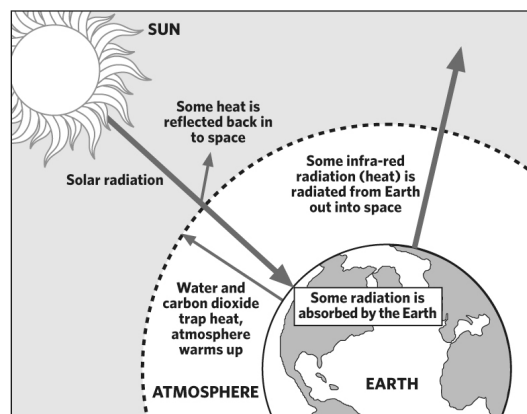


JJ needs your help

Information sheet A – The greenhouse effect

Many scientists predict that the world will become warmer. They say this is due to more carbon dioxide in the atmosphere and the greenhouse effect.

Life on Earth depends on energy. The Sun's radiation passes through the atmosphere to the Earth's surface where some of it is absorbed and some is reflected straight back into space. When the Earth's surface absorbs energy from the Sun it warms up – the solar energy is converted into heat. This heat energy is then emitted back into the atmosphere as infrared radiation or heat. Greenhouse gases such as water vapour, carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) in the atmosphere trap this heat energy. This is called the greenhouse effect because, as in a greenhouse, the heat can get in but then some of it is trapped, making the air warm up. The greenhouse effect keeps the surface of the Earth about 33 °C warmer than it otherwise would be. Without it, life as we know it would be impossible.



The increases in levels of greenhouse gases in the atmosphere are due to human activities such as burning fossil fuels, increasing use of landfill sites, deforestation, keeping cattle and growing rice (paddyfields and cattle produce significant amounts of methane).

The atmosphere contains very little carbon dioxide, but the amount is slowly rising. With more carbon dioxide in the atmosphere, the Earth traps more energy than it radiates back into space. If the Earth absorbs more energy than it loses, the atmosphere, the Earth's surface and the oceans will become hotter. Climate scientists are telling us to expect an average temperature increase of between 1 °C and 6 °C over the next 100 years. Sea levels will rise – mainly because water in the oceans expands as its temperature rises. A warmer atmosphere will evaporate more water from the oceans. Certainly the climate would be different.

Scientists who study climate change are modelling weather patterns with computers. They predict that global warming will not affect all parts of the Earth equally. Some areas will become wetter while more droughts will occur elsewhere. The number of extreme weather events like hurricanes has increased since 1950 and this is having a major impact on economies around the world, in addition to the social impacts and loss of life. Rising sea levels will threaten the homes and livelihoods of millions of people, for example in parts of Bangladesh, Britain and Holland.

The balance of nature will alter as climate zones change. Britain in the twenty-first century may be too warm for many native trees, such as oak or for the conifers planted by foresters. Crops that are grown now may not survive with the increased warmth and dryness. Insect pests normally killed by cold winters could thrive. If temperatures rise as predicted, diseases like malaria, which is spread by mosquitoes, may become more widespread.