

Energy Efficiency Webquest for KS2 ©

Teacher's section

INTRODUCTION

So many decisions in our daily lives rely on an inexhaustible energy supply, however we increasingly face the issues of wasteful energy use. Scientists are reaching a consensus that humans are responsible for increased carbon dioxide emissions that are causing global warming and climate change. Everyone needs to take a personal responsibility to reduce their 'global footprint', i.e. be aware of the impact our decisions about the energy used to supply our lifestyles. This Webquest is an introduction to energy efficiency that can be followed up with class work supported by staff at the West Wales Eco Centre.

It would be useful if this Webquest were done after an introductory session on climate change to the whole class. To extend understanding of energy generation and efficiency this Webquest should follow electricity work completed in Science and would go some way in addressing the over reaching topics of sustainability and global citizenship. By doing this Webquest pupils are developing their higher order thinking skills.

National Curriculum references for the energy efficiency webquest:

Scientific enquiry - nature of science 1.1, 1.2

Scientific enquiry - communication in science 2.1, 2.3, 2.5, 2.6

ICT - Communicating and handling information 1.1, 1.2, 1.3, 1.4

Geography - Theme 3.1, 3.2, 3.3, 3.4, 3.5

Common requirements: communication, IT, problem solving, PSE (community, moral, environmental aspects) skills

PROCESS

Pupils will

?? research ways in which energy can be used more efficiently in school, by using the resources and the skills identified.

?? identify specific cost savings

Follow up, after the introductory session

?? implement these efficiency measures

?? monitor their effectiveness

?? present their findings to the school community.

The organisation of teams could be structured as follows but this is just a guideline as it depends on computer access and skill level.

?? Teams - maximum of 2 (given the space restrictions in Pembroke College's IT bus)

?? Each team to address a specific task and identify how the school can save money on energy bills by being more efficient in the following areas:

- heating in the school
- heat loss (including, insulation and draught proofing)
- lighting in the school
- electrical appliances

Question for all

1. What is a kilowatt? [define:kilowatt](#)

Heating

http://www.energychest.net/energy_in_buildings/index.html

<http://www.think-energy.com/ThinkEnergy/7-11/activities/Great-escape.aspx>

http://www.foe.co.uk/living/poundsavers/save_energy.html

<http://www.est.org.uk/myhome/climatechange/stats/homeenergy/>

Lighting

http://www.energychest.net/energy_in_buildings/index.html

<http://www.pluggingintothesun.org.uk/interact.htm>

<http://www.est.org.uk/myhome/climatechange/stats/homeenergy/>

<http://www.newtownabbey.gov.uk/sustain/energy.htm>

Appliances

http://www.energychest.net/energy_in_buildings/index.html

<http://www.est.org.uk/myhome/efficientproducts/energylabel/>

<http://www.fujitsu-siemens.co.uk/> click on The Big Turn off

http://www.nationwide.co.uk/energy/energy_efficient_appliances.asp

Insulation and draught proofing

http://www.energychest.net/energy_in_buildings/index.html

<http://www.diynot.com/pages/in/in013.php>

<http://www.south-ayrshire.gov.uk/energyagency/householders.htm>

<http://www.est.org.uk/myhome/climatechange/stats/homeenergy/>

Games

[http://www.think-energy.com/ThinkEnergy/7-](http://www.think-energy.com/ThinkEnergy/7-11/activities/Energyword.aspx)

[11/activities/Energyword.aspx](http://www.think-energy.com/ThinkEnergy/7-11/activities/Energyword.aspx)

<http://www.think-energy.com/ThinkEnergy/7-11/activities/Energy-challenge.aspx>

<http://news.bbc.co.uk/1/hi/sci/tech/3915245.stm>

Top tips

<http://www.think-energy.com/ThinkEnergy/Top-Tips/Default.aspx>

<https://www.energyefficiency.powergen.co.uk/advicecentre/category4/AttoGAppliances.htm>

<http://www.ukrocketman.com/digital/locostefficiency.shtml>

[http://www.ecotricity.co.uk/about/EnergyPopups/popup_insulation\(new\).html](http://www.ecotricity.co.uk/about/EnergyPopups/popup_insulation(new).html)

<http://www.est.org.uk/myhome/whatcan/10pointchecklist/>

<http://www.durham.gov.uk/durhamcc/usp.nsf/pws/Sust+comms+-+Become+More+Energy+Efficient>

Skills, TV ads

<http://www.deni.gov.uk/schools/energy/sample.htm>

<http://www.est.org.uk/myhome/whatcan/tv/>

RESOURCES

?? Computer access – class & / or suite

?? PowerPoint presentation – climate change

?? Check websites to ensure they still exist

?? Labels from appliances

?? Leaflets on energy efficiency

Websites for background information:

<http://www.defra.gov.uk/environment/climatechange/schools/7-11/info/index.htm>

http://www.wwf.org.uk/core/wildlife/fs_0000000014.asp

http://www.create.org.uk/schools/teachers_default.asp sustainable energy use

<http://www.think-energy.com/> British Gas education site

<http://www.e4s.org.uk/> environmental teaching resources

<http://www.est.org.uk/> useful information (including renewables)

http://www.wwf.org.uk/core/wildlife/fs_0000000014.asp climate change information

<http://www.cse.org.uk/cgi-bin/projects.cgi?education&&1003> very comprehensive

<http://www.school4energy.net> European sustainable energy education forum

http://www.bbc.co.uk/northernireland/oyb/family_life/energy_efficiency.shtml

<http://www.ase.org/section/audience/educators/> US site

Children's sites

Climate change

<http://www.coolkidsforacoolclimate.com/>

<http://www.defra.gov.uk/environment/climatechange/schools/7-11/index.htm>

Books

Tower to the Sun – Colin Thompson

Captain ECO and the fate of the earth – J. Porritt & E. Nadler

Eyewitness Science Energy

Think Energy – British Gas

Power Pals – British Gas

Global warming info and activity pack – DETR, 2000

Organisations for information, leaflets and posters:

?? West Wales ECO Centre 01239 820 235

?? CREATE 01942 322271

?? Centre for Sustainable Energy - 0117 929 9950

?? Centre for Alternative Technology

?? Electrical appliance suppliers - labelling of appliances

+ optional fieldwork visit to electrical appliance retailers to research energy efficient appliances

EVALUATION

Pupils individual and group work will be evaluated in various subjects:

Language – reading, writing, speaking and listening

Maths – using and applying maths, data handling

Science – physical processes

ICT – communicating and handling information

Geography – sustainability in local area

PSE – environmental, social, economic aspects

CONCLUSION

Climate change is happening and the consequences of such rapid climate change are extremely serious for future life on the Earth. This Webquest will give pupils the opportunity to engage with this issue directly and take specific action to reduce carbon dioxide emissions. With their new found knowledge and understanding they can appreciate their role in society and can influence people who make choices about how energy is used.

PUPIL'S SECTION

You are going to research ways in which energy can be used more efficiently, by using the World Wide Web - to identify specific cost savings. Following this introductory session you need to implement these measures and then monitor their effectiveness.

The World Wide Web is bursting with information – some of which is very biased or even untrue. You need to be a detective and find information you trust enough to repeat (you could look for people's ideas that back each other up, also, avoid accepting the first thing you find). You need to present your ideas and plans in a suitable format to the rest of the school community (pupils, teachers, governors and parents).

THE QUEST

You will identify how your school can use energy more efficiently. By accepting this quest you will be able to use money saved for other items the school needs.

The tasks are to:

1. research a specific topic / area in the school (see below)
2. prepare information (poster, leaflet, web page, slide show, spreadsheet.... your choice needs to be a collaborative decision to communicate your findings effectively to the whole school community)
3. collaborate with your team to ensure you all pass on relevant messages

You will be split into action groups to research and act on findings in the following areas:

- Heating in the school
- Heat loss (including insulation and draught proofing)
- Light in the school
- Electrical appliances (TV, VCR, DVD, CD, computer, etc)

THE PROCESS

By splitting into action groups you will focus on one issue relating to energy in your school. By developing the collaborative project all your work will be brought together – joining up all the learning.

EVALUATION

You will be evaluated individually on the area assigned to you and collectively on the quality of the information on the work produced.