

Area of Study

Top up and Tasters (Geography): Local and global citizenship.

Overview

This transition unit aims to explore with learners how to manage the effects of climate change and global warming. It allows learners to actively discover the impact of climate change and decide how they can change their own habits to make a difference. Active learning and role-play makes these large global issues fun, interesting and challenging for the open-minded and inquisitive learner.

Related learning

- Junior Certificate Geography - links to atmospheric studies and how weather occurs.
- Leaving Certificate Geography - links to specific options on oceanography, meteorology and specific biomes.
- Links to transition units like IT, drama, debating, sciences, business and industry.
- Links to the awareness of environmental, ethical and citizenship issues.

Outline of the unit

- Beginning with a news story review of summer 2007's weird weather stories e.g. Wildfires, flooding, and droughts. Media and presentation of pictures. See appendix 1. Students view "An Inconvenient Truth" (Al Gore) DVD which illustrates the global effect and impact of climate change.
- Global warming – explore a specific case study and effects of CO₂ and O₂ exchange (link to science).
- Study of impacts in real time—ice caps/sea level rise/ pollution. Warm/wet/cold experiments to illustrate above through the use of small experiments e.g. radiator, kettle, ice cube (link to science). See appendix 2.
- Case studies of effect of these changes on the weather today, e.g. Hurricane Katrina, UK flooding and drought in the Canary Islands. HYPERLINK "http://news.monstersandcritics.com/europe/news/article_1375683.php" http://news.monstersandcritics.com/europe/news/article_1375683.php

Outline of the unit

- Storm-surge experiment. See appendix 3
- Topic based group-work project for presentation and submission, worked on in class and in own time. Students work in pairs or threes on a topic of interest with clarification and guidance from the teacher, e.g. Cars' carbon wheelprint, UK under ice, you me and WEEE etc.
- "Power of one" project: school based investigation of the usage of energy in our building. Output related on a graph in classroom added to every week. Check the number of switches that could be "off" once a week in the school and represent this on a graph in class to draw comparisons on whether we are reducing energy usage in school over the academic year and the effects of the seasons. See appendix 4.
- "Handle a Hurricane Experiment." A fun, drama based role-play mimicking real life situation of a news conference warning the public of an impending hurricane approaching Florida, USA. (HYPERLINK "<http://www.ohiorc.org/record/839.aspx>" www.ohiorc.org/record/839.aspx)
- Filming of news conference above, serves to allow students to review the decisions made during the role-play.
- Debate on issues to consolidate their understanding of problems facing the world due to global warming.
- Presentation of projects.
- Evaluation of transition unit.

Breakdown of the unit

35 hours class contact time and 10 hours project research topic time.

It would be timetabled for one double period for a year or 2 single classes for a year or 2 doubles per week for half year.

Aims

This transition unit aims to:

- help students understand the global concern of climate change and global warming.
- encourage students to look objectively at evidence of global warming in the world today.
- promote students consideration of their role and responsibility in the care of the environment and the future health of the planet.

Learning Outcomes

On completion of this unit students should be able to:

- recognise changes in global weather patterns and their effects on populations.
- identify global patterns by evaluating case studies of these effects.
- apply these examples when doing project work and presentation.
- dramatise crucial decisions made every day by people living in these severe weather areas.
- formulate opinions and make decisions on their role in the stewardship of the environment and protection of our earth.
- argue and debate new and better ways to deal with our contribution to global warming.

Key skills

How evidenced

information processing	Recording and selecting information for 'Power of One' experiment and for their project work and presentation.
critical and creative thinking	Recording and selecting information for 'Power of One' experiment and for their project work and presentation.
communicating	Presentation of the group's projects through ICT. Group-work for storm surge experiment. Role-play for news conference.
working with others	Collaboration in group work, presentation and project work, debating and filming.
being personally effective	Planning of project and presentation, planning film production, Students will reflect on their own learning in their decision-making and response to evidence presented and project presentation.

Learning approaches

- Discussion and debate
- Role-play
- ICT
- Self directed learning
- Investigation
- Experiments
- Group-work
- Filming of role-play for review.

Assessment approaches

Students will be assessed on their:

- project presentation.
- self-assessment in Transition Year journal.

Evaluation methods

Student evaluation sheets

Teacher evaluation sheets

Resources

- News story review of weird weather stories e.g. Wildfires, Flooding, and droughts. (Appendix 1)
- "An Inconvenient Truth" (Al Gore) DVD
- Radiator, kettle, ice cube.(Appendix 2)
- Storm-surge experiment. (Appendix 3)
- Power of one" project. (Appendix 4)
- "Handle a Hurricane Experiment." (See website)
- ICT and AV equipment.

Websites related to environmental issues

www.enfo.ie

Ireland's public web site on environmental issues, will organise guest speakers, visits to the centre, they have a lending library of media resources for teachers, plenty of posters and leaflets on a variety of issues.

www.sei.ie

Sustainable Energy Ireland, site for energy saving ideas and lots of alternate energy sources bio fuels, wind turbines, solar panels, lots of download, leaflet on alternates on.

Resources

www.ecounesco.ie

EcoUnesco; competition for the young environmentalist-will give workshops, provide guest speakers, etc.

www.cultivate.ie

Organise events and lectures on sustainable living, green issues such as powering down and life after peak oil production.

www.epa.ie

The Environmental Protection Agency.

www.yptenc.org.uk/docs/environmental_facts.html

Young People's Trust for the Environment. Information leaflets on many environmental issues aimed at students

www.cotf.edu/ete/main.html.

A NASA site on environmental issues such as global warming.

www.eco-portal.com

This is a portal which links to sustainable development sites

Student's Evaluation of Transition Unit

Title of transition unit _____

Please begin by completing the following sentences

1. The thing I most enjoyed about this transition unit was....
2. The most interesting thing I learned was....
3. This will be useful because...
4. The thing I least enjoyed about this transition unit was...
5. The things I found most difficult were...
6. If this transition unit was being taught to another group of students what changes, if any, would you suggest to make it better?

Teacher's Evaluation of Transition Unit

Title of transition unit _____

1. What parts of the unit were most successful?

2. What parts did not work so well?

3. To what degree do you consider that the following were achieved?

	Give a rating on a scale of 1 - 5	Comment
Learning outcomes		
Key Skills		
Students were actively involved and interested in learning		

4. If you were teaching this transition unit again, what changes would you make:

To content...

To teaching methodology...

To assessment...

5. Were there any unexpected outcomes?

Why has it been so wet?



The sign of things to come or a freak?

Rain, rain and more rain - the summer of 2007 will go on record as a washout. But is this a sign of summers to come - another unhappy portent of global warming - or simply an old-fashioned blip in Britain's notoriously fickle weather?

The flooding crisis has deepened with the news that 350,000 people are to lose their water supply. Tewkesbury in Gloucestershire has come to resemble an island and 43,000 homes in the county are without power. But those outside flood zones have a more selfish concern at heart - when will summer start for real? And, given all the talk of climate change, is this what summers are going to be like in future, or just a glitch?

The jetsream

Ribbon of fast-moving air, 30,000ft above
Caused by a meeting of southern warm air and northern cold air
Its position has a large bearing on UK weather

"The weather across the UK has been far from typical this summer," says BBC broadcast meteorologist Daniel Corbett.

He said a broad band of low pressure had been sitting across the UK, pushing the jet stream - a ribbon of fast moving air in the upper atmosphere - further south than usual, keeping high pressure and settled weather away from the UK.

"In a normal summer the jet stream is to the north of the UK. This allows the Azores high to build across the UK and bring settled and more typical summer weather for the UK," said Mr Corbett.

Weather maps: Why this summer has been so wet

The rain has been so intense due to the combination of warm moist air, the position of the jet stream and the fact that the storms have been relatively slow to move away, says Paul Davies, chief forecaster at the Met Office. "It is not possible to say that any single event is caused by climate change," he says. "What we are able to do is estimate the changes in the risk of extreme events occurring due to climate change." "There is an expectation of heavier extreme rainfall events in most places as climate warms and the atmosphere becomes moister.



Evesham in Worcestershire was under water

"In the UK, extreme rainfall is likely to increase in winter, but in summer the predictions are unclear. Improved modelling and understanding in the future will help us to reduce this uncertainty for the UK." But Jim Dale, a risk meteorologist at British Weather Services, says it's down to bad luck, not global warming. "It's a sexy subject and people like to stick labels on things. Global warming is the latest bandwagon going past so whenever we get a heatwave or floods they blame it on that." And while people have recalled the severe floods of yesteryear, such as 1912, 1947 and 1953, the 2007 events of June and July are just as bad, he says.

Drying up

So is there a silver lining amid all the doom and gloom?

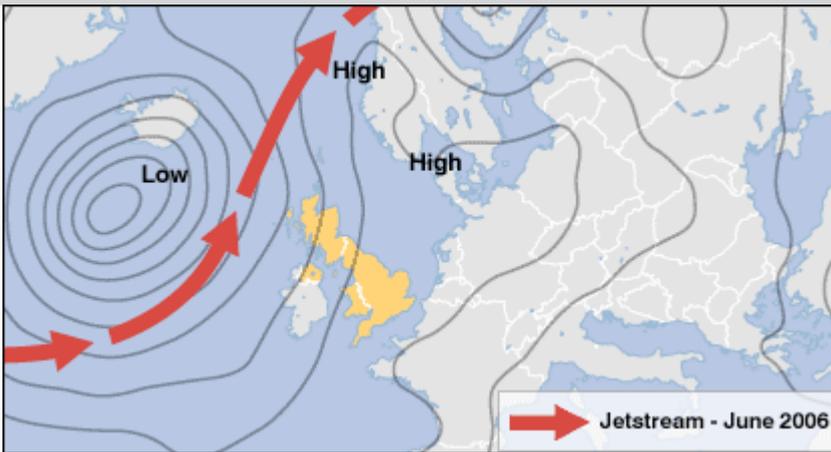
1953 Floods

"I was just 6 years of age. Now, 50 years on, I can still remember my mothers screams and my grandfather panicking and rushing to get us all upstairs, safe. During all of the commotion, my grandfather, William McDonald, was swept away by the currents. He was just 55 years old."

Robert Snowden, on holiday in Yorkshire in 1953

Holidaymakers flying to parts of Europe on the other side of the jet stream can enjoy higher-than-average temperatures there. And there is a hint that things may dry up in the UK in August, the Met Office predicts. Its statistics show that average temperatures, which include day and night, have been above average for every month since March 2006. This is another story of the summer that has gone virtually unnoticed, says Paul Simons, weather columnist in the Times. "Despite all the gloom and doom, temperatures are fairly normal for the time of year," he writes. "In days gone by, a wet summer would invariably be cold, even with snow in July and frost in August."

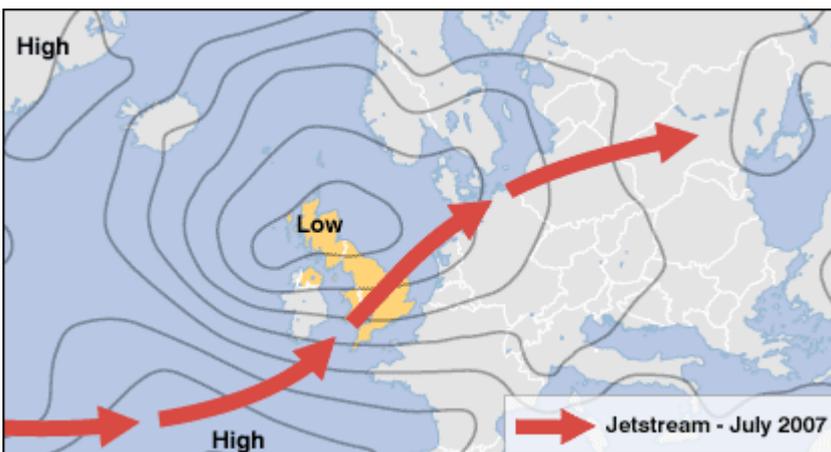
Summer 2006



In a 'normal' summer, the Atlantic jetstream directs areas of low pressure, which bring cloud and rain, to the north of the UK. High pressure systems over Europe and the Atlantic bring warm, settled conditions.

Pressure chart: 29/6/06. Source: Met Office

Summer 2007



This summer, the jetstream is flowing further south allowing low pressure systems to sweep straight over the centre of the country. High pressure systems over Europe and the Atlantic have been weak.

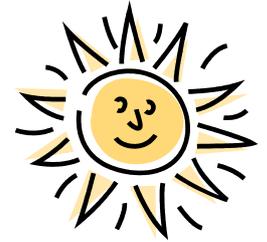
Pressure chart: 4/07/07. Source: Met Office

Appendix 2

Warm/ Wet/ Cold Experiments.

Warm: Transfer of heat from radiator to object to illustrate the concept of radiating heat from earth's surface to the atmosphere.

1. Place object (school jumper, ceramic object, even students hands) above radiator to feel the warm air waves displacing cold air as it RISES and warming the new surface.
2. Liken this to the sun warming the earth surface, and in turn warming the atmosphere. The warmer the air= different weather patterns.



Wet: To illustrate water cycle

1. Boil kettle near to a window or glass pane where condensation will form.
2. Revise the water cycle to remind students of how most weather fronts form.
3. Advise students that the higher the level of evaporation (due to higher temperatures) result in more violent storm systems.



Cold: To inform students on melting ice caps

1. Simply allow ice cube to partially melt and allow students to observe the low temperature of the melt water by measuring temperature with a thermometer.



Appendix 3

Storm Surge Experiment

How do Storm Surges really work????

The aim of this fun experiment is to illustrate how storm surges simply occur due to a force pushing the surface of the water, either a Tsunami, or a strong wind, pushed on by a major hurricane or storm.

In this task, you will provide the force to push the waters surface.....how?????

- Treat this as a scientific experiment, provided for you is a results sheet and a clear grid to record your results.
- You must write this up as a science experiment and put it in your folder for next class.
- Write it up under the headings: Aim, objective, apparatus, method, diagram, results (this is where your grid comes in) and conclusions.
- Also, answer the questions that follow to illustrate your hypothesis on the experiment.
- NB: Try not to soak each other or the classroom!!!!

Procedure for experiment on measuring theoretical storm surges:

- Taking your baking tray, lay it on the desk on a steady surface.
- Take one straw and bend in into an 'L' shape.
- Place the straw in its 'L' shape inside the baking tray on its short end, so that the shorter end of the 'L' faces straight up touching the side of the dish, and the longer end is suspended about a half an inch over the bottom of the dish.
- Tape the straw to hold it in place.
- CAREFULLY, pour enough water into the dish until it reaches just below the straw.
- Using your clear ruler at the opposite end of the baking tray, place it in the water and take a reading of the level of the water 'before storm surge'.
- One member of your group must provide the wind, by blowing into the straw, and another must hold the straw in the water. Both this student and the third must observe the effect of the wind on the surface of the water, and on its advance up the straw.
- Adding extra straws and extra 'wind' and deeper or shallower water will alter your results. Record these accordingly.
- HAVE FUN!!!

Answer these questions:

- What happens when the water is deeper/shallower?
- What difference do you notice if the wind speed is slow/fast? Why?

Record your observed and recorded results here.

Group Number: _____

Member's names: _____

Attempts	1	2	3	4	5
Recorded data:					
Observed data:					
Conditions:					
Conclusions drawn:					

Use this box to jot down notes or ideas:

Appendix 4

The 'Power of One' experiment

Area: _____

Using the sheet provided take a tour of your allocated area and note down all visible uses of energy or electricity.

Then review these to see which of these usages could be turned off or reduced.

Can you think of any way we could reduce energy consumption in school?

1. _____
2. _____
3. _____