Science KS3 **The Earth**

Glossary:

- **Chlorophyll**
  Green dye found in plants.
- **Climate change**
  Changing the weather and environmental conditions.
- **Combustion**
  Burning in oxygen or air.
- **Core**
  Centre of the Earth.
- **Crust**
  Surface of the Earth, divided into tectonic plates.
- **Deforestation**
  Cutting down forests of trees.
- **Emit** Give out.
- **Fossil fuels**
  Non-renewable fuel including oil, natural gas and coal.
- **Global warming**
  Rise in the average temperature of the Earth's surface.
- **Greenhouse effect**
  Greenhouse gases trapping infra-red radiation keeping the Earth warm.
- **Infra-red radiation**
  Heat energy.
- **Magma**
  Liquid rock in the mantle.
- **Mantle**
  Hot layer beneath the Earth's crust.
- **Organism**
  An individual living thing, e.g. bacteria or a human.
- **Photosynthesis**
  Chemical reaction which produces glucose.
- **Radiation**
  Energy waves emitted by the Sun.
- **Radioactive**
  Dangerous particles or waves emitted by unstable atoms.
- **Respiration**
  Chemical reaction which releases energy from glucose.
- **Tectonic plates**
  Large pieces of the Earth's crust.

Activities

- Explain the greenhouse effect in terms of radiation.
  a) Where does the original radiation come from?
  b) What happens to it when it reaches the surface of the Earth?
  c) What type of radiation is emitted from the surface of the Earth?
  d) What happens to this radiation?
  e) Why does this cause the green house effect?

- During deforestation, large areas of trees are cut down and burned.

Explain two ways deforestation leads to global warming.

- Carry out research into **Alfred Wegener** who developed the continental drift theory, which led to the modern theory of plate tectonics.

a) What evidence did he have for continental drift?
b) Why was his theory so controversial?

- Green plants produce glucose via photosynthesis.
  a) Describe the process of photosynthesis.
  b) Explain how plants use this glucose to get energy.

QUICK QUESTIONS:

1. Draw and label a diagram showing the structure of the Earth.
2. Name three gases found in the atmosphere.
3. Name two gases which contribute to the greenhouse effect.
4. Where does the Earth's external energy come from?
5. Where does the Earth's internal energy come from?
6. Name two processes which release carbon dioxide into the atmosphere.
7. Name a process which removes carbon dioxide from the atmosphere.
8. Why do plants need chlorophyll?

KS3 Spine The Earth

1. The atmosphere

- There is **air** all around the Earth's surface, but less and less the higher in the sky you go.
- The layer of air at the Earth's surface is **transparent** to most of the **radiation** coming from the Sun.
- The Earth's atmosphere contains approximately 78% Nitrogen, 21% oxygen and 0.04% carbon dioxide.

2. Internal source of energy

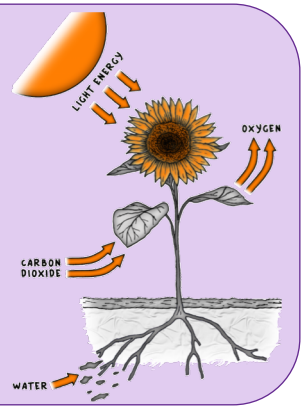
- **Radioactive decay** of materials inside the Earth acts as the Earth's **internal** source of energy.
- It is this energy which causes the **tectonic plates** to move. This leads to earthquakes, as well as the formation of mountains and volcanoes.

3. External source of energy

- The radiation from the Sun, which is **absorbed** by the Earth's surface, acts as an **external** source of energy.

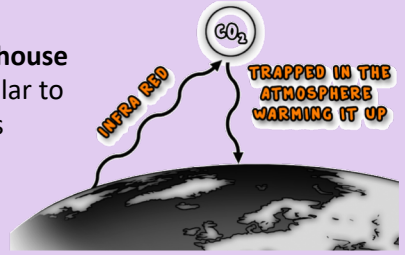
4. Photosynthesis

- **Radiation** from the Sun provides the energy for **photosynthesis**.
- **Organisms** which contain **chlorophyll** can absorb this energy to make **glucose** via photosynthesis.



5. The greenhouse effect

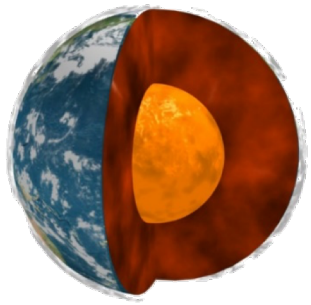
- The radiation absorbed by the surface of the Earth is **emitted** as **infra-red radiation**.
- Infra-red radiation cannot pass through the Earth's atmosphere but is absorbed by it, keeping the Earth warm.
- This is called the '**greenhouse effect**' because it is similar to the way a greenhouse is heated by the sun.



6. The structure of the Earth

- The Earth's **crust** is made of large pieces called **tectonic plates**. Beneath the Earth's crust is a hot layer called the **mantle**. When there is less pressure, the mantle melts and forms **magma.**

The centre of the Earth is called the **core**.



7. Human impact on climate

- Human activities produce **carbon dioxide** and **methane**.
- **Burning fossil fuels** and **deforestation** increase the levels of carbon dioxide in the atmosphere. Cattle produce large amounts of methane.
- This increases the **greenhouse effect** and leads to **global warming** and **climate change**.
- Climate change causes: ice caps to melt, oceans to warm and changes to habitats.

8. The carbon cycle

- Carbon is needed by all **cells**.
- It is removed from the atmosphere by **photosynthesis** and returned to it by **respiration** and **combustion**.