



The Greenhouse Effect

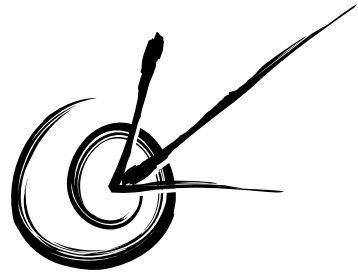
Activity courtesy of



Department of
Environment
& Conservation

Lesson aims

Students will discuss what the Greenhouse Effect is and what role we play in reducing greenhouse gas emissions.



Learning outcomes

As outlined in the National Profiles:

Studies of Society

Resources

Use of resources.
Management and enterprise.

Natural &
Social Systems

Natural systems.
Economic systems.



The Greenhouse Effect



Background information

The Greenhouse Effect is not a new phenomenon. It is a natural process that helps to heat the earth's surface to the temperatures necessary to support life.

Naturally occurring gases such as carbon dioxide, methane, nitrous oxide and halocarbons and also water vapour in our atmosphere act like a blanket around the earth. They allow the sun's rays to warm the earth's surface, and also prevent much of the heat escaping, so that the earth's temperature is maintained at reasonable levels. The gases which trap the heat from the sun are called Greenhouse Gases.

The Greenhouse Effect is a bit like car windows on a sunny day - they allow the sun's rays in to heat up the car, but prevent much of the heat escaping which is why the inside of your car is warmer than the outside air. We now know that human activity, particularly the burning of fossil fuels (coal, oil and natural gas) and land clearing, is generating more greenhouse gases than the Earth would normally produce through its natural processes. The earth's 'blanket' is getting thicker – this thickening is called the Enhanced Greenhouse Effect.

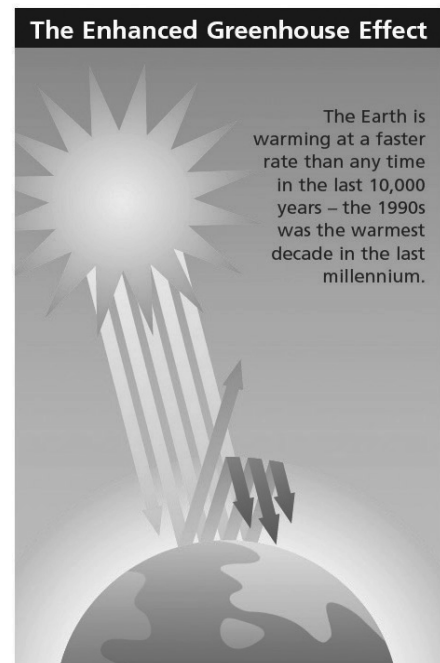
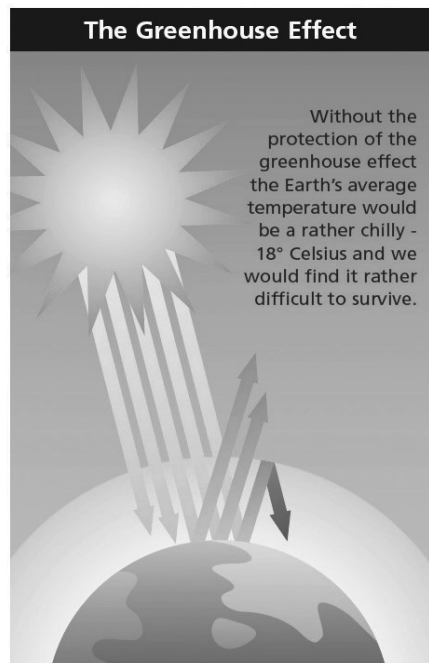
Can we reduce Greenhouse Gas emissions?

The good news is, yes we can! A large part of the problem is that people don't know how they can help and don't think that their individual contribution will make a difference. However, no matter how small a

part you think you are playing in conserving the environment, it is making all the difference.

How can we help?

- **Avoid Emissions** – Make sure to turn off lights and other energy-sucking devices when they aren't being used. This also applies to schools because most schools do not turn off their lights when not in use.
- **Reduce Energy Use** – Replace fluorescent light bulbs with Ultra Compact LEDs. These use less energy and last longer than fluorescent light bulbs. Additionally UCLEDs do not contain any deadly mercury.



- **Plant a Tree** – Well-placed landscaping cuts energy costs in summer and winter. Whilst alive, the tree will store carbon dioxide that would otherwise be in the atmosphere. Trees that are placed so that they will provide shade for your house will also help it stay cool in the summer. Better yet, make it a fruit or a nut tree. Planting perennials that yield food, including berry bushes and garden vegetables and herbs, will help you eat locally while 'fixing' more carbon in the soil. Introducing these plants in public places, by the sides of roads and in parks, is another way to benefit the community and the climate.

The Greenhouse Effect



Sources & further information

Clean up Australia – look at ways to tackle Climate Change.

www.cleanup.org.au

Greenhouse Gas Reduction Scheme. The NSW Greenhouse Gas Abatement Scheme (GGAS) commenced on 1 January 2003. It is one of the first mandatory greenhouse gas emissions trading schemes in the world.

www.greenhousegas.nsw.gov.au

Greenhouse Fact Sheet. A comprehensive set of reports outlining Australia's Greenhouse Gas emissions - as a Nation, by State, and by Industry.

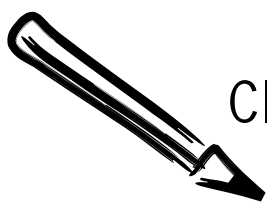
www.climatechange.gov.au/reporting/publications/fs-ngers.html

Greenhouse Gas Online provides a freely available and up-to-date resource dedicated to Greenhouse Gas news and scientific publications.

www.ghgonline.org

Climate Change Education Package. Mr Tim Grant, Green Teacher Magazine, Toronto, Canada.

www.greenteacher.com



Classroom activities

When humans produce an unnatural amount of Greenhouse Gases, the earth's protective blanket starts to trap too much heat in the atmosphere and temperature is steadily rises. Even a very small rise in the earth's mean temperature will have quite dramatic negative impacts on our environment.

These impacts include melting of polar ice caps, rising sea levels, increasing intensity and frequency of storms, and changes to weather patterns, including prolonged droughts, that will reduce agricultural productivity as well as our recreational and tourism activities.

Scientists predict that if the earth's mean temperature increases more than 2°C, irreversible damage could occur to ecosystems throughout Australia including the destruction of Ningaloo Reef and the Great Barrier Reef.

- Have students research what the earth's average or mean temperature is currently and what it was 10 years ago.
- Ask the class to draw a picture of the world and around it a 'blanket' of the 'Enhanced Greenhouse Effect' – have students draw pictures of the types of emissions that are contributing to the thickening of the blanket. E.g. Coal burning, land clearing.

Class discussion

Discuss the following methods of reducing Greenhouse Gas emissions.

What are the benefits and draw backs of using these methods?

- Build more dams for hydro-electricity
- Improve public transport
- Build a nuclear power station
- Build more wind farms
- Plant more trees
- Can the class think of any other ideas?

Visit the activities link to download further education materials which focus on climate change.

Activities courtesy of the Western Australia Department of Environment and Conservation.