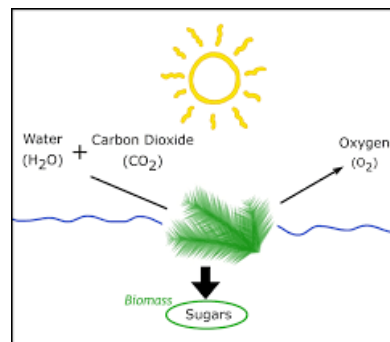
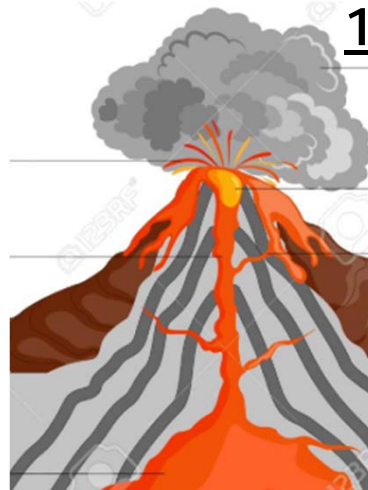


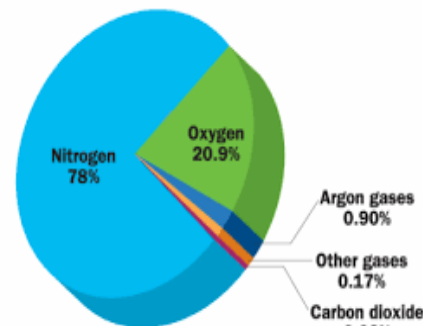


## Development of the atmosphere 1

- 4.6 billion years ago the Earth was a molten ball of rock covered in volcanoes
- **Volcanic activity released gases that formed the early atmosphere – methane, ammonia, water vapour and carbon dioxide**
- The Earth cooled to 100°C and the **water vapour condensed to form the oceans**
- Algae evolved in the oceans and **photosynthesised to produce oxygen**
- Oxygen levels gradually increased over the next billion years which enabled animals to evolve
- The Earth's early atmosphere is similar to the atmosphere of Mars and Venus today



## Composition of the atmosphere 2



## Decrease of Carbon dioxide 3

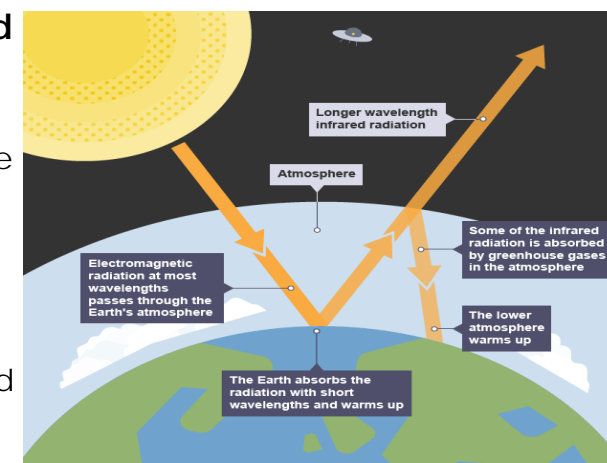
- Absorbed by green plants for photosynthesis
- Formation of sedimentary rocks and fossil fuels, e.g. coal and oil
- Absorbed by the oceans

## 4 Greenhouse gases and the greenhouse effect

Greenhouse gases are important in maintaining the Earth's temperature.

- **Methane**
- **Carbon dioxide**
- **Water vapour**

Greenhouse gases in the atmosphere have increased leading to the greenhouse effect



## Human activities 5

- Human activities increase the amounts of greenhouse gases in the atmosphere, e.g.
- **Combustion** of fuels releases carbon dioxide
- **Farming cattle** releases methane
- **Deforestation** releases carbon dioxide and reduces the absorption of carbon dioxide

## Peer review 6

- Based on peer-reviewed evidence, scientists believe human activities will cause the temperature of the Earth's atmosphere to increase
- It is difficult to model complex systems such as global climate change.
- This leads to simplified models, speculation and opinions presented in the media that may be based on only parts of the evidence and which may be biased.

## Climate change 7

- Effects of global climate change:
  - **Rising sea levels/Flooding**
  - **Melting ice caps**
  - **Drought**
- The carbon footprint is the total amount of carbon dioxide and other greenhouse gases emitted over the full life cycle of a product, service or event.
- **The carbon footprint can be reduced by reducing emissions of carbon dioxide and methane.**

## Pollutants from fuels 8

- **Carbon dioxide** formed from combustion of fuels. Causes global warming
- **Carbon monoxide** formed during incomplete combustion and is a toxic gas
- **Sulphur dioxide** forms from sulphur impurities reacting with oxygen in the atmosphere. Causes acid rain
- **Nitrous oxides** form from nitrogen and oxygen in the air reacting at high temperatures, e.g. in a car engine. Causes respiratory problems
- **Carbon particulates** are formed during incomplete combustion. Causes global dimming