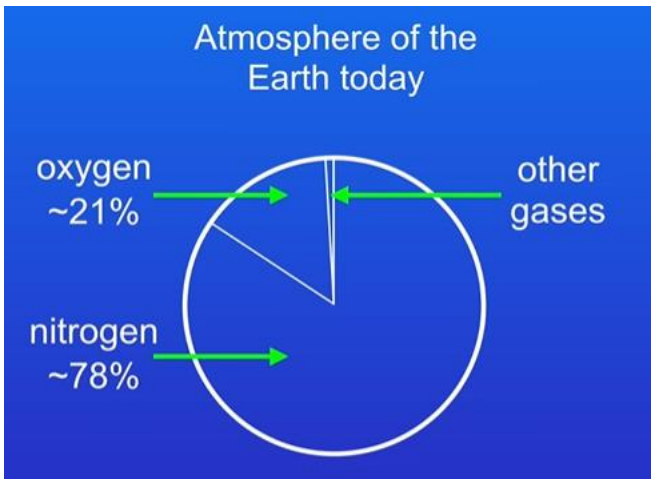
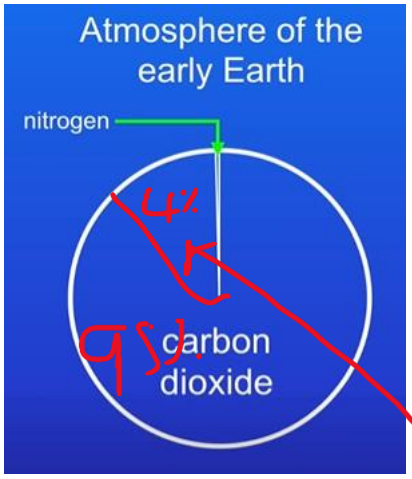
The atmosphere:

Earth is approximately 4.6 billion years old





Other gases include:

- Carbon dioxide
- Water vapour
- Noble gases

Water vapour

How life formed on Earth:

1. Earth is hot (with no atmosphere)
2. Earth begins to cool and form volcanoes

3. Volcanoes erupt and release CO_2, water vapour, methane and ammonia
4. Water vapour condenses forming clouds and then it begins to rain for million of years
5. Life forms in ocean (green algae) and then undergoes photosynthesis, taking in CO_2 and releasing O_2
6. Land animals and plants are able to survive
7. CO_2 is dissolved into oceans and locked up in sedimentary rocks meaning that it is trapped in fossil fuels
8. Denitrifying bacteria releases nitrogen (N_2) into the atmosphere

Fossil fuels:

Coal is formed from the remains of ferns and trees and if they die in marshy wetlands, then they don't decompose which is due to a lack of oxygen or acidic conditions which prevents bacteria from carrying out decomposition

Plant remains are covered with sediments and compressed and heat and pressure creates coal

Crude oil is formed from plankton and when these dies, they settle in mud on the sea bed and if oxygen is not present then they do not decompose and then overtime they are compressed by sediments and then heat and pressure create oil

Natural gas is mainly methane and it creates similar to oil

The greenhouse effect:

Energy from the sun travels to the Earth as short wavelength radiation

This radiation is absorbed by the Earth when it reaches the surface of the Earth warming the Earth

Surface of Earth radiates the energy as long wavelength radiation

Greenhouse effect keeps Earth warm enough to survive

Climate change:

CO_2 increases when we burn fossil fuels

Methane increases when cattle pass wind

Effects of climate change:

- Increased sea levels
- Severe weather
- Increased temperature

Why it's difficult to create models – Its complex

Carbon footprint:

Carbon footprint – Total amount of CO_2 and other greenhouse gases emitted over the full life cycle of a product, service or event

Reducing CO_2 emissions:

- Insulating homes
- Using public transport

- Switch to renewable sources of energy generation

Reducing methane emissions:

- Reduce intake of beef and dairy products
- Trapping methane from landfill and burning it to generate electricity

Fuels:

Fuel – Release energy when they are combusted

Sulphur oxide:

1. Sulphur is an impurity of fossil fuels
2. Sulphur reacts with oxygen when fossil fuels burn in air forming sulphur dioxide
3. Sulphur dioxide rises up into the clouds reacting with water causing acid rain
4. Acid rain erodes buildings, statues, trees made from limestone

Oxides of nitrogen:

1. Heat from the engine and car exhaust cause nitrogen and oxygen to react forming nitrogen oxide
2. Nitrogen oxide rises into the clouds and reacts with water forming acid rain
3. Acid rain erodes statues, buildings, trees made from limestone

Carbon particles (soot):

- Known as particulates
- Damages health
- Reduce energy from sun that reaches the Earth's surface (global dimming)