We do not yet know enough about how to do this, and so we must learn our way into it. I welcome this handbook as a contribution to this great task.

Professor William Scott

President: National Association of Environmental Education

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Introduction

Environmental education helps to foster caring, responsible attitudes and inspires young people to take action in order to live more sustainably. It can also develop their sense of identity and pride in their local environment and community. It not only covers the natural world and 'green' issues, but also the 'built' environment.

There are three interrelated components of environmental education:

- **Education IN the environment**
Using children's immediate surroundings and the wider world as a learning resource. This can be thought of as the 'hands-on' element.
- **Education ABOUT the environment**
Developing knowledge and understanding about the environment should begin with an awareness of the local environment and then extend to an understanding of global environmental issues.
- **Education FOR the environment**
The development of positive attitudes and behaviours towards the environment. This can only be effective if the other two elements are in place.

With children and young people spending less of their free time outdoors (due to issues such as technology and safety worries), and budget cuts leading to the closure of outdoor learning centres across the country, environmental education in schools is more important than ever! This handbook highlights the opportunities for environmental education that can be found in the 2014 Early Years Foundation Stage Profile and the 2014 Primary National Curriculum in England.

Most of the case studies and photographs in this handbook are from schools who received Hugh Kenrick Day bursaries. Administered through NAEE since 2012, these bursaries have provided funding for almost 2000 pupils from over 40 schools across Birmingham to carry out outdoor environmental education work both in school and through educational visits.

(For more information about Hugh Kenrick Day bursaries, contact info@naee.org.uk.)



A Brief History of Environmental Education in the Curriculum



The roots of environmental education

Although the term ‘environmental education’ was coined in the 1960s, the links between education and the environment go back much further; particularly to the work of the Scottish Professor of Botany, Sir Patrick Geddes (1854—1933), who pioneered methods that brought learners into direct contact with their environment.

From the 1940s onwards, various ideas and initiatives came into use that could be said to be the ‘roots’ of environmental education: ‘environmental studies’ (involving a mix of history, geography and nature study in the school locality), ‘field studies’ (work further afield, such as residential visits), wildlife gardening, ‘Earth Education’ (based on direct experiences with nature and engaging children’s feelings and senses), greater focus on the ecology of urban areas and the development of ‘city farms’.

Environmental education as a cross-curricular theme

The breakthrough for environmental education came in 1990, when it was introduced as a ‘cross-curricular theme’ (alongside health education, education for citizenship, careers and guidance, and economic and industrial understanding). The theme encompassed both the built and natural environments through the following seven topics: Climate; Water; Energy; Plants and animals; Soil, rocks and minerals; Buildings; Industrialisation and waste; and People and communities. However, when the National Curriculum was reviewed in 1994, there was no mention of the cross-curricular themes and the revised curriculum no longer included any explicit reference to environmental education.

More recent initiatives

In 2000, Education for Sustainable Development (ESD) was introduced as a non-statutory element of the curriculum. This was followed in 2006 by the launch of the Government’s *Sustainable Schools Strategy* (S3), which encouraged schools to follow the recommendations in the eight ‘doorways’ (Buildings and grounds; Energy and water; Travel and traffic; Food and drink; Purchasing and waste; Local well-being; Inclusion and participation; and Global dimension) in order to become a completely sustainable school by 2020. However, S3 was scrapped by the Education Secretary in 2010.

In 2006, the Government launched the *Learning Outside the Classroom Manifesto*, which advocated the use of outdoor learning — from the school grounds and local area, to visits further afield and residential trips — as an essential aspect of education. The manifesto highlighted the values of hands-on, experiential learning as a way of enhancing and supporting work back in the classroom.

Where is environmental education now?

Since the National Curriculum was further streamlined in 2014, there is still no explicit reference to environmental education, and certainly no return to it being an official ‘cross-curricular theme’. However, this handbook aims to highlight the places where education *in*, *about* and *for* the environment **can** be found in the Early Years and Primary curricula.



Environmental Education in the Early Years Foundation Stage (EYFS)

Environmental education begins in the Early Years Foundation Stage, when children start to find out about the world around them. The strong focus on 'learning through play' makes it the ideal time for children to begin exploring the built and natural environment that makes up their immediate surroundings, in order to develop a sense of place, an awareness of their world and a deeper understanding of the need to care for it.

In terms of 'environmental education' in the Early Years Foundation Stage, this handbook will refer mainly to outdoor learning, as this hands-on approach is a good way of introducing young children to the concept of the 'environment'.

The three characteristics of effective learning outlined in the EYFS framework (2014) all fit in well with outdoor learning and environmental education:

Playing and exploring: Through open-ended, hands-on experiences which result from their innate curiosity, children use raw sensory material to build concepts, test ideas and investigate. They combine, explore and refine their current understanding through imaginative play. They develop a 'can do' attitude by taking risks in new experiences and seeing failures as opportunities to learn.

Active learning: Children concentrate and become involved in activities. They keep on trying if they encounter difficulties, and enjoy their achievements.

Creating & thinking critically: Children generate and develop their own ideas, exploring different strategies to achieve goals. They use what they already know to learn new things, making links between ideas. They make choices and decisions about how to approach tasks.

The following pages will outline opportunities for environmental (outdoor) education for each of the EYFS areas of learning.



Environmental Education Opportunities within the EYFS Prime Areas of Learning



Communication and language development

- **ELG 01 Listening & attention:** Listening to stories and information outside; responding to what they hear with relevant comments, questions or actions.
- **ELG 02 Understanding:** Following instructions, e.g. for staying safe; answering 'how' and 'why' questions about the natural and built aspects of their environment.
- **ELG 03 Speaking:** Describing observations about their environment in a way that the listener can understand, using the correct tense; telling oral stories; using talk to organise, sequence and clarify thinking; developing their own narratives and explanations by connecting ideas or events.

Physical development

- **ELG 04 Moving & handling:** Being active outdoors; moving safely with confidence, control and coordination; showing an awareness of space, of themselves and others; using tools and equipment; handling animals with care and respect.
- **ELG 05 Health & self-care:** Learning about healthy food and growing their own fruit or vegetables; being aware of how to stay safe, e.g. not eating parts of plants without permission; understanding the need to thoroughly wash their hands after handling animals, plants, soil etc.

Personal, social and emotional development

- **ELG 06 Self-confidence & self-awareness:** Being confident to try new activities and initiate ideas; having the confidence to speak in a familiar group.
- **ELG 07 Managing feelings & behaviour:** Behaving appropriately in groups and outside; recognizing risks and adapting their behaviour accordingly.
- **ELG 08 Making relationships:** Forming positive relationships with adults and other children; making friends and cooperating; negotiating plans and taking turns; showing sensitivity to others' needs and feelings (including animals).





Environmental Education Opportunities within the EYFS Specific Areas of Learning

Literacy development

- **ELG 09 Reading:** Reading outdoor print, e.g. signs; letter or phoneme hunts around the school grounds; laminating pages of old books for children to read outside.
- **ELG 10 Writing:** Using different natural materials to write, e.g. in sand, on a wall with a paintbrush dipped in water; using phonic knowledge to write items that they find in the local environment, e.g. names of minibeasts, parts of plants.

Mathematics development

- **ELG 11 Numbers:** Counting objects, e.g. legs on a spider, petals on a flower; finding groups of objects; solving problems, e.g. how many plants will fit around the pond?
- **ELG 12 Shape, space & measures:** Recognizing and making patterns and shapes; using non-standard measurements (e.g. How many hands fit around a tree trunk? How many welly heights is the puddle?); using direction and position words.

Understanding the world

- **ELG 13 People & communities:** Understanding that in their school, their local area and the world, there are many similarities and differences between themselves and others, and among families, communities and traditions.
- **ELG 14 The world:** Using all of their senses to find out about the built and natural environment; investigating objects and materials; developing curiosity; raising and answering simple scientific questions; carrying out simple tests; identifying similarities and differences in relation to places, objects, materials and living things; talking about features of their own immediate environment and comparing to different environments; making observations of animals and plants, explaining why some things occur and talking about changes; investigating sound and light.
- **ELG 15 Technology:** Beginning to understand that they should turn off lights and devices when they are not being used.

Expressive arts and design

- **ELG 16 Exploring and using media and materials:** Singing songs (e.g. Five Little Bees), making music (using natural and human-made objects and materials for instruments) and dancing (e.g. dancing like minibeasts at the “Ugly Bug Ball”); large scale (messy!) art work outside; using natural and human-made objects in art work (e.g. leaf crowns, Andy Goldsworthy-style pictures on the ground, ‘litter monster’ puppets to encourage others not to drop litter).
- **ELG 17 Being imaginative:** Expressing their ideas, opinions and feelings about their environment imaginatively, using a range of media and materials; observational sketches.



Case Study: Environmental Education in the Early Years Foundation Stage

St Barnabas CE Primary School, Birmingham

St Barnabas CE Primary School is located in Erdington, Birmingham. Many of the children have limited experiences of the environment beyond their own home and school, so the school greatly values educational visits (in the local and wider area) and outdoor learning in the school grounds.

Each Spring term, the Reception children complete a topic on plants and growing. This links with the document *Development Matters in the Early Years Foundation Stage* and Early Learning Goals under the area of *Understanding the World*, where children are required to learn about features of their own environment and how environments vary from each other.

During the topic, the children plant bean and sunflower seeds, care for them and watch them grow. Their role-play area is a garden centre and they also have a small world garden. The topic also links to literacy, as they read non-fiction books (*My Bean Diary*, *How Plants Grow*) and fiction books (*Jaspers Beanstalk*, *Jim and the Beanstalk*), that not only help them to understand more about plants, but also provide opportunities to learn about story structure and the features of non-fiction texts.



The story *Jasper's Beanstalk* also has strong links with mathematics, as children learn the days of the week, which fits in perfectly with their learning about time. Both of the story books they study provide opportunities for story prediction, retelling and writing, including letters to the giant in *Jim and the Beanstalk*.





In May 2014, the topic also included a visit to Martineau Gardens¹, a community garden located two miles from Birmingham City Centre. The visit enabled the children to widen their knowledge of the environment beyond their immediate locality and gave them many different learning experiences to support the work taking place at school.



The visit also helped the children to become more aware of their own responsibilities and to develop a more caring approach towards the environment. For example, the compost heap helped them to understand about recycling garden waste; none of the children had heard of a compost heap before but they were able to apply their new knowledge back at school. They were able to taste herbs and see vegetables growing first hand. Seeing bean plants with flowers linked in with the stories they had been reading, and they could compare the bean plants to their own back at school, which had only just begun to grow roots. As they explored the gardens, they talked to each other using the new vocabulary they had acquired: 'nectar', 'bark', 'compost'.



After the visit, the children used their new knowledge and vocabulary to write recounts and paint pictures. They told the parents and nursery children about their trip and what they had learned, sharing photographs and work, in the Foundation Stage assembly. During this talk, there was clear evidence of how the trip had influenced their attitude towards the environment and how they need to care for it: *"We all need to look after our world and our plants are very important in keeping us healthy"; "We must look after the bees, they help our fruit to grow and give us honey"*.

Ann McCulloch Foundation Stage teacher

¹ www.martineau-gardens.org.uk/education



Environmental Education in the Primary National Curriculum



In the introductory pages of the 2014 Primary National Curriculum, reference is made to the fact that a “*balanced and broadly based*” curriculum should promote “*the spiritual, moral, cultural, mental and physical development of pupils at the school and of society*” and prepare pupils for “*the opportunities, responsibilities and experiences of later life*”. This definitely has strong links with environmental education, as our future generations need to be equipped with the skills and knowledge to make decisions that will impact on their local environment and the planet as a whole.

It is stressed that the national curriculum should just be one element of children’s education and that teachers should use it to develop a range of “*exciting and stimulating lessons to promote the development of pupils’ knowledge, understanding and skills*”. What better way to make lessons exciting, stimulating and relevant to children than using their local (and wider) environment as a place of learning?

The three main curriculum subjects that have the most obvious opportunities for environmental education are science, geography and design & technology, but there are also links to English, maths, history, PE, creative subjects and even languages.

Environmental Education through Science

Science is the logical place to start; after all, science is all about helping us to make sense of our world. The introduction to the science curriculum states that “*pupils should be encouraged to...develop a sense of excitement and curiosity about natural phenomena*” and two of the aims are:

“To ensure that all pupils develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.”

“To ensure that all pupils are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.”

So, there are plenty of opportunities for education IN the environment (practical work in and out of the classroom), ABOUT the environment (understanding processes that affect us and the planet) and FOR the environment (using scientific knowledge to solve current and future environmental problems).

‘Plants’, ‘animals’, ‘living things and their habitats’ and ‘evolution and inheritance’ are all sections in the programmes of study that link to environmental education and encourage hands-on investigation. ‘Materials’ has links to waste and recycling, and ‘electricity’ can be used to teach about energy saving.

The old adage ‘think global, act local’ is really important, as children and young people can’t be expected to understand global issues if they don’t know about the immediate world around them; for example learning about local and national weather patterns in order to understand climate change and the impacts on weather patterns globally. So it’s great to see that the programme of study for every year group in the primary science curriculum mentions that



*“pupils should use the **local environment throughout the year**”, with reference to exploring, observing and asking/answering questions about plants and animals in different habitats, including plants that they have grown themselves. The importance of care and respect for other living things is also emphasised: *“pupils...should understand how to take care of animals taken from their local environment and the need to return them safely after study”*.*

Environmental Education through Geography

Geography also has close links to environmental education. The introduction to the geography curriculum states that *“a high quality geography education should inspire in pupils a curiosity and fascination about the world and its people”* and equip them with *“knowledge about diverse places, people, resources and natural and human environments”*.

Fieldwork is an essential aspect of geography, which helps to develop an understanding of physical and human processes on a variety of scales — local, national and global — through sensory experiences. Pupils can learn about the quality and vulnerability of different environments and the possibilities for positive environmental management. They can discover how we, as humans, have shaped the world, which in turn should help them to develop decision-making skills and gain a sense of personal responsibility.

Environmental Education through Design and Technology

Design and technology looks at using *“creativity and imagination”* to *“design and make products that solve real and relevant problems...considering their own and others’ needs, wants and values”*. There are lots of ways that this could be applied to environmental issues, for example rainwater harvest and storage for watering plants, making plastic bottle bird feeders (meeting the ‘needs’ of animals) or creating new habitats in the school grounds.

Another relevant aspect of the DT curriculum is the aim that pupils should *“understand and apply the principles of nutrition and learn how to cook”*. Pupils can grow their own food crops and use them in healthy recipes, which in turn links to plant life cycles and plant parts/functions in science (e.g. roots/bulbs/tubers, leaves, fruit, seeds and their uses as food).

The subject contexts for both primary key stages state that pupils should *“work in a range of relevant contexts”* including school, gardens, playgrounds, the local community and the wider environment. This reinforces what has already been stated about the importance of developing an understanding of, and affinity with, a child’s local environment before they can begin to learn about more diverse places or make sustainable lifestyle decisions.

The main part of this document will outline the opportunities for environmental education in the subjects for each of the primary key stages, with a case study showing good practice for each key stage.

Environmental Education through Key Stage 1 Science



Working scientifically (Years 1 & 2)

- Science at key stage 1 is all about children experiencing and observing phenomena in the natural and human world around them, which of course should start with the school grounds (not forgetting to include both the natural *and* the built environment).
- Pupils should use all of their senses to make ‘observations’ and build on their curiosity to ask questions about what they notice. They use a range of simple equipment, such as magnifying glasses, pond dipping nets, bug collection pots and measuring tapes, and record their results and observations by writing and drawing.
- They should begin to use scientific language, such as the names of animals, parts of plants and terms such as ‘habitat’. It is important to use the correct vocabulary in context, but also to explain the meaning (for example, you could explain how ‘minibeasts’ should actually be called ‘invertebrates’, i.e. no backbone).

Plants (Years 1 & 2)

- Pupils in Year 1 learn to identify and name common wild and garden plants (including deciduous and evergreen trees), and name the main parts of plants.
- In Year 2, they are expected to observe and describe how seeds and bulbs grow into mature plants and investigate the basic conditions required for healthy growth.
- Hands-on and sensory experience of plants is essential, for example dissection (taking apart a plant and separating it into the roots, stem, leaves and flower); acting out the roles of different parts of a plant (“I’m so pretty,” say the flowers, “Yum yum,” say the leaves); signing songs (e.g. “Five little peas in a pea pod pressed...”).
- Learning about plants can help young children to understand their importance to other plants, animals, humans and the planet as a whole, which should make them more inclined to want to look after them and grow their own.
- Also, finding out about the plants that grow in their school and locality can help pupils gain a sense of ownership of their local area, which in turn should lead to more sustainable communities.

Animals (Years 1 & 2)

- Year 1 pupils should be taught to recognise and name a variety of common animals (including fish, amphibians, mammals, reptiles and birds), group them according to what they eat (i.e. carnivores, herbivores, omnivores) and describe the structure of a variety of common animals (including pets).
- Pupils in Year 1 should name the basic parts of the human body and identify which part is associated with each sense. This provides many opportunities for sensory work outdoors (bark rubbing, “smelly cocktails”, blindfold walks etc.).
- In Year 2, pupils look at the basic needs of animals, are introduced to animal life cycles and learn about the importance of exercise and healthy eating for humans.
- Children should be given the opportunity to observe animals at close hand, and handle them (when appropriate), being careful to treat them with care and respect.



- As stated in the plants section, learning about animals in their local environment can help children understand the need to protect them (particularly declining species such as hedgehogs) and inspire a sense of ownership of their school and local area.

Seasonal changes (Year 1)

- Pupils in Year 1 are expected to learn about seasonal changes, such as day length and weather. This also links to their learning about plants, i.e. evergreen and deciduous trees.
- Activities with an outdoor environmental basis can include feeding birds in the school grounds (when, what and why), collecting different coloured Autumn leaves and other natural objects for environmental art (e.g. in the style of Andy Goldsworthy) and creating hibernation ‘houses’ for animals such as hedgehogs.

Living things and their habitats (Year 2)

- In Year 2, pupils learn that most living things live in habitats, which provide the basic needs of the plants and animals that live there.
- They should be introduced to the terms ‘habitat’ (“*a natural environment or home for a variety of plants and animals*”) and ‘micro-habitat’ (“*a very small habitat, for example for woodlice under stones, logs or leaf litter*”), and need to be given opportunities to investigate the plants and animals that live in habitats and micro-habitats in their school grounds and local area.
- When studying local habitats and micro-habitats, children should observe how living things depend on each other, for example: food chains and how plants provide shelter for animals. This can lead on to an understanding of our place in the world and how we rely on plants and animals, which should in turn lead to a recognition of why habitats and the organisms within them should be looked after.
- It is important that young children begin by investigating their local environment, before going on to study less familiar habitats, such as the seashore or the rainforest.

Everyday materials (Year 1) / Uses of everyday materials (Year 2)

- This section can link to the environment by investigating materials that occur in the natural environment or can be found in the built environment. It could also lead to simple discussions about the use and misuse of natural materials and resources, and beginning to talk about recycling.
- Year 1 pupils identify a variety of everyday materials (natural, e.g. wood, rock, water; and human-made, e.g. plastic, glass, metal) and look at some of their properties. Then in Year 2 they begin to link materials and their properties to the ways we use them.
- Outdoor activities could include building dens/shelters for toy animals (investigating how to make them warm and dry inside), re-using plastic bottles to make bird feeders and making rubbings of tree bark, walls, manhole covers etc. The importance of not destroying plants during these kind of activities and tidying up after themselves should be stressed.

Environmental Education through Key Stage 1 Geography



Locational awareness

- Pupils should build up their geographical knowledge outwards, starting with their school and local area, then its location in the UK and the world (related to the seven continents and five oceans).

Place knowledge

- They should study *“the human and physical geography of a small area of the United Kingdom”*, so it makes sense for this to be their local area, and then somewhere slightly further afield.
- Pupils could be involved in helping to plan educational visits to places outside of their immediate local area, for example locating both their home and visit area on a map, identifying transport routes (suggesting more sustainable transport choices) and planning games or songs for the journey, based on how long it will take to get there.

Human and physical geography

- There are links with learning about seasons in science (Year 1), as pupils are required to *“identify seasonal and daily weather patterns in the United Kingdom”*. They are also expected to be able to locate hot and cold areas of the world (in relation to the Equator and the North and South Poles), which could possibly link to simple work on climate change.
- Through learning both inside and outside the classroom, pupils should learn and use basic geographical vocabulary to refer to physical features (e.g. ocean, forest, vegetation) and human features (e.g. city, factory, harbour).

Geographical skills and fieldwork

- In key stage 1 geography, it is important that pupils have first-hand experience of their local environment — using *“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”* — before they can move on to learning about more diverse places.
- This can include looking at maps (including simple compass directions and keys), aerial photographs and plan perspectives, which can show how landscapes have changed over time, perhaps due to human influences. Children could create their own maps or models to show what their local area might look like in the future, considering potential positive and negative human impacts.
- Local walks are a great way of really ‘getting to know’ the local area, particularly for those children who travel to school by car. Going on a walk in the local area can also help teachers to find out more about the area where the school is located (particularly if they don’t live nearby) and can even give children the chance to teach their teacher about places they know well! An interest in the local area can inspire a sense of ownership, which in turn could lead to more sustainable communities, with children wanting to look after their local area and remain/return there when they are older.



Environmental Education through Key Stage 1 Design and Technology

Design, make and evaluate

- Pupils should be taught to “*design purposeful, functional, appealing products for themselves and other users based on design criteria*”, so this could include designing and making things like plastic bottle bird feeders or bird cakes (be aware of allergies), with birds being the ‘other users’.
- Pupils are expected to “*select from and use a range of materials and components*”, so they could investigate the properties of natural and pre-used materials (i.e. recycling rather than waste) and choose which would be suitable for a particular purpose, for example making a musical instrument or a scarecrow (to protect plants they are growing). This will link with their work on materials in science.
- Prior to making something, pupils can draw up a list of design criteria, which they can then use to evaluate their finished product. For example, an effective den (perhaps for a toy woodland animal, at key stage 1) should be warm, dry, camouflaged and stable.

Cooking and nutrition

- Pupils in key stage 1 should be taught to “*use the basic principles of a healthy and varied diet*” and “*understand where food comes from*”. Obviously both of these expectations link well with growing food crops in school. These can then be used to make healthy dishes, ideally involving parents/carers, for example through ‘healthy lunchbox’ sessions in school. As well as linking to science (parts of plants used for food, seasons etc.), inspiring a love of tasty, home-grown fruit and vegetables can help to combat childhood obesity.
- ‘Understanding where food comes from’ also links perfectly to visits to school farms and early discussions about issues such as free-range animals. Pupils have an opportunity to explore the range of products that come from animals, such as milk, eggs, meat and wool. An awareness of where these products really come from can lead to children growing up to make informed choices about what they buy and eat.



Environmental Education through Key Stage 1 English



Spoken language

- Working outside in the local environment can provide a context for children to develop their communication skills, for example sharing ideas and information with their peers and adults, talking and working collaboratively to solve problems, learning and using new vocabulary.
- Role-play can also be used as a useful way of debating and exploring issues, such as whether it's better to walk/scoot/cycle to school or come in the car, the impacts of litter on wildlife (perhaps there is a problem with rubbish being thrown into the school grounds or local park), and keeping safe on visits out of school (road safety, 'stranger danger', sun protection etc.).
- Songs, rhyme and word play are a great way of exploring nature and the environment, for example 'We're going on a bug hunt' (an adaptation of Michael Rosen's *We're Going on a Bear Hunt*, based on areas in your school grounds) or the action rhyme *A Little Seed* by Mabel Watts.

Reading

- There are many information texts and stories that children can read which are about animals, plants, nature and looking after the environment. These can form the basis of a whole cross-curricular topic. For example, *Jack and the Beanstalk* can be used to teach about growing bean plants (the children could make their own giant's castles and attach them to garden canes for their "beanstalks" to reach), healthy eating (mixed bean salad), and garden design (Jack's mum needs a new garden since the giant fell down and flattened it!).
- Any damaged or ripped books could be laminated and made available for children to read outside.
- Pupils can use phonics and other strategies to read new vocabulary linked to topics such as plants, animals and habitats, and environmental print out of school, including road signs and shop names.
- They can follow simple written instructions, for example those on a seed packet.

Writing

- The natural and built environments can provide exciting stimuli for pupils to write fiction, non-fiction or poetry. For example: they could imagine themselves shrunk down to the size of a beetle and write a story about life in the undergrowth; an educational visit can inspire a vivid recount; sensory experiences can be used to write a poem.
- Children can use phonics and other strategies to write new vocabulary and share this with others, for example writing labels for food crops they have planted.
- They can write simple instructions for future key stage 1 children to tell them how to look after a plant or feed the birds visiting the playground.



Environmental Education through Key Stage 1 Mathematics

Number (Years 1 & 2)

- Pupils can practice counting and calculation using natural objects, for example “how many legs are there on an ant plus a spider?”; paint numbers onto stones or use piles of pebbles to add and subtract outside; count the number of legs on a woodlouse by counting in pairs; use sticks to practice writing numbers (as both numerals and words) in the soil; split an outdoor space or a set of objects into different fractions.
- They can also use natural objects to help with counting in 2s, 5s etc. For example a horse chestnut leaf has 5 lobes, so 2 leaves have 10 lobes, 3 leaves have 15 lobes etc.
- Pupils can recognize naturally occurring patterns and create their own using natural objects.
- Number work can also be applied to problem solving, for example sharing out harvested fruit equally between members of a group.

Measurement (Years 1 & 2)

- Pupils can compare natural objects such as leaf lengths, tree heights, mass of pine cones etc. They can also use standard and non-standard units of measurement and equipment (e.g. measure the height of your seedling using a ruler, find a twig as long as your little finger) to begin to measure and record lengths, heights, mass/weight, capacity/volume and time.
- Work on sequencing events links well with writing recounts (e.g. a Bean Diary) or instructions using chronological language.
- Measurement can also be used to solve problems, for example “how many lettuces can I plant in this tray?”

Geometry (Years 1 & 2)

- Look for 2D and 3D shapes in the natural or built environment and begin to name, describe and sort them.
- Give directions to a partner for how to get to a particular feature in the school grounds, using directional/positional vocabulary.

Statistics (Year 2)

- Create tally charts of data such as the number of different types of birds visiting the bird table in 10 minutes; or different types of vehicles passing the school in half an hour (which could lead on to discussions about how and why this could/should be reduced). These can then be used to create simple pictograms or block graphs.
- Go outside to create human graphs (e.g. standing in height or age order), pictograms (e.g. sit in lines to show your favourite vegetables), and simple Venn or Carroll diagrams using large P.E. hoops, skipping ropes or sticks.

Environmental Education through Other Subjects in Key Stage 1



History

- As part of the Key Stage 1 history curriculum, pupils should be taught about “*significant historical events, people and places in their own locality*”, so this might include studying the history of the school, going on a local walk, or inviting older local residents to talk to the children (e.g. about how the local environment has changed — for better or worse).
- They should learn about “*changes within living memory*”, so this could be used to teach about how they have grown and developed and then link to the growth of plants, life cycles of animals (e.g. butterfly, frog) or seasons work (Year 1 science).

Physical Education

- Obviously a lot of PE is taught outside, but this could be linked to the environment by developing warm-up activities based on plants or animals (e.g. the “bean game” or mimicking a plant growing and stretching upwards).
- Adventurous / forest school activities like den building or woodland obstacle courses can help develop skills such as teamwork and agility (e.g. balancing on a log). However, it is important to also protect the wildlife of the areas where these activities are carried out.

Art and design

- Pupils should “*use a range of materials creatively to design and make products*”, so natural objects could be used as materials or media for art work, for example experiment with painting using different feathers or leaves attached to clothes pegs, or use shells to print patterns into clay.
- Pupils should be taught “*to develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form and space*”, so what better stimuli than the ‘art’ found in nature (leaf shapes, bark patterns, tree rings, flower structures, cloud formations etc.)?
- They should also learn “*about the work of a range of artists... describing the differences and similarities between different practices and disciplines, and making links to their own work*”. The ideal artist to study, in terms of the environment, is Andy Goldsworthy, as he only uses natural objects (including using plant sap for glue and thorns instead of nails or pins) and leaves nature to ‘reclaim’ his artwork when he has finished. This can help to develop a ‘leave only footprints, take only photographs’ approach to working outdoors.

Music

- Ask the pupils to make up their own nature songs based on familiar tunes, such as *The Farmer’s in his Den*, *London Bridge*, *Jingle Bells* or *Heads, Shoulders, Knees and Toes* (e.g. parts of a plant: roots, stem, leaves and flower, this time working bottom to top).
- Make links to design and technology by exploring the musical properties of natural and pre-used objects or materials and making musical instruments (e.g. rain sticks, wind chimes, drums, shakers).



Case Study: Environmental Education in Key Stage 1

St James' Catholic Primary School, Birmingham

St James' Catholic Primary School in Rednal, Birmingham, runs an outdoor learning project, which has a particular focus on learning about where food comes from and keeping healthy. The project has been very successful, especially since the new (KS1) National Curriculum has great emphasis on the outdoors and the seasons.

The school has a tiny area of land just outside the Year 2 classroom, which for years had mainly been neglected. Some attempts had been made to grow vegetables and other plants on this patch of land, but the hard clay soil made it extremely difficult to manage. However, in 2013 we decided, with some determination, to combat this problem and set up an allotment space for the Year 1 and Year 2 children. The main aims of the project were to



increase children's knowledge and understanding of where fruit and vegetables come from, to observe the growth process and to begin to understand the roles of the different parts of a plant. Other integral aims were to boost children's self-esteem, encourage team work and communication skills, develop a respect for the environment and a responsibility for the plants in their care.

The project was led by one of the teaching assistants and six Key Stage 1 children, helped by one of the grandparents, who spent a considerable amount of time weeding, erecting trellising, making planters, and laying slabs around the edges to enable the children to have easy access.

Since then, the garden has been used to grow and harvest food crops including:

- rocket
- lettuce
- radishes
- strawberries
- turnips
- carrots
- potatoes
- tomatoes
- sweet peas
- broad beans



All of this produce ends up in the school salad bar, to be enjoyed by everyone.

The children looked after the garden by weeding and watering, and they kept a journal of the growing process, regularly measuring the plants' growth and creating labelled diagrams.

Other activities included carrying out computer research about the different types of vegetables and how we can link these to a healthy lifestyle, and art work with some of our talented artists using their painting skills to decorate the planters.



To develop the theme of children learning where their food comes from, we visited Mount Pleasant School Farm², which is only a ten minute drive away from school, and is set in the grounds of a working dairy farm.

The visit offered wonderful opportunities for our children to gain a valuable insight into the role of a farmer and farm life, by becoming involved in various jobs on the farm, including:

- feeding the hens and cockerels with mash
- collecting the eggs from the hen house
- feeding the sheep
- saving their left-over fruit to be fed to the pigs

They were able to feel the sheep's wool and learn about its uses, find out more about the life of a dairy cow and have an opportunity to try milking on a life-size model!



The farm also provided an excellent opportunity to see sustainability in action, with rainwater being used to water the hens and clean the children's wellies (more jobs they could get involved with!) and their milk cartons being collected for recycling. This was very valuable, as St James' has recently taken part in the Birmingham Sustainable Schools Programme and is working towards achieving an Eco-Schools Silver Award.

Lindsey Hall Key Stage 1 Phase Leader

² www.mountpleasantschoolfarm.com





Environmental Education through Key Stage 2 Science

Working scientifically (Years 3, 4, 5 & 6)

- Science in lower key stage 2 aims “*to enable pupils to broaden their scientific view of the world around them...through exploring, talking about, testing and developing ideas*”. The progression into upper key stage 2 is that they “*develop a deeper understanding of a wide range of scientific ideas...through talking about their ideas, asking questions about scientific phenomena and analysing functions, relationships and interactions more systematically*”. All of this can, and should, incorporate learning in and about the natural and built aspects of their local and wider environment.
- Pupils can use dataloggers to take measurements such as temperature, light levels and sound levels, which can give them information about their local environment. This could then lead on to discussions about environmental quality.
- In upper key stage 2, pupils should identify “*scientific evidence that has been used to support or refute ideas or arguments*”, so this can lead on to informed discussion and debate about global environmental issues such as global warming. Perhaps the pupils could have access to school fuel bills before and after energy-saving measures have been put in place, in order to observe these global issues more locally.

Plants (Year 3)

- In Year 3, pupils find out more about the ‘jobs’ that each part of a plant does, including the role of flowers in plant life cycles, exploring further the requirements for life and growth and observing variation.
- Hands-on and sensory experience of plants is essential, for example dissection of plants, flowers and fruit, identifying and labelling the different main parts. Hand lenses and microscopes can be used to look at pollen, seeds etc. in more detail. Obviously this must be linked in with having respect for plants and not picking them indiscriminately for study.
- Learning about plants helps pupils to understand their importance to animals, other plants, humans and the planet as a whole, which should make them more inclined to want to look after them and grow their own.
- Also, finding out about the plants that grow in their school and local area can help pupils gain a sense of ownership of their local area, which in turn should lead to more sustainable communities.

Animals, including humans (Years 3, 4, 5 & 6)

- There are many opportunities in key stage 2 for pupils to observe animals at close hand, and handle them (when appropriate), being careful to treat them with care and respect. They must also be reminded that they should return any animals safely after study to the place where they found them (or a similar habitat if this is not possible).
- In Year 3, pupils focus on food and nutrition for humans and other animals (which links to healthy eating and cooking in Design and Technology) and begin to group animals based on their body structures (e.g. those with and without skeletons).



- The focus in Year 4 is mainly on food – including the digestive system of humans, the functions of different types of teeth and the construction and interpretation of food chains. A great place to observe food chains (and also life cycles) is a pond, where pupils can clearly see plants (on the surface and under the water), herbivores (e.g. snails, water fleas) and carnivores (e.g. caddis fly larvae, dragonfly larvae). They could study the pond-life under a microscope and try to look at the mouth parts of carnivores and herbivores.
- In Years 5 and 6, pupils focus mainly on the human body – including changes as we age, and the impacts of diet, exercise, drugs etc. on the functions of the body. This could then be linked to looking at the impacts of human activities on our planet, particularly those which cause negative effects, for example dumping waste into the seas will eventually lead to irreparable damage, in the same way that drugs can damage the human body.

Living things and their habitats (Years 4, 5 & 6)

- In Year 4, pupils should be beginning to group and classify living things in a variety of ways, looking at living things found in their local and wider environment, and identifying how habitats change throughout the year.
- The statutory requirements for Year 4 also state that pupils should be taught to “*recognise that environments can change and that this can sometimes pose dangers to living things*”. Pupils should explore positive and negative human impacts 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*”. This is probably the most explicit reference to environmental education in the entire Primary National Curriculum.
- In Year 5, pupils look more at plant and animal life cycles and the different types of reproduction. This offers many opportunities for hands-on outdoor work such as invertebrate sampling, pond dipping and flower dissection (always remembering to encourage respect for the plants, animals and habitats being studied).
- It is also suggested in Year 5 that pupils find out about the work of “*naturalists and animal behaviourists, for example David Attenborough and Jane Goodall*”. Learning about these people should surely inspire a love and interest in the natural world and a desire to conserve our planet.
- In Year 6, pupils build on their prior learning (from Year 4) by looking at the classification system in more detail. It is suggested that “*pupils might work scientifically by using classification systems and keys to identify some animals and plants in the immediate environment*”, then go on to look at plants and animals from more diverse habitats, such as tropical rainforests.

Evolution and inheritance (Year 6)

- There are many opportunities to observe adaptations of plants and animals in the local environment, linking back to earlier work on the needs of plants and animals.
- Links can also be made to human influences on animals, for example the peppered moth evolving to have black wings for camouflage during the Industrial Revolution.

Earth and Space (Year 5)

- Global environmental issues can be linked to work on Earth and space. A great way of bringing this in is to use the book *Dinosaurs and all that Rubbish* by Michael Foreman.



Rocks (Year 3)

- Pupils are required to compare and group rocks according to their appearance and simple physical properties, describe simply how fossils are formed and understand that they provide a record of plants and animals that lived in the past, and look at how soils are formed from rocks and organic matter. It is suggested that *“linked with geography, pupils should explore different kinds of rocks and soils, including those in the local environment... observing rocks, including those used in buildings and gravestones”*.
- There are many opportunities for practical work, including testing the soil (type, acidity) and using this information to choose suitable plants (e.g. food crops, plants to attract particular wildlife) to grow in the school grounds; also making soil layer ‘cocktails’.
- Links can also be made to history, for example the use of certain rocks as Stone Age tools, and the history of mining (with its associated environmental impacts) in certain parts of Britain. Literacy links can also be made, e.g. using the book *What’s Under the Bed?* by Mick Manning and Brita Granstrom.

States of matter (Year 4) / Properties and changes of materials (Year 5)

- Work on solids, liquids and gases can lead to a basic understanding of environmental issues such as pollution and global warming.
- Learning about the properties of materials, how they can change and their uses can link to waste and recycling. Pupils can learn about the finite nature of many natural materials and the energy required to create new materials, which should lead to an increased awareness of why we should not over-use resources.

Light (Year 3 & Year 6) and sound (Year 4)

- Pupils can do outdoor work on light and shadows, which can lead to making choices for parts of the school grounds to plant certain species (i.e. shade lovers or sun lovers), which then links to work on plant adaptation.
- They could also make simple periscopes to help them look at birds or other wildlife without disturbing them.
- Using dataloggers to measure sound levels can lead to work on sound pollution and how it can be alleviated, for example planting a hedge to block out the noise of a busy road.

Forces (Year 3 & Year 5)

- Pupils can investigate forces in nature, for example how sycamore seed “helicopters” or dandelion “parachutes” reach the ground, or why water invertebrates are usually a very streamlined shape. This can also link to work on adaptations of plants and animals.

Electricity (Year 4 & Year 6)

- Pupils can learn about how much of our electricity is produced by burning fossil fuels, which are finite, and hence recognise the need for energy saving. They can also find out about renewable energy sources, linking solar power to their work on light and also photosynthesis from their studies of plant needs.

Environmental Education through Key Stage 2 Geography



The introduction to the geography programme of study for key stage 2 states that pupils should “*extend their knowledge and understanding beyond the local area*”, which should ideally link back to learning about their local environment in order to compare and contrast.

Locational awareness

- Pupils should locate our place in the world, as part of Europe, and relate this to the other continents, the Northern and Southern Hemisphere etc. This helps to link with local and global citizenship.
- They should learn about the human and physical aspects of the UK, look at how these have changed over time (through natural or human influences) and think about how they may change in the future (positively or negatively).

Place knowledge

- Pupils should study “*the human and physical geography of a region of the United Kingdom*”, which could be their local area or somewhere slightly further afield (ideally a contrasting locality, such as the countryside if they live in a city). They should also study a region in “*a European country and a region within North or South America*”, but this should ideally be linked back to comparisons with their own locality, for example recognizing that there are endangered species (e.g. hedgehogs) that need our help as much as those in the rainforests.
- Pupils could be involved in helping to plan educational visits, for example locating both their home and visit area on a map and identifying transport routes (maybe suggesting more sustainable transport choices).

Human and physical geography

- Work on climate zones and biomes can lead to learning about global issues like deforestation or climate change.
- Human geography links to the impacts humans have had — or may have in the future — on the local and global environment, for example settlement and land use, economic activity and the distribution of natural resources. Pupils can learn about the finite nature of many resources, the impact of mineral extraction and energy production, and the fact that not everyone in the world has access to clean water.

Geographical skills and fieldwork

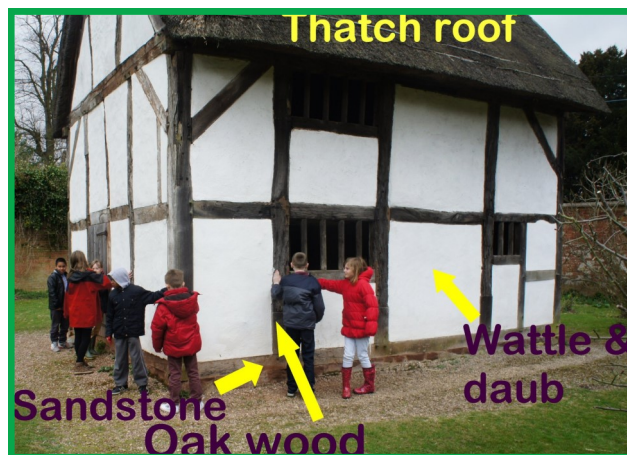
- Pupils should “*use fieldwork to observe, measure, record and present the human and physical features in the local area*”. School grounds work can be used to develop a range of fieldwork skills that can then be applied further afield.
- This can include looking at a range of maps, plans and graphs; and using compass directions, grid references and keys. Pupils could create their own maps or models to show what their local area might look like in the future, considering potential positive and negative human impacts.
- Regular local walks can be very beneficial in helping pupils (and staff) to get to know the area and inspire a sense of ownership, leading to sustainable communities.



Environmental Education through Key Stage 2 Design and Technology

Design, make and evaluate

- Pupils should be taught to “*use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose*”. There are many applications for this outdoors, such as habitat creation, constructing bird boxes, or bug ‘hotels’, and making useful items from waste (e.g. plastic bottle bird feeders, planters, watering cans, or even a fizzy drinks bottle greenhouse — search online for instructions).
- They are expected to “*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*”, so they could investigate the properties of natural and pre-used materials and choose which would be suitable for a particular purpose.
- They should evaluate their ideas and products against design criteria, by looking first at existing products, or even objects from nature, that can inspire their designs.



Cooking and nutrition

- Pupils in key stage 2 should be taught to “*understand and apply the principles of a healthy and varied diet*”, and “*understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed*”. Obviously both of these expectations link well with growing food crops in school.
- Food grown in school can be used to make healthy dishes, ideally involving parents/ carers, grandparents etc., for example growing crops and making recipes from different home cultures. As well as linking to science (parts of plants used for food, seasons, pollination by bees etc.), inspiring a love of tasty, home-grown fruit and vegetables can help inspire healthy, sustainable lifestyles.
- ‘Understanding where food comes from’ also links perfectly to visits to school farms and discussions about issues such as organic farming and free-range animals. Pupils have an opportunity to explore the range of products that come from animals, such as milk, eggs, meat and wool. An awareness of where these products really come from can lead to children growing up to make informed choices about what they will buy and eat.

Environmental Education through Key Stage 2 English



Spoken language

- Working outside in the local environment can provide a context for children to develop their communication skills, for example sharing ideas and information with their peers and adults, talking and working collaboratively to solve problems, learning and using new vocabulary.
- Even in key stage 2, role-play is a useful tool for debating and exploring local and global environmental issues.

Reading

- There are many information texts and stories that children can read which are about animals, plants, nature and looking after the environment. These can form the basis of a whole cross-curricular topic. For example, *The Animals of Farthing Wood* by Colin Dann is a perfect illustration of the impacts (both positive and negative) of human actions on wildlife and natural habitats, and can be used to stimulate debate.
- Pupils can read and follow instructions, for example on a seed packet or on the back of a construction kit for a bird box.

Writing

- The natural and built environments can provide exciting stimuli for pupils to write fiction, non-fiction or poetry. For example: a particular tree in the school grounds could inspire a diary entry about a day in its life, a poem about the changes over the seasons, an explanation text about the tree's life cycle etc.
- They can use new vocabulary in the context of an encyclopaedia entry, a glossary, labelled diagrams or instructions, ensuring that they think carefully about their intended audience and use appropriate language.

Environmental Education through Key Stage 2 Mathematics

Number (Years 3, 4, 5 & 6)

- Number work can be applied to problem solving in the school grounds, for example: "How many blades of grass would you tread on if you walked across the field?"
- There are many natural sequences and patterns that can be investigated, for example spirals of seeds in flower heads, counting petals, evidence of Fibonacci numbers.
- Leaves with several lobes or leaflets (e.g. horse chestnut leaves have 5 lobes, ash leaves can be found with 9 leaflets) can be used for multiplication or times table work. More able pupils could be given multiplication calculations with bracken fronds.
- Pupils could use sticks to make Roman numerals and include them in calculations.



Measurement (Years 3, 4, 5 & 6)

- Pupils can compare natural objects such as leaf lengths, tree heights, mass of pine cones etc. They can also use standard and non-standard units of measurement and equipment (e.g. find a stick the length of your cubit—the distance between your wrist and elbow) to measure and record lengths, heights, mass/weight, capacity/volume and time.
- Pupils could use sticks and pebbles with numerals painted on to make large clocks for practising time work, or make sundials (linked to science work on light and the Sun).
- Pupils can estimate lengths and widths, perhaps using sticks or other methods they have devised, and then measure them using appropriate equipment (e.g. tape measure, string, trundle wheel). This can then lead on to working out areas and perimeters (e.g. the school field, playground, local park, allotment area) and using this information to decide about fencing or how many plants will be needed.
- Lots of maths can be done related to trees, for example using a clinometer (or the alternative 'pencil method') to measure the heights of trees, or using a formula to work out its age based on its circumference (search online for how to do this).

Geometry (Years 3, 4, 5 & 6)

- Pupils can look for 2D and 3D shapes in the natural or built environment, then describe their properties, name the shapes and classify them. They could also make 2D and 3D shapes using twigs and other natural objects (e.g. vines to tie the twigs together).
- Pupils can go on an angle hunt around the school grounds or a local park, and then use twigs to make their own angles. They can also look for examples of parallel lines, perpendicular lines and symmetry in the natural and built environment.
- Pupils could give directions to a partner to reach a particular feature in the school grounds, using directional/positional vocabulary, including points of the compass. This can be extended to using maps with grid references.
- Coordinate grids can be created using sticks or chalk and then used to identify the position of particular items, e.g. a stone, a piece of litter.
- Pupils can draw diagrams on centimetre squared grids and then scale these up to make larger pictures outside using metre squared grids.

Statistics (Years 3, 4, 5 & 6)

- Pupils can collect data (e.g. different birds visiting the bird table) and use this to create tally charts (perhaps using sticks for the tally lines), human pictograms, block graphs (e.g. standing in height or age order), and Venn or Carroll diagrams using large P.E. hoops, skipping ropes or sticks. If possible, photograph these from above.

Algebra (Year 6)

- A simple introduction to algebra can be done outside, with different objects being used instead of letters to represent particular numbers (and sticks for +, x, = etc.).

Environmental Education through Other Subjects in Key Stage 2



History

- The key stage 2 history curriculum includes a local history study, so this might include studying the history of the school, going on a local walk, visiting a local churchyard to look at the names on the gravestones (e.g. is there a family name that occurs on many graves?) or inviting older local residents to talk to the children (e.g. about how the local environment has changed).
- When studying early civilisations (i.e. Britain between the Stone Age and the Iron Age), pupils can look at how people only took what they needed, for example when collecting plants or killing animals for food, and that they did not waste anything— a valuable lesson to remember in today's consumerist, 'throwaway' society.
- Studying the impacts on Britain's people and landscape of various invaders and settlers can lead to thinking about how we, and future generations, can affect the environment, for better or worse.

Physical Education

- Obviously a lot of PE is taught outside, but this could be linked to the environment by developing warm-up activities based on plants or animals (e.g. "Beetle Tig" or predator and prey chasing games).
- Adventurous activities like den building, orienteering and woodland obstacle courses can help develop skills such as teamwork and agility (e.g. making a log bridge to cross a stream). However, it is important to also protect and respect the wildlife of the areas where these activities are carried out.
- Pupils can also perform dances based on the movements of plants (e.g. a tree swaying in the breeze) or animals (e.g. crawl like a millipede, jump like a frog, fly like a butterfly).

Art and design

- The 'art' found in nature (leaf shapes, bark patterns, tree rings, flower structures, cloud formations etc.) can provide excellent stimuli for creative work. Natural objects can also be used as materials or media for art work (e.g. linking clay to work on soils in science).
- As previously mentioned, a great artist to study, in terms of the environment, is Andy Goldsworthy, who only uses natural objects (including using plant sap for glue and thorns instead of nails or pins) and leaves nature to 'reclaim' his artwork when he has finished. This can help to develop a 'leave only footprints, take only photographs' approach to working outdoors.

Music

- Pupils could use the 'music of nature', for example bird songs, to inspire their own compositions. They could also write 'protest songs' about environmental issues.
- Make links to design and technology by exploring the musical properties of natural and pre-used objects or materials and making musical instruments (e.g. rain sticks, wind chimes, drums, shakers).

Languages

- Pupils can learn the names of plants and animals in different languages (including scientific plant names in Latin) and also talk about features such as the weather.



Case Studies: Environmental Education in Key Stage 2

Gunter Primary School, Birmingham

Gunter Primary School is located in north-east Birmingham, in an area of high deprivation. For many of the children, their experience of other environments is largely limited to what we can provide through school visits and the work we do in our school grounds. A grant from the Hugh Kenrick Days fund enabled us to visit Hams Hall Environmental Education Centre³, where we chose the activities 'Lea Ford Cottage' (history / design technology) and 'Woodland and Freshwater Habitats' (science / geography).

Lea Ford Cottage (a late 16th Century timber framed cottage) was introduced by having the children consider how the building could have been made using materials from the local environment. This helped the children to begin to see the huge difference between a time when people had to mainly obtain and use their own supplies, in comparison to today's global market and distribution. Making wattle and daub back at school (sadly without the manure!) is a good follow-up. We have previously used clay from our grounds for making pots at school, which continues the idea of using local resources.



The session in the woodland was an eye-opener! When asked what kind of wildlife would be found in the local area, there were many reasonable suggestions, but a few children were convinced that eagles and even monkeys would be found in the woodland. Given the opportunity to get out and explore and collect, the children spent a very happy and educational afternoon in the woodland. What value can be placed on this enjoyable experience of actually getting into an environment they would not normally visit?

Back at school, we are fortunate to have been given a plot of land attached to the school. We are creating our own mini-woodland, garden and wildlife study areas, and the children will make wildlife identification keys and 'guidebooks' using their own photographs.

Malcolm Sanders *Deputy Headteacher*

³ Unfortunately, both Bell Heath and Hams Hall Environmental Education Centres were closed by Birmingham City Council in July 2014. However, all of the activities mentioned in the case studies could be carried out in the school grounds or a place in the local area, such as a woodland or park.



Lozells Primary School, Birmingham

Lozells Primary is situated in Aston, a very densely populated, built-up area of Birmingham. We visited Bell Heath Environmental Education Centre³ in order to extend three areas of our curriculum studies outdoors: science, literacy and numeracy.



The children enjoyed looking for invertebrates in the pond, stream and woodland habitats, and began to find out how different creatures are adapted to different habitats. The children also thought about how insects moved and behaved, especially when trying to avoid being found!

When we returned to school, the visit was linked with our gardening project. The children's observations of woodland minibeasts working away to turn the leaf litter into soil helped them to understand how this important function can be used to help us grow our own food, by helping us to make our own compost for the school allotment area. The children could see that even the smallest beings have an important job to do and need to be looked after.

The pupils gained a better understanding of why it is important to look after the environment, by protecting local habitats, and why we need to recycle. They used this new knowledge to create a play to share with the rest of the school, outlining the importance of looking after our environment.

Kate Gatherall *Year 3 teacher*

Bellfield Junior School, Birmingham

'Rocks and soils': a topic that doesn't always inspire children. The challenge was to make it more interesting for the children, to use the outdoor environment to support their learning and to get them to enjoy the topic. Due to the lack of green space in and around our school, we decided to visit Bell Heath Outdoor Education Centre as an immersion into this topic.

The children had the chance to explore the grounds, understanding the different types of soils: soils that allow water to pass through them quickly or slowly, where different soils can be found, which animals benefit from soils and so on. They particularly enjoyed the hand digging—they needed to feel the differences in the soil and there's no better way to do that than by getting dirty, feeling the soils in your hands and discussing and describing the textures (great literacy link!). The children completed simple tick-sheets to help them analyse and identify the different types of soil (e.g. Is the soil sticky? Can you roll it into a ball?).



The session ended in the classroom looking at different types of rock, including experiments to see how quickly a droplet of water dropped through each rock. The children had the chance to work out which rock was which from the clues given and the experiments that had taken place. Discussions followed about where you would find these rocks and why. Back at school, the children completed more experiments, based on what they had learned, recording these experiments using more technical language.

Outdoor learning is high on our agenda. Our grounds are not great, but there is a park down the road and we have begun purchasing more equipment to support a multitude of cross-curricular learning – getting children to enjoy learning and the environment are important and we want to develop these aspects more.

Nigel Attwood *Deputy Headteacher*



Case Study: A Whole School Approach to Environmental Education

Bretforton First School, Evesham



Bretforton First School, in Evesham, Worcestershire is a vibrant school comprising Foundation Stage to Year 5 pupils, which has successfully undertaken a whole school approach to being more sustainable. The school's motto is "Small enough to care, Strong enough to grow", and this links in well with the fact that it is an Eco-School with two Green Flag awards, which also hosts District Eco-Schools meetings and encourages other schools in its cluster. Bretforton challenged each class to undertake an Eco-Challenge tied in with the Creative Curriculum theme for each term. The classes received some resources, ideas and website links to help them.

The results have been nothing short of amazing, especially considering the ages of the



children and the fact that students were leading the projects with fairly limited teacher input. A range of projects have included designing and constructing a bug hotel; developing class raised flower or vegetable beds, including a focus on how gardening brings more wildlife to the school grounds; and taking one lesson a week, such as science or art, outside.

Eco Coordinators Mrs Jane Neal and Jo Ellis, teaching assistants at the school, reflected on the approach, which included working with Education Consultant Rupert Brakspear: *"This is the third year that we have set Eco-Challenges, and we are delighted in the way that we have been able to embed the nine Eco-Schools topics into the curriculum. All pupils are enthused when working on the challenges, and tackle the real life situations with a purpose."*



The children's responses speak volumes:

"I can't believe how many things people throw over the wall into our grounds, when they could put them in the recycling bin!" George, Year 5

"The challenges are fun and they inspire us to go outside and learn about Eco topics. I love growing my own veggies!" Charlotte, Year 5

Henricus Peters

Managing Editor, NAEF journal



Environmental Education and Spiritual, Moral, Social & Cultural Development (SMSC)

Spiritual

- Pupils can find out about religious festivals, ceremonies and stories that take place outdoors or involve plants/animals.
- Pupils can use natural objects to make decorations for celebrations or festivals. They could also create prayer flags related to the environment.
- Pupils can create their own 'sacred spaces' outdoors for quiet reflection etc.

Moral

- Help pupils to understand the need to treat plants, animals and each other with care and respect.
- Pupils will develop an awareness of local and global environmental issues and consider how they can adapt their lifestyles now and as future adult decision-makers, in order to live more sustainably.

Social

- Children enjoy learning about themselves, each other and the natural world.
- Develop social interaction by inviting family members to help with outdoor activities.

Cultural (including promoting British values)

- All maintained schools are expected to “*promote the fundamental British values of democracy, the rule of law, individual liberty, mutual respect and tolerance of those with different faiths and beliefs*”.
- **Democracy:** working together to make decisions, utilising individuals' strengths and not leaving anyone out.
- **The rule of law:** drawing up rules for how to behave outdoors (in the school grounds or further afield); agreeing boundaries (e.g. don't go past the tree with the bird box on it).
- **Individual liberty:** making informed choices; feeling safe and secure; being able to make mistakes and learn from them; enjoying freedom.
- **Mutual respect:** understanding that their behaviour has an effect on others; treating plants, animals and the natural world with respect.
- **Tolerance of those of different faiths and beliefs:** learning about the diversity of their local community; inviting parents/grandparents/carers to help with projects such as gardening or accompanying on educational visits; visiting local places of worship or cultural centres.





Useful Organisations & Websites

Natural environment (plants and animals)

Botanic Gardens Education Network (BGEN): bgen.org.uk

Buglife (The Invertebrate Conservation Trust): www.buglife.org.uk

Bumblebee Conservation Trust: bumblebeeconservation.org

Earthworm Society of Britain: www.earthwormsoc.org.uk

Plantlife: www.plantlife.org.uk

RSPB Early Birds: www.rspb.org.uk/youth/learn/earlyyears

RSPB Wildlife Explorers: www.rspb.org.uk/youth/learn

The Tree Council : www.treecouncil.org.uk

Wild About Gardens: www.wildaboutgardens.org

Wildlife Trackers: www.flyonthewall.uk.com/wildlifetrackers

Wildlife Watch: www.wildlifewatch.org.uk

Woodland Trust (kids): www.woodlandtrust.org.uk/learn/children-and-families
& Nature Detectives: www.naturedetectives.org.uk



Built environment

Engaging Places: www.engagingplaces.org.uk

Heritage Explorer (Images for Learning): www.heritageexplorer.org.uk

Outdoor learning / environmental education / sustainability

Eco-Schools: www.eco-schools.org.uk

Council for Learning Outside the Classroom: www.lotc.org.uk

I'm a teacher, get me OUTSIDE here! (loads of great ideas, including a superb section on outdoor maths): creativestarlearning.co.uk

Institute for Outdoor Learning (IOL): www.outdoor-learning.org

Love Outdoor Play: loveoutdoorplay.net

National Association for Environmental Education (NAEE) www.naee.org.uk

Sustainability and Environmental Education (SEEd): se-ed.co.uk

TIDE (Teachers in Development Education): www.tidec.org

Health and safety (for outdoor learning)

Learning About Safety by Experiencing Risk (LASER): www.lasersafety.org.uk

Royal Society for the Prevention of Accidents: www.rospa.com

Safer Strangers, Safer Buildings: www.childseyemedia.com/safer_strangers.html

Subject associations

Association for Science Education: www.ase.org.uk

Design and Technology Association: www.data.org.uk

Earth Science Teachers Association: www.esta-uk.net

Geography Association: www.geography.org.uk

Historical Association: www.history.org.uk

Mathematical Association: www.m-a.org.uk



Soil, gardening, food and farming

BBC Nature—10 plants to encourage wildlife to your garden: www.bbc.co.uk/nature/22433553

Community Composting Network: www.communitycompost.org

Farming and Countryside Education (FACE): www.face-online.org.uk

Federation of City Farms and Community Gardens: www.farmgarden.org.uk

Food For Life Partnership: www.foodforlife.org.uk

Garden Organic: www.gardenorganic.org.uk

Gardening with Children: www.gardeningwithchildren.co.uk

Grow Your Own Potatoes: gyop.potato.org.uk

Growing Schools: www.growingschools.org.uk

Potato Council – Love Potatoes: www.lovepotatoes.co.uk/kids

RHS Campaign for School Gardening: apps.rhs.org.uk/schoolgardening/default.aspx

The Soil Association: www.soilassociation.org

Soil Net: www.soil-net.com

Tesco Eat Happy Project—Farm to Fork: www.eathappyproject.com/farm-to-fork

Recycling

Make it and Mend It (recycling, gardening, craft): www.makeitandmendit.com

Scrapstores (scrap materials for creative play): www.childrensscrapstore.co.uk

WRAP Recycling: www.wrap.org.uk

School grounds development (ideas or practical help)

The Conservation Volunteers: www.tcv.org.uk

Groundwork: www.groundwork.org.uk

Learning Through Landscapes: www.ltl.org.uk

Spiritual, Moral, Social and Cultural Development (SMSC)

Black Environment Network (BEN) www.ben-network.org.uk

REEP (Religions, Environment & Education): www.reepinfo.org



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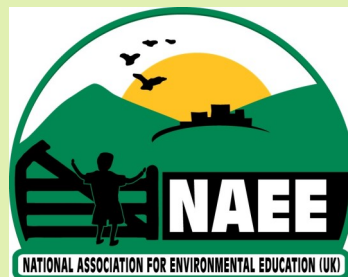
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