Educational Resource Pack

Project Managed by:

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Introduction

In order to implement the YEP! Project in your school a number of sustainable energy educational resources from across our European partnership have been reviewed to provide a full catalogue of high quality material that can be used with students in this age group. Each region has chosen from this selection the resources that support their locally developed programme of work for the students.

As the programme of student work is progressively planned in stages educational resources have been identified that fulfil the criteria of the stages of work. As a result each resource is allocated a code that corresponds to the criteria as follows:

Code	Criteria
1i	Materials for pupils that inform about the issues and potential solutions for energy issues addressing behavioural measures and alternative technologies. They emphasise the practical applications of sustainable energy skills to the real life contexts of home and work; raise awareness about related political, social and environmental factors and the implications for individuals.
1ii	Materials for pupils that provide a method for surveying the energy situation of schools and workplaces; identifying areas of good practice, areas for improvement, suggesting targets for reduced consumption and identifying related costs and carbon emissions.
1iii	Materials for pupils that; provide a framework for follow up actions to improve energy efficiency in schools and workplaces, provide a means of monitoring progress towards reduction targets and suggest measures to enable improvements.
2i	Materials for teachers and workplaces that inform about the aims of the project
2ii	Provide a planning framework
2iii	Demonstrate the links to their curriculum/ business
2iv	Inform and support the project delivery
2v	Develop skills for delivering energy education

This resource pack gives the detail of these resources and guidelines for their use with students. More information about the types of resources available, including the inventory of tools from across the European Partnership is available on the project website (www.youngenergypeople.com).

1. Certificate in Sustainable Energy Skills for Life and Work

Code: 1i

Introduction – The use of this resource will give students the opportunity to gain a nationally recognised qualification. The qualification aims to provide candidates with a foundational knowledge about sustainable energy in order to provide them with a general understanding of the associated issues, a greater understanding of the need and benefits of sustainable energy use and an awareness of some opportunities within this field.

Aim: The qualification is divided into three units to help candidates achieve the learning outcomes as follows:

- **Unit 1 – Current Issues in Sustainable Energy**
  Candidates will be able to:
  - Describe the sources and uses of energy
  - Explain the global issues that relate to energy consumption
  - Describe the potential solutions proposed to global energy issues

- **Unit 2 – Energy for Individuals and the Community**
  Candidates will be able to:
  - Assess the information about energy consumption
  - Identify sustainable energy related choices
  - Explain the relevance of sustainable energy and its benefits

- **Unit 3 - Opportunities in Sustainable Energy**
  Candidates will be able to:
  - Identify the variety of jobs available
  - Describe sustainable energy support networks available to customers and traders
  - Identify energy issues and how they relate to small businesses

Material: Full resources pack supplied by SWEA, training can also be delivered by SWEA

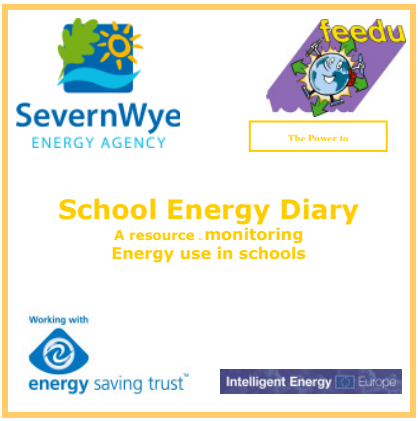
Procedure: In the case of using this course with school students it is advised that course content is discussed with teachers to decide how much additional instruction would be needed for students to obtain the qualification and how this can be structured into school time. The standard delivery is 15 hours that includes 3 short assessments, it is expected that the students in this project will require considerably less.

Guidelines for Teachers: The course was designed as a basic introduction for adult learners and as such gives a general overview for the context of energy sustainability and the value it has for individuals in their homes and at work. It assumes no prior knowledge and the tutor guide is structured to assess the starting point of individuals taking the course and for instruction to fill the knowledge gaps. The units introduce basic scientific concepts behind the source of our energy and the factors of climate change, as well as understanding how thermal properties of buildings can be improved by insulation and other efficiency measures. The links to school Science, Geography and Citizenship curricula are strong.

Details: Course developed and managed by SWEA through affiliation with City and Guilds and National Open College Network. Certification costs would need to be met for each candidate.

2. School Energy Diary CD-Rom

Code: 1ii



Introduction – The energy diary was developed to make the monitoring of energy consumption as accessible as possible. Students need only enter meter readings in order to obtain accurate consumption, cost and carbon emission data. To facilitate the analysis and sharing of the data throughout the school the spreadsheet was designed to automatically generate graphs for printing and display. When the Energy Diaries were piloted one teacher commented that she found the Energy Diary particularly useful for teaching spreadsheets as it showed pupils an external, real-world use for the theory they were learning.

Aim: To illustrate how consumption patterns vary and the positive impact that improving energy behaviour patterns can have on consumption, cost and emissions.

Material:

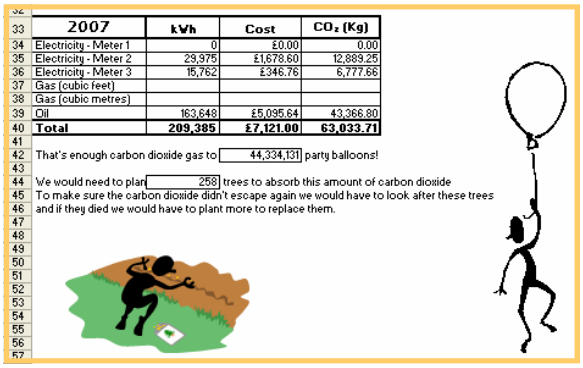
Included on the CD-Rom:

- School Energy Diary
- User's Guide
- A Quick Guide to Reading Meters
- Recording sheet (to record meter readings)
- School Energy Policy
- Supporting Information for School Energy Diary
- Example of completed School Energy Diary

Procedure: The CD is very easy to use with most of the instructions on screen, there is some initial setting up to do in terms of setting the spreadsheet to the correct unit rate as charged by your suppliers, but following this the spreadsheet can be used independently. All that is needed is for the SEMT to collect or receive accurate meter readings and enter them into the sheet. Overtime this will build a pattern of consumption and graphs can be printed and displayed in central areas to help maintain the momentum of energy efficiency campaigns in the school.

Guidelines for Teachers: Only a very basic understanding of spreadsheets needed. It can be interesting to explore the calculations behind the spreadsheet and these are supplied in the supporting information.

Details: Freely available from SWEA



2007	kWh	Cost	CO_2 (Kg)
Electricity - Meter 1	0	£0.00	0.00
Electricity - Meter 2	29,975	£1,678.60	12,889.25
Electricity - Meter 3	15,762	£346.76	6,777.66
Gas (cubic feet)			
Gas (cubic metres)			
Oil	163,648	£5,095.64	43,366.80
Total	**209,385**	**£7,121.00**	**63,033.71**

That's enough carbon dioxide gas to 44,334,131 party balloons!

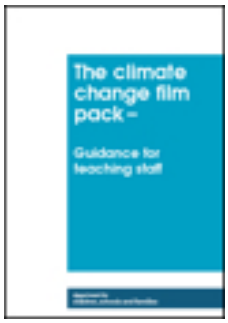
We would need to plan 258 trees to absorb this amount of carbon dioxide
To make sure the carbon dioxide didn't escape again we would have to look after these trees and if they died we would have to plant more to replace them.

The spreadsheet allows comparison to a baseline year to illustrate the effectiveness of the energy efficiency programme.

3. The Climate Change Film Pack

Code: 2v

Introduction – This is produced by the DCFS and uses the Al Gore file 'An Inconvenient Truth' as a basis for tackling the facts and individual responsibilities with regard to climate change. The pack links the content to existing programmes of study in Science, Geography and Citizenship.



Aim: To illustrate the facts and individual responsibilities in relation to climate change.

Material: DVD 'An Inconvenient Truth'; The Climate Change Film Pack

Procedure: It is recommended to use this resource to aid the teaching of your usual programme of study, if a current topic has a link to this subject.

Guidelines for Teachers: The pack is organised by key stages and topics are linked to the programmes of study with its own comprehensive set of teaching guidelines. Some areas of particular relevance are highlighted below:

Science
Combustion of fossil fuels and production of Carbon Dioxide
Energy Transfer by radiation

Geography
Old habits and New Technology (p.43 – 45)
What will the impact of climate change be on *our* place?(p.51)

Citizenship
The discussion ideas in this section will be particularly useful in preparing the pupils for the planned debate at Shire Hall.

Details: Downloadable from:
http://www.teachernet.gov.uk/sustainableschools/upload/CC%20Final%20guidance%204oct.pdf

4. Design Quality Analyser

Code: 1ii

Introduction – Principally aimed at students for key stages 3 and 4 and the teaching of Construction and the Built environment syllabus, Geography, Citizenship, Design Technology and Art and Design. This is a quick and easy on line activity that introduces students to the bigger picture of building design to illustrate how efficiency and sustainability are one of many issues in design and that a balanced and practical approach must be taken.

Aim: To understand the limitations and realities of putting sustainability into practice; to understand the relationship between building design and user needs.

Material: Internet

Procedure: The analyser asks students to respond to statements in reference to a particular building (e.g. your school) and to consider its functionality, quality and impact. From the student responses feedback is generated which becomes the basis of discussion about what is good design and where the opportunities for improvements can be made. There is also an opportunity for a virtual tour of Charter House School to use as an example of how building features are incorporated for best functionality, design and impact.

(The three aspects of good design *from http://www.whichplaceswork.org.uk/dqa/default.aspx*)

Guidelines for Teachers: If students are asked to give their own opinion of the quality of the school building and what they think could be done to improve it prior to analysis, the feedback can provide an informed basis for discussion. Having analysed the school building the feedback can be used as part of the process for evaluating the student ideas and their practicalities. When considering the school building students could be asked to consider it from varying perspectives of the users, students, teaching staff, visitors, others to illustrate the number of different needs that need consideration in design.

Details: Freely available at: http://www.whichplaceswork.org.uk/dqa/default.aspx

5. Site Visits and How Places Work

Code: 1ii

Introduction – A site visit to an example of a sustainable building or a renewable generation site is a good way to illustrate the possibilities to students. There are many local examples in Gloucestershire including automated wood chip boiler at The Wilderness education centre who are happy to tailor visits for schools to their requirements. Schools interested in site visits may also be interested in signing up to 'How Places Work'. This scheme puts schools in contact with local expert, volunteers who can give guided tours of sites and is coordinated by CABE (Commission for Architecture and the Built Environment).

Aim: To demonstrate the applications of sustainability and renewable energy.

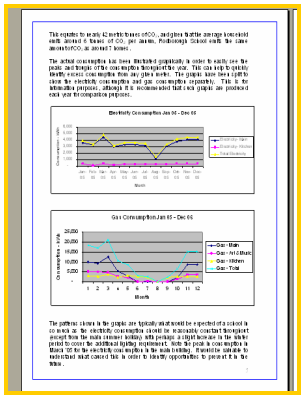
Procedure: As with all student site visits it is useful to brief students beforehand for the things they will be viewing and to have some follow up work planned. Support for this will either be given through CABE , SWEA , The Wilderness Centre or the site selected by the school.

Details: www.**wildernesscentre**.co.uk/
http://www.cabe.org.uk/default.aspx?contentitemid=398&aspectid=13&ssl=23.3

6. Student Survey and Action Pack

Code: 1ii

Introduction – The energy survey of the school will be conducted by all members of the School Energy Management Team. SWEA has developed the student survey pack which provides step by step guidance covering each aspect of conducting an energy survey and how to assess the findings of the survey so as to enable production of an energy report.



Aim: To give students an in depth understanding of the building and its use in relation to energy consumption; to inform the action towards improved energy efficiency through the setting of targets for reduced consumption and action planning.

Material: A report template will be provided by SWEA together with task sheets for each section of the report and reference material that will enable students to complete each of the tasks and develop the completed report with recommendations and an action plan.

Procedure: The delivery of this aspect of the project will be planned in consultation with SWEA and each school. The main decisions that need to be made relate to how much of the school will be surveyed, and the size of the groups undertaking the tasks. This will vary for each section of the report as each task sheet will require different time allocations. In the first instance, energy data needs to be collected and analysed. On completion of this, tasks should be allocated to groups of students providing them with an overview of requirements (what information to collect, and how to interpret findings). One session should be spent giving an outline of the process, a further session surveying the agreed area of the school, and a final session collating the findings, completing the survey and identifying the main recommendations and action points. A separate meeting will be arranged for the group leaders to present the findings of the survey to the head teacher at which point the action plan will be agreed and signed off by senior management for implementation by the SEMT.

Guidelines for Teachers: It will be beneficial for students to be able to identify different energy sources and which energy type is used to power different pieces of equipment. Students should also be able to understand the impact of using energy in terms of CO_2 and furthermore, the different amounts of CO_2 in a unit of energy (so as to understand environmental impact). Some understanding of the cost of energy would also be useful, although not imperative. The two main areas for consideration when conducting energy surveys are to understand if the pieces of equipment being used are; a) the most efficient for the job and, b) being used in the most efficient way as this is where the most opportunities for energy savings will lay.

Details: From SWEA

7. YEP! Project Information Packs

Code: 2i, 2ii, 2iii, 2iv

Introduction – SWEA are producing a supporting pack for the delivery of this project by teachers and workplaces. Each part is delivered with the project stages outlining the practical aspects and supporting materials for use with the students.

Aim: The objective is to give a comprehensive guide to the project in the five schools

Material: None

Procedure: The information pacts are designed for use by staff to help them plan the work into their school context.

Guidelines for Teachers: The packs contain information about the project and other participants, the guide programme of activity for the phases of school implementation and this resources pack. To be produced later in the project action will be parts giving more detail about the work placement approach and a report of the project and its evaluation.

Details: Delivered by SWEA in time for the introduction of each new project phase.