

Overview

In June 1991, Mount Pinatubo on the Philippine island of Luzon erupted, in the second largest eruption of the 20th century. The Philippine authorities managed to rescue 60 000 people from around the volcano, thanks to timely warnings. The information that prompted these warnings was provided by several teams of scientists.

However, the same scientific data had limitations in what it could predict. The warning levels given show clearly that the eruption was far bigger than anticipated. It was also impossible to predict precisely when the main explosion would occur, and sadly some of the deaths occurred because people decided to evacuate too late.

The activity

There is one activity in this unit, in two parts.

A starter discussion in which students are prompted to consider how they might have reacted to the alerts of imminent volcano eruption.

The main part of the activity involves the interpretation of information recorded by research scientists studying the activity of the volcano.

Students read about the evidence gathered by different scientists, and follow how this information led to increasing alert levels. They are asked to summarise this information, and then to link each rise in alert level with the scientific evidence that prompted it. They consider how specific the warnings were and the limitations of the scientific information.

Through this activity, students learn that the successful evacuations were largely thanks to the combined information from scientists monitoring the volcano. However, they should also appreciate the limitations of the data and how the timing and extent of the Mount Pinatubo eruption could not be precisely predicted.

Curriculum links (for students aged 14–16)

How Science Works (from POS KS4 for England)

Data, evidence, theories and explanations

1a how scientific data can be collected and analysed

1d that there are some questions that science cannot currently answer and some that science cannot address

Communication skills

3a recall, analyse, interpret, apply and question scientific information or ideas

3b use both qualitative and quantitative approaches

3c present information, develop an argument and draw a conclusion, using scientific, technical and mathematical language, conventions and symbols and ICT tools

Applications and implications of science

4a about the use of contemporary scientific and technological developments and their benefits, drawbacks and risks

GCSE or equivalent 14–16 specifications

England (GCSE)

AQA Science A 4461

Unit Chemistry 1b, Oils, Earth and atmosphere

12.6 What are the changes in the Earth and its atmosphere?

AQA Science B 4462

Unit Chemistry 1

12.6 What are the changes in the Earth and its atmosphere?

AQA Chemistry 4421

Unit Chemistry 1

11.6 What are the changes in the Earth and its atmosphere?

OCR Science A (21C science) J630

Module P1: The Earth in the Universe

P1.2 How have the Earth's continents moved, and with what consequences?

OCR Physics A (21C) J635

Module P1: The Earth in the Universe

P1.2 How have the Earth's continents moved, and with what consequences?

OCR Science B (Gateway Science) J640

Module P1: Energy for the home; Item P1h: Stable Earth

OCR Chemistry B (Gateway Science) J644

Module C2: Rocks and metals; Item C2c: Does the Earth move?

OCR Physics B (Gateway Science) J645

Module P1: Energy for the home; Item P1h: Stable Earth

OCR Applied Science (Double Award) J649

Module 2.6: Planet Earth; 2.6.2 Planet Earth: The surface

Scotland (SCE standard grade)

no direct links

Wales (WJEC GCSE)

Science

Chemistry 1: 8. Geological processes

Physics

Physics 3: 5. Seismic waves

Applied Science Double Award

Unit 2: Science and society: (e) The surface and atmosphere of the Earth

NI (CCEA GCSE)

Science (Single Award)

Module 2 Chemical patterns and our environment: the world about us

Learning objectives

By working through the unit, students should be able to:

- summarise the ways in which observations and measurements of sulfur dioxide emissions and earth tremors helped to predict the eruption of Mount Pinatubo
- explain how this data then led to a series of alert levels, but not to absolute information on when and to what extent the volcano would erupt
- consider how individuals made decisions about their personal responses to the alert levels and orders to evacuate.

Teaching and learning approaches

Learning Skills, learning by/from:

- interpreting and evaluating data
- reflective reading
- creative writing
- devising 'visual' ways of expressing and communicating ideas (including maps, diagrams, charts)
- 'case-studies' in a variety of contexts

For further information about Learning Skills for Science (LSS) click **here**.

Acknowledgements

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