

Climateprediction.net and 21st Century Science

Overview

Climateprediction.net can play an important part in Module C5; you may also wish to refer to it in Module C3.

Chapter C5 – Radiation and Life

Lesson C5.8 Global warming – what’s the problem?

Lesson C5.9 Where does atmospheric CO₂ come from?

Lesson C5.10 The carbon cycle

Lesson C5.11 Are human activities causing global warming?

Lesson C5.12 Global warming – nothing is inevitable

The published resources for 21st Century Science (OUP) include material showing how we know about climate and CO₂ levels in the past but nothing on how we can know what is going to happen in the future.

Lesson C5.8 Global warming – what’s the problem?

Modified lesson plan C5_8SoW.pdf

As an introduction to climate change, use material from climateprediction.net to discuss the film *The Day after Tomorrow*.

For class discussion or homework, an activity which considers environmental changes and how they might affect climate. AC5-8b_climate_discussion.pdf. This is quite hard, the answer to many of the questions is ‘no-one knows’ and so might be more suitable as an extension exercise for gifted students.

Lesson C5.9 Where does atmospheric CO₂ come from?

Modified lesson plan C5_9SoW.pdf

This lesson includes a demonstration experiment, looking at the absorption of radiation by air and CO₂. An ideal opportunity for datalogging – see sample results in CO2_bottle_experiment.xls

Lesson C5.11 Are human activities causing global warming?



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Lesson C5.12 Global warming – nothing is inevitable

There are three activities that would fit well in Lessons 5.11 and 5.12:

- Use the introductory PowerPoint presentation to introduce the idea of climate modelling, and modelling in general.
- Use the ‘Bucket Model’ to show how a physical model can help us to think about why the Earth’s temperature is roughly stable, and why it may change.
- Use the ‘Bucket model’ Excel spreadsheet to show how a spreadsheet can solve iterative equations to make predictions.

Other relevant points

Lesson C5.1 Taking chances with the Sun?

UV and sunburn. Different countries have different cultures regarding sunburn. Will changing climates require changes of culture?

Lesson C5.3 Radiation in space?

The effect of the atmosphere on radiation from the Sun. Contrast the successful global collaboration to solve the problem of CFCs and the ozone layer with the current political situation regarding treaties to reduce greenhouse gas emissions. (see Russia/ Kyoto discussion activity in the KS3/4 geography section)

Chapter C3 – The Earth in the Universe

Lesson C3.1 Earth processes to explain

Lesson C3.7 Forecasting and preparing for disasters

Geohazards – some of these are weather/climate related. If our climate changes then will these become more or less likely? How can we find out? Is there anything that we can do about it?

Ideas about Science

A study of *climateprediction.net* can illustrate the use of modelling to make scientific predictions. An important feature is the way the cp.net model tests itself against the Earth’s past before predicting the future. This is relevant to these *Ideas about Science* sections:

- Theories
- The scientific community
- Making decisions about science and technology



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