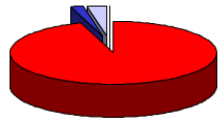


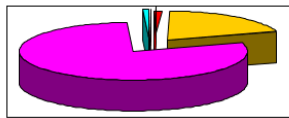
# Chemistry Crib Sheet: Topic 9

## Evolution of the Atmosphere

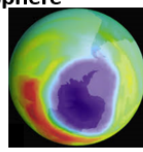
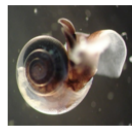
■ Carbon dioxide ■ Methane ■ Ammonia ■ Oxygen ■ Nitrogen ■ Others



Early Atmosphere – 200 million years ago



Today's Atmosphere



**1. Volcanoes produced nitrogen, carbon dioxide, ammonia and water vapour**

**2. Water vapour condenses to form the oceans**

**3. Carbon dioxide dissolves into oceans and is then absorbed by marine organisms' shells**

**4. Green plants & algae remove carbon dioxide from air by photosynthesis. This also releases oxygen.**

**5. Oxygen build up creates ozone layer, blocking harmful rays from Sun.**

### Ways to reduce carbon footprints:

- Carbon footprint = amount of  $\text{CO}_2$  released in the lifecycle of an object/event
- Renewable energy instead of fossil fuels
- Cut waste to stop methane production
- "Carbon tax" – e.g. forcing people to pay more money for driving cars that release more  $\text{CO}_2$
- Carbon capture – removing  $\text{CO}_2$  from the atmosphere and storing it underground



Today's atmosphere is being changed by:



**i) Complete combustion of Fossil Fuels releasing  $\text{CO}_2$**

Incomplete combustion also releases carbon monoxide (CO) and particulates

Carbon monoxide is poisonous because it stops red blood cells carrying oxygen properly.

Particulates cause breathing problems and global dimming (which reduces the amount of light reaching the Earth).

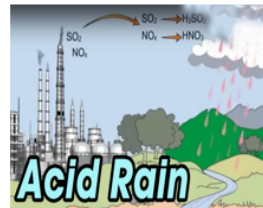


**ii) Agriculture and landfill**

Carbon dioxide is a greenhouse gas (like methane and water vapour).

**iii) Fossil fuels contain impurities that cause sulfur dioxide and nitrogen oxides to be released**

These oxides dissolve in water to make acid rain – killing plants, damaging buildings and corroding metals.



### Possible consequences of climate change:

- Ice caps melt, leading to flooding of coastal areas
- Changes in rainfall patterns – affecting the amount of food some countries can grow
- More storms
- Changes in weather patterns – affecting species distribution

