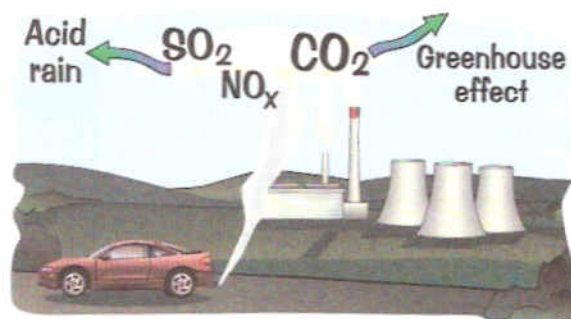


Atmospheric Pollution

The two main sources of atmospheric pollution are...

1) Burning fossil fuels

- 1) Fossil fuels are coal, oil, and natural gas.
- 2) The main culprits who burn these are cars and factories.
- 3) They release mostly carbon dioxide, which causes the greenhouse effect.
- 4) But they also release sulfur dioxide and oxides of nitrogen, which cause acid rain.



2) CFCs (Chlorofluorocarbons)

- 1) These are used in aerosols, fridges, air-conditioning units, and polystyrene foam.
- 2) They are creating a hole in the ozone layer.
- 3) This allows harmful UV rays to reach the Earth's surface.

People are usually OK at remembering the two sources of pollution in the atmosphere, but when it comes to sorting out their effects, it's a whole different ball game. You have to make a real effort to learn exactly where each type of pollution comes from and exactly what the effect of each pollutant is. For example, sulfur dioxide does not contribute to the Greenhouse Effect one bit, and neither do CFCs. There are dozens of ways to get them all mixed up, but there are no points for being confused.

Deforestation increases CO₂ and the greenhouse effect



We have already deforested a lot of our country. Now many less economically developed tropical countries are doing the same for timber and to provide land for agriculture. If the loss of millions of species wasn't enough, this is also causing a major increase in the greenhouse gas, carbon dioxide (CO₂) — see next page for more on the greenhouse effect.

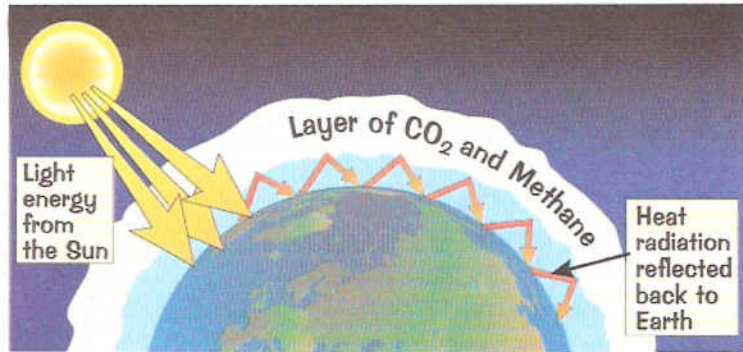
Deforestation increases CO₂ in the atmosphere in two ways:

- 1) The trees unsuitable for timber are burned releasing CO₂ directly into the atmosphere. Microbes also release CO₂ by decaying the felled trees that remain.
- 2) Because living trees use CO₂ for photosynthesis, removing these trees means less CO₂ is removed from the atmosphere.

The Greenhouse Effect

Carbon dioxide and methane trap heat from the Sun

- 1) The temperature of the Earth is a balance between the heat it gets from the sun and the heat it radiates back out into space.
- 2) The atmosphere acts like an insulating layer and keeps some of the heat in.
- 3) This is exactly what happens in a greenhouse.
The sun shines into it and the glass keeps the heat in so it just gets hotter and hotter.
- 4) There are several different gases in the atmosphere which are very good at keeping the heat in. They are called "greenhouse gases," oddly enough. The main ones that we worry about are methane and carbon dioxide, because the levels of these are rising quite sharply.
- 5) Human activity is increasing the Greenhouse Effect causing the Earth to warm up.

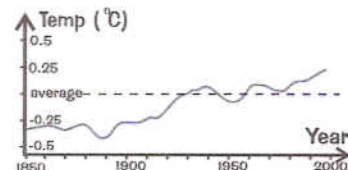
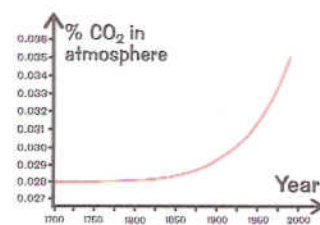


The greenhouse effect may cause flooding and drought...(!)

- 1) Changes in weather patterns and climate could cause problems of drought or flooding.
- 2) The melting of the polar ice caps would raise sea levels and could cause flooding to many low-lying coastal parts of the world including many major cities.
- 3) Warmer, drier weather may cause droughts in some regions.

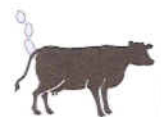
Modern industrial life is increasing the greenhouse effect

- 1) The level of CO₂ in the atmosphere used to be nicely balanced between the CO₂ released by respiration (of animals and plants) and the CO₂ absorbed by photosynthesis.
- 2) However, mankind has been burning massive amounts of fossil fuels in the last two hundred years or so.
- 3) We have also been cutting down trees all over the world to make space for living and farming. This is called deforestation.
- 4) The level of CO₂ in the atmosphere has gone up by about 20%, and will continue to rise ever more steeply as long as we keep burning fossil fuels — just look at that graph — eek!



Methane is also a problem

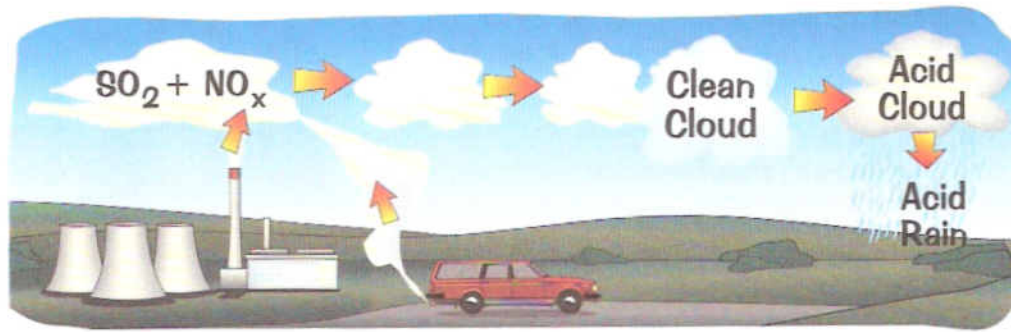
- 1) Methane gas is also contributing to the Greenhouse Effect.
- 2) It's produced naturally from various sources, such as natural marshland.
- 3) However, the two sources of methane which are on the increase are:
 - a) Rice growing
 - b) Cattle rearing — it's the cows "passing gas" that's the problem, believe it or not.



Acid Rain

Burning fossil fuels causes acid rain

- When fossil fuels are burned, they release mostly carbon dioxide, which is increasing the Greenhouse Effect. They also release two other harmful gases:
 - sulfur dioxide
 - various nitrogen oxides.
- When these mix with clouds, they form weak acids. This then falls as acid rain.
- Cars and factories are the main causes of acid rain.

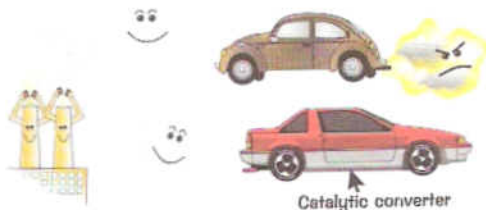


Acid rain kills fish, trees and statues

- Acid rain causes lakes to become acidic, which can harm plants and wildlife.
- Acid precipitation causes aluminum and magnesium salts (in the soil) to dissolve into the water. The resulting aluminum and magnesium ions are poisonous to many fish and birds.
- Acid rain kills trees.
- Acid rain damages limestone buildings and ruins stone statues.



Acid rain is prevented by cleaning up emissions



- Many factories now have Scrubbers to take the harmful gases out before they release their fumes into the atmosphere.
- Cars are now being fitted with catalytic converters to clean up their exhaust gases.
- The other way of reducing acid rain is simply to reduce our usage of fossil fuels.

Learn about acid rain — and always take a coat...

There aren't too many details on acid rain. Don't forget they won't ask you easy stuff like "Is acid rain caused by cars or monkeys?", they'll test you on harder stuff like "Explain what change would take place in a lake if it was affected by acid rain." Learn and enjoy. And smile.

Deforestation

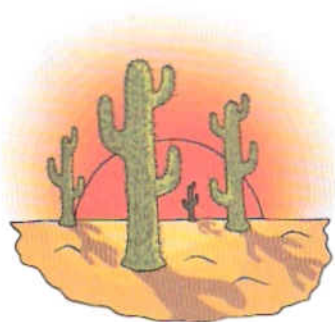
Deforestation damages the environment

Deforestation can lead to changes in the climate, soil erosion, and a reduction in the number of species in an ecosystem.

- 1) Plants store carbon in their tissues.
- 2) When the plants are burned, the carbon in their tissues is released into the atmosphere as CO₂ gas.
- 3) CO₂ gas is a greenhouse gas — it contributes to global warming.



- 1) Deforestation can also reduce rainfall.
- 2) Trees release lots of water vapor into the air by transpiration.
- 3) If trees are lost there's less transpiration, so less rainfall.



- 1) Plant roots help keep soil in place. Without them there is more risk of soil erosion, which makes the land less fertile.
- 2) Reduced plant cover increases rates of evaporation from the soil.
- 3) This interferes with the salt/water balance of the soil and causes an imbalance that makes it hard for plants to grow.
- 4) Without trees and vegetation, the soil can dry out and desertification can result.

- 1) As forest is destroyed, organisms lose their habitat.
- 2) Species can become lost from an area, or even extinct.



Lots of deforestation facts to learn here...

Not a very cheerful page, but pretty important. And you know what that means... tear it out of the book and pretend it never happened. Just kidding — it's actually got to be learned, learned, and then learned some more. Well, at least I amuse myself.