

Climate Change – Teacher notes

This resource is centred on a graph, which shows climate change for England from the year 1772 to the year 2000. Due to its nature the graph has a number of features that make it difficult for students to easily understand. The resource could be the basis of either an exercise in encouraging students to look closely at the graph and start to understand how it was constructed, or used for encouraging students to predict what might have happened in the 100 years prior to 1772 and what might happen in the next hundred years.

Student Task 1

Can you identify the trends shown on this graph and understand what it is telling us? The graph is a very complicated one. Look carefully at it and first identify the elements that make it complicated and then research and explain what each means. Some definitions given on the information sheet may help you.

Notes on Task 1 – Understanding what the graph is telling us:

The graph itself is displayed on Page 1 of the resource and could be shown via an OHP, data projector or given out as a handout. On page 2, the information sheet, are three sections, which attempt to explain what a moving average is and why it is being used for this graph. What 'Central England' is defined as and why the graph is presented as 'anomalies from the 1961 to 90 average'. All of these concepts may well need further explanation and research and discussion from students to fully understand them. The actual data giving the monthly averages from Jan 1772 to September 2005 are also available to download if you want students to try and reproduce the graph. Note this is an extremely challenging task!

Student Task 2

Can you predict what the graph would look like in the hundred years prior to the given graph and what it may look like for the next hundred years?

Notes on Task 2 – Predicting what will happen in the next 100 years

Page 3 shows the same graph with blanked out regions representing the 100 years either side of those given. The students are asked to try to predict, based on the evidence given in the graph what the graph would look like in these two areas. On page 4 two graphs are given. The first shows the actual data from 1659 to 1772 that does show more variation than your students may predict. The second graph shows some possible projections for what may happen in the next 100 years based on 4 scenarios from low to high greenhouse gas emissions. This graph comes from the Hadley Centre for Climate Prediction and Research, which is part of the Met Office, and provides a focus in the United Kingdom for the scientific issues associated with climate change. Note that the prediction graph shows a scale with the predicted rise in temperature from 0 to 5 degrees Celsius given 4 scenarios ranging from low to high emission rates of greenhouse gases. The red arrow shows the range from 1.4 to 5.8 degrees rise in the next hundred years, which is, the current model referred to in the notes, which accompany the initial graph.

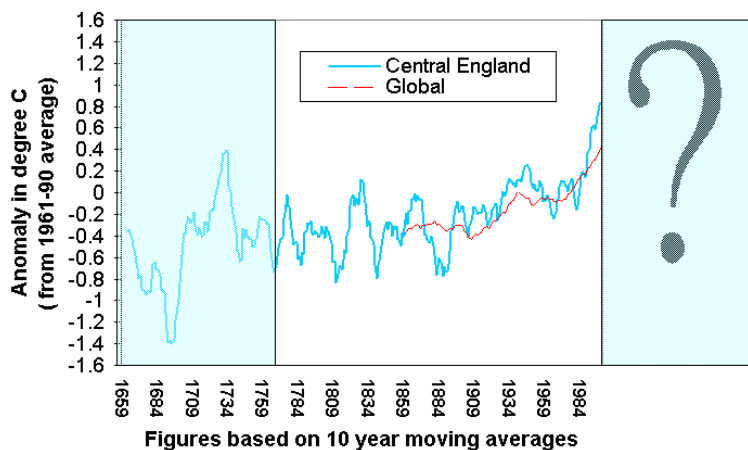
The information in this resource was primarily taken from 'The Environment in your Pocket 2005' produced by Defra and freely available for schools. The actual text given by this graph in the booklet is as follows:

Average **global** surface temperatures have increased by 0.4 to 0.8°C since the late 19th century. 1998 was the hottest year since global records began in 1861, 2004 was the fourth warmest, and all ten of the hottest years on record have been during the period 1990–2004. This trend is statistically significant and is unlikely to be entirely natural in origin. Current climate models predict that global temperatures will rise by a further 1.4 to 5.8°C by the end of the 21st century.

During the 20th century, the annual mean **central England** temperature warmed by about 1°C. The 1990s were exceptionally warm in central England by historical standards, about 0.6°C warmer than the 1961–1990 average. Four of the five warmest years since 1772 have been since 1990 and 2004 was the ninth warmest.

www.defra.gov.uk/environment/statistics/globalmos/index.htm

Central England & Global surface temperature anomalies 1663 to 2100



Figures based on 10 year moving averages