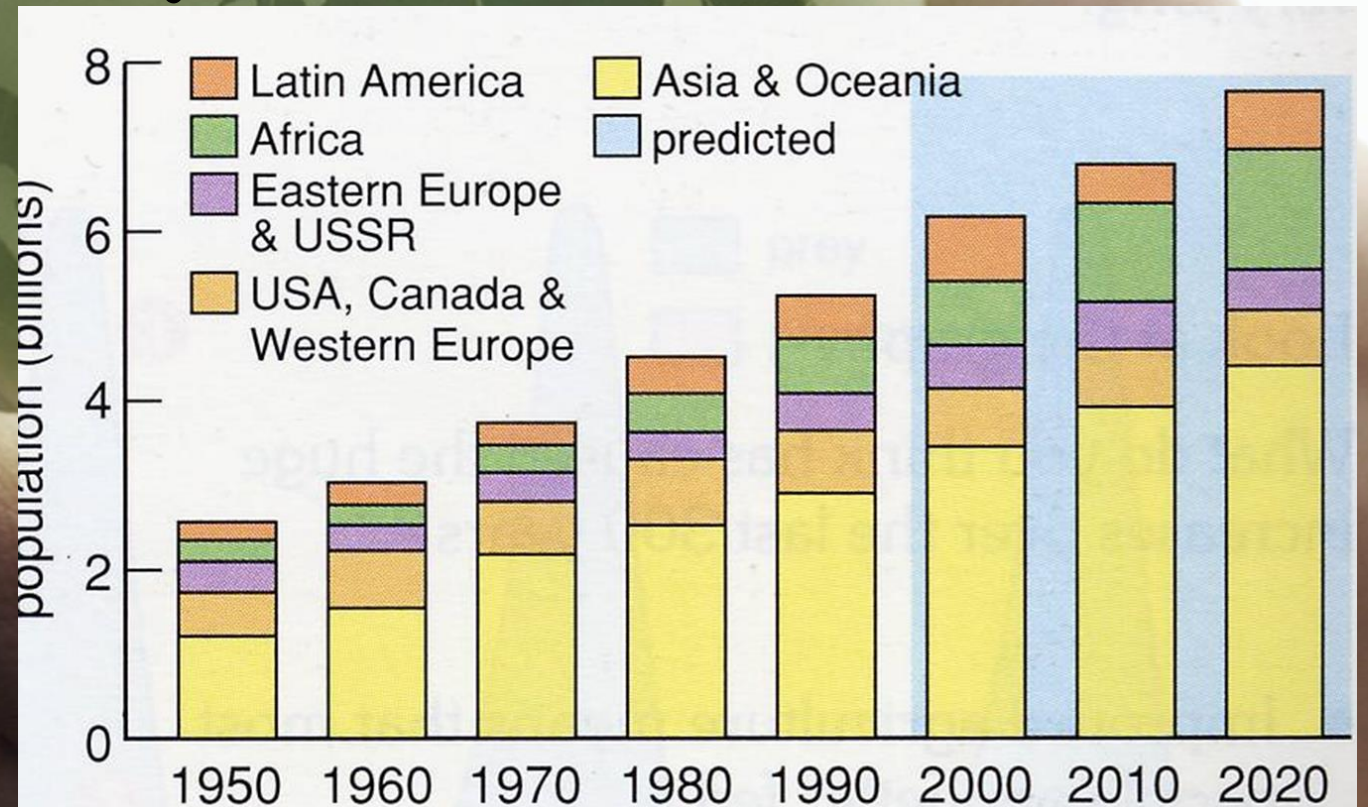




Human Impact on the Environment

World population by regions 1950 - 2020

- Humans often upset the balance of different populations in natural ecosystems, or change the environment so that some species find it difficult to survive.
- With so many people in the world, there is a serious danger of causing permanent damage not just to local environments but also to the global environment.



Pollution

- Rapid growth in the human population and an increase in the standard of living means that:
 - raw materials are rapidly being used up
 - more waste is produced
 - more pollution
- Humans reduce the amount of land available for other animals and plants by building, quarrying, farming and dumping waste.

- Human activities may pollute:
 - Water
 - with sewage, fertilisers or toxic chemicals
 - Air
 - with smoke and gases such as sulfur dioxide which contribute to acid rain
 - Land
 - with toxic chemicals such as pesticides and herbicides, which maybe washed from the land into water

Agricultural Pollution

- Crops are sprayed with fertilisers.
- Fertilisers dissolve in rain, and runoff into the rivers
- This makes them nutrient rich and encourages plant growth.
- Rivers become blocked with plants and algal growth.

- Eutrophication
This occurs when fertilisers applied to soils run off into freshwater systems, making them rich in nutrients such as N, P and K.
- Crops are sprayed with pesticides to remove insect pests.
- Pesticides stay in the ecosystem for a long time
- They can have a devastating effect on wildlife.

Freshwater Pollution

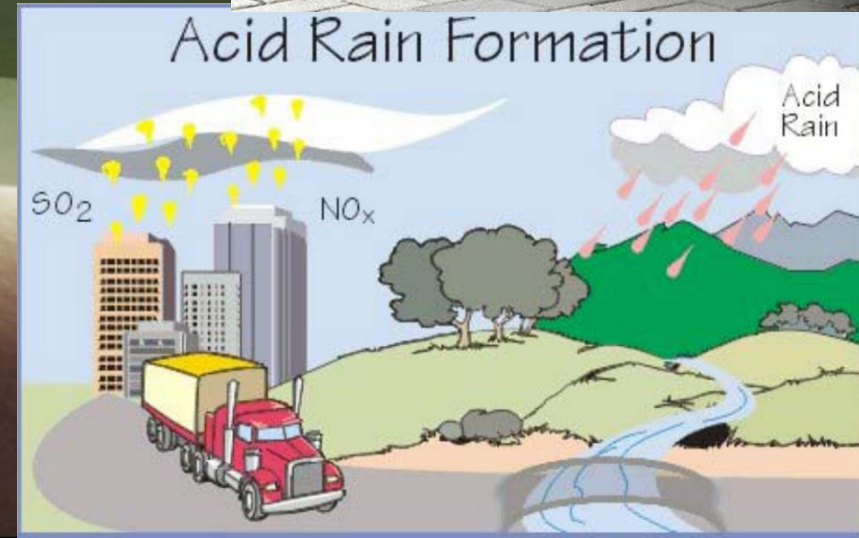
- There are 5 main stages
 - Fertilisers used by farmers may be washed into lakes and rivers
 - Rapid growth of water plants cause by the fertilisers
 - Death of some of these plants due to lack of light from overcrowding
 - Microbes which feed on the dead organisms now increase in number
 - Oxygen is used up quickly by the microbes
 - Suffocation of fish and other aquatic animals due to the lack of oxygen in the water.

Sewage

- Organic waste (sewage) provides food for bacteria, which allows them to grow and reproduce
- Bacteria use up the oxygen in the water when they respire
- There is less oxygen for other organisms such as fish and insects.
- Animals such as fish, stonefly nymphs and shrimps decrease in number.

Acid Rain and Air Pollution

- When fossil fuels are burned carbon dioxide is released into the atmosphere.
- Sulphur dioxide and nitrogen oxides are also released from...
 - Industry
 - Power stations
 - Motor vehicle exhausts
- These gases can harm plant and animals directly, but the main problem is the formation of acid rain.



What problems can acid rain cause?

- Trees and lakes are badly affected
- Fish can die when the pH of the lake they live in becomes too low.
- Acid rain increases the corrosion of metals...
- ... and reacts with limestone in buildings and statues to wear the limestone away.

Activity 1

Draw a cartoon to show how human activities contribute to air pollution.



Activity 2

- Air is a mixture of four gases; nitrogen, oxygen, carbon dioxide and water vapour. When fuels burn, oxygen from the air is used up and smoke, ash, carbon dioxide, sulphur dioxide, nitrogen oxides and hydrocarbons are produced, which can pollute the air.

- The table above shows how much of each of these pollutants were produced in one year in America.

1. Name three gases present in the air.
2. Which gas in the air is used up when fuels are burned?
3. How much carbon monoxide was produced by motor vehicles in one year?
4. Which source of air pollution is the greatest in one year?
5. Suggest one method of reducing the level of this pollutant.

Pollutant (tonnes)	Source			
	Power stations	Motor vehicles	Burning waste	Industry
Soot particles	8 000 000	1 000 000	900 000	6 900 000
Sulphur dioxide	22 200 000	800 000	1 000 000	6 700 000
Nitrogen dioxide	9 200 000	7 400 000	600 000	300 000
Carbon monoxide	1 600 000	57 800 000	7 000 000	8 100 000
Hydrocarbons	600 000	15 100 000	1 500 000	4 200 000

What can you do?

<https://www.bbc.co.uk/bitesize/clips/znfpyrd>

- Replace a regular light bulb with a compact fluorescent bulb and save 150 pounds of CO₂ a year.
- Properly inflated tires can improve your petrol mileage by more than 3%.
- Adjust your thermostat down in the winter and up in the summer. One degree each way could save you £100 per year on your utility bill.



What can you do?

<https://www.bbc.co.uk/bitesize/clips/zr2jmp3>

<https://www.bbc.co.uk/bitesize/clips/zvg3cdm>

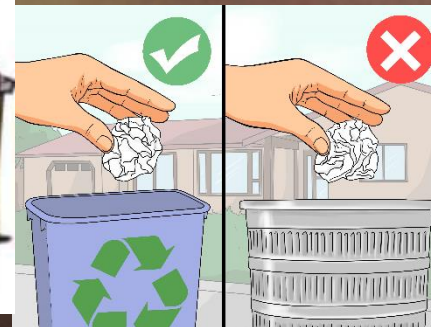


- Turn off electronic devices when you're not using them and save thousands of pounds of CO_2 a year.
- Recycle - if everyone in UK did it would decrease the amount of rubbish sent to landfills by 75%.
- Take a shorter shower - every two minutes you save can conserve more than 45 litres of water.

What can you do?

<https://www.bbc.co.uk/bitesize/clips/z7x2tfr>

- Drink tap water instead of bottled. Tap water is more strictly regulated than bottled.
- Pack a lunch in reusable containers.
- Use both sides of your paper and recycle. Paper is the biggest form of waste from schools. The average school tosses more than 8 million sheets a year (38 tons). Every ton recycled saves approximately 17 trees.



Activity 3

Imagine you are a pollution inspector who is called out to inspect a house, a farm and a factory.

- For each one, write a short report describing the pollution you might see, describing the effects each is having on the local ecosystem.
- Make some suggestions for controlling each type of pollution.