

A simple climate model

Introduction

This activity is available from the climateprediction.net web site. Students use a very simple climate model in an Excel spreadsheet. They can change variables and plot graphs to find the equilibrium temperature under different conditions.

The resource can be found in the sections offering resources for Science for Public Understanding:

<http://climateprediction.net/content/science-public-understanding>

Four files are available: teachers' notes (pdf) and student instructions (pdf) together with either a spreadsheet (xls) or a paper-and-calculator worksheet (pdf).

How Science Works

Da A dynamic model is a set of proposed inter-relationships between key variables in a situation. Dynamic models can be constructed and implemented on a computer. They are widely used in science to make predictions and to test explanations in complex situations.

Db A dynamic model incorporates hypotheses about the important variables in a situation, and the way they inter-relate. The outputs from the model will depend on the assumptions built into it and the data used to set the initial conditions. Data derived from a computer model are therefore less trustworthy than data that have been measured directly.

Dc A dynamic model shows negative feedback if a change in the input tends to be cancelled out by changes in other variables, so that the output remains relatively constant. A model may behave in this way for small changes in input, but not if the change in input is large.

Dd A dynamic model shows positive feedback if a small change in the input tends to be magnified by changes in other variables, leading to a large change in the output.

De Dynamic models also differ in their sensitivity to small changes in the nature of the inter-relationships proposed. So we cannot ever be entirely certain of the initial conditions, predictions from a sensitive model should be treated with more caution than those from a more stable model.

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