MODELLING CLIMATE CHANGE:
ANALYSING OBSERVED CLIMATE CHANGE

Studying climate change isn't just about models, observations are needed too.

In this activity, you will analyse temperature and rainfall observations from Reading for the last 30 years, and compare these with data for Central England and the whole globe.

Task A The climate of Reading, Berkshire

1. Open the Excel spreadsheet *MCC_DataAnalysis* and click on the tab 'Reading monthly'. This shows monthly mean temperature and rainfall. What period of time does the data cover?

2. Look at the July temperature data. In which year was the warmest July? And the coldest? Calculate the range of July temperatures over the period 1971 to 2000.

3. Using the July rainfall data, find the range of rainfall over the period 1971 to 2000.

Task B Climate change at Reading

4. Using the data on the tab 'Reading monthly', calculate the annual mean temperatures. Plot annual mean temperature against year.

5. Calculate the annual mean rainfall for each year and plot against time.

6. Look at your two graphs. How have temperature and rainfall changed over time? What do you notice about how they vary from year to year?

7. Fit a linear trendline through each plot (select the chart, and from the 'Layout' menu, in the Analysis section, select 'Trendline'). The slope of the line gives you the linear trend.

8. Over the period 1971-2000 how much has temperature and rainfall changed per decade?

1 of 2

Science Enhancement Programme

MODELLING CLIMATE CHANGE:

ANALYSING OBSERVED CLIMATE CHANGE

Task C Climate change at Reading compared with global climate change

Another common technique used by climate scientists is to look at the data in terms of a difference from a long-term mean – known as an *anomaly.*

9. Go to the tab 'Reading annual'. Plot the 'annual anomaly' against time. What do you notice?

10. Select the tab 'CET' – this gives mean quarterly temperatures for Central England. Calculate the annual average, and the anomaly. Plot the anomalies against time. What do you notice?

11. Choose the tab 'Global' – this gives global temperature anomalies. These data are derived from data collected by stations across the whole world. Plot the anomalies against time. What do you notice?

12. On the 'Central England' and 'Global' graphs, adjust the scales of the vertical axes so that they are the same as on the 'Reading' graph. What do you notice about the three graphs?

13. Fit trend lines through the three graphs (Reading, Central England and Global). What do these graphs show and what can you say about the trend in °C per decade?

Science Enhancement Programme