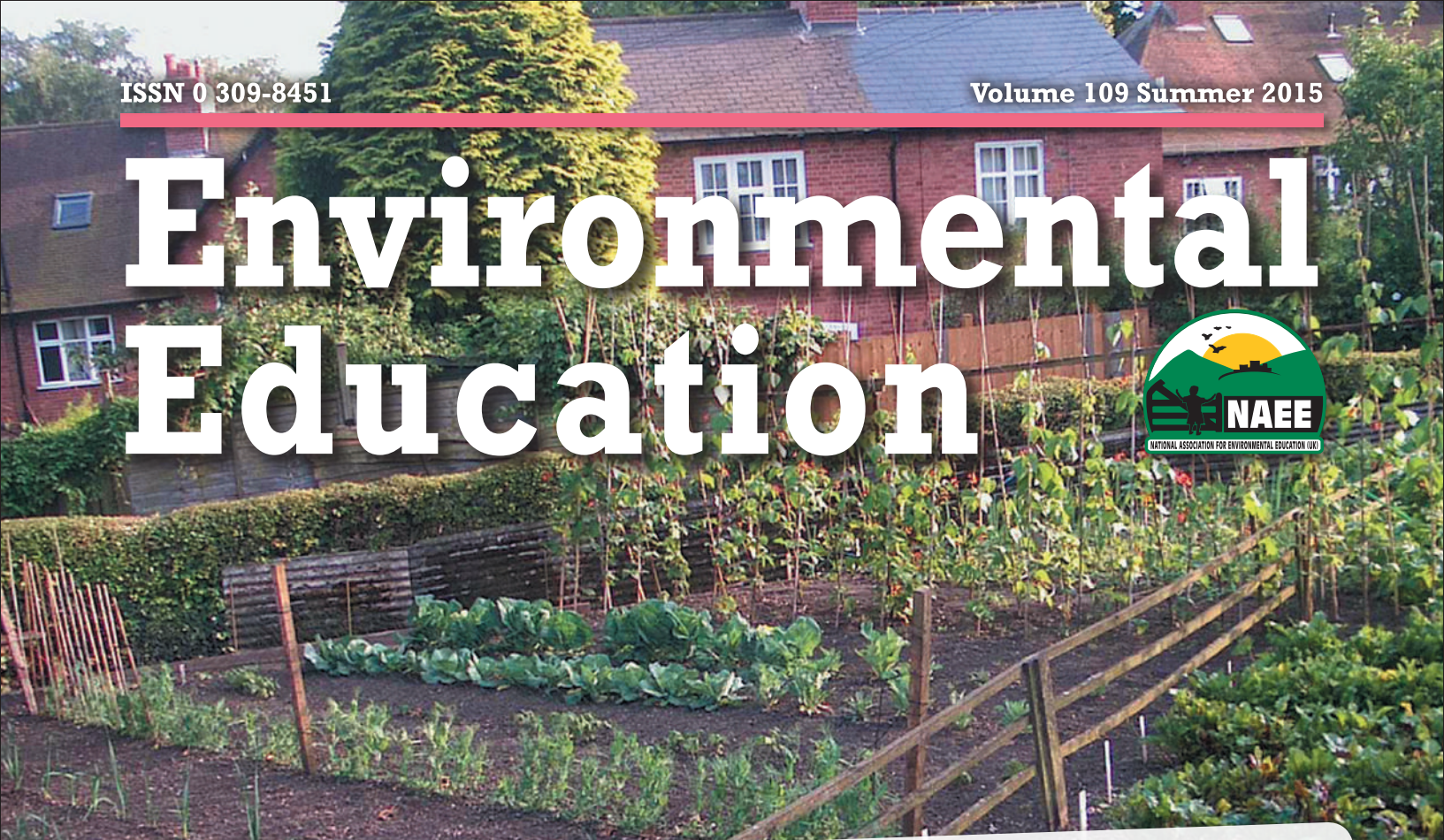


Environmental Education




Articles include:

- » 'Investigating Soils in the Primary Curriculum'
- » 'Solid as a Rock: what's beneath our feet'
- » 'Discover Superworm'
- » 'School Farmers' Markets'
- » 'Urban farming, Shanghai'
- » 'Oil versus Soil' Borneo




Looking for 'Superworm'

The Environmental Curriculum



Opportunities for Environmental Education across the National Curriculum for England

Early Years Foundation Stage & Primary



Charity number 013048

NAEE launches new Curriculum Guide for Environmental Education



Soil painting

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Front Cover: The Environmental Curriculum, NAEE's guide to environmental education in the new primary curriculum, by NAEE Executive member Juliette Green, see details on page 20. Front Cover pictures: Background photo: Moor Pool Allotment, Birmingham, see p. 22; 'Looking for Superworm' see page 8; The owl is an example of painting with soil of 3 contrasting colours. Photo ESTA. See page 6

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An organisation for anyone who has an involvement or interest in Environmental Education and Sustainable Development. An educational charity, for teachers of Environmental Education everywhere!

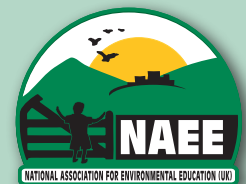
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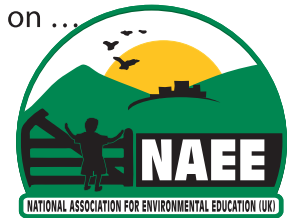
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Editorials

Sue Fenoughty, Summer Journal Editor

Although Environmental Education is no longer a cross curricular theme as it was 20 years ago, the relevance of its 7 topics continues to stretch across all subject areas of the national curriculum. As this year celebrates the UN International Year of Soils, the focus for this journal is on one of these topics: 'Soil, Rocks & Minerals.' Soil is literally a dirty word to many people, especially to house proud parents (see Anne Kenrick's comments on page 16). We tend to take soil, and what lies beneath our feet, for granted, but Tracy Atkinson, of the Earth Science Teachers' Association (ESTA), describes some exciting activities for primary pupils to investigate soil (page 6). More exciting activities, with links to the curriculum, are described by Juliette Green from the 'Rocks and Soils Day' she attended earlier this year (page 18). In fact, soil's links to the curriculum are quite pervasive, and Henricus Peters, managing editor, has sent the curriculum links below as his contribution to this Editorial. Soil's vital role in growing our food features in the farming-related articles on pages 9,11 and 24, and also in the

Kenrick Report (pages 16 &17) where 3 schools visit the Martineau Gardens in Birmingham to learn more about how plants grow. The sense of joy and wellbeing at being outside is captured in the article 'Still Scooting' (page 23) where young Lily can happily dig in the school's soil pit! Henricus Peters gives a first hand account of the threat to the soil and ecology of Borneo's rainforests on page 27; 'Oil versus Soil'. Fire can be another threat to soil and wildlife but in the UK's West Midlands, the Fire Service runs fire safety courses, for Forest School trainers, etc. to learn how to build fires safely, and with minimum impact on the environment. Now raise your gaze from the ground and look upwards! On page 28 is a report from our regular contributor from Pakistan, where he has been holding 'Astronomy Camps' for school students. Time to read on ... and remember, we'd love to hear from you and have your comments! Send emails to: info@naee.org.uk



Did you know?

Soil is the basis for food, feed, fuel and fibre production and for services to ecosystems and human well-being. It is the reservoir for at least a quarter of global biodiversity, and therefore requires the same attention as above-ground biodiversity. Soils play a key role in the supply of clean water and resilience to floods and droughts. The largest store of terrestrial carbon is in the soil so that its preservation may contribute to climate change adaptation and mitigation. The maintenance or enhancement of global soil resources is essential if humanity's need for food, water, and energy security is to be met.

Curriculum Links relating to Soil (see also NAEE's Guide to the New Primary Curriculum, details page 20)

Science

- KS 1&2 Science, Year 3: Pupils should be taught to: [plants] 'explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant'; [rocks] 'recognise that soils are made from rocks and organic matter'.
- KS 3 Biology - Nutrition & digestion: Pupils should be taught about 'plants making carbohydrates in their leaves by photosynthesis and gaining mineral nutrients and water from the soil via their roots'.
- KS4 Biology: links to the study of ecosystems; and KS4 Chemistry: links to the study of Earth and atmospheric science.

Design & Technology

- KS2: Understand seasonality, and know where and how a variety of ingredients are grown
- KS3: links to 'designing and making' processes, in the context of agriculture and/or horticulture.

Geography

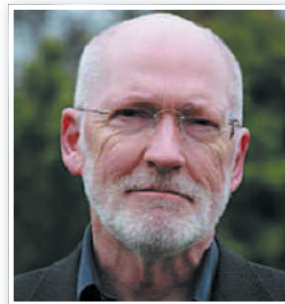
- KS1: Pupils should be taught to 'use basic geographical vocabulary to refer to: ...key physical features, including soil'.
- KS3: Pupils should be taught to 'understand, through the use of detailed place-based exemplars at a variety of scales, the key processes in physical geography relating to... weathering and soils'.

Henricus Peters, Managing Editor

The President's Column

The Sustainable Schools Framework - and those doorways

Professor William Scott



Much of the work of the Sustainable Schools Alliance [SSA] is focused around the Sustainable Schools Framework which was something the Blair government set up. It had 8 'doorways'. The framework was formally abandoned by the Coalition Government in 2010 – along with the rainbow motifs, but the SSA is keeping it alive, despite its being an inadequate way of framing sustainability in schools. Indeed, it has added a 9th doorway – Biodiversity and Nature – which was inexplicably omitted from the original 8.

The use of the doorway metaphor meant that the language of the sustainable schools framework was already familiar to school leaders because it mapped squarely onto many recent policy foci; for example, healthy eating / citizenship / well-being / transport / energy / and social inclusion. The government hoped that schools would see in the framework something of what they were already doing, and be encouraged to develop it further. And the evidence (anecdotal at least) seems to be that this strategy was effective in enabling schools to think about sustainability and learning, sometimes for the first time.

That's what good doorways do, of course: they allow you to enter, but that's all they do. Once you're inside, you don't usually then spend time looking back at the doorway. So why did so many schools seem to be doing just that: reifying these 8 areas and building work around them? This is not to argue that the doorway themes don't matter, they do, but if you get the point about sustainability then the doorways have done their job. This is not something that the department for education (DCSF as it then was) seemed fully to appreciate, given how much advice and guidance is couched in doorway terms.

For example:

"The Sustainable Schools strategy is made up of eight sustainability 'doorways'. Each plays a role in the curriculum and campus, but can also

have a big impact on the whole community. ... Each doorway may be approached individually, though schools will find that many of the doorways are actually interconnected."

Well, indeed they are. They all are connected, and are merely access points into the life of the school as a whole. They are convenient (and familiar) entrances onto the same space: the work and life of the school as a community and in its community. This is a space that is both physical and cultural – and increasingly global. NAEF's publication *Positive Action* recognises all this, and argues persuasively for environmental education's being seen as a 'green corridor' leading to the doorways where the point of teaching about sustainability, and managing the school in a sustainable manner, is to protect the environment for us all, now and in the future.

The huge risk, however, is that too great a focus on the doorway metaphor can encourage a fragmented approach, and the presentation of a series of seemingly unrelated ideas. Whilst it might encourage a coverage from a range of perspectives, this focus on doorways can militate against seeing connections, relationships, and consequences, and limit creativity. All these are plausibly highlighted as essential qualities in ESD in Chris Gayford's 3-year study of 15 schools for DCSF and WWF.

And once you've entered this space, and want to develop practice and understanding, you need the sort of help that the doorways (mere entrances, after all) simply cannot provide: you need a way of thinking about sustainability in relation to education, schools, learning, and young people's lives, which means you need a way of thinking about sustainability itself; that is, you need a conceptual framework that is fit for purpose, which does not yet exist. The addition of an overdue 9th doorway cannot change any of this.

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An International Internship: Environmental Education in Birmingham & Belgium

Charline Mosseray, *student,*
Haute Ecole de la Province de Namur, Belgium

I'm a Belgian student in my final year studying a Bachelor's degree in Sustainable Development Advising. Between March and May 2015, I undertook a joint internship with NAEF and TIDE~global learning (Teachers in Development Education).

After searching on the internet, I chose NAEF for my internship as I am really concerned about the environment and sustainable development, and was interested in observing environmental and sustainable management in other countries, and looking at how this is transmitted to future generations. I was curious to see what I could learn that was new, as my main experience about sustainable development at school so far has been from an economic point of view.

My experiences in Birmingham have helped me to realise a comparison between Belgium and the UK, in particular comparing the cities of Birmingham and Brussels (which both have a population of around 1.1 million). If I consider waste sorting as an example, it is something that is in people's everyday habits in Brussels and all over Belgium, but a bit less for the people of Birmingham. This is possibly because the policies are quite poor, especially compared to other parts of the UK that I researched. However, many Belgians totally don't care about the environment and can be quite disrespectful. Things do seem to be progressing in both countries, though, and I'm pleased to see organisations like NAEF and TIDE acting to encourage people to change their habits and vision of the environment.

Thinking about my experiences of environmental education in the West Midlands, I think that teachers really want to give children the opportunity to understand their environment. The activities I had the chance to assist with were quite interesting for me to figure out how we can pass on the messages of environmental responsibility and sustainability with simpler words to young people. I can see how the association is trying to help children to have a better understanding of nature, even though environmental education and sustainable development are not statutory themes of the English curriculum. The next step should probably be to go further and, as soon as children understand their environment, teach them how they can be involved in its conservation.



*Charline gets to know Kaa, the sand boa,
at Birmingham Botanical Gardens*

In Belgium, as in England, environmental education is not something properly implemented in the curriculum until now. The good thing is, Belgium is now working on the creation of a course about citizenship, and sustainable development will be a part of it. What I find very interesting in that initiative is: there are so many ways to teach sustainable development and I think that one of the best ways is sensitisation and the change of daily habits.

This internship really made me think more and more about my future in environmental education. Everything I learnt and saw gave me ideas about what I could do myself. To be a sustainable development educator interests me; I would like to sensitise and communicate, not only about the environment but also about the economic and social aspects of sustainability.

What I will remember from my stay in Birmingham is the experience of working with teachers and children, of speaking English and living in Birmingham with all the lovely people I've met here. I could definitely live here and work on a project to improve sustainable development in this city. I will definitely come back to England, and I hope things are going faster about the conservation of our environment in mentalities and policies because this is what each of us have to do for tomorrow.

Investigating Soils in the Primary Classroom

Tracy Atkinson, *Earth Science Teachers' Association (ESTA), Primary Team*

Soil can be fun and fascinating to investigate, especially as there are several activities for pupils to do in order to find out about the numerous types of soil found across the country. Pupils can discover the immense importance of soil, the properties of different soils and that soil really is not boring brown stuff. The following looks at some basic investigations which are ideal as an introduction to examining soils followed with ideas for using soil as an exciting medium to produce an impressive cross-curricular display.

Finding and Using Soil Samples

Sourcing good and contrasting samples of suitable soil can be difficult in some locations, especially in urban areas, but it can be done. Empty litre ice-cream tubs are ideal for collection and storage: aim to have one tub full per group of pupils. If these samples can be collected from different sites, or areas of the country, lessons will be more interesting and the results more varied as each group can investigate a different type of soil. When travelling around, observe the colours of the soils in the fields; many farmers are happy to let you collect one tub full before crops are planted. Soil samples can be kept and used again in subsequent years, so planning and collecting well ahead is a good idea and you will be gaining a useful resource. Recording the source of any samples is recommended.

Health and safety can be an issue but as long as adequate instructions are given about sensible handling and thorough hand-washing after contact there should be no problems, after all it is no different from a gardening session. Soils can be sterilised by heating, to make them safer to use, but this is generally not necessary if precautions are followed. It is also valuable for pupils to be able to look closely at a fresh soil sample before starting the more in depth activities.

Equipment for each group:

- Soil samples (one fresh (damp) and one dry per group);
- Paper/plastic plates (white)
- Plastic spoon/lolly stick (optional)
- Magnifiers
- Colander and kitchen sieve (one set per group)
- Paper and pencils

Use the class camera to help record and compare results.

Initial Observations

Working in groups, pupils should look closely at a small sample of fresh, damp soil spread on a paper plate. Magnifiers and spoons/lolly sticks may help with this. Pupils record what they can see and feel. Soil is made of five different components: rock fragments, organic matter (e.g. dead and decaying plant material), living organisms (e.g. worms or centipedes), water and air (in the pore spaces between soil particles). It is worth making sure that there is at least one mini-beast in each sample as they tend to cause some excitement.

Following their initial examination of the soils, pupils should try rolling small amounts of soil into balls or sausage shapes to find out if the soil particles will stick together. Not only do they enjoy doing this but it will indicate the type of soil being tested. The results should be recorded and any similarities and differences between the samples compared. In addition to this activity, other observed variations may include colour, smell and texture (e.g. sticky or gritty).



Examples of the three types of soil separated by sieving which also show contrasting colours: dark brown, pale/chalky and red.

The three main types of soil:

- » Clay clings together and easily forms ball or sausage shapes without breaking. Clay soils are made of minute particles with only tiny pore spaces between them. They absorb and retain water, often becoming waterlogged.
- » Loams form balls but tend to break up. Loamy soils are made up of a mixture of particle sizes with medium pore spaces. Loams hold some water and allow water to pass through.

» Sands do not stick together or form balls. Sandy soils have generally larger particles and pore spaces, allowing water to pass through easily. They tend to be well-draining, drier soils.

Most soils will not be purely one type but will be between two types, such as a sandy loam.

Separating Soil Samples

The proportions of the soil components can be found by separating the samples. This is often done by adding water to a sample in a tall, transparent and sealed container. After shaking the muddy solution the sample should be left to settle so that the different layers can be seen. Larger fragments will settle at the bottom with layers above becoming finer. Organic matter will float. Whilst this method has its uses, it is impossible for pupils to investigate the different layers more closely than looking through the container. The thickness of the layers can be measured with a ruler from the outside and compared with any other samples if similar quantities have been used.

A fun, hands-on approach: Separating by Sieving

Each group will need the same amount of a dry soil sample (about a paper cup full), 3 paper plates, a colander and a sieve. The colander is placed over one plate and the dry soil sample shaken through it. Anything left in the colander is tipped out onto another plate. The soil that has passed through the colander should then be sieved through the kitchen sieve onto another plate. Any soil left in the sieve is tipped onto the remaining empty plate. This results in three grades of soil, from coarse to fine, being separated out and available for further investigation, weighing or later use.

» Pupils can compare the different grades and textures of the sieved samples. How do they feel? Gritty, smooth, powdery etc. If a variety of samples have been sourced and sieved, there may be a difference in the proportions of coarse or fine particles between the samples of each group. There may also be differences in the colours and textures of the samples, so give each group the opportunity to look at the other groups' separated samples and discuss their results. The finest of the samples is worth keeping for a fun painting activity.

Round up your soil Investigations with some fun painting with soil

Soils vary in colour depending upon the mineral

content of the underlying rock, the amount of organic matter present and changes in water content. They have provided a ready medium for our ancestors to use for painting. Soil painting offers pupils a creative and fascinating opportunity to discover the various colours, properties and textures of soils. When using soil as a pigment for painting you can also include aspects of art, history and science. For soil painting, clay soils seem to be the best because of the small particle size, but most finely sieved soils work well too. Colours can vary from pale cream through yellows, reds and browns. Soil for painting can be prepared well in advance but if soil samples have been found for other investigations, then the finest sieved samples would work very well, as only relatively small quantities are needed. Using a paint tray, mix several colours/shades of soil into a paste with a small quantity of water. Excellent pictures can be produced with only three colours on white paper, so do try it even if there is only a small selection to use. The soil paints not only provide colour but also texture to the pupils' pictures. The other separated samples can also be used to make collages. Draw a pattern or motif onto a piece of paper then using PVA glue, stick different grades and colours of the dry samples onto each part of the pattern in turn to create a collage showing the various types of soils investigated in class. This could be done in a kind of table so that the samples can be compared in a more measurable way. Collages can be enhanced by also using sands, leaves, small stones or twigs combined in abstract or representational pictures and work well as part of Autumn displays. The paintings and collages are certainly an ideal way to add interest to your soil work display. (*see owl painting on front cover of journal*)

There's more to do

The ESTA Primary Team have developed several activities and investigations which can help pupils understand the varied properties of soils, their importance to farming and growth of crops and their influence on flooding or drainage. Although there is not enough space to outline all the other activities here, some of them are listed below and can be done with simple, 'kitchen-sink' equipment. More information can be obtained from the ESTA Primary Team and/or their Working with Soil pack. I have done all these activities in the class room and the children really enjoy them. If you are interested in any of the other activities or want to purchase a Working with Soil pack (£6 plus p&p) please contact the ESTA Team on estaprimary@hotmail.co.uk

Discover *Superworm* in your local forest!

Rachel Giles, Forestry Commission England National Learning Manager

A visit to the forest provides endless opportunities – it opens eyes and minds to a whole new way of learning and offers freedom for children to develop outside of the constraints of the classroom.

During a visit to a forest, children who struggle to sit still will enjoy the freedom of moving around and burning excess energy. Those who don't particularly enjoy reading and writing may develop richer language by engaging in conversation about what they see and feel.

Our rangers have seen, at first hand, numerous situations where teachers have been astonished at what particular pupils can achieve. For example, less academically able youngsters can find themselves excelling at all things practical out in the woods.

This is why we believe firmly in developing our learning offer 'to enable everyone, everywhere to connect with the nation's trees and forests'¹ by developing new learning activities and resources for schools and groups. Part of this offer, and brand new this summer, is the *Superworm* trail available at 20 forests across England, created to provide plenty of learning and fun for children and their teachers.

Superworm, written by ex-Children's Laureate Julia Donaldson and illustrated by Axel Scheffler, tells the story of a superhero worm, who rescues baby toads from busy roads and beetles from wells, but then finds himself in trouble when he is caught by the evil Wizard Lizard. Luckily, his friends devise a cunning plan to rescue him and all ends well. (see Book Review, page 29)

The continuing partnership between Forestry Commission England and

Julia Donaldson and Axel Scheffler's bestselling children's books builds on the success of *The Gruffalo* and *The Gruffalo's Child* activities. Over one million visitors followed Forestry Commission England's Gruffalo trails in the summer of 2014.

We have developed the *Superworm* trail because of the huge potential for linking the characters and themes of the story with our wonderful forests, and for providing fun and educational activities for children of quite a broad age range.

We have designed the trail to appeal to family visitors and hope that teachers and early years practitioners will also see the value, with plenty of opportunities to link with the early years foundation stage (EYFS) framework and primary curriculum. Each activity trail includes up to 10 panels (distances will vary between 800 and 1,500 metres). Each panel has 3



Examining leaf litter for minibeasts

activities on it. The first on each is a simple activity designed to appeal to very young children, for example spotting shapes on Wizard Lizard's hat, pretending to be a superhero and looking for spider webs. The second activity on each panel is slightly more in-depth and aims to appeal to older children. Tasks involve looking for worms and minibeasts and thinking about uses of wood and other materials.

The third activity is more open-ended and is explained in an accompanying trail leaflet. Adults can choose which activities to do with their group and explain them at an appropriate level. These activities include lists of things to find, such as clues left behind by forest animals and different sorts of trees.

In partnership with the Youth Sport Trust, we have also ensured that the *Superworm* trail has plenty of opportunities for development of physical literacy². Through the activities, children are encouraged to stretch, skip, balance and jump; skills which lay the foundations for learning sports later on.

We are sure that teachers of early years and key stage 1 will see many opportunities, in addition to PE and physical development, to link their *Superworm* visit to the curriculum – for example understanding the world (EYFS), identifying, naming and describing materials (science Year 1) and beginning to understand simple food chains and habitats (science Year 2).

But of course, *Superworm* is just one of a variety of learning opportunities provided by the Forestry Commission on the Public Forest Estate in England. We strive to produce high quality, varied activities for learners of all ages, including downloadable lesson plans, seasonal learning trails, ranger-led introductory talks and bags of resources for school groups to hire on site.

To find out more about learning opportunities in your local forest, please sign up to receive a termly newsletter at www.forestry.gov.uk/england-learning.

1 Taken from the Forestry Commission England National Learning Strategy – our vision is “to enable everyone, everywhere, to connect with the nation’s trees and forests so that they understand their importance and the role of the Forestry Commission in their management, and act positively to safeguard forests for the future.”

2 Physical literacy is the outcome of high quality PE and school sport, It helps primary school children’s development as competent, confident and healthy movers at an early stage. It builds their motivation, confidence, physical competence and understanding of movement, providing them with better grounds to sustain their lifelong participation in physical activity.

Soil Association support for School Farmers’ Markets

Rupert Aker, *Head of Learning at the Soil Association.*

A key element of the Soil Association’s work is to enable children to discover where their food comes from and how it is grown. We seek to equip young people with the knowledge to make informed choices about food and healthy lifestyles, together with the skills to grow and cook their own food. Through our *Food for Life Partnership* project, we work with farmers and growers to engage pupils with where their food comes from and how it is grown. We develop these themes through real-life learning experiences – visiting farms and encouraging farmers to visit the schools involved. This allows children to learn social and enterprise skills that will also stand them in good stead for the future.

School Farmers’ Market origins

School farmers’ markets pull together the growing

opportunities for local producers and social interaction and shopping opportunities for the community. The School Farmers’ market project was developed in partnership with the Mid Wales Food Land Trust who developed the original concept in Powys. We worked with them to replicate the project more widely in England and Wales and have now successfully delivered School Farmers’ Markets in over 150 schools in areas as diverse as the inner-city London borough of Hackney, to the Shropshire hills and the redundant coal mining communities of County Durham.

School Market Training

As well as growing and cooking, the project trains the schools in how to run a market, providing links to the curriculum with an 8-week programme of activities. Pupils learn about business planning by



*Pupils from Ashton Vale Primary School, Bristol, select produce for their School Farmers' Market.
Photo Terry Rook*

taking a leading role in preparations for the market which includes advertising and inviting local food producers. Pupils also run the actual Market day when they take on different roles, from market manager, to questionnaire evaluator. The schools make some income from the markets that helps towards future growing and cooking activities.

Market Day

The markets are usually run at around 3pm when parents come to pick up their children, providing a captured audience and pester-power from the pupils who have been working on the project. The markets tend to run for around 1.5 to 2 hours, providing a condensed but often frenetic trading opportunity. The school usually has its own pupils' stall and a café selling teas, coffee and cake. The number of producers varies according to school size and community engagement, but most range from 5-6 to over twenty! Most schools will run a market on a termly or twice-yearly timescale, but where we work with a number of schools in an area, this can provide regular opportunities for local producers and customers.

Benefits of School Farmers' Markets

There are three key audiences that school farmers' markets can benefit:

(i) Local producers

Small producers and food enterprises can find it difficult to find new markets for their produce, especially when some of the town centre markets have a waiting list for stallholders, so markets in schools can provide a useful opportunity for start-ups and occasional traders (for example a retired couple growing bio-dynamically in Shropshire really valued the opportunity to take their fruit and vegetables to many of the 36 schools we worked with to supplement their pension). The school

markets also provide a 'shop window' to reach a new local audience who may not normally go to farm shops or farmers' markets. For some producers it has provided an opportunity to trial new added-value products, for example a farmer's daughter in the Peak District started selling a range of Scotch eggs that sold out so quickly it gave her the confidence to develop the business on a larger scale. Most schools charge just £5 for a stall, so it is not a huge outlay for the producers involved. Baked products tend to be the most popular, as is produce that can be taken home for the children's dinner (sausages and burgers sell better than large roasting joints). Our evaluation in the Peak District showed that 96% of the producers said they would sell at a school farmers' market again and said it was better than other sales routes (internet) as they were able to meet their customers and enjoyed working with the children.

(ii) Local community

Schools are often the only community focus in villages where other services including shops and post offices have disappeared and many of the markets have received positive feedback from elderly residents and others outside of the school community who have appreciated the opportunity to shop and socialise in their village. Some schools have built on the markets to offer a community café or lunches for the elderly as a further extension of the project. Schools increasingly have a community cohesion agenda that aims to link them more fully with people and businesses in the locality, so this project is an ideal way for them to help achieve this.

(iii) Schools and pupils

Children, even in rural areas, are often disconnected from where their food comes from and how it is produced. This project enables them to learn more about farming and food, and engage them in enterprise projects that will develop key skills, attitudes and knowledge - potentially inspiring them to find careers in this sector. Additionally, schools are being required to deliver more real-world learning, enterprise skills and opportunities to learn outside the classroom and this project helps address this need. The schools often report that running the markets helps deliver the curriculum in an inspiring and engaging way. Anecdotal evidence from teachers, parents and the children themselves points to significant outcomes for the children involved. For example growing and cooking skills and subsequent improvements in health and nutrition; new experiential learning opportunities for children, who do not always thrive in the classroom; and improved attainment,

communication skills, teamwork and self-confidence. The schools can also raise money from stall fees, café sales and from produce on the school stall – often between £250 and £500 per market. If they hold two or three a year, this can be a significant amount to reinvest in growing areas in the school grounds, cooking equipment or a farm visit. Clun Primary school in Shropshire raised a few hundred pounds from the first market that was spent on raised beds and strawberry plants for the summer market. These cream teas then raised additional funds which the children wanted to spend on pigs,

but a compromise was reached with the purchase of a flock of chickens.

Training Package

We have developed a training package and curriculum-linked resource to enable schools to run markets throughout the country, and we hope that farmers and growers may themselves group together to set up farmers' markets in schools and perhaps also new settings such as universities, workplaces and hospitals. We are happy to talk to anyone who is interested in exploring these opportunities.



For more information see *Food for Life Partnership*: www.foodforlife.org.uk

Whirlow Hall Farm Trust

A farm providing diverse experiences for visiting schoolchildren from nearby Sheffield

Norman Farmer,
*NAEE Executive,
Sheffield and Trustee of
Whirlow Hall Farm Trust*

A vineyard flourishes at this South Yorkshire farm

Whirlow Hall Farm Trust has been linking children and young people with farming and the countryside since the early 1970s. It is a 138 acre (56 hectares) farm rented from Sheffield City Council and run by a charitable trust serving the community of Sheffield and the wider area of Yorkshire and North East Derbyshire. It is supported by donations, and social enterprise trading and services. The farm rises from about 600 feet to over 900 feet (180 -270 metres) above sea level and is a mixture of sheep, cattle, pigs, poultry, and various horticultural crops. Soils are on the heavy side with plenty of clay but with careful management they can be productive as grass and horticulture crops flourish in a challenging climate. Perhaps a most surprising success is the vineyard on a south westerly facing slope which last year produced 1,100 bottles of very drinkable wine. An orchard of nearly one hundred trees has been planted and is awaiting the first crop of apples to sell in the farm shop.



Education about farming & the countryside

A variety of children, students and adults of all ages are to be found on the farm each working day and often at weekends. Visitors can be class groups of young and very young children, students on placement, groups and individuals with special educational needs, or some of the 80 or so volunteers who contribute their skills to the running and maintenance of Whirlow Farm. Education about farming and the countryside was, and is the main raison d'être for the existence of the charity but over the years the social and

personal development of its clientele is widely recognised as another of its major successes. Indeed on busy days with so many disparate groups on the farm it is a credit to staff and volunteers that all our students work happily alongside each other. Access to the farm is relatively easy being to the southwest of the city centre and on the edge of the Peak District and just within the Sheffield City boundary.

Day and Residential School

Children of nursery and primary school age either visit the farm for a day or are residential in the farm house and the converted barn. Often half a class will stay for the first part of the week and the rest of the class towards the end of the week, all cared for by their own school staff who agreed an educational programme before their visit. Those in residence, in particular, often do farm jobs as part of their stay: frequently as simple as collecting eggs or feeding and grooming some of our animals. While for many day visitors the farm tour can be a major part of the day with a wide range of other activities on offer either on the day or when the class returns for a



Older pupils with their potato crop, the result of Whirlow's 'Growing Schools' project

second visit. These can range from animal care to pond dipping, to following the adventures of the 'Little Red Hen' or, possibly, 'The Gruffalo'.

'Programmes for older pupils

Older pupils and students follow programmes agreed with their schools, colleges or carers and usually with no residential element. Often they are studying for some basic qualification with the farm educational staff providing most of the input. Much of this work is made as practical as possible according to the group or individual requirements. When I was at the farm the other day a group had gone to the wood and collected fallen branches, sawn them into logs, fired the pizza oven and made their own pizzas for lunch. Another regular group are pupils excluded from their secondary schools whose attendance on their days at the farm is often markedly better than when back in their classroom. Some older students on work placements have stayed on to become members of the farm staff. One member of staff who started on placement is now leaving after 9 years on the farm.

Fundraising

Both the farm enterprise and the educational endeavour require substantial financial support. Staff and volunteers, along with Whirlow Farm Board as trustees, have to devote considerable time and energy in raising funds to ensure the continuing success of the farm in meeting the aspirations of young people and the wider community.



For further information, please contact Whirlow Hall Farm, Whirlow Lane, Sheffield, S11 9QF
www.whirlowhallfarm.org Phone: 0114 235678

Making London a National Park City

Alona Sheridan, NAEF London representative.

The population of London is growing rapidly and could reach 13 million within 35 years; it will be a challenge to address the city's future needs while protecting and enhancing the natural environment in ways which can benefit the whole of Greater London. As environmental educators we should consider the impact of an expanding capital city on our students and on the wildlife that shares these spaces.

The campaign for a Greater London National Park began in April 2014. A rather ambitious idea, it raised many questions in my mind. While supportive in principle, I could see no way that this concept could become a reality although I know that Greater London has many green spaces. To put the vision in perspective, 47% of London (within the M25) is green space, including gardens, parks, grass areas on estates, the rivers that run through London and Greater London's rural areas. London's ecology is very diverse and includes endangered wildlife among its flora and fauna.

We think of National Parks as mainly rural, with towns and villages surrounded by farmland and open countryside. National Parks are there to protect the natural beauty of open spaces and to encourage people to understand and enjoy those spaces. A National Park city could not entirely replicate this. Planning regulations in London would be different and the infrastructure would have to be suited to the needs of a populous city.



Mayow Park in Sydenham, London SE26

Daniel Raven-Ellison, the founder of the National Park City campaign, believes key principles of National Parks could apply to London. A former geography teacher, he walked from Croydon in the south of London to High Barnet in the north over a period of days in the summer half term last year, choosing green routes through woodland, where he saw many animals but a lack of child visitors. His vision for an urban national park would include children playing in the woods in all 33 boroughs of London:

"A Greater London National Park dares us to dream of an alternative future. It takes our common notion of what a national park is for, and disrupts it by inviting us to rethink what it means in relation to living in the city. For businesses, planners, politicians, teachers, gardeners, parents and children, it is an opportunity to develop a shared identity that challenges us to see the city differently and contribute however we are able to." Daniel Raven-Ellison *http://www.projectdirt.com/cluster/greaterlondonnationalpark/#!/journal_entry/33536

*Friends of Mayor Park get down to gardening jobs
Photo Friends of Mayow Park*

Within one year of the start of this initiative, around 100 organisations have signed up in support including large companies, universities, charities and community groups, as well as politicians of all shades.

The people heading this campaign with Daniel identified six key areas that we, as environmental educators, would support:

- » Children
- » Health
- » Wealth
- » Recreation
- » Environment
- » Nature

Louv, R. (2005) *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, Algonquin Books, Chapel Hill.

In 2012 the National Trust published a report 'Natural Childhood' by Stephen Moss. <http://www.nationaltrust.org.uk/document-1355766991839/>

The author states in his Executive Summary:

'This report presents compelling evidence that we as a nation, and especially our children, are exhibiting the symptoms of a modern phenomenon known as 'Nature Deficit Disorder'. We look at what this disorder is costing us, why it's proving so difficult to reverse, and gather current thinking on what we must do to eliminate it, before opening up the question to the nation for consideration.'

Children should be able to get out of doors to explore, to get their hands dirty, learn to care about the natural world around them and rest from the virtual world of electronic media.

Richard Louv coined the phrase 'Nature Deficit Disorder' in his book, *'Last Child in the Woods: Saving our Children from Nature Deficit Disorder'* describes the human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses'.

London Environmental Educators' Forum (LEEF) training events, 2015

Alona Sheridan, NAEF London representative

London's environmental educators have varied and interesting training opportunities through LEEF (London Environmental Educators' Forum) thanks to co-ordinator Anna Portch. Features of LEEF events include friendly participants, willingness to share ideas and bringing food to share for lunch or break. LEEF events focus on practical environmental learning.

Environmental Education in the new curriculum

In February, LEEFers descended on the Queen Elizabeth Olympic Park and Lee Valley VeloPark in Stratford, east London, for a training day on environmental education opportunities in the new curriculum.

The magnificent VeloPark, its roof curved like a giant 'Pringle', was our base for the day. The session opened with an overview of changes in the new curriculum, particularly in science, with greater focus on practical, hands-on science in Key stages 1 and 2, greater emphasis on outdoor learning and the environment, using relevant scientific



LEEFers look across the VeloPark

language and links with DT. We also learned about the London curriculum with its own teaching units supporting aspects of the KS3 curriculum <https://www.london.gov.uk/priorities/schools-and-education/the-london-curriculum>.

In groups we looked more closely at five of the KS2 programmes of study (PoS): English; Mathematics; science; Geography; Computing, design and technology. We planned activities for these PoS. Plenty of creative ideas were generated and shared.

A tour of the VeloPark building followed, highlighting its architecture; an educational resource in itself.

Training Evening at Hackney City Farm

Not everyone can attend daytime training. Previously LEEF evening get-togethers have been social or book events. Anna Portch arranged the first ever evening training in the straw bale classroom at Hackney City Farm, east London. The unusual title for the session was:

"Funny things that children say about animals and plants: how might we help them? What children think about plants and animals and how we, as educators, can help to correct some of their misconceptions".

The session was led by Dr Melissa Glackin, lecturer in science education at Kings College London, including teacher in-service training and PGCE secondary outdoor learning.

Melissa encouraged us to recall and share children's ideas about animals and plants. We should ask ourselves how children arrive at these ideas and how to support them to correct their misconceptions. We shared some misconceptions, including:



Potatoes grow on trees.

Potatoes are round and look like other things that grow on trees.

Worms are snakes.

Is that a real cow? It seems very big.

(this comment was from a child who had only ever seen cows in fields from the

passenger seat of a car driving past fields).



Since that session I have heard further examples from NAEF executive members:

Overheard at the Birmingham Botanical Gardens where children were looking at Swiss Cheese Plants:

"I never knew cheese came from these plants" said one. *"Don't be silly, cheese comes from pigs"* was another child's reply.

Slugs are just snails that have lost their shells.

NAEF would love to hear from you with other examples of children's misconceptions.

When children express these beliefs we should listen, elicit what they know by asking them to explain their thinking, encourage discussion and then help towards reconstructing their thinking. Their ideas come from their experiences and interpretation of their world. To change their views they need time to reflect on their thinking and any new understanding. Challenge their thinking if need be: when a child says that water or sunlight helps trees get bigger, we should ask 'How does it help?'

Both training sessions were valuable, an opportunity to think about activities for children, how they understand their world and to share resources and experiences with other environmental educators.



Is that a real cow?

To find out more about LEEF, go to www.leef.org.uk

NAEE 'Kenrick Days' Report (1)

'Mother Earth' - comment from Anne Kenrick, horticulturist, former RHS Chelsea Flower Show judge. NAEE Vice President.

Many of us do not know or realise what we are standing on! It may be a pavement, the ground floor of a building or a field, but are we aware of the enormity and richness that lies beneath us? For children, going outside the classroom to find out provides them with marvellous excitement, curiosity and fun! You have only to see their excitement when they are searching for bugs under stones or fishing for tiddlers, but there's disbelief when they learn that their lives depend largely on the earth – or "dirt" as they call it. They know there'll be trouble if they go back into the house (or classroom) covered in mud! It is a great surprise, too, when they discover that there are different types of soil, that some make bricks or china, and deeper down, there are minerals from the rocks -

they might even strike gold! I always recall the day when I was digging up potatoes in my garden being closely watched by some young Scouts (Beavers) all from an inner-city area. The boys shouted in triumph as they collected up the spuds and learned to their utter astonishment that potatoes made chips, for their favourite dish, fish and chips!

It is vitally important that we pass on to the next generations the responsibility to preserve and protect our environment and use the earth's valuable resources in a sustainable manner. Mother Earth's richest gift of all, however, is nutrient-rich soil, needed to make plants grow and upon which all our lives depend.



'Kenrick Days' Report (2):

Report of city school visits to outdoor learning centres in and around Birmingham

NAEE has just completed its third year of awarding bursaries to city schools, funded by the Kenrick Trust. Known as 'Kenrick Days', the bursaries are helping many Birmingham schools to fulfil Anne Kenrick's wish to see today's generation getting outdoors, and learning about their environment, including growing and caring for plants. The bursaries go towards the cost of taking city pupils to outdoor learning centres in and around Birmingham – including day visits to a farm. Since the closure of the city's Outdoor Learning Service last July, NAEE's Kenrick working group has succeeded in providing visits for 14 schools this academic year at 4 centres: Botanical Gardens, Birmingham Wildlife & Nature Conservation Park (run by the city council), Mount Pleasant Farm (now financed by the Worgan Trust) and Martineau Gardens, a charitable trust, only 2 miles from the city centre. Since the project began in 2012, two thousand Birmingham school children have benefited from these 'Kenrick Days' visits

Kenrick Days visits to Martineau Gardens

(from Juliette Green, NAEE)

School visits to Martineau Gardens are steadily increasing, in part due to a greater focus on plants in the new primary curriculum but also as the centre becomes better known. In April, 42 Year 1 pupils from The Oaks Primary School visited to be 'Plant Professors', learning about the parts of plants and

requirements for growth. The visit focussed on the children using their senses to explore the plants at the Gardens, including a blindfolded 'Meet a Tree' activity, making 'sticky bracelets' (using natural materials found on the ground as they walked through the woods) and tasting some of the produce grown at the Gardens. The children and staff were all keen to explain what they had learnt and tell us how much they had enjoyed their day. The School is in a high area of deprivation (70% of children receive free school meals) but, despite being surrounded by heathland, having countryside to the south and being close to both Chinn Brook and the Stratford-upon-Avon Canal, children and their families do not tend to visit these green spaces. This is for a variety of reasons, including safety concerns and a general disengagement with, or lack of understanding of



Pupils from The Oaks Primary school bark rubbing at Martineau Gardens, Birmingham



*St Barnabas pupil
at Martineau Gardens*

the natural world. Visits like this are essential for giving children a positive example of how to care for the environment, which they can then take back to their local area and families.

Over two days in May, St Barnabas Primary School from north Birmingham, brought 60 Reception children as part of their 'Plants and Growing' topic (covering the 'Understanding the World' area of learning in the Early Years curriculum). This is a cross-curricular topic that involves children growing plants in their newly-created school allotment area and links with other parts of the curriculum including literacy and maths. Finally, in June, 60 Year 1 pupils from St John's Primary School, Sparkhill, made visits over two days investigating their topic 'How Does Your Garden Grow?' In their application, the teacher told us: "our playgrounds are the park tennis courts... They are 'concrete cages' which often have graffiti. There is no green space and nowhere to dig." Her aim for the visit was to "open the children's eyes "to the beauty of the natural environment" and "inspire them to see what is possible" so that they can learn to look after their own local environment.

Farm Report

from Nina Hatch, Head of Centre, Mount Pleasant School Farm; NAEE Chair

Four Birmingham primary schools were awarded bursaries for farm visits during 2014-15. We are delighted that the School Farm remains open despite Birmingham City Council withdrawing funding in July 2014. This is due to the benevolence of the Worgan Trust, founded by the late Paul Cadbury. The Trust realised the importance of continuing to give children a chance to consider where their food comes from, and the relevance of farming to

modern day life. They have taken on the sustainably built classroom and set up a distinct charity to continue to employ myself as the Teacher/Centre Manager. Bill Scott our NAEE President recently met Candia Compton, Paul Cadbury's granddaughter and current chair of the Trust at the farm.

Visits down on the farm:

The essence of a farm visit involves a hands on experience of feeding some of the farm animals, and seeing the daily pattern of farming life. This was interpreted and utilised very differently by each school. The two Reception class teachers from Northfield Manor Primary took the farm as their cross curricular focus for the whole summer term covering Science, Mathematics, English, Geography, Art and Design Technology. They hatched out hen's eggs and their work culminated in a Creative Arts exhibition in the Hall. The children designed 50p tickets, sold them to their parents and then showed them round their art work, pottery, poems and photos all based around the farm. Ironically the teachers decided that the ticket money should be donated back to NAEE! For Bellfield Junior School Year 3 children, again the farm was the WOW event for a half term project comparing modern day farming to that in Ancient Egypt. Their visit was slanted to enable the children to appreciate similarities and differences between the 2 farming eras - inevitably this included considering climate issues. Rosary School Year 3 classes each spent a whole day focussing on food production for their topic 'where our food comes from'. Key Stage 1 children at St James are already growing food in their school garden and have an active Eco Club so their farm visits were a stimulus for a 'Fantastic Animals' project.



*Bellfield Junior School pupils feeding the chickens
at Mount Pleasant Farm*

Solid as a rock: practical activities to inspire pupils' curiosity about what's beneath their feet

Juliette Green *NAEE Executive member and environmental education teacher*

The Year 3 science topic of rocks can be very dry if it's not adequately resourced or taught in a practical way. The Rocks and Soils Day at Green Meadow Primary School, Birmingham, run by Triskelion Education in April, showed how to really bring this topic to life!

Sixty Year 3 pupils participated in the day, which took place entirely outdoors, on the school field, and was run by a team of five outdoor education practitioners. The day was organised into four sessions, each with a different theme:

- » Fossils (fossil hunt and identification)
- » Rocks (properties of rocks and uses)
- » Soils (layer cocktails and clay pot making/ decorating)
- » Gemstones and precious metals (panning and jewellery making)



Using natural objects as tools to decorate clay pots

Curriculum links

The sessions were directly linked to the curriculum in the following ways:

- » **Science** – Year 3 science unit
Rocks: Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties; describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock; recognise that soils are made from rocks and organic matter.
Also building on prior learning from the key stage 1 science units about everyday materials and their

uses: the names of everyday materials including metal and rock; the fact that everyday materials can be compared and grouped on the basis of their simple physical properties; the fact that everyday materials are suitable for particular uses; how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

- » **Geography** – Describe and understand key aspects of human and physical geography, including mountains, volcanoes and earthquakes, types of settlement and land use, and the distribution of natural materials including minerals.

- » **History** – Stone Age tools; how the Romans used stone (building, art).

- » **Art and Design** – Developing techniques including the use of different materials.

- » **Design and Technology** – Using a range of tools and equipment to perform practical tasks; selecting materials according to their functional properties; understanding how developments in design and technology have helped to shape the world.

Finding, identifying and analysing fossils

In this session, the children worked in pairs to hunt for fossils hidden in trays of gravel. They talked about how fossils are formed when plants and animals die, sink into the mud and through the process of permineralisation or natural mould become fossils. The main fossils they found were ammonites, gastropods and bivalves, but there were also others including vertebrae and teeth.

The children then went on to analyse the fossils to try to work out details about the animals, for example their diet and body shapes. This was an excellent way of showing how we use a range of sources of evidence to find out information about the past.

Properties of rock and Stone Age tools

This session began by discussing what might be underneath us as we sat on the grass of the school field. The book *'What's Under the Bed?'* by Mick Manning and Brita Granstrom, and a model of the cross-section of the Earth, helped the children to find out about the layers of rock and soil below us

and information about the Earth's crust, mantle, outer and inner core.

The children then split into two sub-groups, with one group looking at a variety of different rocks and stones, and the other group finding out about how Stone Age people made tools from rock and other natural materials. The sub-groups then swapped over.

The first group had a tray of rock samples between three and were asked to explore their properties (e.g. hardness, rough or smooth, colour), using hand lenses to really focus on the details. They then decided as a group how they could group the rocks. This brought out some interesting points about vocabulary, with several groups mistakenly using the words 'hard' and 'soft' when really they meant 'rough' and 'smooth'. One group took the novel approach of finding out the names of their rocks and then putting them in order of the number of letters in the name! Useful discussions also took place about the ways in which pebbles can be polished and rounded when on the beach or in a river bed, and why coal is such a good fuel due to its formation from fossilised plants (and the associated concerns about it being a finite fuel).

The second group were shown some flint tools made by one of the practitioners (Tony Tohill). He showed them how to 'nap' the flint, using a piece of antler to chip chunks off and leave a serrated edge. He also showed them an adze (an ancient type of edge tool) that he had made and a flattened stone used for grinding vegetables. The children were fascinated by these objects and the fact that they had been made using traditional techniques and natural materials. (I think they believed that Tony was an actual caveman!)

The session finished with a plenary challenge: where are the rocks? In pairs, the children were given photographs of rocks in different locations, including sandstone cliffs, limestone pavement, the city of Oxford, a muddy field, a sandy beach, a gravel quarry and a volcano. Their task was to identify where the rocks were. This threw up some interesting answers, with children going beyond the obvious and mentioning metal cars (as we had discussed that many metals are found inside rock) and even the windows of a house (with glass being produced by heating sand).

Soil formation and uses of soil

At the start of this session, we briefly recapped the layers beneath us, focussing particularly on the

different types of soil – humus, topsoil, clay soil, down to the bedrock. Half of the group then went to make clay pots while the other half made soil layer 'cocktails', swapping over after about 20 minutes.

The clay pot group talked initially about how clay is a type of soil and what it can be used for. They were then given a lump of clay each and asked to make a pinch pot, or anything else they wanted to (with some interesting plates, plaques and even a scarecrow being produced!). The children were encouraged to use natural objects as decorating tools and the results were superb – particularly from those who had used shells to make patterns and imprinted dock leaves, which gave a striking effect.

The other group were each given a transparent plastic cup and asked to make a soil layer 'cocktail'. They had a range of stones of different sizes and colours, humus, topsoil and sand to choose from. They could decide what type of 'landscape' to make, with some children using sand on the top to create a desert and others adding large chunks of slate or granite to make exposed mountain peaks. They were then given some grass seed to sprinkle over the top and asked whether they thought it would grow, depending on the make-up of their layers. We also discussed where they should place their pots to give the grass seed the best chance of growing well.

The sparkly stuff!

Gemstones and precious metals

The children were intrigued to see that this session involved a panning pool! However, despite the sunny weather, they were not about to take a dip, as the pool was filled with water, sand and a mixture of small pieces of fools' gold and gemstones (turquoise, tiger's eye, amber etc.). The children worked in small groups to 'pan' for the gold and jewels, using metal sieves. The results were outstanding, with each child collecting an impressive haul that they were then able to identify. When they had panned and identified their treasure, each child made a clay bead – using a round stick through the middle to keep the hole open while they decorated it. These will be painted back in class and then put together to make group bead chains.

The children discovered how gemstones are formed, places (including several locations in the UK) where they have been found and how they are extracted (through mining or being deposited in rivers and streams).

Reactions from pupils and staff

The day was a real success, with pupils and staff keen to tell us what they had learnt and how much they had enjoyed themselves.

Here are some quotes from the pupils, school staff and session practitioners:

"It was awesome! We got to touch real fossils"

Ochae-Mae, Year 3 pupil

"It was fun! There were lots of different activities.

We even got to take home an amethyst!"

Josh, Year 3 pupil

"Probably my favourite day ever in Year 3!"

Year 3 teacher

Mike Watson, Director of Triskelion Education:
"The children engaged and responded well in each session and learning objectives were easily met. Being outdoors added to the excitement and ensured that the children - and their teachers - experienced a day to remember."

Laura Clay, self-employed outdoor education consultant:
"It was a great day and all the children thoroughly enjoyed it. The outdoor sessions brought learning to life in a creative and fun way."

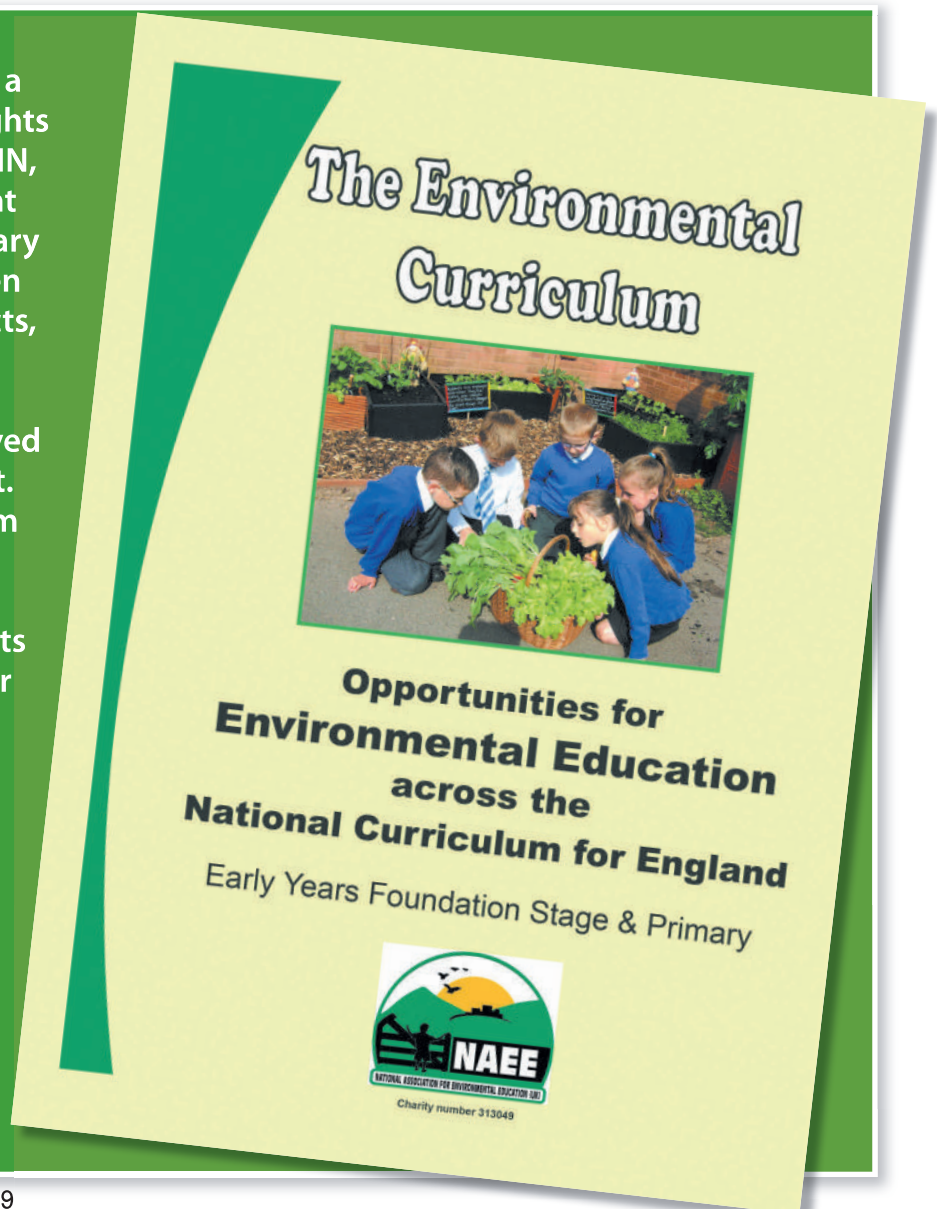
More information

Triskelion Education specialises in providing curriculum-linked outdoor learning solutions to schools. The company combines a wealth of experience and many creative ideas to provide engaging activities, events and programmes, delivered by skilled practitioners.

Contact Triskelion Education: tel. 01675 442505 / 07747 753607,
email services@triskelion-online.com, web www.triskelion-online.com

The Environmental Curriculum, a new resource from NAEE, highlights the opportunities for education IN, ABOUT and FOR the environment in the 2014 Early Years and Primary curricula. The handbook is broken down into key stages and subjects, and includes photographs and case studies of good practice in schools, particularly those involved in the Hugh Kenrick Days project. NAEE President, Professor William Scott: "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"

Available as a downloadable PDF from the NAEE website or by contacting info@naee.org.uk



Fire management & safety in the great outdoors: Fire Service teams up with outdoor learning educators to run courses

Mike Watson, *Triskelion Education and*
Martin Davis, *West Midlands Fire Service Training Unit*

With the holiday season fast approaching, many people will be looking forward to relaxing outside. Lighting fires will no doubt feature as a fun outdoor activity for some, but with fire making comes responsibility - and danger - as the country's fire and rescue services know only too well.

Lessons to be learned

Most wildfires are caused by people, sometimes deliberately, often accidentally. When the culprits are children, they may be acting out of curiosity, ignorant of the damage they can cause if it all goes wrong. Research conducted by Daniel M.T. Fessler at the University of California indicates that if children never learn to make or use fires safely as an everyday tool, the novelty of, and fascination with, fire can continue into adulthood with potentially dangerous consequences. West Midlands Fire Service believes the appeal of making fire for the sake of it can be reduced through education, so they have teamed up with outdoor learning specialists, Triskelion Education, to train those responsible for teaching or supervising the use of fire in an educational outdoor setting. Subjects covered include fire dynamics; safe fire building; fire control; the dangers of wood



Photo courtesy of Sutton Park National Nature Reserve service

smoke; good behaviours and the environmental impact of firemaking. When so many children now have the opportunity to engage with fire related topics at school events, outdoor learning venues or camps, there's never been a better time to ensure that their teachers are trained by experts.

Environmental impact of wildfires

During 2013/14, the number of outdoor fires attended by fire and rescue services in Great Britain rose to 143,500, an increase of 20% over 2012/13. The rise was mainly due to an 80% increase in grassland fires. Incidents of outdoor fires are typically higher in unseasonably dry springs and summer, when the weather is warmer and there is a build-up of dry or dead vegetation. In the dry spring of 2011, fires broke out across the 2600-acre Swinley Forest in Berkshire. Thought to have been started deliberately, the fire destroyed three square kilometres of the forest. In March this year, West Midlands Fire Service attended a fire affecting 200 square metres of grassland in Sutton Coldfield Park, Birmingham, a designated National Nature Reserve. The 2000 acre landscape includes open heathland, woodlands, wetlands, marshes and lakes and is home to a rich mix of plants and wildlife. Sadly, it is also a regular target for arsonists, with one of the most serious incidents being recorded in 2003 when 5,000 square metres of the area's heathland were destroyed. However they start, wildfires can have a devastating environmental effect, especially on wildlife. The Swinley Forest fire occurred during the breeding season for the area's rare birds, including the woodlark and nightjar. According to the RSPB, adult birds would have been able to escape the fire but eggs and chicks in its path would have been destroyed. In the 2003 Sutton Park incident, fire crews had to move distressed wild ponies to safety.

Safe fire building: a typical fire pit



More information

Murray, D.R., Fessler, D.M.T., and Lupfer, G.J. *Young flames: The effects of childhood exposure to fire on adult attitudes.*
(Downloadable pdf from www.danielmtfessler.com/select-publications/)

For further information about the one-day training programme Fire Management & Safety for Education and Outdoor Learning, contact Mike Watson at Triskelion Education on 0774 7753607. www.triskelion-online.com

Learning from the past

Rob Sutton,

Chair, Moor Pool Heritage Trust, Birmingham

The garden suburbs of the 1900s which have survived in their original format have left a tremendous educational opportunity for today's children. An example is the Moor Pool garden suburb in Harborne, Birmingham which was the vision of John Nettlefold, the Unitarian philanthropist, politician and industrialist (Guest Keen and Nettlefold). As the first Chairman of the Birmingham Housing Committee, Nettlefold desired to see a radical change in the way our cities developed and to provide a far healthier environment for our children. In a speech to the City Council in 1906 he said:

'... We can, if we will, arrange for healthy, wholesome surroundings for every Birmingham adult, and, even more important, give every Birmingham child the 'light and air' that are so essential to its healthy development.'

Looking and learning from the parallel development of the Garden Cities such as Letchworth and Welwyn, Nettlefold insisted that allotments should play a crucial part in the design of the Moor Pool Estate. Hidden from the casual observer, Moor Pool had over a dozen allotment areas such that most tenants could access one within 50 to 100 yards of their garden gate. All the allotments were provided with a fruit tree, as was each garden, in recognition of the importance of diet. Unlike most local authority allotments there are no water supplies on Moor Pool. Despite this, the allotments have always produced prolific crops. A big factor is the quality of the soil which is a dark colour but light and easy to work. Time and commercial interest took its toll and for many years the allotments had almost become forgotten as they became increasingly overgrown. The situation has now changed as the history and significance of the Estate have become recognised. The reformed allotment association has promoted their survival and benefits they could bring to the community. Their ownership by the Moor Pool Trust will ensure that not only do they continue to serve their original purpose but they become a valuable educational resource and a continuing feature of future visits by children to the Estate. Under the Today's Children, Tomorrow's Community educational project, children will be encouraged to get 'hands on' with plant propagation using



Pupils from a Sparkhill primary school visit the allotment

the allotment set aside for them. The soon to be completed outside growing area with commercial greenhouse linked to the planned Nettlefold Environmental Centre will enable this work to expand still further.

'A valuable education resource'

Moor Pool has encouraged involvement with plant cultivation at an early stage, beginning with its mother and toddler group who have their own small garden near the entrance to the community hall. Other schools have visited the allotments and helped with planting around the Estate as well as taking part in regular Forest Schools work in the 'Orchard'. Adults have had their day too, propagating apple, pear and plum trees from cuttings taken from the older varieties found on the allotments. Now that the Trust actually owns the community buildings, it is in a position to further support the educational work and complete the cycle of children experiencing the whole process of sowing seedlings to taking home that vegetable 'that I grew'. When that happens then the project will have achieved one of its main environmental aims and provide a legacy that Nettlefold, a champion of sustainable environmental urban planning, would have been proud of.

More information: available from the Moor Pool Heritage Trust. www.mpht.co.uk

Still scooting ! With a great destination at the end of the journey

David Fellows, NAEE Cumbrian representative

It's five years since I wrote about our first granddaughter Lily scooting to school. Time moves on so quickly but here she is today, still scooting, but enjoying cycling, swimming and walking too. She's also been very fortunate that her junior school has proved just as enticing as her previous infant school for her to rush through the gate every day and get absorbed in the rich variety of activities on offer. Many changes have been made at the school since our son was there some thirty years ago. There were two schools then, but a few years ago they amalgamated and became the Sir John Barrow School (SJB) in memory of one of the town's famous sons. Now that the school has almost 300 pupils on roll, it is quite a challenge to successfully accommodate and educate them all on such a small site.

The school site

The school site is tucked away at the side of a high railway embankment that carries trains along the Cumbrian coast. On the other sides it's surrounded by Victorian terrace houses and at the rear is a busy highway down to the coast. Towards the east end of the grounds, the main road is well screened by a solid brick wall and there's a large collection of tyres well placed for jumping and bouncing on. Between the slope and the flat ground is a well constructed willow tunnel, ideal for hide and seek once the leaves have reappeared. When the trees are in leaf there's quite a woodland feel to the area. Up in the far west corner is a little woodland complete with a mosaic stepping stone path and next to it a growing area. More tyres have been put to good use here to separate the crops. It's a good, easy way of creating raised beds that children can get round to tend to the produce. As well as being involved in the "Growing Schools" movement they are also involved in the "Forest Schools" programme using what limited woodland they have for introducing forest skills and then using the large woods at nearby Conishead Priory

Foundation Stage soil pit

Playdale, a local company, provided the wood-based activity apparatus within the school's limited outdoor area which is well used by the children. All the more welcome when recent surveys express concern over the lack of outdoor activity that many children now get. Something else makes SJB stand out: at the other side of the school, the nursery and

reception classes have a busy play zone. There's a covered sand pit but also a covered soil pit, and by it a well equipped area for plant potting and seeding or just some mud pie making, all constructed by the husband of one of the staff. Next to it, attached to the wall, is a large board with lots of drain pipes on it, all angled so that water poured in at the top eventually finds its way to the bucket at the bottom - designed to show gravity in action and a very practical outcome of a technology project by the local secondary school.

Pressures on academic performance, accountability and security make teaching a far more demanding job than when I started out. Too much pressure can be counter-productive, but the head teacher and her dedicated team have managed to maintain something very precious in fulfilling her aim, in her own words *"to be a school where pupils rush through the gates looking forward to the day and enjoying learning."*



Ready to set off for school



Shanghai: Urban farming - a support tool for the school curriculum

Sky Farms China install urban farm eco systems & learning centres in Shanghai as a move towards sustainability and more resilient cities

Susan Evans, *Post Grad dip Sustainability, MSC Maths, BSC Maths, B.Ed Hons. Location: Hong Kong.*

Green urban environments and reconnecting students with their food can have positive sustainable effects. Providing students with opportunities to learn how to grow vegetables in an urban environment can be inspiring, practical and educational. Integrating project learning into the curriculum has challenges. In this article we discuss an urban farm* case study, based at the Shanghai American School, that highlights our approach to integrating project learning across the school using a hands-on approach and co-creation of an annual urban farming experiment plan.

Case study: Shanghai American School

Good to China's Sky Farm team started working with the Shanghai American School in 2012, providing student visits to the Sky Farms located on urban rooftops (see photo on page 26). At the Sky Farm locations, students are introduced to a building that has been consciously built with renewable

materials, using sustainable practices with a view to healthier environments and better quality of living. Students are given the opportunity of a hands-on experience to create their own mobile urban farm.

In 2013 the Sky Farms team installed an urban farm at the Shanghai American school (see photo above). It composed of 13 planting beds, water capture system, drip system, solar lighting, composter and herb garden, plus systems organization. Once installed, the challenge faced was how to engage and benefit teachers and students. Our team worked together with the Principal and 2 key teachers for the best part of one school year to develop a school wide program.

Project Goal

The project goal was set to position the urban farm as a project learning support tool to meet Science Standards. Specific Objectives to meet the project

goal were:

- To cross the National Science Inquiry Standards with the urban farm potential to provide project based learning.
- To provide an accessible and planned way to benefit from the project learning opportunities provided by the urban farm.
- To provide a sustainable set of projects that can be developed each year to enable an experimental usage of the urban farm for each grade.

Background

While many teachers like the idea of an urban farm and the ecosystem it provides, there are challenges that teachers face and can be summarized as follows:

- Consumed with other responsibilities or activities, so resistant to commit time to development of urban farm
- Urban farming leadership team passionate but not skilled
- Few teachers skilled in urban farming so most are unable to “make the leap” to integrate the urban farm into their curriculum
- National science syllabus has changed recently and teachers have new responsibilities to develop the curriculum to meet these standards
- Urban farm has limitations on size, so grade group discussions required to optimize usage

Observations

- Unless there are specific “experiments” and “activities” that support the curriculum standards, it is extremely challenging for teachers to integrate the urban farm into their curriculum.
- The challenges of time and energy are perceived to far out-weigh the benefits of using the urban farm.

Based on this feedback and observations we devised a plan with the aim to engage teachers and students firstly through “hands-on learning” and secondly by “co-creation: engagement in the development process”.

Hands on learning

An annual introduction to urban farming was created, consisting of an introduction to the urban farm components and the active zones

Over two full days, workshops were provided with three active learning stations, namely, urban farm overview tour, composting and planting.

Co-Creation: teacher participation

Process: Agreement with the leadership team and Principal to explore the development of an annual plan for urban farming experiments by grade and to include teachers in the development.

Specifics:

- To develop “an annual plan” that includes project based learning for each year group. At the end of the day we aim to have a prototype plan to present to all teachers of the elementary school.
- To start thinking of the urban farm as a supportive tool to be used in meeting science standards

A one-day ‘war room’ was set up and teachers were invited by grade group to provide input and feedback to the stimulus provided.

Three concepts were developed to help frame the project and provide stimulus:

1. Different concepts were drawn up to provide various ways to think of the urban farm: socially and scientifically
2. Specific science standards by grade group
3. Seasonal change and the relevant timing of projects within the annual curriculum

With teacher input, a prototype for an annual experiment plan was created. This plan was used to inspire further ideas. Conversation mapping was used to develop ideas. Teachers were invited to participate and same grade teachers sat with their peers: one table per grade group. Firstly, teachers were presented with the prototype plan and then they created and built on these ideas. This work led to the first annual experimental plan rolled out in the Shanghai American School.

Key observations:

The Principal held a positive attitude with a vision for success: he enabled and participated in the development, and he praised the leaders for their management and organization of the development. At the start, some teachers were less engaged than others. However, after encouragement to participate and share ideas, they really started to create around the concepts.

Following these activities there was a change in teacher energy; they were inspired by the ideas and interested in the opportunity to use the urban farm as a resource (see quotes on the next page).

Conclusion

In this case study, the combination of a strong leader, a motivated, socially outgoing and inclusive group of teachers, plus the use of co-creation enabled the Shanghai American Elementary school to a successful integration of a highly flexible project-learning tool. In our experience we find that organizations are keen to install physical learning environments such as urban farms, but less motivated to provide funding for pre and post installation development. We have found that without pre and post, people and systems development, and engagement activities, these projects struggle to survive or to reach their optimal goals.

Quote from Shanghai American School:

"GoodtoChina ran an extremely professional and

engaging workshop. Our tour of the consciously renovated building helped illustrate that sustainability and urban development can coexist. Our students got their hands dirty and wrestled with thorny questions like 'is eating organic beef really better for the environment if it needs to be flown to China from California?'

Throughout, the GoodtoChina staff were flexible, well-prepared and knowledgeable. They connected with teachers and students alike. It was one of the highlights of our week-long exploration of Shanghai. Thank you!" -Jon Nordmeyer, Shanghai American School

*'Urban farms' in the article from Shanghai above do not have any livestock, but focus on growing crops, similar to 'market gardens' in the UK - Ed.

For more information contact: susanevanskelly@gmail.com



Students tend plants at the Shanghai American School



Photo: rooftop farm Shanghai, China

For information about City Farms in the UK: contact the School Farm Network at the Federation of City Farms & Community Gardens, Bristol: www.farmgarden.org.uk - Ed.

Oil versus Soil: Bio-fuelling forest destruction in Borneo

Henricus Peters, *NAEE Managing Editor*

The island of Borneo, in eastern Malaysia, is caught 'between a rock and hard place'. Teeming with amazing wildlife, with the Orangutan as its centrepiece, Borneo is a biodiversity hotspot with seemingly 'lush' tropical soils. However, it is these very same soils, and their loss, that are now under the microscope. I was able to visit there recently, and see first-hand some of the oil plantations – and the efforts to save Borneo's soils and wildlife from them.

Alternative energy

Because of its warm tropical climate and the resultant exceptional growing conditions, land on the island of Sabah is highly sought after for growing crops; especially the palm oil plant. The global search for 'alternative energy' has created a huge, insatiable demand for palm oil. Whilst replacing fossil fuels with renewable bio fuels made from plant oil sounds like a great way to reduce carbon emissions and thus mitigate climate change, this simple formulation leaves out one key factor – the devastating ecological impact on the rainforest and with it, the soil!

Creating a palm oil plantation means logging the area – thus destroying plant and animal habitats and micro-habitats. Studies show that the conversion of forests to palm plantations produces more carbon than all the bio-fuel they might produce would save. The soil becomes depleted.

Plantations might look green – but they actually



Palm oil factory

create a 'green dead zone': robbing wildlife of vegetation and the essential micro-organisms of a whole native ecosystem, increasing conflicts between wildlife and humans. It also pushes indigenous shifting cultivators towards slash-and-burn agriculture. The result is often a total exhaustion of the soil, a collapse of the ecosystem and, in the worst cases, desertification. Remember the dust-bowls of the United States? These were due to farmers exhausting, rather than resting their fields! In Kalimantan, the area given over to oil palms has increased by 300% since 2000, to 31640 sq. km. (as of 2012). In Sabah, some 20% of the land – about 14000 sq. km. – is now carpeted with oil palms.

Further, because young oil palms take five years to produce their first crop, timber sales – code for the rainforest's wood – subsidise the pre-production phase. While palm oil is an extraordinarily versatile food product – the economic driver in all of this – it is not a sustainable fuel. So the orangutans not only have their trees cut away – they are carted away and sold as well!

Threats to Borneo's Rainforests

The relentless expansion of oil palm production means that a lack of time is a real threat to the conservation of the Bornean Rainforest. Primarily due to clearing forest for oil palm plantations, forest is being cut down to meet the global demand for palm oil. Habitat loss on this scale could lead to the extinction of many of the island's 'flagship' species. Worst-case scenarios indicate that if forest destruction continues, the orangutan will face extinction. Part of the solution is setting aside forest reserves, such as Sepilok – the Orangutan Rehabilitation Centre (SORC), where rainforest and its precious soil, is protected.

Wildlife of the Rainforests – In Trouble: Part 2 of this feature, in EE110, will look at the animal species whose way of life is threatened, and the rehabilitation centre that is making a difference.

Acknowledgements and more Information:

www.worldlandtrust.org/projects/malaysia



Native rainforest tree

'Astronomy Camps' arranged by Nature Club of Pakistan

Article compiled by **Alona Sheridan**, *NAEE (London based)*

The NAEE receives a number of communications each year from Muhammad Raza Khan, president of the Nature Club Pakistan. He regularly sends information about projects organised by the Nature Club to encourage children to appreciate their environment.

One project which took place between 8th and 19th November 2014 particularly caught my attention:



boarding a PIA plane

Astronomy Camps

Nature Club arranged Astronomy Camps for students at Lahore Grammar schools and Beacon House schools. This involved half day outings for students from five different campuses. The aim was to explain the effects of astronomical phenomena on the environment in a way that would engage the students and ensure a positive learning experience.

Multi-media approach

Muhammad sent five Powerpoint presentations containing photos of the different school groups. A multi-media approach was used, combining sports,

art, boarding an aeroplane and a planetarium show.

Educating school-age children about the effect of astronomical phenomena is not common, and I have not heard of such activities in the UK. What makes this project all the more remarkable is that it has taken place in a troubled region as depicted in news items in the UK.

The photos selected here give a flavour of the events and the enthusiasm of the young people. Can you imagine the excitement of boarding a PIA plane and getting to sit on the passenger seats, holding



Lahore students working together

a globe, watching audio-visual presentations in a large hall and sitting at a table working with students from other schools?

And imagine the excitement of these activities taking place away from the school campus.

Many thanks to Muhammad Raza Khan for giving us the opportunity to gain an insight into some of the exciting work he and his organisation are doing.



Muhammad Raza Khan demonstrates astronomical phenomena



Excitement going off-campus!

Book Reviews

Superworm

- a children's book written in verse

Julia Donaldson; illustrations by Axel Scheffler

Pub. Alison Green Books.

ISBN: 978-1-407159-44-7. Price: £4.99

'Superworm' is written and illustrated by the team who produced the hugely successful book, 'The Gruffalo'. Superworm is a hero to all of the animals around him, helping them out with any problems they encounter. As a result, he is highly valued and respected and the animals rally round to support him when he ends up in a sticky situation later on in the story.



In my experience as a teacher, children are immediately hooked by the catchy verses and colourful illustrations. In terms of its educational value, Superworm teaches children about the value of friendship, community and support. However, deeper within the story there is a subtle environmental tone, with the selection of a worm as the main character possibly reflecting the Earthworm's role as a keystone species in several ecosystems. Furthermore, the Forestry Commission have embraced Superworm as a theme for their self-led family nature trails around the country. (See article 'Discover Superworm in your local forest!' page 8.) The use of Superworm for a nature trail exploits the book's latent environmental potential and although the focus is weighted more towards PSHE than Science in terms of links to the curriculum, the book is extremely valuable and I would not hesitate to recommend it. **Zoe Midgley, NAEE Executive**

I Love My World

Chris Holland

Publisher: Wholeland Press, ISBN: 978-0-9561566-0-0

Available from: www.wholeland.org.uk

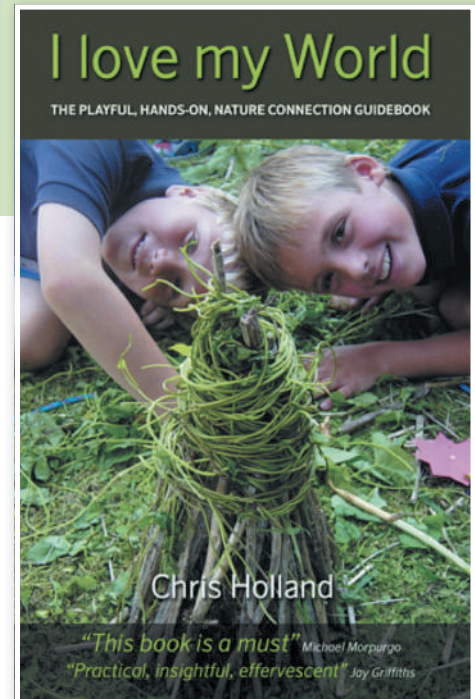
Price: £15.95 for hard back copy

'I Love my World' claims to be the book most used by qualified Forest School teachers, endorsed by no less than Michael Morpurgo. It is packed full of well thought-out, inspiring ideas for leading outdoor activities with children, teenagers and adults.

Holland's teaching plans are empowering and precise, with clear instructions on how to prepare, what to expect, and how to lengthen or deepen a given activity. His tutorials range from detailed teaching on how to safely and reliably build fires or make shelters with groups of children, to artistic explorations of geography – 'Aerial Maps' and 'Magic Map Spots' – and the application of science to the art of outdoor survival – 'Filtering water with rubbish'. I'm sure I would have much preferred to learn about how to filter sand and grit out of water by digging in a boggy field and using a pair of old tights than by sitting in a science lab!

The book is self published, leaving a lot to be desired if a reader requires glossy photos to enhance the reading experience. The images are fairly poorly printed in black and white, although it is worth noting that to see the pictures in colour there is an e-version, or a link within the book to view a slideshow of images. Yet I am still left feeling that this is one of the most inspired and empowering textbooks I have come across for anyone – parents and teachers alike – wishing to use the great outdoors to educate about the environment.

Philippa Riste, NAEE



WEBWATCH

by Henricus Peters, *NAEE Managing editor*

Soils Special: 2015 is United Nations Year of Soils

'Soils have been neglected for too long. We fail to connect soil with our food, water, climate, biodiversity and life. We must invert this tendency and take up some preserving and restoring actions. The World Soil Day campaign aims to connect people with soils and raise awareness on their critical importance in our lives.' www.fao.org/globalsoilpartnership/world-soil-day/en/

How is soil under threat?

The following video clips give an overview of why soil needs protecting:

- Support World Soil Day and the International Year of Soils 2015
www.youtube.com/watch?v=TqGKwWo60yE&feature=youtu.be
- Let's Talk About Soil <https://vimeo.com/53618201>

Deforestation: Tree and plant cover protects soil. Forest clearance on a large scale puts soil at risk of erosion and/or the leaching of nutrients from the soil by heavy rainfall or floods. Read more on the WWF website: http://wwf.panda.org/about_our_earth/deforestation/deforestation_causes/forest_conversion/

Sealing: The growth of cities puts much soil out of reach under tarmac and concrete.

Climate change: Global warming can result in more extreme weather such as flooding or drought, leading to loss of soil by water or wind. Read about both of these issues on the Secondary section (Threats to Soil) of the soil.net website (see below).

'Land grabs': Many organisations that campaign on behalf of poorer people are concerned that large corporations are forcibly taking land from people who depend upon it for their livelihood, especially in Africa. www.theguardian.com/global-development/2014/may/21/world-bank-aid-donors-land-grabs. www.oxfam.org.uk/education/resources/explore-land-grabs.

There is a multitude of websites and resources, but only a fraction of them are really useful for classroom resources. Here we list some of the best sites.

- British Society of Soil Sciences www.soils.org.uk/teachers-and-educators. Includes a range of videos, facts and figures.
- www.soil-net.com. A great site by the folks at Cranfield University, UK; includes downloadable worksheets, online games and teacher resources.
- www.wossac.com The World Soil Survey Archive & Catalogue at Cranfield University, UK.
- www.nationalstemcentre.org.uk/elibrary/resource/1943/rocks-and-soils Lesson plans and activities produced by the Hamilton Trust.
- Lesson plans, worksheets and experiments: www.tes.co.uk/teaching-resource/rocks-and-soils-6184519 and www.primaryresources.co.uk/science/science3a2.htm
- www.nhm.ac.uk (search 'soils'). A wide range of online and virtual gallery investigations; also downloadable items.
- Soil Association www.soilassociation.org The UK's key membership charity campaigning for healthy, humane and sustainable food, farming and land use.
- Soil Society www.soils.org.uk/education
- Rockwatch www.rockwatch.org.uk
- Earth Science Teachers Association www.esta-uk.net

Please send your favourite weblinks to Henricus.peters@gmail.com

Sowing the seeds for a sustainable future: why water education matters

Adriana Spence, *Global Action Plan, London*

One part minerals, one part organic matter, one part water, a sprinkle of nutrients and a breath of oxygen: a recipe for healthy soil.

Like many other complex ecological systems, however, the ideal balance depends on the integrity and health of its individual components. Intensive, industrial farming practices which exhaust the soil of nutrients, vital biodiversity and much needed water upsets this delicate balance. Yet encouraging and maintaining this balance is achievable if we empower the next generation to develop a more sustainable relationship with our food and water systems, and the soils on which they rely.

Water saving is key to sustainable soils

One of the principal components of soil is water, yet it is also most vulnerable to intensive farming practices. 70% of our global freshwater supplies are used in agriculture. As accessible freshwater constitutes 1% of the water on the entire planet, it is an exceedingly limited and precious resource. Water saving education is therefore vital to creating sustainable soil systems.

Water Explorer - a fun, fully resourced educational platform for 8-14 year olds - has been launched by environmental charity Global Action Plan with support from HSBC's Water Programme to galvanise student water saving action.

Encourage self-efficacy, fresh perspectives and outdoor learning

Present in 11 countries around the world, Water Explorer integrates water conservation, access to fresh water, embedded or 'Secret water' and wider concerns about health and sanitation into its programme using an array of lesson-ready challenges that can be led by teacher or student. These include:

- » Uncovering the 'Secret water' of a product, be it a cup of tea, a sheet of paper, or a t-shirt. Students are inspired to reduce their water footprint by analysing the surprisingly large quantities of water involved in producing and supplying an item.



South Africa: 'Water Explorers at Eghweni School in their vegetable garden.'

- » Debating the need for chemicals in crop farming in the 'Thirsty Farming' challenge.
- » Connecting with natural surroundings: the 'Grow your own Food' challenge gets students outdoors and managing pesticide-free food systems. Students develop self-efficacy and social skills while learning to value the time, resources and effort that go into growing your own food.
- » The 'Water Butt' challenge inspires students to collect and manage the precious resource that is water by building their own rainwater harvesting system.

Empowering the next generation to take water saving action by combining practical and theoretical learning; engagement with nature and wider global perspectives, Water Explorer can help you to engender the knowledge and determination needed to create sustainable futures in which tomorrow's food systems can thrive.

To find out more, go to waterexplorer.org and see back cover of this journal.

Water EXPLORER



OUR WORLD IS BEAUTIFUL

BUT IT NEEDS WATER TO SURVIVE

- ➔ We are calling on Water Explorers around the world to make every drop count.
- ➔ Water Explorer is a free, fully planned and resourced international programme for 8 - 14 year olds.
- ➔ Students lead challenges to make a change. They could gain awards, workshops and their own water festival!



TO GET STARTED REGISTER AT:



WATEREXPLORER.ORG