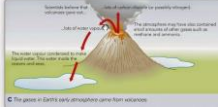


# Early Atmosphere evolving

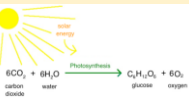
Volcanoes produced **Carbon dioxide, nitrogen (and a bit of methane and ammonia)**



Oceans formed

From condensed water. **Carbon dioxide dissolved** in the oceans. **Carbonates precipitated** (turned into solid bits) to form sediments.

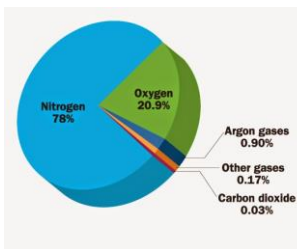
Green plants and algae



Took in  $CO_2$  and released  $O_2$  in photosynthesis.

Sedimentary rocks and fossil fuels were formed:

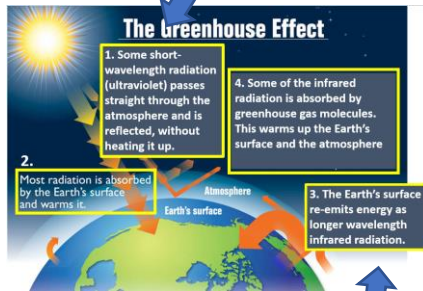
Decreased the  $CO_2$  levels



# Greenhouse Gases and Climate change

**Carbon dioxide**  
**Methane**  
**Water Vapour**

Short wavelength doesn't interact with the gases



Longer wavelength emitted does interact with the gases

Human activities increase the levels of  $CO_2$  and  $CH_4$

- $CO_2$**
- burning fossil fuels
  - Deforestation
- Methane**
- Cows (and rice paddies)
  - landfill

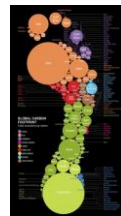
# C14 The Earth's Atmosphere

Effects of climate change:

- Rising sea levels
- Droughts
- Extreme weather events
- Changes in wildlife distribution

Why do some people deny humans cause climate change????

Difficult to model. Models are simplified. Media can be biased. MUST check the evidence is PEER REVIEWED



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

**Solution:**

- Reduce carbon footprint (emissions of  $CO_2$  and methane)
- Use less fossil fuels
  - Carbon capture and storage
  - Eat less meat
  - Send less food waste to landfill

# Atmospheric Pollutants

Gases released in combustion of fossil fuels and their effects:

Gases	Released when	Effects caused
Carbon dioxide	All fossil fuels burn	Global warming
Water vapour	All fossil fuels burn	None
Carbon monoxide	Incomplete combustion of fuels (not enough $O_2$ )	Poisonous gas
Solid particulates	Solid fuels burn incompletely	Global dimming Asthma
Sulphur dioxide	Coal burns (sulphur is an impurity in coal)	Acid rain Respiratory problems
Nitrous oxides	Nitrogen in air reacts with oxygen at high temperatures	Acid rain Respiratory problems

