

Problem based learning - The climate change challenge

Introduction

In this problem based learning activity students will work in groups to understand and evaluate the action being taken locally or regionally in response to the threat of climate change.

The activity - Guidance on how to organise each stage of the students' work

The process involves **6 stages** over **2/3** lessons.

Stage 1 Question writing - in groups,

In this stage you have to analyse the problem. Start by identifying the key questions that you will need to answer before you can make up your minds on the issues and formulate clear recommendations. Try to reach agreement in the group on a set of questions. At the end of this stage, discuss your questions with your teacher.

As in the other activities of this kind, your role will be to support the groups' work encouraging debate, checking that they have considered the different aspects of the problem and asking them about their plans for the research. Make sure that everyone in the group is involved and that they are keeping a record of the discussion. Since this is a substantial and complex task with many dimensions you will have to help groups to share out the research work to be done.

Here are some of the questions that your students may suggest that they need to investigate

Local impacts of climate change

- *What can we find out about the predictions that scientists have made about the impacts of climate change where we live?*
- *How might the predicted changes affect the people who live and work in our region?*

Policy on climate change

- *What advice is being given to councils about what they should be doing in response to climate change?*
- *What do the experts think should be being done in response to the issue of climate change?*
- *Does our local authority have a strategy for dealing with climate changes?*

How Science Works

Gf To make an informed decision about the management of a given risk, we need to take account both of the probability of the event occurring, and the seriousness of the consequences if it did. This is particularly difficult in the case of events of very low probability, but with very serious consequences if they occur.

Hb Decision makers aim to make evidence based decisions, taking into account factors that include: technical feasibility, benefits expected, economic cost, risks to human health and wellbeing, risks to the environment. Cost-benefit analysis is the process of estimating the size of the costs and the value of the benefits as a way of determining the best policy option. A cost-benefit analysis should consider which individuals or groups receive the benefits, and which suffer (or pay) the costs.

Hd Some decisions about science and technology may need to comply with national and international agreements, legislation and agreed principles such as sustainable development.

He In practice much of the evidence available to decision makers is often uncertain. It is not possible to make accurate predictions about the future. The system may be too complex; some issues may not yet be well understood.

Hf Decision makers are influenced by the mass media, by special interest groups and by public opinion as well as by expert evidence. Decisions about science and technology may be influenced by decision makers' prior beliefs or vested interests, which can affect their interpretation and evaluation of the evidence.

- *Are they focussing on mitigation, reducing climate change, or on adaptation, ways of minimising the impacts of inevitable climate change?*
- *What can we deduce about local attitudes to climate change from what is being reported in the media?*

Implementation

- *What actions, if any, has our local council already taken to deal with the challenges?*
- *Is there any evidence of the different parts of the council (eg housing, transport and so on) working together to respond to the issues?*
- *What are the costs of responding to climate change and where is the money going to come from?*

Evaluation

- *What criteria should we use to decide whether or not what our council is doing is adequate?*
- *Can we compare our council with other local authorities in the UK or elsewhere?*

Stage 2 Finding resources - in groups

Plan how you will research answers to your questions and share out the questions amongst the members of your group and between groups in the class. In this stage you find the resources you need to answer your questions. At the end of this stage you should agree on the key aspects of local policy and action that you want to evaluate.

There is a huge variety of sources of information on this topic. There is a list of suggestions on the last page of this activity. Many students will need some guidance with finding appropriate sources of information that are relevant to the topic they are tackling and presented at a level that they will find accessible. Remind them that this activity is only about their local area.

During this stage you might help the class draw up an outline of the report that they will produce at the end with a draft series of sub-headings corresponding to the questions being explored by each group.

Stage 3 Answering the questions – private study

Work on the question, or questions, you have agreed to investigate. Some of the resources are provided for you. You may need to find one or two other sources to answer the questions. There is a very large literature on the topic of climate change and so you will have to be careful in selecting the resources to use; remember that you are only looking at local responses in this activity. You may also find that you need to modify your questions as you learn more about the problem.

Stage 4 Response to the problem - in groups

Share your findings from stage 3 with the others in your group. Discuss the answers to each of the questions. Put all the information together to produce a coherent analysis that can help others understand the aspect of the problem that you are working on.

Stage 5 The product – in groups

As a group produce a contribution that you would like to see included in a report to your local authority.


Stage 6 Whole class working towards consensus – and the final product

Share your findings with the rest of your class and your teacher. Come to a consensus about the appropriateness and adequacy of your local council's responses to the threat of climate change. Also agree on any recommendations that you intend to put forward.

At the end of this stage spend some time reflecting on what you have learned: both about the issues itself but also about the challenges of interpreting evidence and options and formulating well-founded opinions about topics which involve difficult decisions where the evidence is conflicting and uncertain.

This activity deals with an important issue. You may well want to encourage your class to send the letter (as an e-mail) and briefing paper to the chief executives of the local councils, or the local mayor. Of course, it may be that the class cannot reach consensus and so have to send more than one letter. Contact details will be available on local council web sites.

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In this problem activity you are going to explore and evaluate the local, or regional, responses to climate change. As in previous activities of this kind you have to decide what you need to know and understand to deal with this problem. You then, as a group, take responsibility for your own learning in collaboration with other groups in your class.

Scenario

Every community wants to thrive, not just survive, in a world that is starting to feel the impacts of climate change.

Climate change is the biggest challenge facing the world. Yet, despite the fact that it will significantly affect every organisation and every region, our collective response fails to measure up to the scale of the problem.

Every local authority needs to take action on behalf of the people who live in the area under its control by

- analysing the risks and opportunities associated with climate change in its area, and then challenging individuals and organisations to respond appropriately;
- implementing innovative solutions to climate change (from new technologies, products and services through to new patterns of behaviour and changes in the ways that organisations work).

The Task

Your task is to find out more about the issues raised by the scenario so that you can determine your own views on the matter. Working in groups your aim is to evaluate the policies and actions being implemented by the local authority where you live and to make recommendations.

The process

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References

Local authorities

The Directgov web site gives details of local authorities, region by region, with links to the related web sites. Some, but not all, council web sites have a section about the environment. It is always possible to search the sites for entries about climate change.

<http://www.direct.gov.uk/en/DI1/Directories/Localcouncils/index.htm>

Policies and guidance

The web site of the Department for Environment, Food and Rural Affairs (DEFRA) has a section about adapting to climate change with links to show what is happening (or meant to be happening) regionally and in local authorities. Regional adaptation and other related documents are available from the site.

<http://www.defra.gov.uk/environment/climate>

The Nottingham declaration web site supports Local Councils acting on climate change. The site shows which councils have signed up to the declaration. The site also outlines the scope that local authorities have to respond to climate change and the powers that they can bring to bear to deal with the issues.

<http://www.energysavingtrust.org.uk/nottingham>

The UK Climate Impacts Programme (UKCIP) provides a booklet which describes a simple resource which local authorities can prepare so that they understand better their local exposure to weather and climate.

http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=278&Itemid=377

Evidence and analysis

The UK Climate projections are the latest results of modelling climate change and its impacts on the different regions UK by the Met Office. The results are shown for three different scenarios.

<http://ukclimateprojections.defra.gov.uk/>

The UKCIP web site offers a range of tools to support analysis and planning.

http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=74&Itemid=187

This web site will help you to find details of local newspapers that are on-line in England. You can search print or electronic versions of your local papers to see which aspects of climate change are being reported in the area.

<http://www.wrx.zen.co.uk/>

Campaigns

The following campaigning web sites give an indication of what activists think should be happening nationally and locally in response to the challenge of climate change

A campaign on the issue of climate change by the Local Government Association.

<http://www.lga.gov.uk/lga/core/page.do?pageld=269299>

A UK political campaign to promote action against climate change

<http://www.campaigncc.org/index.shtml>

EU Commission campaign web sites

http://ec.europa.eu/environment/climat/campaign/index_en.htm

<http://www.climatechange.eu.com/>

The Friends of the Earth web site about its climate change campaign:

<http://www.foe.co.uk/campaigns/climate/index.html>

The Greenpeace web site about its climate change campaign:

<http://www.greenpeace.org.uk/climate>

WWF climate change campaign

http://www.wwf.org.uk/what_we_do/tackling_climate_change/