

# CLIMATE CHANGE

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1 May 2008

## Part 1

1. What aspects of climate change does the lecture intend to focus on?
2. How does the lecturer describe the effect of greenhouse gas on the earth?
3. What happens when sunlight energy hits the earth's surface?
4. What are the special properties of greenhouse gases?

## Part 2

5. The lecturer divides the lecture into two time periods that alternate. What are they?
6. How thick were the ice sheets which covered Europe and North America during the glacial periods?
7. What is the pattern of ice movement during the glacial and inter-glacial periods?

## Part 3

8. Where do scientists go to measure past concentrations of carbon dioxide in the atmosphere?
9. When the scientists extract the ice core what do they take from it to analyse? Why do they extract the ice core?
10. What is the name of the other greenhouse gas that scientists are interested in? Why?

## Part 4

11. What does the Ice Core Data graph show scientists?
12. What is the concern about the patterns of temperature nowadays compared with the past?
13. What are two pieces of evidence of global warming?
14. According to the Global Average Surface Temperature graph when was an overall increase in global temperatures first noted?
15. What are the two reasons given for the rise in sea levels?

## Part 5

16. What is permafrost?
17. What example does the lecturer give of the effect of weather pattern changes due to global warming on the behaviour of animals and plants in Britain?
18. What is “El Nino” and how has global warming changed it?

## Part 6

19. Why is the graph called the Keeling Curve so important to scientists?
20. Why is the past data recorded at the meteorological station on the island of Mauna Loa important?
21. Where is Mauna Loa situated, and what is its geographical feature?
22. What point does the lecturer make about CO<sub>2</sub> fluctuations?

## Part 7

23. What happens during photosynthesis?
24. Why are concentrations of carbon dioxide in the atmosphere higher in winter?
25. What does the lecturer say has caused the increase in carbon dioxide concentrations since the mid 1800's?

## Part 8

26. Why is large scale deforestation adding to the problems of global warming?
27. What does the lecturer mean by ‘anthropogenic global warming’?
28. According to the lecturer, what will be necessary to find a solution to global warming?

# Key

## Part 1

1. She is going to look at it within the context of global warming, both in terms of the history of global warming and past rhythms, as well as the present day.
2. She says that it is like a greenhouse which allows sunlight to pass through the glass but traps the heat energy that is reflected back from surfaces inside the greenhouse. This increases the temperature.
3. Some of the energy will be absorbed, some of it will be reflected and some of it will be re-emitted (sent out again) as heat.
4. They allow light and heat energy to pass right through to the earth but they prevent the transmission of this heat energy back into space. Like a blanket they keep in the heat.

## Part 2

5. The glacial and the interglacial periods. The glacial periods are very cold and the inter-glacial periods are warmer, e.g. the time period of now.
6. The ice sheets were one and three quarter miles thick.
7. In the glacial periods the ice moved southward and during the inter-glacial periods the ice retreated northwards towards the Arctic.

## Part 3

8. Antarctica and Greenland.
9. They take little bubbles of air trapped when the ice was formed, so they can tell what the atmosphere in the past was like.
10. The other gas mentioned is methane. Methane also contributes to the greenhouse effect, just like carbon dioxide.

## Part 4

11. It shows that the amount of carbon dioxide and methane in the atmosphere affect the temperature, i.e. more of these gases means higher temperatures.
12. The increase in temperature is happening more quickly now.
13. 1) temperature is rising                      2) sea levels are rising
14. In the 1940's.
15. The first is the warming of the water because it expands when heated. This is called thermal expansion. The second is that the melting of the ice caps, glaciers and ice sheets due to the increased global temperature is causing the water levels to rise.

## Part 5

16. It is an area of frozen ground which is now melting with rising temperatures.
17. Birds are nesting two weeks earlier than 30 years ago, which means that warmer weather (Spring) is earlier than it used to be.
18. El Nino is a weather pattern that is caused by a change of direction and intensity of ocean currents and winds in the Pacific Ocean. This phenomenon which used to take place every seven years is now becoming more frequent.

## Part 6

19. It enables scientists to measure accurately the relationship between climate change and concentrations of carbon dioxide in the atmosphere.
20. The data was not affected by any man made pollution because the island is very isolated and free of pollution.
21. It is a volcanic island in Hawaii.
22. Each year there is a high and a low amount of CO<sub>2</sub>

## Part 7

23. Trees absorb sunlight and carbon dioxide.
24. During winter trees and plants do not absorb carbon dioxide as they do not photosynthesise as many of them have no leaves.
25. The increase in the burning of fossil fuels such as coal and oil, which releases carbon dioxide in fossils into the atmosphere (which was previously locked up in the earth structure millions of years ago).

## Part 8

26. Large scale deforestation, especially in the Amazon Rainforest, means that trees are less able to absorb carbon dioxide in photosynthesis, so the carbon dioxide released into the atmosphere is not reabsorbed and kept in the atmosphere.
27. Anthropogenic is related to anthropology, the study of human behaviour and social activities; it means that global warming is caused by human activities such as wide scale burning of fossil fuels and large scale deforestation.
28. According to the lecturer, the solution requires a single view on how to solve the problem. Therefore, this will require political will as well as good international relations and co-operation among countries to arrive at a single view on how to solve the problem.