**Energy Island/alternative energy in Wales**

Lesson plans/Teachers’ Notes Key stage 3

Overview of the resource

Geography in the news is designed to give teachers a topical and entertaining online information and activity source. It will help to support the National Curriculum’s requirement for the flexible inclusion of current global and Welsh issues into pupils’ geography lessons in addition to more formalised schemes of work, and/or may be used to stimulate extended work within schemes or work. Each edition contains a main theme and 2 linked articles each of which forming the focus for lesson activities. In addition, a Global current events screen can be used on a regular basis as a home page or lesson starter stimulus. The ‘Brainbox’ links may form entertaining wider geography discussion points, for instance, as end-of-lesson activities.

Key Words are highlighted within the resources and have been defined by rollover annotation. Website links are included at key points in the resources to facilitate further research on selected topics.

Each edition will be archived to allow repeated access and use in the future. They are fully downloadable to allow storage and reuse in classrooms without internet connection.

**Main Theme**

The principle National Curriculum links are:-

Range

* ‘Living in Wales: their local area\* and an investigation of at least one aspect of the geography of the whole of Wales’,
* ‘Describe the causes and consequences of how places and environments change, *e.g. by season; from past to present; the need for sustainability’*
* *‘Threatened environments: characteristics of, and possibilities for, their sustainable development.’*

Skills

* *‘explain the causes and effects of physical and human processes and how the processes interrelate, e.g. causes and consequences of tectonic activity, impacts of migration in Europe’*
* ‘explain how and why places and environments change and identify trends and future implications, *e.g. population increase,* *climate change, globalisation.’*
* **‘carry out:**
  + at least one group investigation and one independent investigation into a geographical question or issue
  + investigations into ‘geography in the news’, topical events and issues in the locality and the wider world’.
* **‘ask and answer the question -** what are the geographical issues for people living in this location? How and why do people’s views on issues differ and what do I think?’

The activities will offer learners opportunities to:

* Use ICT to be informed of current and relevant geographical relevant information and events.
* Develop both knowledge and informed opinions on a range of issues and suggested solutions to current geographical problems.
* Develop investigating skills related to current issues.
* Work independently and cooperatively.

**Main article: Anglesey – Energy Island**

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| **Aims:** to highlight the dangers of current energy usage and the solution of conversion to alternative technologies. To learn that it is a key development strategy of both the Welsh government and Anglesey local government to develop the alternative energy sector as a means to sustainable economic development. | |
| **Objectives:** The activity is intended to give an up to date case studies of the development of the alternative energy sector in North Wales. Pupils will learn that this is part of strategic planning by both local and national governments. They will learn the concept of a growth pole and of the trickle down concept. They will start to learn why the physical and human environment of Wales makes it particularly apt for alternative energy production. | |
| **Resources required:**   * **Online resource** * **Printer to down load map or paper copy issued** * **Access to internet/search engine – possibly at home.** | |
| **Activity type:**  Initially the resource can be displayed for a whole class discussion. Pupils should either print or be given the outline map of North Wales. Using the resource pupils should engage in a group discussion on ‘what is the energy island concept’. Key terms from the resources such as ‘growth pole’ and ‘trickle down’ should also be discussed. Pupils should use a basic GIS system such a Google maps or the WJEC atlas to identify the locations from the resource and annotate them onto the blank outline map. The extension activity is to research for other energy initiatives in the region. | **Suggested time:**  This activity is designed to take a one hour lesson and possibly a follow up homework to produce an annotated map of North Wales showing key locations for the development of the energy sector. This of course could be done in class. |
| **Lesson introduction:**  After the initial discussion as outlined above the students should read the resource and case studies. They should then be encouraged to key locations from the resource and mark them on their maps. They should then add more details from the case studies. Extension work is to find out more examples of development of the alternative energy sector in the region. | |
| * **Further activity opportunities 1:**   Students could follow up with further research across a greater scale of Wales – a good focus would be to look at relevant science in the news articles such as the build it and be dammed article on the proposed Severn Barrage   * **Further activity opportunities 2:**   Pupils could research courses available in the new renewable energy centre built on Coleg Menai’s Llangefni campus. | |
| **Notes:** | |

**Linked article 1: Energy in Wales**

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| **Aims:** pupils should learn that there are a large number of alternative energy sources which could replace the burning of fossil fuels. They should learn that Wales has a particularly high potential making it a potential market leader in this sector. This area of work is designed to follow on from a sequence of lessons dealing with the negative impacts of current energy use – climate change and acid rain. | |
| **Objectives:** The activity is intended to introduce the concepts of alternative energy in the Welsh context. It looks at marine renewables with a special focus on tidal power and possible development of a range of technologies to harness this valuable resource. It then examines onshore and offshore wind power; biofuels but especially energy from waste. The main focus here is to look at developing anaerobic digestion as well as forestry waste. H.E.P. is the next focus with a link to our sister magazine ‘Science in the News’ in order to consider energy storage and especially pumped storage. The final focus – surprisingly is solar power and its growth in Wales. Understanding is assessed using a quiz and a formal written letter | |
| **Resources required:**   * **Online resource** * **Access to writing paper or DTP software.** | |
| **Activity type:**  An initial class discussion should focus on the resource and the different featured alternative types of energy and why the physical/human environment of Wales makes it especially suitable for these energy types. This resource is designed to be used to help facilitate students to write a letter to the Welsh Government on their opinions on how Wales should address the energy issue. The pupil level descriptors are not copies of The N.C. documents but are designed to help pupils understand the different levels/complexity of response required at each level | **Suggested time:**  This activity will probably require one one hour lesson or a homework session to access the resource. There then needs to be the discussion. Level 5/6 Year 9 pupils typically require two one hour lessons to do themselves justice on the letter. More able & talented need longer and this is usually done at home. |
| **Lesson introduction:**  An initial class discussion should focus on different alternative energy sources as featured in the resource. A sequence of questioning should link this back to previous work done on negative impacts of energy use such as climate change.  This then follows on to looking at the features of the physical and human Geography of Wales which makes it especially suitable for the development of these technologies. Pupils should then read the resource and attempt the quiz. A discussion then takes place on the three elements of the letter as well as the requirements of the formal aspect of the assessment component. | |
| * **Further activity opportunities 1:**   Pupils should research other technologies available for use in Wales.   * **Further activity opportunities 2:**   Pupils should research other negative impacts of these different technologies as these are required to distinguish themselves at the higher levels in the letter | |
| **Notes:** | |

**Linked article 2: Tropical Storms**

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| **Aims:** pupils should learn that 2011 has been a very active year for tropical storms and by the time the resource is live there should have been some big headlines. | |
| **Objectives:** The activity is intended to explain that the formation of tropical storms is tied to surface temperatures of oceans in the tropics. They should learn about the mechanisms forming tropical storms and the component parts that make these such a devastating natural disaster. They should also learn to make the connection that if ocean temperatures increase as a result of climate change then the range of areas feeding storms increases and that the likelihood is that storms will increase both in frequency and severity. | |
| **Resources required:**   * **Online resource** * **DTP software** * **Presentation software** | |
| **Activity type:**  An initial class discussion should focus on the resource; discuss the mechanisms of how a storm forms and the requirements for it to strengthen into a hurricane strength storm. This discussion should then focus on The Saffir-Simpson scale brainbox. This should lead to questions on the component parts of the storm danger package, pressure/surge, winds/waves and precipitation. Finally draw out potential links with climate change. | **Suggested time:**  This activity will probably require an initial one hour lesson but news activity can be developed. This could form the focus for an oracy activity with pupils devising scripts to go along with presentations and link this to literacy strategies tied to writing the newspaper versions. |
| **Lesson introduction:**  An initial class discussion should focus on discussing the mechanisms of how a storm forms and the requirements for it to strengthen into a hurricane strength storm. This discussion should then focus on The Saffir-Simpson scale brainbox.  This should lead to questions on the component parts of the storm danger package, pressure/surge, winds/waves and precipitation. Finally draw out potential links with climate change. | |
| * **Further activity opportunities 1:**   Pupils should prepare scripts to present their views to accompany presentations. This can form part of an oracy activity.   * **Further activity opportunities 2:**   More able and talented could be encouraged to explain the concepts of sensible and latent heat which are raised in this article but not developed. They could be asked to define and explain thee terms and then explain why they are so important in understanding the formation of tropical storms and the distribution of storm source regions. | |
| **Notes:** | |