

GENERAL CERTIFICATE OF SECONDARY EDUCATION

TWENTY FIRST CENTURY SCIENCE

A144

SCIENCE A

Unit A144: Controlled Assessment

CASE STUDY

NEWS SHEET

Background information:

This leaflet contains some reports about different people's views about:

Possible effects of air pollution on public health.

The articles give information about some of the research which has been done, and some of the opinions which have been published. The people who wrote the articles do not all agree – how can you decide how badly air pollution might affect you – and what should be done about it?

Read the articles and then choose a question for your Case Study that interests you about

Air pollution and public health

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Page 4 How big a problem is asthma? © Asthma UK, For journalists: key facts & statistics, http://www.asthma.org.uk/news_media/media_resources/for_journalists_key.html

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Air pollution and public health

Study proves the cause of asthma

BBC News Website

It's hard to avoid pollutants in the air – you can't just stop breathing! Air pollution has been linked with asthma for some time, but proof has always proved elusive. Now support for a direct link comes from a study of over 600 primary school children, which found that respiratory disorders got worse as air pollution increased.

The study lasted over 3 years at the University of Groningen in the Netherlands. Results were published in The Lancet medical journal. Children from town and country areas kept diaries of asthma symptoms and tested their lung capacity three times a day. When air pollution was higher, some children were much more likely to suffer breathing problems.

When there were more particulates - bits larger than 10 micrometers - in the air, these children were up to 139% more likely to suffer. And when there were more of the pollutants that make up car exhaust fumes - black smoke, sulphur dioxide and nitrogen dioxide - they were up to 131% more likely to have such symptoms.

Researchers claimed that the length of the study, and its careful links to clinical symptoms, helped to prove a link where other studies could not.

Finding ways to reduce air pollution, such as low or zero emission vehicles, must be an important part of public health policy, the researchers said. The Government has tried to increase the use of diesel cars in Britain by lower fuel taxes. This is called a "green" policy because diesels make less carbon dioxide than petrol-powered engines - but they also emit far more of the particulates.

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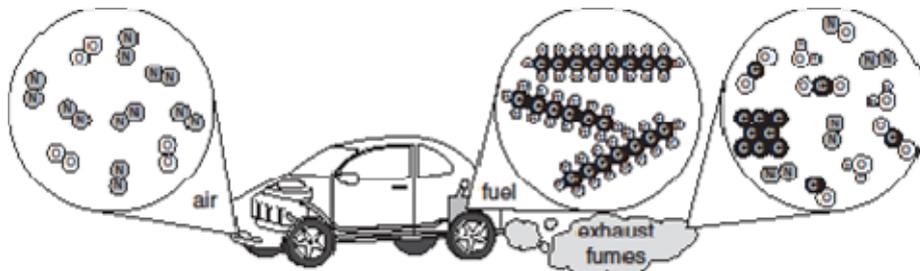


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This appeared in a reader's blog in response to the article:



The chemicals going into and coming out of a car engine

It may be the coffin they carry you off in but its the car that causes the "coff"!

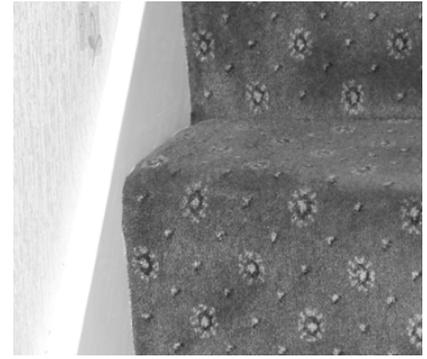
Carpets get the blame for asthma

From a report published in July 2000

A recent report has blamed fitted carpets for a rise in asthma and other allergies.

Almost every house hold in the UK has some fitted carpets, compared to just 16% in France and 2% in Italy.

The report, based on carpet sales and studies of houses in the South, says that this could be one reason why the UK has the worst record in the world for asthma and allergies. "House dust mites like to live in dark and damp environments and we find a lot of them at the base of a carpet. When you consider that each one produces 20 particles of faeces each day, that is an awful lot in a house full of fitted carpets."



© OCR / Peter Nicolson

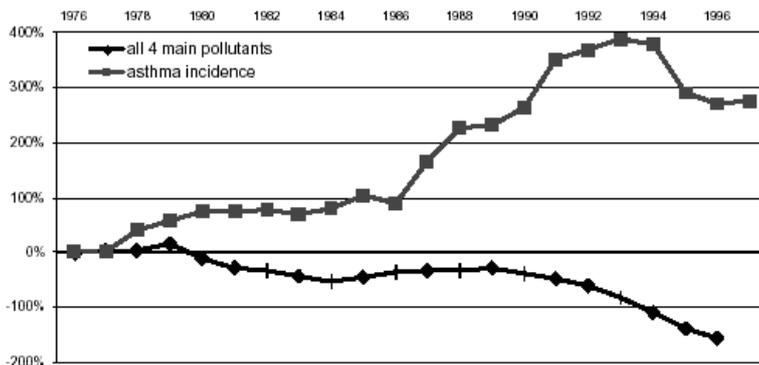
The allergen which causes conditions such as asthma is in the faeces. Up to 100,000 dust mites can live in just one square metre of carpet. They are very difficult to remove and can even resist the suction of vacuum cleaners.

The report has many sponsors, including the National Eczema Society, Action Against Allergy and the Women's Environmental Network.

Householders are advised to fit wood, laminate or linoleum floors, rather than carpets. "Where small children are concerned this simple act could save them from a life's suffering with allergies and breathlessness.", said a spokeswoman for the Network.

However, the claims were disputed by experts from the University of Cambridge who said that dust mites in beds were a more likely cause. "The danger with asthma is breathing in the allergen. Particles in a bed are easily spread into the air - just turning over in bed is enough."

National trends in the incidence of Asthma and 4 major pollutants: PM₁₀ - SO₂ - NO_x - CO (summed)



News flash – November 2004

Researchers in Denver, Colorado compared daily air pollution levels with asthma symptoms for children who were already known to have moderate to severe asthma. Symptoms were monitored over three winters because winter is the season when pollution levels are highest. The numbers of children studied in each year were 41, 63 and 43. They concluded that air pollution seemed to have no effect on asthma flare-ups or lung function.

School Science As 'Media Slave' Is Condemned

by The Association of British Drivers

Students in future will read newspaper coverage of air quality issues in science lessons which, if they mirror the errors of the past and present, will lead them to conclude that outdoor air quality is getting worse when the opposite is true as it's now better than at any time for hundreds of years and ten times better than the air quality in our homes.

Newspapers and TV news items, if allowed to set the agenda for lessons, will link car emissions with asthma causation, yet asthma cases have increased over a period of time when outdoor air pollution has declined. Those with medical knowledge point to the home and enzymes in house dust mite excreta.

Should we worry about wheezes?

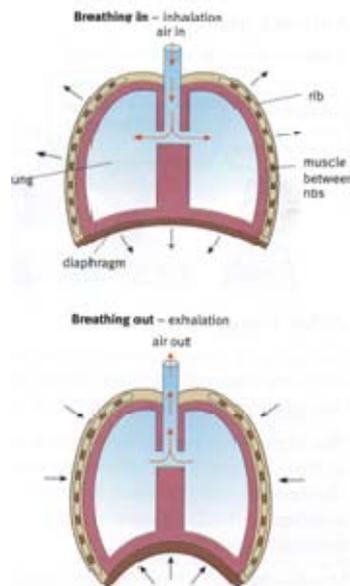
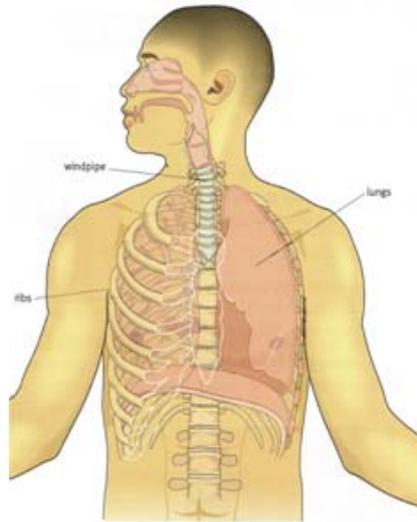
by our health correspondent

Breathe easy

When you breathe in

- you use muscles between your ribs to lift the ribs up and outwards.
- The diaphragm moves down
- this makes more space in your chest and air moves into your lungs.
- Tubes carry air into your lungs. They divide into smaller and smaller tubes.
- At the end of each tube is a tiny air-sac,
- blood flows through capillaries round the air sacs,
- oxygen in the air dissolves in the blood and is carried round the body,
- carbon dioxide waste from the body passes into the air in the sacs and is breathed out.

When you breathe out, the ribs move down and the diaphragm moves up. Air is pushed out of the lungs.



Breathe difficult

Asthma is a long-term health condition in which the tubes in the lungs become inflamed and narrow, making it difficult to breathe.



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A peak-flow meter to measure how well you can breathe

Asthma is one of a group of allergic conditions, including eczema and hay fever, which often occur together.

Symptoms are not present all the time, but can suddenly get worse – this is called an asthma attack.

Once somebody has asthma, attacks can be started by various “triggers” which set off the swelling of the air passages.



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How big a problem is asthma?

5.4 million people in the UK now need treatment for asthma:

- 1.1 million children (1 in 11 of the child population)
- 4.3 million adults (1 in 12 of the adult population).

There were 1200 deaths from asthma in the UK in 2006 (40 were children aged 14 years or under). On average, 3 people per day or 1 person every 7 hours dies from asthma.

You can see that lots of people suffer from the effects of air pollution, sometimes very seriously. Do you have a question about air pollution and health that you would like to find out more about?