WWF

REPORT

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Learning for sustainability in schools

Effective pedagogy

Report by WWF-UK, based on research by Dr Chris Gayford

ABOUT WWF-UK

Our planet can no longer support the demands people make on it. At WWF-UK, we're working to build a future in which people and nature thrive within their fair share of the planet's limited natural resources. To achieve this, we're focusing on three really big challenges: safeguarding the natural world, tackling climate change, and helping to change the way we live.

Working with schools and the wider education system is a fundamental part of our efforts to help change the way we live – enjoying more sustainable lifestyles, addressing humanity's global footprint, and creating a thriving, vibrant future for people and nature.

We've been working with education professionals since 1981 and this report contributes to our ongoing work. Our aim is to support educators in putting sustainability at the heart of everything they do; enabling young people to develop the knowledge, skills, values and attitudes they need to face the challenges of the 21st century and contribute to a sustainable future.

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WWF-UK and Dr Chris Gayford wish to acknowledge the generous assistance and support of each of the schools involved in the study.

EXECUTIVE SUMMARY

The purpose of this research is to identify the key pedagogical approaches used in primary and secondary schools to effectively support learning for sustainability. The research is intended to support the aim, set out in the various forms of guidance to schools, that learning for sustainability should have a higher profile with an explicit presence across the curriculum. The findings are drawn from 32 examples of teaching currently undertaken in 26 rural, suburban and urban schools in Scotland and England – 16 primary schools, one middle school and nine secondary schools. These schools were selected on the basis that they have been recognised as undertaking effective learning for sustainability.

Nineteen key pedagogical approaches were identified. These were aligned with progressive educational thinking, in which effective pedagogy is considered to involve more participative approaches. Research referenced in the report indicates that there is no conflict between the curriculum, national standards in core subjects, and the use of these pedagogical approaches. Conversely, in addition to supporting effective learning for sustainability, these approaches raise attainment, increase pupils' enjoyment and motivation, and promote pro-environmental behaviour and well-being.

However, these successes were only observed where planning was sufficiently well-rooted in the content and skills of the curriculum, teachers' subject knowledge was secure and extensive enough to support pupils' enquiry, independent thinking and debate, and there was good professional development within the school.

In discussions with the teachers that provided these examples, there was evidence of periodic reviews to improve teaching practice. However there was little evidence of evaluation of the effectiveness of the learning for sustainability aspects of these activities with regard to how they had impacted on the values and attitudes of pupils.

Recommendations

The following recommendations are made in light of the findings and research referenced in this report.

For the government and its agencies

1 Review national strategies to ensure that there is a requirement to provide pre-service and in-service teacher education to build capacity in the pedagogies identified in this report.

2 Work strategically with external agencies and stakeholders to assess the current support available and ensure that teachers have access to appropriate, high quality advice, guidance and Continuing Professional Development (CPD) in the pedagogical approaches identified in this report.

3 Strategies should include actions to ensure that capacity building is supported by high quality professional development within schools, with particular attention paid to collaborative working between teachers.

4 Provide resources and support to help teachers ensure that, during planning, learning for sustainability is sufficiently well-rooted in the content and skills of the curriculum.

For Pre-service Teacher Education Institutions

5 Ensure lecturers and student teachers are adequately equipped and motivated to deliver the pedagogical approaches identified.

For schools and others involved with teachers' CPD

6 Schools should provide training and support to give teachers confidence to use the full range of teaching and learning approaches identified in this report.

7 This training should be supported and encouraged by explicit emphasis from the senior management team so that it is an essential part of the curriculum and the general ethos of the school.

8 Develop programmes of support to ensure that teachers' subject knowledge is secure and extensive enough to support pupils' enquiry, independent thinking and debate around sustainability issues.

9 Ensure that a means of evaluating the impact of activities on pupils' values and attitudes is built into learning and teaching programmes from the beginning so that practitioners are able to assess and evaluate effectiveness, and continually improve their practice.

While this report identifies the pedagogies that are effective in delivering learning for sustainability, further research is needed to identify the most effective ways of building teachers' capacity to use these pedagogical approaches.

INTRODUCTION

Why learning for sustainability?

Our planet can no longer sustain the demands humanity is making on its natural resources[i], and the way those resources are controlled and shared has led to inequality and injustice. As we move further into the 21st century, dealing with these issues will become ever more urgent. In preparing our young people for life beyond school, we'll need to equip them to deal with these unprecedented challenges.[ii]

What is learning for sustainability?

Achieving sustainability – where we live within the environmental limits of our planet in a just and equitable society – will require new knowledge, skills, values and attitudes. Learning for sustainability is the process of developing the knowledge, skills, values and attitudes needed to move from where we are now to a state of sustainability.[iii]

It is important to note that learning which simply develops knowledge, understanding and skills is not enough. The values that learners attach to this knowledge, and their attitudes to applying these skills are of huge importance. Learning about sustainability in ways that do not address values and attitudes is not considered either learning for sustainability or effective practice.[iv]

It should also be noted that in England education relating to sustainability is referred to as *education for sustainable development* (ESD) while in Scotland it is referred to as *sustainable development education* (SDE). For the purposes of this report these two names are understood to mean the same thing, and in this report the term *learning for sustainability* is used to refer collectively to practice in both countries.

The context for schools

The revised version of the National Curriculum for England and the Curriculum for Excellence in Scotland[v], together with the various forms of guidance, all make it clear that learning for sustainability should have a higher profile with an explicit presence across the curriculum. This reflects a continuing trend towards recognising the importance of sustainability issues in both government and wider society.[vi]

METHOD

The purpose of this report is to identify the key pedagogical approaches used in primary and secondary schools to effectively support learning for sustainability. In this report, learning for sustainability is only considered effective if it is part of the regular learning and teaching within the school and not simply a 'one-off' event or project.

Throughout the report the term 'pedagogy' is used in the traditional sense, being concerned with the strategies and styles used in teaching.

The research findings are drawn from a series of examples of teaching currently undertaken in a range of rural, suburban and urban schools in Scotland and England. The schools were selected from those that had been involved in the two recent longitudinal studies of learning for sustainability carried out in England[vii]; those that had been involved in WWF learning for sustainability activities such as Pathways[viii] or Global Footprinting[ix]; those that were put forward by Eco-Schools Scotland as examples of good practice; and those that had received a national award or recognition for their learning for sustainability work.

A selection of 16 primary schools, one middle school and nine secondary schools responded to the request for examples of pedagogy. Of these, five primaries and two secondaries were Scottish, the remainder were English. The schools that participated in this report are listed in Appendix IV.

The enquiry was carried out mainly using 'desk research'. It was found that schools were less willing to respond to questionnaires than to personal letters followed up with telephone conversations and e-mail contact; therefore this approach was adopted as the most effective way of identifying and recording the wide range of different activities that had been undertaken. The questions asked are given in Appendix III.

The focus here is on the way that 'sustainability' features in the taught curriculum of schools. This may be as part of classroom teaching or associated with day-to-day teaching. It also includes out-of-classroom activities such as projects, focus weeks, end of term performances, community involvement and others. However, it purposely did not include activities such as school councils or eco-clubs, which are usually voluntary activities or ones where only a few pupils may be involved.

The concept of sustainability is broad, and various national and international definitions exist. Rather than attempting to pick and choose between these definitions, the *Eight Doorways*[x] of the English Sustainable Schools Framework with the addition of biodiversity and the *Nine Themes*[xi] of the Eco-Schools Scotland programme were used as a starting point for discussion with schools.

Using these frameworks as a starting point for discussion reflects the way schools employ them to provide organising themes around which to build their learning for sustainability activities. During conversations with schools it became clear that Fair Trade is also commonly used as an organising theme. In addition, the major issues of sustainability – such as climate change, carbon footprint, globalisation, international trade, environmental conservation, and improvements for the local community – were also used by some of the schools.

A few schools offered more than one useful example, so there are 32 examples in Appendix I. The examples ranged from the very brief to the more extended; some were fairly simple activities that take only a few lessons while others are more elaborate and demanding.

It was essential to keep an open mind during discussions with schools about what constitutes effective pedagogy as we hoped there would be interesting strategies adopted in some schools that have not yet been identified in previous enquiries and possibly would be new to the literature.

The latter part of this report looks at the relationship between the findings of this research and other research exploring progressive thinking on pedagogy and learning for sustainability. We intend that this research will contribute to the development of pre-service and in-service teacher education relating to both learning for sustainability and effective pedagogy.

FINDINGS

The examples given by the schools have two important dimensions, one is the factual information given regarding the activity described and the other is the context in which the activity took place. The examples do not translate easily into unambiguous prescriptions for actions to be followed but must be interpreted in the light of the particular circumstances in which they take place.

The 32 examples were analysed for references to pedagogical approaches; the text in italics in Appendix I indicates the references identified. All the pedagogical references were then collated and grouped by type and according to whether they were being employed by a primary or secondary school. See Appendix II for the results of this analysis.

Analysis of the pedagogical approaches found in the 32 examples clearly shows that there are many different and effective ways for schools to undertake learning for sustainability. The approaches we identified fall into two broad groups: the pedagogies employed to deliver learning for sustainability, and practical approaches employed in timetabling learning for sustainability.

Pedagogies which support learning for sustainability

More progressive educational thinking considers effective pedagogy to involve more participative approaches between teacher and pupils.[xii] Here the role of the teacher is to facilitate and guide learning rather than being a 'fount of all knowledge', and the learner is an active partner in judging their progress towards learning objectives. The use of this style of pedagogy was found across all the examples.

1. Tasks involving pupils taking responsibility for researching different aspects of a topic was an approach used in six of the examples – four primaries and two secondaries. These research tasks provided opportunities for pupils to apply and develop their process skills to find out things for themselves. Examples of this included accessing information through the internet and library-based research.

2. An extension of the use of research tasks was the use of stimulus material such as DVDs, films, talks and artefacts to develop pupils' knowledge. This approach was used in eight of the examples – three primaries and five secondaries. Films and video clips were marginally more common (five examples).

3 Presenting research findings and other information to either the rest of the class or a wider audience was also seen in 10 examples – seven primaries and three secondaries. The use of creative approaches in these presentation tasks provided opportunities to develop IT, presentation and speaking skills, in addition to developing knowledge and understanding around learning for sustainability.

4 The use of group work, collaborative tasks and peer learning featured in 14 examples (seven primaries and seven secondaries), sometimes within classes or year groups, sometimes across year groups. This allowed pupils to develop their ability to collaborate with others more effectively, in addition to offering opportunities for the development of wider social skills such as listening and taking responsibility.

5 Encouraging meaningful participation in decision-making about school life and involving pupils in community-based decisions and actions is evident in six examples. Examples of this included involving pupils in decisions about school improvements, and in one case involving pupils in decisions relating to the renovation of the village hall.

6 Enquiry-based, problem-solving approaches, employing activities that use critical and systems thinking, which allow pupils to think, challenge and debate opportunities for change were a feature of four of the examples – one primary and three secondaries. These approaches have value in developing an appreciation of, and an ability to work with, complexity and uncertainty. Examples include encouraging learners to consider the nature of 'good' questions and tasks based on finding solutions to problems.

7 Role-playing is used to develop understanding of different perspectives and experiences of sustainability issues in four of the examples – two primaries and two secondaries. This role-playing takes different forms such as acting out how an imagined character might react to taking on the 'mantle of the expert'. This is useful in helping pupils view issues from varied perspectives and explore different viewpoints in ways that engage both their imaginative and intellectual capacities.[xiii]

8 An extension of both enquiry-based, problem-solving approaches and appreciating other perspectives is the use of reflective learning – encouraging pupils to examine and question their thoughts, feelings and actions in the light of what they've learned. It is interesting to note that 'reflection' is only explicitly mentioned in one secondary school example. Research indicates that this is an essential step in changing behaviour with regards to sustainability. It's not clear whether reflection is being used in other activities but not being named specifically, or whether it is not a pedagogical approach that is generally used.

9 The use of creative arts as a way of expressing thoughts and ideas is found in four of the examples – two primaries and two secondaries. Art-based activities are the most common, but one example mentions the use of music.

10 Exploration of the different ways in which pupils can individually or collectively take action to address sustainability issues in practical ways is a feature of nine of the examples – five primaries and four secondaries. This mainly takes the form of measures to reduce waste and energy use, although improvements to the school grounds also feature. Many of these use real-life contexts for learning focused either in the school or locally, but in some a global dimension is also present. In developing sustainability skills and attitudes, the chance to apply what has been learned to situations that exist in 'the real world' provides important opportunities to consolidate and embed what pupils have learned.

11 A further development of 'taking action' is the organising of special projects or events related to sustainability. This approach is used in four of the examples, where conferences, and in one case a fashion show, were organised. These provide opportunities for developing knowledge related to a wide range of sustainability issues, as well as many important process skills and abilities such as planning, making judgements and decisions with reasons, and dealing with compromise.

12 The school grounds provide opportunities within a safe environment for pupils to develop an understanding of, and affiliation with, other living things. The use of the schools grounds features in seven of the examples – three primaries and four secondaries. Such contact has also been shown to have a host of other pedagogical and developmental benefits.[xv]

13 An interesting variation on the use of school grounds is their use in growing food and other plants, or the use of food in learning activities. This approach is specifically mentioned in 11 examples – six primaries and five secondaries. As a pedagogical approach this has applications to developing an understanding of natural cycles and energy use (e.g. through 'food miles') in addition to providing valuable links between learning for sustainability, health promotion, science, geography and other curricular areas. The practical 'hands on' approach has also been shown to be beneficial in increasing motivation for learning.[xvi]

14 Parental or community involvement in learning for sustainability activities is a feature of 15 of the examples, but is far more common in primary schools (11 primaries and four secondaries). Linking activities related to sustainability between the school and pupils' homes not only provides greater relevance for the pupils, but also helps to create improved understanding by the local community of the values and practices related to learning for sustainability promoted by the school.

15 Approaches that are outward looking and inclusive feature in many of the examples. The use of a local to global progression and/or linking with schools in other countries is mentioned in five of the examples – three primaries and two secondaries. Linking beyond the local community to the wider world and the development of a 'local to global' progression provides further opportunities to explore the interconnected nature of the world.

16 The involvement of external experts in learning for sustainability activities, to increase pupils' understanding of 'real world' issues, helps them to develop their questioning skills, enables them to appreciate different perspectives, and encourages them to evaluate the information they are given. This is a feature of eight of the examples, all primary schools.

How learning for sustainability activities are timetabled

Within the curriculum documents of England and Scotland there are specific areas of knowledge relating to sustainability and broader overarching aims regarding the development of values and attitudes such as care, respect and responsibility.

Effective learning for sustainability is an overarching theme that can be integrated across subjects to make a coherent link between different areas of knowledge in ways that also develop skills, values and attitudes. Within the examples there were three practical strategies for how to include learning for sustainability in the timetable, which occurred repeatedly.

1. Setting aside curriculum time for activities that specifically focused on learning for sustainability was an approach used in 11 of the examples. This varied from the use of focus days or weeks to blocks of lessons over a week or term. In the 'block of lessons' examples this was time that had already been identified for personal development activities, or was created by 'pooling' teaching time from two or more subjects. These activities were generally described to pupils as sustainability activities. Setting aside specific curriculum time was almost twice as common in secondary schools as in primary schools (seven secondaries and four primaries).

2. Many of the issues relating to sustainability require an interdisciplinary approach in order for pupils to appreciate the complex nature of the problem. Cross-departmental working or activities that encompassed several classes or years – such as older pupils taking on the role of 'peer mentors' to younger pupils – were used in 14 of the examples. Of these, eight were secondaries and six were primaries.

3. Learning for sustainability activities that incorporated tasks which intentionally developed other curricular areas – mainly maths, science, technology and social studies – were found in 10 of the examples: seven primaries and three secondaries. These activities also incorporate other overarching themes – most commonly citizenship, health, enterprise and creativity.

Other findings

In discussions with the teachers who provided these examples, there was little evidence of evaluation of how effectively the learning for sustainability aspects of these activities had impacted on the values and attitudes of pupils. However, there was evidence of periodic reviews to improve teaching practice.

While we recognise that it is difficult to evaluate effectiveness in terms of impact on values and attitudes, there are examples that could form the basis of evaluative approaches.[xvii] If learning for sustainability practice, and particularly its impact on values and attitudes, is to be strengthened, then it will be necessary to address this lack of evaluation.

Another theme that emerged in discussions with schools was the value that practitioners placed on opportunities to work collaboratively with colleagues to develop new approaches. These opportunities provided genuine participatory approaches to professional development, where teachers know the context in which they work and the barriers they experience, facilitating reflection on their practice and consequently on their pedagogy.

RELATIONSHIP BETWEEN THESE FINDINGS AND OTHER RESEARCH

Impact on standards

A recent report by Ofsted[xviii] evaluated the use of creative approaches to learning and their impact on raising pupils' achievement and personal development. The creative approaches examined in the report encouraged pupils to be questioning, imaginative and open to possibilities, and to reflect critically on the effect of ideas and actions. When a comparison is made between the pedagogical approaches described in this report and those described in the Ofsted creative approaches report, there are substantial similarities.

The key findings of the Ofsted report, with regard to creative learning approaches, were that:

- In schools with good teaching, there is not a conflict between the curriculum, national standards in core subjects and creative approaches to learning.
- Pupils enjoyed the challenge and had a sense of personal achievement, and the confidence they gained encouraged them to develop and present their own ideas with greater imagination and fluency.
- These examples were accompanied by better than average achievement and standards, or a marked upward trend.
- However, these successes were only observed where curriculum planning was sufficiently well-rooted in the content and skills of the curriculum; where teachers' subject knowledge was secure and extensive enough to support pupils' enquiry, independent thinking and debate; and where there was good professional development within the school.

Given the similarities between the creative approaches that form the basis of these findings and the pedagogical approaches described in this report, it is likely that theses finding would apply in both cases.

This assumption is further supported by an earlier Ofsted report, *Improving learning: improving lives*[xix], which found a positive relationship between learning for sustainability and improvements in achievement and attainment.

Internationally there is further evidence, especially from the United States, that compared to more traditional pedagogies used in schools, creative/learning for sustainability approaches to education appear to be more successful in meeting the needs of young people.[xx]

Impact on pupils

There is a growing literature[xxi] which explores children's concerns for the future, making it possible to identify the nature and range of these concerns from early to later years. The environment is consistently present, with a growing awareness of social and environmental issues. Hicks & Holden[xxii] showed that while many children cited environmental issues that they'd heard about on the news or witnessed locally, some also showed a lack of understanding of these issues. They went on to reveal a genuine concern and desire to be better informed and to know what they could do. A desire for practicality and relevance, for pupils to be confident in what they say about issues and to take action themselves, was also reported.

A recent three-year longitudinal study[xxii] found that where pupils were involved in monitoring, recording and reporting the effectiveness of the measures taken to improve sustainability within their school, or involved in planning changes in the school or local community, there were valuable educational outcomes and increased pupil motivation. It was also found that pupils appreciated events and activities that interrupt the routine of the school and extend their experience of learning for sustainability. These were particularly effective if they involved enrichment activities or focused events, such as 'Fair Trade Fortnight'. They were especially motivated if these activities provided an opportunity to work with friends, had an element of challenge, and involved pupils in planning and disseminating the outcomes.

Wider benefits

There is increasing evidence that contact with nature and the natural environment is important for human well-being.[xxiv] In many western societies there is concern about children's reduced outdoor experience. These concerns have led to the recent publication of a national outdoor learning manifesto in England[xxv] and the development of an Outdoor Learning Framework[xxvi] in Scotland, which strongly support the use of the school grounds and local environment for learning experiences.

The findings of this report demonstrate that use of the school grounds and the local environment is a common pedagogical approach in learning for sustainability. Also, research into behaviour change[xxvii] shows that there is a correlation between contact with nature at a young age and greater pro-environmental behaviour and better mental well-being in later life. It is indicated that contact with nature is effective in supporting learning for sustainability, and in fostering pro-environmental behaviour and increased well-being.

CONCLUSIONS

This report has identified a set of pedagogical approaches that are common to schools practising effective learning for sustainability. The pedagogical approaches that are most commonly used are:

- pupil-led research and enquiry aimed at gathering information and 'finding things out'
- use of a wide range of stimulus material, particularly film clips/ DVDs
- creative presentation of research results
- the use of group work, collaboration and peer learning
- the involvement of pupils in meaningful decision-making
- enquiry-based, problem-solving approaches involving critical and systems thinking
- role-play aimed at exploring different perspectives and experiences
- reflective learning
- the use of expressive arts to explore ideas
- taking action to address 'real life' issues based on what has been learned
- organising special events
- outdoor learning, using the school grounds and contact with nature
- growing food and other plants
- parental and community involvement
- a 'local to global' progression and/or school linking
- involving external experts.

Research we reference in this report indicates that there is no conflict between the curriculum, national standards in core subjects and the use of these pedagogical approaches. Conversely, in addition to supporting effective learning for sustainability, these approaches raise standards, increase pupils' enjoyment and motivation, and promote pro-environmental behaviour and well-being.

However, note must be taken that these successes were dependent on planning being sufficiently well-rooted in the content and skills of the curriculum; teachers' subject knowledge being secure and extensive enough to support pupils' enquiry, independent thinking and debate; and there being good professional development to support staff within the school.

It must also be noted that this research found little evidence of evaluation of how effectively the learning for sustainability aspects of these activities impacted on pupils' values and attitudes. It must therefore be concluded that action will be required to address this lack of evaluation.

RECOMMENDATIONS

The following recommendations are made in light of the findings and research we reference in this report.

For the government and its agencies

1 Review national strategies to ensure that there is a requirement for pre-service and in-service teacher education provision to build capacity in the pedagogies identified in this report.

2 Work strategically with external agencies and stakeholders to assess the current support available and ensure that teachers have access to appropriate, high quality advice, guidance and Continuing Professional Development (CPD) in the pedagogical approaches identified in this report.

3 Strategies should include actions to ensure that capacity building is supported by high quality professional development within schools, with particular attention paid to collaborative working between teachers.

4 Provide resources and support to help teachers ensure that during curriculum planning learning for sustainability is sufficiently well-rooted in the content and skills of the curriculum.

For Pre-service Teacher Education Institutions

5 Ensure lecturers and student teachers are adequately equipped and motivated to deliver the pedagogical approaches identified.

For schools and others involved with teachers' CPD

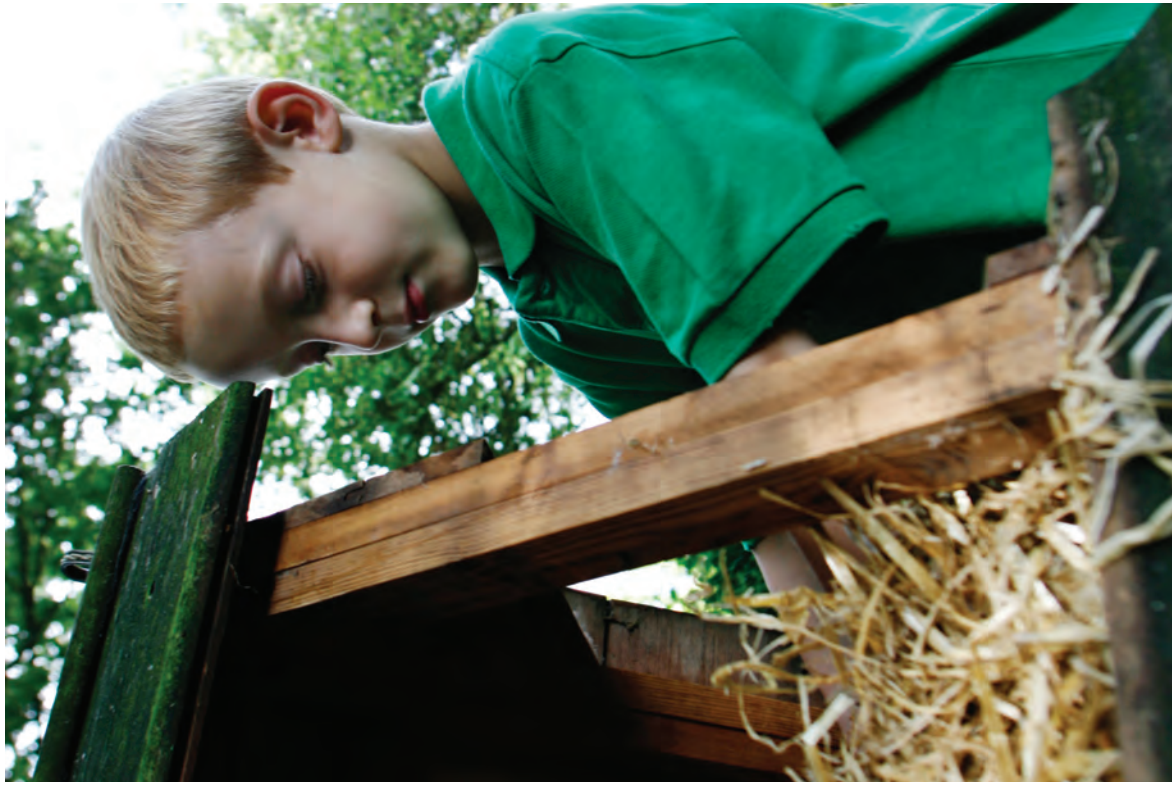
6 Schools should provide training and support to give teachers confidence to use the full range of teaching and learning approaches identified in this report.

7 This training should be supported and encouraged by explicit emphasis from the senior management team so that it is an essential part of the curriculum and the general ethos of the school.

8 Develop programmes of support to ensure that teachers' subject knowledge is secure and extensive enough to support pupils' enquiry, independent thinking and debate around sustainability issues.

9 Ensure that a means of evaluating the impact of activities on pupils' values and attitudes is built into learning and teaching programmes from the beginning so that practitioners are able to assess and evaluate effectiveness, and continually improve their practice.

While this report identifies the pedagogies that are effective in delivering learning for sustainability, further research is needed to identify the most effective ways of building teachers' capacity to use these pedagogical approaches.



APPENDIX I

Examples of learning for sustainability activities

These examples have been grouped in order to provide some organisation. But it soon becomes apparent that many address a number of different areas within the overall concept of sustainability. This is neither surprising nor problematic. It is simply a demonstration of how different schools are helping to make learning for sustainability more coherent for their pupils.

It is simply a demonstration of how different schools are helping to make learning for sustainability more coherent for their pupils

In these examples, the text has been italicised where mention is made of specific pedagogies or approaches.

1. Enrichment days focusing on sustainability

This **secondary school** is in an English rural market town and it has developed *a series of enrichment days* for students in Years 7-10 (pupils aged 11 to 15 years). These take place in October for the Year 7 pupils (aged 11 to 12 years), but the school is experimenting with different times in the year to carry out these activities, depending on the stage that pupils have reached in their education and the types of activities to be undertaken.

As an example, the Year 7 pupils work in tutor groups where they are involved in a task called 'a journey to a better future'. This activity takes two days and the specifications for the task are written by members of the school 'Green Committee' who also act as peer tutors. This is also seen as a launch pad to encourage Year 7 pupils to join this committee. The activity involves a series of workshops, which are linked to the 8 Doorways and biodiversity. For example, pupils in the 'climate change action group' are set the carbon challenge, in which they *look at ways of reducing energy use*. The workshop concerned with waste involves 'junk modelling'. There is another one concerned with fair trade, and this involves a game (see *www.fairtrade.org.uk/work/fun_games* for some examples). Another is *led by older pupils* who have visited the linked school in *Kenya* and here they consider the issues that the differences in lifestyles raise. The music workshop involves creating songs to change the world, and the biodiversity workshop considers *wildlife around the school and the different animals and habitats that occur there*. In yet another workshop, pupils develop model solar cars. There is a *pupil consultation workshop* in which values and

attitudes are explored for the school and themselves in the future. All pupils in the year group experience all of the workshops and each group that attends each workshop produces a presentation booklet.

2. A thinking skills-based course with a sustainability dimension

Located in an urban area in a major city in England the pupils from this **secondary school** come from what can be described as a deprived area. There is a strong link with the Roman Catholic Church. They have run an 'open minds' course in 2008-09 and again in 2009-10. It is part of a *thinking skills* course, which has several functions, helping pupils in Year 7 (ages 11-12 years) to develop the capacity to think more effectively.

There are three themed lessons per half term, with linking-thinking (often referred to as systems thinking) as one of the important underlying principles. The purpose of the course is two-fold with sustainability, including global issues and how these issues impact on the pupils' lives, as the vehicle for the thinking skills. Consequently the pedagogical agenda is a valuable way for pupils to think about some of the important issues of the day. Some of the topics that have been addressed include, 'why do people make bad decisions?'; 'should we buy clothes from major clothing chains that sell very cheap clothes?'; 'why do people who live in Kensington, London SW7 live a lot longer on average than those living in Kensington, Liverpool L7?' (the pupils' local area); 'why do people drive 4x4 cars?'; why are buildings constructed as they are?' (here the pupils consider the construction of their own school, which was built with particular attention to environmental sustainability); 'how are we affected by the media?'

They often begin with the idea that people behave in the way that they do because they do not know any better, and there are also issues related to social mobility, personal aspirations and aspects such as peer approval. Stimulus material is used, for example, in the form of video clips, *different scenarios, statements for pupils to evaluate* etc. Pupils consider the nature of good questions and how to formulate them. Emphasis is on *collaborative learning* in groups, with thinking time planned in, so that individuals at this age do not feel too exposed.

The development of this course is moving towards enabling the more able classes to organise the plenary part to some lessons and thus to further improve the quality of their learning.

3. How did we live 50 years ago compared with now; and what will it be like in 50 years' time?

The Scottish secondary school where this example takes place participated in the Sustainable Secondary Schools Project [SSSP] (see *www.ltscotland.org.uk/publications/s/publicationtcm4509094*). All first year pupils attend the Sustainable Development Education course called 'Tracks through time'. This is *taught as a discrete subject by teachers from a number of different subject discipline backgrounds*.

The broad theme of the course is to consider how people lived about 50 years ago, to compare this with how we live today and to envision what it will be like in 50 years' time if we continue to live as we do now. This helps to place emphasis on the changes that are needed for a more sustainable future.

The course is taught for 70 minutes *once a week for 18 weeks*. An important aspect is learning about and investigating humankind's impact on the environment both then and now. Pupils *work in groups* and towards the end of the course *undertake small research projects*, each focusing on one of the following topics: energy, waste, 'green space', transport and food. They learn about the effects that our current lifestyles have on climate change, biodiversity, health, etc, and the actions that can be taken for a more sustainable future.

A range of methodologies are adopted including direct teaching, various types of *group work* including *investigations* using books and the internet in the school's learning resource centre, making reports either using *PowerPoint or constructing a web page* as well as *group presentations by pupils to the class*. There are other activities such as a *lesson in the school grounds* explaining the habitats that were lost when the school was built and what has been done to replace them in a modest way. The rich biodiversity in woodland and the marsh garden is compared with the limited biodiversity on the playing fields, etc. There is also a brief *drama activity* involving a shopper from 50 years ago meeting a shopper of today and one from 50 years in the future.

Within each, they are expected to consider the broad issues of waste management, climate change, biodiversity, the economic impact and ethical impact

Pupils work *in groups* of six and each follow one of these themes: food and diet, the local environment, leisure, transport, fashion, and school. Within each, they are expected to consider the broad issues of waste management, climate change, biodiversity, the economic impact, and ethical matters within the context of 'respect for others'.

The learning is also put into a practical context by *involving pupils in the actions the school is takin*g to reduce its impact on the environment, such as the wind turbine and solar thermal panels that have been installed. Later in the year data is gathered showing the energy generated and the weather conditions.

4. How can we act more sustainably?

Year 7 pupils (aged 11 to 12 years) in the geography department of this **secondary school** in England carry out this activity at the very beginning of the year, when they first come into the school, where the emphasis is on sustainability for the *first six lessons*. They begin by thinking widely about 'what it is to be a sustainable citizen', starting with what this might be like *locally before moving on to national and then global concerns*. After this they consider how they affect their school on an everyday basis, which includes the sort of simple things that they can do, such as switching off lights and refusing plastic carrier bags.

'What are the two worst things that we do to affect sustainability?'

There is a written assignment, which is *based on the questions* 'what are the two worst things that we do to affect sustainability?' and 'why are these things bad and what are the effects of these actions?' They are also asked to comment on the two *things they can do most easily to help solve the problem*.

The activity then goes on, using stimulus material, to consider the problems resulting from shipping materials to China from other parts of the world for recycling. The processing of these materials frequently produces toxins that can seriously affect the workers and the local environment. *Pupils are challenged to think about how to reduce waste*.

The teaching topic concludes with a 'design a T-shirt activity' where each pupil selects one aspect of sustainability for their design and when completed they *explain to their group the reasons for choosing the design*.

The project had been devised to stimulate and challenge a de-motivated class

5. We've got the whole world in our hands!

In this Scottish **primary school** the class was set the challenge of finding out more about some of the problems caused by humans to the Earth and its life forms. They were then given the task of identifying which organisations exist to help address each problem. In addition they were expected to *organise a conference* entitled 'We've Got the Whole World in Our Hands', which included a panel of invited experts in the style of the television programme Question Time to which they should address their questions. Also, as part of this conference, *each group would produce a display showing the particular aspect of the project that had been their responsibility to research*. Furthermore, each group was required to produce a page for a special environmental *supplement of the school newspaper*. Since the project had been devised to stimulate and challenge a de-motivated class in an effort to drive up presentation skills and pride in their work, all of the display material had to be hand-written.

The issues covered in this project were: global climate change, pollution and marine litter, over-hunting for food or trophies, over-fishing and destructive fishing, habitat loss and invasive species. The knowledge and understanding that the pupils developed related to the causes and effects of these issues and the facts about the wildlife or places affected.

As a result of carrying out this project, pupils were able to source, interpret and evaluate information, to *develop skills in relation to displaying data, extracting information from a variety of sources, such as books, the internet, talks and video material*. They developed a variety of other presentation skills, for example in relation to functional writing, such as *creating fact files and magazine articles* and sending out invitations to potential panel members. All of this required pupils to *collaborate in groups* in order to investigate the various issues and then to organise the information they had found. They also needed to plan the conference, which included who they should invite, the appropriate catering, seating and layout for the event, and the registration and process for welcoming with speeches. An important aspect of the project was that pupils should take individual and collective responsibility for completing tasks within the group or whole class.

6. A course based on the Eco-schools philosophy

In this large Scottish **secondary school** they are developing a wide range of activities related to sustainability, which are integrated into the curriculum. One particular initiative is to introduce the new intake of pupils as soon as possible to the Eco-schools (Scotland) philosophy and practices. This is part of the Personal and Social Education(PSE) programme and is their approach to citizenship. There are *14 groups each taking two weeks in succession to cover this part of the course*. In this way, the whole course extends over most of the year. An important aspect of the course is that *pupils in their final year at the school act as 'peer leaders'* for the younger pupils, which incidentally they are able to count towards their Millennium Volunteer Awards.

This is related to broader concepts, such as the effects on the school's carbon footprint

In the first week of the course, pupils were taught about the general principles of Eco-schools and in the second week they *worked in groups* of three on what was described as 'the paper problem – reduce waste'. This is related to broader concepts, such as the effects on the school's carbon footprint. To reinforce this idea the slogan 'reduce what you produce' is used. Pupils were introduced to the practical problem of the excessive use of paper in the school and *set the task of finding solutions*. To begin, pupils were given boxes of paper that had been written on, drawn on or printed on one side. The question was posed: 'what could this be used for?' Analysis revealed that it had been used in classrooms and the general conclusion was that there is too much being used inefficiently. The decision was then made that paper which had been used on one side should be redistributed round the school. All staff were sent e-mail messages asking whether they require more scrap paper. The response was generally positive and *once the process had been set up it was continued for the year.*

7. Introducing 'green passports'

Green passports were produced by the Eco-Committee of this **first school** (pupils from 5 to 9 years in England). This initiative is based on all the elements of Eco-Schools and was supported by one of the governors and a class teacher. The reasoning behind introducing this to the school was to ensure that all pupils are engaged and involved with environmental issues. On entry to the school each pupil is issued with a passport, *which they keep as they progress through the school*. Each class teacher checks off the completed tasks in the relevant Year column in order to maintain

the record of what they have achieved. Pupils are presented with their completed passports, signed by the head teacher, as they leave the school.

The passports operate on several levels. They ensure that all *pupils are actively involved* and they provide a record of all the environmental experiences pupils have had throughout their time in school. They also make it easier to identify any areas which may not have been covered. To generate funds for the school's eco-budget while spreading the sustainability message, the format is sold to other schools on a CD Rom so they can produce their own customised versions.

8. An Earth Day focusing on climate change

This English **primary school** held an *'Earth Day'* with emphasis on climate change with *an international dimension*. Much of the day was based on the 350 Day of Action initiative, which is aimed internationally at reducing atmospheric concentrations of CO2 to 350 parts per million (ppm) – see *www.350.org*. In preparation for the day, *pupils, with their parents* had been monitoring energy use in their homes. Pupils had also been *finding information from the global links* that were an important part of the scheme. Particular focus was on low-lying countries, such as Bangladesh and island communities in the Pacific, and the effects of climate change. One of the highlights for pupils is that photographs can be taken of the activities involving pupils, and these could be sent electronically and displayed in Times Square, New York.

There was a tree planting session in the school grounds

The first session took place in the school hall where a simulation was given demonstrating what proportion of the air in the room would be CO2 if it was present as 400ppm and then 350ppm. This exercise then involved the *older pupils carrying out calculations using large numbers in order to help understand the concept of parts per million*. The day included *a cookery session, based on local produce*. There was a *tree planting session in the school grounds* with 350 bulbs to show the school colours when they come into flower next spring. The day concluded with pupils in the school grounds standing in formation to make the number 350. One of the parents photographed this from the roof of the school.

9. A 'mantle of the expert' approach to learning

This **primary school** in England has a new building with many eco-features, which is used as a vehicle for promoting the

This is a scheme that helps in the creation of areas around schools and elsewhere that will encourage wildlife

sustainability agenda across the school community. The grounds were developed in 2007-08 with a grant from the BBC Breathing Places initiative. This is a scheme that helps in the creation of areas around schools and elsewhere that will encourage wildlife – see *www.bbc.co.uk/breathingplaces*. This school has used the *'mantle of the expert'* approach (see *www.mantleoftheexpert.com*) on several occasions with its Year 5 and 6 pupils (ages 9 to 11 years) as a way of developing a wide range of skills and abilities.

The 'mantle of the expert' is a *dramatic inquiry-based approach* to teaching and learning that was invented and developed by Professor Dorothy Heathcote in the 1980s. The idea is that for a time the class do all their curriculum work as if they are an imagined group of experts. For example the imaginary roles might be scientists in a laboratory or archaeologists excavating a tomb or a rescue team at the scene of a disaster, or they might be running a removal company. Because they behave 'as if they are experts', *the pupils work from a specific point of view as they explore their learning* and this brings special responsibilities, language needs and social behaviours. The pupils are not putting on a play or running a business. They are expected to imagine themselves as a group of people with specific responsibilities in order to carry out a task, and through these activities and tasks the pupils gradually take on the same kinds of responsibilities and face the problems and challenges of the real situation.

In this example the class (calling itself the 'GreenER Events Company) became a company *organising an event* around the theme of sustainability. The brief was for the company to organise this as an open community event with a deadline at the end of the summer term.

Pupils were given as much autonomy as possible

The pupils, under guidance, *divided themselves into operating groups*, which included public relations, artwork, finance, wildlife, entertainment, documentation and a board of directors. The pupils discussed their strengths and skills. A particular focus throughout was on interpersonal skills, group roles and the way that groups interacted. *Pupils were given as much autonomy as possible* to plan the project, with regular feedback and discussion involving the board of directors, the class teacher and, where *appropriate, outside experts* – for example the local wildlife trust. The budget was monitored by the finance group using spreadsheets and a project plan. All expenditure had to be sanctioned by the directors

and authorised by the finance group. By arrangement, pupils had access to the telephone, photocopying, email and the post; all of which were charged to the school and came from the second phase of their 'BBC Breathing Places' grant.

An *open afternoon was subsequently held* by the 'GreenER Events Company'. Activities included *art workshops* from recycled materials, demonstrations of an electric tricycle, sustainability surveys, guided tours of the school and grounds, sustainability information points on these tours and information displays in the school, gardening club demonstrations, *refreshments using locally-grown product*s, outdoor games and many more. Posters and advertisements for the event were translated into the languages most commonly used in the local community and printed on recycled materials.

The topics selected for the activity are different from year to year. For example in 2007 it was 'energy'; in 2008, global poverty; and 2009, climate change

10. An Eco-Day for a whole year group

This is an activity for Year 9 pupils (13-14 years) in this English **secondary school** in a market town. The day is timed to engage pupils when, from the school's experience, they often lose their engagement with the sustainability agenda. The topics selected for the activity are different from year to year. For example in 2007 it was 'energy'; in 2008, global poverty; and 2009, climate change. The emphasis is on a *cross-curricular approach, which includes subject areas in the curriculum that are normally difficult to combine with learning for sustainability.*

The activity starts by setting the scene highlighting the human contribution to the problems. The film *The Age of Stupid (www.ageofstupid.net) has been found to provide an excellent stimulus* for this part of the day, which is then followed by *group discussion* and then 15 workshops. One workshop *group prepares lunch using food from the school's own vegetable garden*. The afternoon includes a second set of workshop activities, where some workshops usually have outcomes that extend beyond the day.

Typical activities include 'making music from junk', making biofuel, making 'sustainable plastic', creating environmentally-friendly cosmetics and toiletries, working with sustainable wood, writing environmental poetry, 'footsteps to Copenhagen', tools for self-reliance, gardening and composting, the effects of climate change on the National Park local to the school, and a drama activity based on what it might be like in 2055.

Pupils have continued throughout the year to begin to implement the improvements, and these are part of the school's continuing action plan

11. Improving the school grounds

This was part of the *weekly outdoor* education lessons of one class in this rural **primary school** in England. The outdoor education lessons are carefully planned by the outdoor education team. There are three part-time assistants with responsibility for this area of the curriculum. They plan and carry out lessons for all of the classes in the school, working together with the class teachers so that lessons relate to the work each class is doing at the time.

Here, pupils in this particular class were challenged to *think of ways in which they could improve the school grounds*. They *worked on this in five groups* or teams, each focusing on a different aspect of the grounds. Their task was to consider what was going well and where they could make improvements. A further task was that the pupils had to think of *ways of including the whole school in this project*. This project presented a number of different problems for the pupils. These included the financial cost of improvements, issues of safety, and trying to address the diverse interests and wishes of the whole school.

Initially the teams needed to find out what was happening in the grounds in their present state. This involved all the pupils in the school being questioned about ways in which they used the grounds. Each team then had to analyse what was happening in their area of focus and decide what was working well and what could be improved. The pupils constructed maps of their area to help them identify and locate what was happening. They *then put forward plans for improvement*. The decision about including the rest of the school was that there should be a display in the main school hall. In this way each team displayed their findings and presented their ideas for improvements. During this session, questions were asked and Post-it notes were provided to give everyone in the school the opportunity to respond with their own ideas. These were collected and analysed, and decisions were made about how to proceed.

The *pupils have continued throughout the year to begin to implement the improvements, and these are part of the school's continuing action plan*.

12. A curriculum/campus/community approach

This **secondary school** in a market town in England is fully aware of the campus/curriculum/community model of sustainable school development. It has focused in the initial stage on the development of a curriculum approach. It intends to provide an entitlement curriculum for Key Stage 3 pupils (aged 11 to 14 years), which is called 'Citizenship for sustainability'.

Materials have been written for the school's own use and a network of 12 other secondary schools

It is based on the 8 Doorways identified in the Sustainable Schools initiative of 2006, and involves a *three-year curriculum project for pupils in Years 7 to 9*, focusing on five of the doorways (travel and traffic, food and drink, purchasing and waste, energy and water, the buildings and grounds). Materials have been written for the school's own use and a network of 12 other secondary schools, four of which are already using elements of the programme. Year 7 pupils are taught by non-specialist staff on a whole class basis, and assessment strategies are being piloted for the citizenship dimension of the course. The programme is being rolled out for Year 8 pupils during this school year.

The 'entitlement' curriculum approach has been completed by *various small campus-based projects* and the learning outcomes recorded. This has involved pupils in *hedge planting*, to 'soften' the school boundary between their immediate neighbours, as well as spring bulb and tree planting around the school. An unexpected outcome has been that *herbs are used in food technology lessons and in the school kitchen*.

Together with the school site staff, *pupils have undertaken an energy audit of the school, which has resulted in improvements to the school fabric to reduce energy waste and streamline waste management*. This is linked to an information campaign across the school. The various activities are not restricted to a core group of motivated pupils, thus allowing *wide-ranging discussions and exchanges of ideas between all pupils*. The school is now planning to extend, beyond the school gates, the changes that it is developing to improve sustainability – *into activities within the local community*. The school acknowledges that addressing the curriculum aspects of these initiatives has not been easy, but the process has necessitated discussion of many issues across the school. This has created a situation where there is more confidence to tackle further practical projects. The pupils enjoy this because they can see tangible results.

13. Designing an eco-friendly village hall

The small English village in which this **primary school** is situated was planning to build a new village hall. The committee involved approached the ESD coordinator of the school making it clear that they intended the *pupils to be involved in the plans* and that they wanted the pupils' ideas about making it eco-friendly.

The 8 Doorways provided a useful framework for considering different aspects of the sustainability issues. They began by thinking about the type of energy the hall could use and where it would come from, and what would be the best way to supply and conserve the water – which in this case involved the installation of water butts and the use of grey water where appropriate. Considerations of transport and the implications for local traffic came into focus when it was decided that it would be important to use local materials for the construction. Aspects of purchasing and waste reduction were a significant issue throughout the design stages, which included using newspaper for insulation and recycled materials wherever possible, such as in the construction of work surfaces.

Since the village hall will be adjacent to the local playing field and the school it was considered important to ensure that the overall design should reflect the variety of functions required in the village and should enhance the lives of everyone living there.

Pupil participation was an essential aspect of the project, involving the whole class

Pupil participation was an essential aspect of the project, involving the whole class with pupils actively researching different aspects to make the building as eco-friendly as possible. Pupils worked in teams, each considering a particular aspect of the building, such as energy, materials, insulation, water, lighting and heating. They were expected to work collaboratively to discuss what they knew about their area, what they needed to find out and how to present their findings.

People with different types of expertise came into the school to provide assistance

People with different types of expertise came into the school to provide assistance and an important part of the process was that pupils were encouraged to formulate the questions that needed to be addressed. Knowledge gained from the project on 'climate change' that the pupils had carried out during the previous year provided the basis for a number of the issues that were addressed here. Other problems that were likely to arise were considered, including the cost of the enterprise and the likely opposition that might confront them from local villagers regarding their design

ideas. All of this was *discussed within the class* and then when the designs produced by the pupils were displayed at the launch of the village hall project *they made a presentation to those in attendance.*

This was a one-off project that had not been planned far in advance. The school thought it important to take advantage of situations of this type as they arise as they also provided an opportunity for pupils to be involved in their local community.

It is an important aspect of this long-running project that as many pupils as possible are involved in the process of growing and selling the produce

14. Vegetables and other plants grown at the school for sale at the local farmers' market

Pupils in this relatively small **secondary school** in a semi-urban area in England *use their allotment and other areas within the school grounds to grow a wide variety of plants.* The pupils have helped to construct and maintain a poly tunnel and to develop effective ways of ensuring that the plants are supplied with sufficient water throughout the year. The plants are prepared for sale by the pupils at the local farmers' market once a month. It is an important aspect of this long-running project that *as many pupils as possible are involved in the process of growing and selling the produce.* The particular learnings that take place relate to our dependence on plants as a source of food, and the benefits of locally-grown food that has been grown as organically as possible using sound sustainable production methods. Pupils are able to follow the full cycle of growing plants from seeds or seedlings, taking cuttings and dealing with potentials pests, as well as preparing and maintaining the soil. Issues such as the consequences of importing food products and the public demand for products out of season are also part of the agenda for this project.

The farmers' market has proved to be a valuable context for pupils to develop the skills of planning what to grow, when to harvest, how to present and market their produce, keeping in mind the financial returns, and *ensuring good relations with customers and other stall-holders in their local community.*

15. Focus on growing your own food and its implications

This Scottish **primary school** has placed emphasis on *garden work as an important introduction to sustainability for younger pupils.* All of them are involved in the whole cycle of growing produce, harvesting, preparing and eating what they have grown.

Composting is an important activity to support this aspect of the life of the school. Some of their produce is also taken home. The activity gives the opportunity for the school to teach cooking skills as well as getting pupils to understand the seasonal nature of growing plants, and how to do this sustainably. From this, pupils also understand what can be grown in their own locality and what needs to be imported. They can monitor this within their own school, which naturally leads on to consideration of the environmental impact of 'food miles' and the beginning of the development of concepts around the notion of a 'carbon footprint'.

[One activity is] increasing the opportunities for young children to have contact with and understand better those in the wider community

One of the activities that has arisen from pupils growing food plants is that they *produce 'harvest boxes' that are taken to elderly neighbours*. Thus increasing the opportunities for young children to *have contact with and understand better those in the wider community*. They also have their school garden open as a 'heart and flowers' garden as part of the Scottish Highland Heart Charity.

The school has a number of committees that relate to their eco-action plan, of which 'the school nutrition action group' is one. This deals with matters related to food as well as the canteen. Pupils act as the chair and secretary and the group meets every two weeks. There are also *parent representatives and a teacher*.

16. A science topic related to sustainability with a mixed class of pupils

This topic was planned to cover the aspects of electricity that are required knowledge at the end of KS2 (for **primary school** pupils of 10 to 11 years in a small village in England). They have also adapted their plans to cover aspects of sustainability, focusing on the environmental impact of generating electricity using fossil fuels. This includes global climate change, the use of renewable energy sources, energy use *in school and home*, and the actions that can be adopted to reduce the problems. They also introduce a *global dimension*, which involves considering the CO2 output from different countries.

Although the starting point for much of this related to factual information about electricity generation and the mechanism of global warming, the topic also involved *collecting information about energy use in the pupils' homes* and in the school. From this, they had to draw conclusions about ways in which consumption might be reduced. Pupils were *encouraged to discuss these issues*

with their parents and to consider what might be put into practice. Ideas about different types of energy generation, including both renewable and non-renewable sources, were stimulated by the use of visual materials showing different types of energy generation. *Pupils collaborated* in pairs to discuss and compare their ideas about the advantages and disadvantages of different types of energy generation and to formulate the questions about energy use and suggest possible answers.

When considering the data on world CO2 emissions they discussed explanations for the reasons why rich countries have higher emissions than poor countries and then went on to think about the responsibility of rich countries for global climate change. A particular emphasis throughout was on making connections between what we do as individuals and a community and how that affects other people and other parts of the world. This leads into *making suggestions for the positive actions that they can take and where possible putting them into practice*, often with reference to the school's eco-committee.

Pupils are given a wide range of materials and the opportunity to research and discuss the reasons for the need to identify new types of fuel

17. Design and technology with a sustainability focus

There is a design and technology project for Year 6 (pupils of 10 to 11 years) in this **primary school** in England. The challenge is to design and make a vehicle for the future. For this, pupils are given a wide range of materials and the o*pportunity to research and discuss the reasons* for the need to identify new types of fuel. This naturally leads to consideration of some of the important environmental issues related to travel and transport. To assist with the project, *a local research engineer has visited the pupils* to discuss his work related to new types of fuel for motorised engines. The outcome of this project was that pupils produced a diverse range of product designs.

18. A practical approach to energy, food waste and data handling

In this inner city primary school in England with a large non-European first-generation immigrant local community, they have been running what they call their 'power down campaign'. This has entailed every class viewing the *Action Aid 'Power Down' DVD* (see *www.powerdown-actionaid.org.uk*) and discussing the connections between energy use and climate change.

The school has also launched the school's 'Power Rangers', who are pupils in Year 5 (ages 9 to 10 years). These *pupils work in groups* on a rota monitoring energy use at lunch times in every classroom. Points are awarded for classrooms where the lights are not left on or appliances on standby. They also check that the window blinds are raised to maximise natural light. The points are recorded on charts in the reception area of the school for pupils and their parents to see them. All of the teachers in the school have used the 'jointhepod' website, which gives the wattage of individual appliances and the running costs over different periods of time (see *www.jointhepod.org*).

Pupils have used the interactive games from this website as an aid to their understanding

Pupils have used the interactive games from this website as an aid to their understanding. Here the school is attempting to *emphasise to pupils and their parents* the links between energy waste, financial costs and climate change. This is followed up in the school newsletter with hints to parents on saving energy.

At the same time the school is carrying out a campaign to reduce the amount of food waste, since this is a significant problem at lunch times. Each year group has a separate bin in the dining hall, and the waste in each has been weighed and the amount recorded daily. *As part of their maths class work* the Year 5 pupils have undertaken a large data handling exercise on the information that has been gained. This has been linked to school assemblies encouraging less food waste. The data collected shows that there has been consistent reduction in the amount of food wasted.

19. Sustainable use of energy in the school

The focus in this suburban English primary school is on sustainable energy. This permeates the whole school, including the governors. It involves measuring and monitoring energy use in the school. Targets are set each week and three pupils in Year 7 (ages 10 to 11 years) are identified as the 'energy monitors' for the year. Part of their role is to report to the school at the *Friday morning assembly*.

The school is fortunate to have the use of the sophisticated technology provided by the 'ecoDriver' (see *www.ecodriver.co.uk*), supplied by a local manufacturing company. The software systems monitor electricity use automatically and relay this to a display unit in the school; thus providing continuous information about electricity use in the school. As a result, prompt action can be taken

to reduce unnecessary consumption and prompt feedback can be given on the success of the various actions taken. Consequently, energy use becomes a matter of daily concern for pupils and staff. The school is extending initiatives to address energy use and a biogas boiler has been installed.

All pupils from KS2 onwards (ages 7 to 11 years) receive lessons on energy and data handling and analysis

All pupils from KS2 onwards (ages 7 to 11 years) receive lessons on energy and data handling and analysis. KS1 pupils (age 5 to 7 years) are introduced to aspects of energy to gain a general awareness. Such as where the main uses of energy take place in the school and at home, and why energy is used in this way. Pupils progress to consider what can be done about the problems that arise from energy consumption and some of the ideas that could be developed within an ideal school.

In a practical way this has also resulted in the installation of photo voltaic cells and the use of solar tubes in corridors. *Pupils and their parents share in this by implementing ideas at home where possible.* This work is *integrated particularly into the maths, science and ICT curriculum.*

20. A large energy programme in a secondary school

The citizenship lessons in this suburban **secondary school** in England are part of the much wider Climate Change Schools Project (see *www.slcne.org.uk/climatechange*). This is an initiative set up by a large consortium of organisations, some national and some regional. It is aimed at Key Stages 2 and 3 (pupils of between 7 to 11 primary and 11 to 14 years secondary). Support for the climate change teaching and professional development for teachers is offered through the project. This is a ground-breaking initiative that could be a model for other regions around the country to follow.

There is a range of interactive modules which also focus on the use of technology to develop a clear understanding of the issues

This is a lead school in the programme and three members of staff have helped develop the teaching modules. The programme is very comprehensive and covers the scientific aspects of climate change, its mitigation and possible ways of adapting for the future; in other words 'how to take positive action'. *There is a range of interactive modules which also focus on the use of technology to develop a clear understanding of the issues.* There are also schemes of work in science, geography and design and technology that link directly to renewable energy and the use of the school's renewable energy resources, including a hydrogen fuel cell.

The overall aim of the Climate Change Lead Schools is to become a self-sustaining network of pioneering schools that will help to collaboratively build climate change understanding and positive action from the grass roots of schools and to encourage *positive action in their local communities*. More specifically, the Climate Change Schools Project aims to develop a quality-assessed, curriculum-linked 'standardised package' of climate change resources, enhancement activities and professional development opportunities for teachers that are equally accessible for schools, starting with local authorities in the north-east of England.

[This approach involves] understanding something of the processes involved in generating our energy needs as well as the environmental impact

21. Another approach to the topic of energy

In this **primary school** the topic 'energy and water' is a *6-7 week topic for science*. It involves understanding something of the processes involved in generating our energy needs as well as the environmental impact that occurs as a result. Pupils consider the energy bills for the school and *suggest practical ways in which savings can be made*. Reports are then made back to the school.

The 'energy police' monitor energy use in the classrooms and throughout the school. An *eco-newspaper is produced* as part of the school's enterprise initiative and pupils also take photographs with accompanying information, which are set out on display boards in the school. Pupils use their information, ideas and enthusiasm gained from this topic to *tell their parents and encourage more sustainable use of energy in their homes*. At present, attempts are being made to seek funding for a wind turbine and much further into the future it is hoped that 'sun pipes' can be installed in the darker areas of the school.

22. Utilising renewable energy

This project, in a Scottish **primary school**, was started as part of a scheme to improve the school grounds without increasing the carbon footprint. The pupils were interested in renewable energy sources and from this they decided that a water feature powered by a wind turbine was a good idea. *Various experts were invited for consultation with the pupils*, including the Energy Officer for the region and representatives from Balnamoon Renewables (a company specialising in wind energy) and Rowanbank Environmental Workshop Specialists.

The pupils researched ideas and a plan was devised for a wind turbine of moderate size to offset the cost of the school's electricity

and possibly feed into the National Grid from time to time. This led to discussions about the aesthetic impact of the project locally and the possible reactions of the surrounding community. There then followed an enquiry about the feasibility of the project with the local planning office. Unfortunately it was then clear that nothing on the scale planned would be permitted, but a scaled-down version could be possible. The problem was discussed and the project modified to a smaller 12-volt model. However, since now this would not deliver sufficient power for the original scheme it was decided that it must still serve a useful function. They decided that it should be used in a recycled waste water feature for the school's sensory garden.

£500 [was contributed] to the school for a Scottish Teaching Award for Active Citizenship

There followed consultation with Highlands and Islands Enterprise and Marlec Ltd (another company specialising in renewable energy). These involved positive meetings with the pupil council and it was decided that a pack from Marlec Ltd, which included all of the materials needed, should be obtained. The purchase of this was secured from various outside sources including contributions from the Highlands and Islands Community Energy Company, AMEC, £500 prize money to the school for a Scottish Teaching Award for Active Citizenship, and a *second hand book sale* arranged by the pupils as part of a project to review and upgrade the school library.

They *then engaged a local artist and sculptor to work in residence* for a month with the pupils' ideas, to translate them into a design based on motifs of 'the world and hands'. The resulting 'Global Handprint' fountain symbolised reaching out in friendship across the world and helping to protect it. Each person in the school, including pupils and staff, created a mosaic handprint to adorn the structure so that when the water flows across the facets of the decoration it *reflects the global partnerships between the school and Pakistan, Ireland, France and Poland*. The final stage of the project was that *pupils invited families, friends, ex-pupils and local dignitaries to the grand opening* during National Enterprise Week in November 2009. Pupils also arranged a press release and posters to support the event.

Throughout the project the enthusiasm, concern and creativity shown by the pupils has encouraged the adults within the school to seek ways to facilitate further developments – for a project that *grew from a simple idea in a class lesson to something in which the whole school was involved.*

23. Using waste materials

The basis of this activity for each pupil in a **primary school** class in Scotland was to design and make a hat from materials gathered from home that would otherwise be treated as waste. The underlying purpose was to encourage awareness in the children of the nature of recycling, and that materials no longer of use for their original purpose can be used in a wide variety of alternative ways.

Pupils went on to audit their waste from home and used a number of techniques to present their findings

The activity consequently helped to emphasise that the 'take away' and 'throwaway' society is unsustainable. Pupils went on to *audit their waste from home and used a number of techniques to present their findings, including making graphs using ICT and even simple PowerPoint presentations*. In groups they went on to consider how waste can be reduced at home and to design and implement a waste reduction programme for their homes.

24. Applying the use of waste to art and textiles

During *art and textiles classes* at this English **secondary school**, pupils make garments out of what might otherwise have been thought of as waste materials. In this way pupils are encouraged to recycle conventional dress materials as well as less-conventional materials such as crisp packets and carrier bags. The aim is to recognise that a wide range of waste materials can be re-used in creative ways rather than thrown away.

While *sustainability is integrated across many topics and subjects, departments work independently to include it in their schemes of work*. There are also *'alternative curriculum days'* where an entire year group focuses on a topic related to sustainability. And during the year there was a *'sustainability week'* during which each subject area planned and taught a themed lesson around the general heading of sustainability.

Each pupil made a wooden nest box and assisted the local orchard manager to site the boxes in the orchard

25. A design and technology project – making nest boxes

This small rural village **primary school** in England set up a project in which each pupil *made a wooden nest box and assisted the local orchard manager to site the boxes* in the orchard. Pupils then monitored the use of the nest boxes over the breeding season. In this project, pupils developed practical skills, such as carefully following written instructions and using tools. The main sustainability focus was on local biodiversity and the *actions that might be taken to bring about improvements*. An important aspect of the project was that *pupils needed to discuss their ideas with the*

orchard manager. From this they learned about the competing claims of fruit production and biodiversity, and therefore a wider understanding of the complexity of a diverse, yet managed, ecosystem.

Although the initial idea for the project came from the teacher and the process of making the boxes was adult-led, *pupils were involved in the ongoing monitoring of the nest boxes*. This has led them into discussions about why certain nest box designs and locations might be used and others rejected and how the habitats offered by the orchard might encourage or discourage nesting birds. There were also broader issues that could be explored, regarding the bird population and how they relate to the rest of the ecosystem.

26. Biodiversity using the school grounds

This primary school is very involved in the Eco-schools Scotland initiative and it is a case study in itself. Teachers and learning support staff are active and match aspects of sustainability and biodiversity with what they are doing in class at the time. In other words, it is integrated into the whole life of the school. For example, biodiversity is a whole school topic and involves a 'moth week', a 'big bird watch' (where colour cameras linked to monitors inside the school have been used with bird boxes to allow pupils to see at first-hand chicks hatching and parental care of the young), minibeasts, planters for growing vegetables in season, etc. The wildlife areas of the school are extensive, with a pond and woodland walks. The school's wildlife rangers are assisted by a local company in their activities.

To make their experiences more 'real' they took part in an overnight camp where they harvested their crops and prepared and cooked several dishes

27. History with a sustainability dimension

Pupils in Year 5 (ages 9 to 10 years) in this English suburban **primary school** had been studying *Beowulf*, the Old English heroic poem set in the Anglo-Saxon times between the 5th and 7th centuries. As part of their project on *Beowulf the pupils researched aspects of the lives of people who lived at the time*, with particular emphasis on how they survived by living off the land; in other words, sustainably. In order to experience aspects of this at first hand *they planted the sorts of root crops that would have been grown in Anglo-Saxon times*. To make their experiences more 'real' they *took part in an overnight camp where they harvested their crops and prepared and cooked several dishes that might have been popular at the time*, such as peas pottage, cabbage and

bacon soup, as well as making bread in a newly-constructed bread oven. To complete the experience they undertook several traditional crafts such as weaving and chain making.

28. Local community history

This relates to work with Year 8 pupils (ages 12-13 years) in a **secondary school** in the north of England that has developed this approach over two years, mainly through the history department. An important aspect of the activity is that it relates to the local ex-mining community, which, in the past, has played a very significant role in the region.

This takes place each year from Easter until June/July for about 8-9 weeks through the school's local cultural unit and *it is part of the regular timetable in humanities for 2-3 hours per week*. Throughout, there is an emphasis on social change and what it has meant to the people living there.

The pupils, together with the ex-miners, develop typical miners' gardens and grow what they used to grow

The *ex-miners who take part* are normally between 50-70 years old and they come into the school where the focus initially is on what things were like before the mines were closed in the 1960s and 1970s. The *pupils, together with the ex-miners, develop typical miners' gardens and grow* what they used to grow; mainly vegetables in all sorts of containers that are readily to hand. *This is done in an area of garden within the farm unit of the school. They even go into ex-miners' homes and explore what they were like 40-50 years ago. Other older people from the community also come into the school and bring artefacts as well as their stories* and from all of this the pupils create a record of how things were for these people and their families. Throughout the course, *pupils create displays in the schoo*l of pictures, written material and artefacts for others to see and appreciate.

29. A global issue with a fair trade dimension in geography

This unit, in a large urban **secondary school** in England, relates to development – with lessons and an assessment focusing on fair trade. Pupils are required to learn about more economically-developed countries and less economically-developed countries and the trade patterns between them – including the export of primary goods, dependency, and the nature and importance of higher-value goods. From this they are able to identify the inequalities in the system.

Pupils experience a *lesson given on the 'typical life' of a cocoa farmer in Ghana*. It is made clear that living conditions are difficult in relation to basic requirements such as food, clothing and education on the wages of the farmer, let alone the sorts of luxuries the pupils in the school normally take for granted. From this, pupils are encouraged to compare their lives with the cocoa farmer, suggesting both positive and negative aspects.

In a subsequent lesson, pupils consider 'the banana chain', which is concerned with the different people involved in the production and trade of bananas, and the financial returns at each stage. They are helped to understand the working conditions at the bottom of the chain and the relative wealth of those at the top, and again identify the problems and inequalities. A further lesson addresses the concept of fair trade and the origins and purpose of the Fairtrade Foundation as a champion of producers such as the cocoa farmers and banana producers.

The final taught part of the course takes the form of an interview in which the pupils act out a role-play

The final taught part of the course *takes the form of an interview in which the pupils act out a role-play* involving a Nicaraguan coffee producer who is now selling his produce as a fair trade commodity. Here pupils are able to identify the ways that individuals and whole communities can benefit. The unit concludes with an individual assessment exercise entitled 'What is fair trade?' in which pupils create a booklet about fair trade and answer specific questions on the topic.

30. Focus on Asia

This half-term topic at an English **primary school** is concerned with the 'global perspective doorway'. It focused on Asia, and part of the purpose was to develop some basic geographical skills such as locating and naming countries from maps and a globe. One of the important resources was Oxfam's 'Wake up the world' pack (see *www.oxfam.org.uk* Resources for children), which focuses on the life of a boy in India. Initially, pupils compared their own homes, type of food, the school and the sorts of games they play with those of the Indian boy. The study moved on to consider the availability of water in the two countries and normal methods of transport and the impact that these have on lifestyles.

The pupils in the school are predominantly white but one of the pupils has a family from India and his father had taken his son on a trip to the homeland, making a video at the same time. He was

Parents felt they had something interesting and of value to contribute and could now appreciate that the school is a friendly and welcoming place

able to talk to the class about his experiences. This *was followed up with visits to the school from the mother and father.* They *brought in a range of artefacts*, including clothes. For pupils of this age in the school the issue of dealing with difference and possible stereotyping is considered an important objective. Also, the integration of people, such as the parents, who may feel themselves somewhat alienated from the school, was important. One of the outcomes of this particular initiative was that the parents felt they had something interesting and of value to contribute and could now appreciate that the school is a friendly and welcoming place.

This experience was followed up by *looking at the sort of food that is typically eaten in India* and which is now found in many shops in this country. Children from this school had very limited opportunities in the past to experience these types of foods – such as okra and mangos. There was also discussion about the implications of obtaining these more exotic foods in this country. And the notion of 'food miles' and their environmental impact was introduced.

31. Fair trade day

This is otherwise considered to be a *Citizenship Day* for a whole year group in this **secondary school** in an English market town. In the context of sustainability, this is part of 'the global dimension'. The purpose is to introduce pupils to the concept and importance of fair trade.

Typical activities for the day include an *introductory film or presentation*. This is followed by a session on inequality, which involves a practical demonstration for the whole year group. For example, this can be graphically represented by a typical English breakfast, which is divided into different portions to represent what would normally be expected in countries such as the UK, the USA, Nigeria and so on.

Pupils are then interviewed as part of a plenary and then asked to *discuss their thoughts and feelings on the matter.* Games are used from the Fairtrade Foundation (see *www.fairtrade.org.uk/work/fun_games*). One of these involves a *trading simulation* which is a powerful way to continue the theme. This is followed by opportunities for *small group internet research*. The day also includes *cooking with fair trade ingredients* and devising questionnaires to use with staff and pupils in other year groups.

There is a fair trade fashion show and pupils usually set up a *fair trade cafe for the whole school.*

Presentations were made so that the following two days could be spent by pupils from the different groups simulating 'visiting the other countries'

32. A global education week

The *Global education week* is an annual event in this urban **primary school** in England. The focus is on diversity, and *the whole school is involved in planning activitie*s that are linked to agreed objectives. *A cross-curricular approach is adopted* and during the most recent event the *pupils were organised as vertical age groups*, so there was a good mix of older and younger pupils in each group. Each group *was given a different country to research*. Since this is a fairly multicultural school, as far as possible the countries chosen were related to the to the various pupils' backgrounds. Pupils spent two days researching each country's heritage, music, art, food, etc. After this, *presentations were made so that the following two days could be spent by pupils from the different groups simulating 'visiting the other countries'*. Each pupil was given a 'passport' and instructed to ask questions and make notes and drawings as they 'visited other countries'. Staff training included raising awareness about misconceptions that might arise in relation to difference and possible stereotyping.

APPENDIX II

Analysis of the learning for sustainability examples

In the case studies in Appendix I, where mention is made of specific pedagogies or approaches the text has been highlighted in italics. Here, the case studies have been analysed by extracting the italicised text and grouping together similar pedagogies or approaches. Nineteen broad groups were identified and these are listed below.

- Setting aside curriculum time for activities specifically focused on learning for sustainability.
- Cross-departmental working or activities that encompassed several classes or years.
- Sustainability activities which incorporated tasks that intentionally developed other curricular areas.
- Taking responsibility for researching different aspects of a topic.
- Using a wide range of stimulus material.
- Presenting research findings and other information to either the rest of the class or a wider audience, using creative approaches.
- Group work and using collaborative tasks and peer learning.
- Encouraging meaningful participation in decision-making about school life, and involving pupils in community-based decisions.
- Enquiry-based, problem-solving approaches.
- Using role-playing to develop understanding of different perspectives and experiences of sustainability issues.
- Using the creative arts.
- Using reflective learning – encouraging pupils to examine and question their thoughts, feelings and actions in the light of what they've learned.
- Exploring the different ways in which pupils can take action individually or collectively to address sustainability issues in practical ways.
- Organising special projects or events related to sustainability.
- Using the school grounds.
- Growing food and other plants.
- Involving parents or the community in learning for sustainability activities.
- Using a local-to-global progression, or using school links.
- Inviting external experts to the school.

Some of the text appears in more than one group. For example, older pupils acting as peer mentors for younger pupils appears under both 'Cross-departmental working or activities that encompassed several classes or years and Group work and using collaborative tasks and peer learning'.

Setting aside curriculum time for activities specifically focused on learning for sustainability

Text italicised in case study	**Case Study No**	**S** = Secondary **P** = Primary
series of enrichment days/thinking skills course	1	S
once a week for 18 weeks	3	S
emphasis is on sustainability for the first six lessons	4	S
14 groups each taking two weeks in succession to cover this part of the course	6	S
Earth Day	8	P
a 6-7 week topic for science	21	P
'alternative curriculum days', sustainability week	24	S
'moth week', a 'big bird watch'	26	P
This takes place each year from Easter until June/July for about 8-9 weeks	28	S
a Citizenship Day	31	S
Global education week	32	P

Cross-departmental working or activities that encompassed several classes or years

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
peer tutors, led by older pupils	1	S
taught as a discrete subject by teachers from a number of different subject discipline backgrounds	3	S
worked in groups, pupils in their final year at the school act as 'peer leaders'	6	S
which they keep as they progress through the school	7	P
older pupils carrying out calculations using large numbers	8	P
a cross-curricular approach, which includes subject areas in the curriculum that are normally difficult to combine with learning for sustainability	10	S
ways of including the whole school in this project	11	P
a three-year curriculum project for pupils in Years 7 to 9	12	S
as many pupils as possible are involved in the process of growing and selling the produce	14	S
All pupils from KS2 onwards (ages 7 to 11 years) receive lessons on energy and data handling and analysis	19	P
schemes of work in science, geography and design and technology	20	S
grew from a simple idea in a class lesson to something in which the whole school was involved	22	P
pupils usually set up a fair trade cafe for the whole school	31	S
The whole school is involved with planning activities. A cross-curricular approach is adopted	32	P

Sustainability activities which incorporated tasks that intentionally developed other curricular areas

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
art workshops	9	P
design and technology project	17	P
As part of their maths class work	18	P
All pupils from KS2 onwards (ages 7 to 11 years) receive lessons on energy and data handling and analysis; integrated particularly into the maths, science and ICT curriculum	19	P
There is a range of interactive modules which also focus on the use of technology to develop a clear understanding of the issues	20	S
a 6-7 week topic for science	21	P
sustainability is integrated across many topics and subjects, departments work independently to include it in their schemes of work	24	S
match aspects of sustainability and biodiversity with what they are doing in class at the time	26	P
pupils researched aspects of the lives of people who lived at the time	27	P
it is part of the regular timetable in humanities for 2-3 hours per week	28	S

Taking responsibility for researching different aspects of a topic

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
undertake small research projects	3	S
the particular aspect of the project that had been their responsibility to research	5	P
pupils actively researching different aspects	13	P
opportunity to research and discuss the reasons	17	P
small group internet research	31	S
Each group was given a different country to research	32	P

Using a wide range of stimulus material

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
video clips, different scenarios, statements for pupils to evaluate	2	S
using stimulus material	4	S
extracting information from a variety of sources, such as books, the internet, talks and video material	5	P
The film The Age of Stupid (*www.ageofstupid.net*) has been found to provide an excellent stimulus	10	S
every class viewing the Action Aid 'Power Down' DVD	18	P
Other older people from the community also come into the school and bring artefacts as well as their stories	28	S
brought in a range of artefacts	30	P
introductory film or presentation	31	S

Presenting research findings and other information to either the rest of the class or a wider audience, using creative approaches

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
group presentations by pupils to the class; using PowerPoint or constructing a web page	3	S
explain to their group the reasons for choosing the design	4	S
each group would produce a display; supplement of the school newspaper; develop skills in relation to displaying data; creating fact files and magazine articles	5	P
each team displayed their findings and presented their ideas for improvements.	11	P
made a presentation to those in attendance	13	P
report to the school at the Friday morning assembly	19	P

Reports are then made back to the school; an eco-newspaper is produced	21	P
used a number of techniques to present their findings, including making graphs using ICT and even simple PowerPoint presentations	23	P
pupils create displays in the school	28	S
presentations were made so that the following two days could be spent by pupils from the different groups simulating 'visiting the other countries'	32	P

Group work and using collaborative tasks and peer learning

Text italicised in case study	**Case Study No**	**S** = Secondary **P** = Primary
peer tutors, led by older pupils	1	S
collaborative learning	2	S
work in groups	3	S
collaborate in groups	5	P
worked in groups, pupils in their final year at the school act as 'peer leaders'	6	S
divided themselves into operating groups	9	P
group discussion	10	S
worked on this in five groups	11	P
various small campus-based projects, wide-ranging discussions and exchange of ideas between all pupils	12	S
Pupils worked in teams, work collaboratively	13	P
Pupils collaborated	16	P
pupils work in groups	18	P
small group internet research	31	S
pupils were organised as vertical age groups	32	P

Encouraging meaningful participation in decision-making about school life, and involving pupils in community-based decisions

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
pupil consultation	1	S
involving pupils in the actions the school is taking	3	S
pupils are actively involved	7	P
Pupils were given as much autonomy as possible	9	P
pupils have continued throughout the year to begin to implement the improvements and these are part of the school's continuing action plan	11	P
pupils to be involved in the plans	13	P

Enquiry-based, problem-solving approaches

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
consider the nature of good questions	2	S
based on the questions	4	S
set the task of finding solutions	6	S
challenged to think of ways in which they could improve the school grounds	11	P

Using role-playing to develop understanding of different perspectives and experiences of sustainability issues

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
drama activity	3	S
'Mantle of the expert' dramatic inquiry-based approach, pupils work from a specific point of view as they explore their learning	9	P
a lesson given on the 'typical life' of a cocoa farmer in Ghana takes the form of an interview in which the pupils act out a role-play	29	S
a trading simulation	31	S

Using the creative arts

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
junk modelling, music workshop	1	S
art workshops	9	P
A local artist and sculptor was then engaged to work in residence	22	P
art and textiles class	24	S

Using reflective learning – encouraging pupils to examine and question their thoughts, feelings and actions in the light of what they've learned

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
asked to discuss their thoughts and feelings on the matter	31	S

Exploring the different ways in which pupils can take action individually or collectively to address sustainability issues in practical ways

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
look at ways of reducing energy use	1	S
involving pupils in the actions the school is taking	3	S
Pupils are challenged to think about how to reduce waste, things they can do most easily to help solve the problem	4	S
put forward plans for improvement, pupils have continued throughout the year to begin to implement the improvements and these are part of the school's continuing action plan	11	P
pupils have undertaken an energy audit of the school, which has resulted in improvements to the school fabric	12	S
making suggestions for the positive actions that they can take and where possible putting them into practice	16	P

suggest practical ways in which savings can be made	21	P
design and implement a waste reduction programme for their homes	23	P
actions that might be taken to bring about improvements	25	P

Organising special projects or events related to sustainability

Text italicised in case study	**Case Study No**	**S** = Secondary **P** = Primary
organise a conference	5	P
organising an event	9	P
pupils invited families, friends, ex-pupils and local dignitaries to the grand opening	22	P
fair trade fashion show	31	S

Using the school grounds

Text italicised in case study	**Case Study No**	**S** = Secondary **P** = Primary
wildlife around the school and the different animals and habitats that occur there	1	S
lesson in the school grounds	3	S
tree planting session in the school grounds	8	P
weekly outdoor education lessons	11	P
hedge planting, spring bulb and tree planting around the school	12	S
use their allotment and other areas within the school grounds to grow a wide variety of plants	14	S
wildlife areas of the school are extensive, with a pond and woodland walks	26	P

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
tree planting session in the school grounds, a cookery session, based on local produce	8	P
refreshments using locally-grown products	9	P
group prepares lunch using food from the school's own vegetable garden	10	S
hedge planting, spring bulb and tree planting around the school	12	S
herbs are used in food technology lessons and in the school kitchen	12	S
use their allotment and other areas within the school grounds to grow a wide variety of plants	14	S
garden work as an important introduction to sustainability for younger pupils, eating what they have grown	15	P
planters for growing vegetables in season	26	P
they planted the sorts of root crops that would have been grown in Anglo-Saxon times	27	P
pupils together with the ex-miners develop typical miners' gardens and grow what they used to grow	28	S
looking at the sort of food that is typically eaten in India	30	P
cooking with fair trade ingredients	31	S

Involving parents or the community in learning for sustainability activities

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
pupils, with their parents	8	P
planning to extend into activities within the local community	12	S
provided an opportunity for pupils to be involved in their local community	13	P
ensuring good relations with customers and other stall-holders in their local community	14	S
produce 'harvest boxes' that are taken to elderly neighbours, have contact with and understand better those in the wider community	15	P
collecting information about energy use in the pupils' homes, encouraged to discuss these issues with their parents	16	P
emphasise to pupils and their parents	18	P
pupils and their parents share in this by implementing ideas at home where possible	19	P
encourage positive action in their local communities	20	S
tell their parents and encourage more sustainable use of energy in their homes	21	P
pupils invited families, friends, ex-pupils and local dignitaries to the grand opening	22	P
audit their waste from home	23	P
assisted by a local company in their activities	26	P
Other older people from the community also come into the school and bring artefacts as well as their stories	28	S
followed up with visits to the school from the mother and father	30	P

Using a local-to-global progression, or using school links

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
linked school in Kenya	1	S
locally before moving on to national and then global concerns	4	S
an international dimension, finding information from the global links	8	P
global dimension	16	P
reflects the global partnerships between the school and Pakistan, Ireland, France and Poland	22	P

Inviting external experts to the school

Text italicised in case study	Case Study No	**S** = Secondary **P** = Primary
invited experts	5	P
appropriate outside experts	9	P
People with different types of expertise came into the school	13	P
a local research engineer has visited the pupils	17	P
Various experts were invited for consultation with the pupils	22	P
A local artist and sculptor was then engaged to work in residence	22	P
assisted the local orchard manager	25	P
assisted by a local company in their activities	26	P

APPENDIX III

A demonstration of how different schools are helping to make learning for sustainability more coherent for their pupils.

Questions asked of participating schools

I would like to know how 'sustainability' features in your taught curriculum. I'm focusing on learning and teaching that involves activities undertaken by teachers and pupils in order to acquire knowledge and to build skills and encourage the development of attitudes. My primary concern is the learning activities that take place in your teaching, or those of colleagues, as part of what might be described as classroom teaching or associated with day to day teaching. However, I would also like to know about out of classroom activities, such as projects, focus weeks, end of term performances, community involvement and perhaps others that you can think of.

[NB For the purposes of this questionnaire I am not including activities such as school councils or eco-clubs, which may include voluntary activities or ones where only a few pupils may be involved.]

I'd be grateful if you could answer the questions below. Please answer each one separately and e-mail your responses to me, if possible.

Question 1 I am looking for examples of activities that are undertaken in your school. Please confine yourself at most to only one or two activities. In primary schools these are likely to be across subject discipline areas, whereas in secondary schools these may be related to a subject specialism or may be part of the PSHE/Citizenship programme or whole school or whole year activity.

Question 2 To what extent is learning for sustainability, as suggested by the 8 Doorways and biodiversity [to English schools]/the 9 Themes of the Eco Schools Programme [to Scottish schools], integrated into the planned taught curriculum in your school? Is it a) in a particular topic, b) across several topics, or c) integrated across many topics? If you wish to expand on your answer, please do so below.

Question 3 Which of the following best describes the situation regarding the taught curriculum for sustainability in your school? Is it a) there is a whole-school approach to the planning of learning for sustainability, b) it is up to individual departments or small teams, or c) it is up to individuals?

Question 4 To what extent is the teaching in your planned taught curriculum used to inform or develop other activities within the school, such as assemblies, out of school activities, special events, etc? Is it a) never, b) occasionally, or c) often? If it is b or c, please give some very brief examples.

Question 5 Please let me know briefly what attitudes to sustainability you are trying to encourage in your pupils.

Question 6 I am also interested to know whether there has been any evaluation of the teaching on sustainability in your school. If so, what form has it taken?

Name of school.....

Name of respondent.....

APPENDIX IV

Schools that participated in this research

We would like to thank all of the following schools for their time and assistance in providing the examples of practice used in this study

Alphington Primary School, Exeter

Argyle Primary School, Camden, London

Ashley Church of England Primary School, Walton-on-Thames, Surrey

Bishop Challoner Catholic Collegiate School, Tower Hamlets, London

Bishop Stopford School, Kettering, Northants

Bowbridge Primary School, Newark, Nottinghamshire

Bydales Secondary School, Redcar & Cleveland

Crispin School, Street, Somerset

Cults Primary School, Cults, Aberdeen

Currie Community High School, Edinburgh

Echline Primary School, South Queensferry, Edinburgh

Fyndoune Community College, Sacriston, Durham

Glebe School, West Wickham, Kent

Glebelands School, Cranleigh, Surrey

Inverary Primary School, Inverary, Argyll

Inverkeithing High School, Inverkeithing

Meare Village Primary School, Meare, Nr Glastonbury, Somerset

Moorside Community Primary School, Halifax

Nunnery Wood High School, Worcester

Raigmore Primary School, Inverness

Redhill Church of England Primary School, Worcester

Ringwood School, Hampshire

St Nicholas Church of England Middle School, Nr Pershore, Worcestershire

St Thomas Roman Catholic Primary School, Keith, Moray

The Academy of St Francis of Assisi, Liverpool

Southwood Primary School, Milton Keynes, Buckinghamshire

Staunton-on-Wye Endowed Primary School, Hereford

Sytchampton Endowed First School, Worcester

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For Scotland see www.scotland.gov.uk/Topics/Environment/SustainableDevelopment

iii SDE Network, *www.sdenetwork.org/index.php?option=com_content&view=article&id=56&Itemid=59*

iv SDE Network, *www.sdenetwork.org/index.php?option=com_content&view=article&id=56&Itemid=59*

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vi See the Sustainable Development Commission for a summary of current sustainability policy across the UK. *www.sd-commission.org.uk/*

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viii Pathways: A development framework for school sustainability. *http://assets.wwf.org.uk/downloads/pathways.pdf*

ix Schools' Global Footprint Resource. www.ltscotland.org.uk/schoolsglobalfootprint

x The 8 Doorways: Food and drink; Energy and water; Travel and traffic; Purchasing and waste; Buildings and grounds, Inclusion and participation; Local well-being; Global citizenship.
See *www.teachernet.gov.uk/sustainableschools*

xi The 9 Themes: Litter; Energy; Health and well-being; Transport; Waste minimisation; Biodiversity; School grounds; Water; Sustaining our world. See www.ecoschoolsscotland.org

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32

32 examples of current teaching practice from schools in England and Scotland

19

19 pedagogical approaches which support effective learning for sustainability, raise attainment and increase pupil motivation and enjoyment

LINKS MADE

Links made to other recent education research on standards, pupils and wider benefits

9

9 recommendations made for teacher education, professional development and education policy

Why we are here
To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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