

# Knowledge Organiser Key Stage 3

Subject: Science

Year: 8

Topic Title: Materials + the Earth

## Key Facts

### 1. **Sedimentary rock formation**

Sedimentary rocks are formed from the broken remains of other rocks (**sediment**) becomes joined together.

**transport → deposition → sedimentation → compaction → cementation**

### 2. Sedimentary rocks contain **fossils**

### 3. **Igneous rocks** are formed by magma that has cooled and solidified.

4. If magma cools **slowly**, it will form rock with **large** crystals

5. If magma cools **quickly**, it will form rock with **small** crystals

### 6. **Metamorphic rocks** are formed from other rocks that are changed because of heat or pressure.

7. If existing rock doesn't melt, the minerals they contain are changed chemically, forming metamorphic rocks

### 8. The Earth's resources are limited. We can **recycle** many resources, using less energy:

- **Glass**. It can be melted and remoulded to make new objects
- **Metal**. It can be melted and remoulded to make new objects
- **Paper**. It is broken up into small pieces and reformed to make new sheets of paper
- **Paper** can only be recycled a few times before it is only good enough for toilet paper / cardboard / fuel / compost
- **Plastic**. Many plastics (but not all) can be recycled so we use less crude oil, and reduces waste in landfill.

### 9. **Polymers** are made by joining lots of small molecules together to make a long molecule

10. **Polymers** are: unreactive, solids at room temperature, insulators, strong and hard-wearing

11. **Ceramic materials** are made from clay, like bricks and pottery

12. **Ceramic materials** are solids, hard and tough, and **brittle**

13. **Composite** materials are made from two or more different types of material.

14. **Composite** materials show **properties** of the materials they are made from.

15. Fibreglass is made from glass fibres and a tough polymer; reinforced concrete is a composite material made from steel and concrete.

16. **The greenhouse effect** keeps our planet warm by trapping the Sun's thermal energy that is reflected off the Earth's surface

17. Carbon dioxide is an important greenhouse gas.

18. Human activity (like burning fossil fuels) increasing carbon dioxide levels in the atmosphere

19. More thermal energy is trapped, causing the planet to become warmer than it would be naturally.

20. **Global warming** is this increase in the Earth's temperature

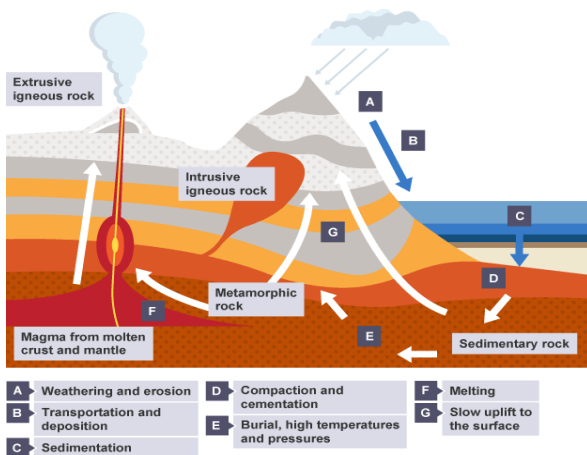
21. **Climate change** and its effects as a result of **global warming** includes: ice melting faster than it can be replaced in the Arctic and Antarctic; the oceans warming up causing sea levels to rise; changes in where different species of plants and animals can live

## Key words

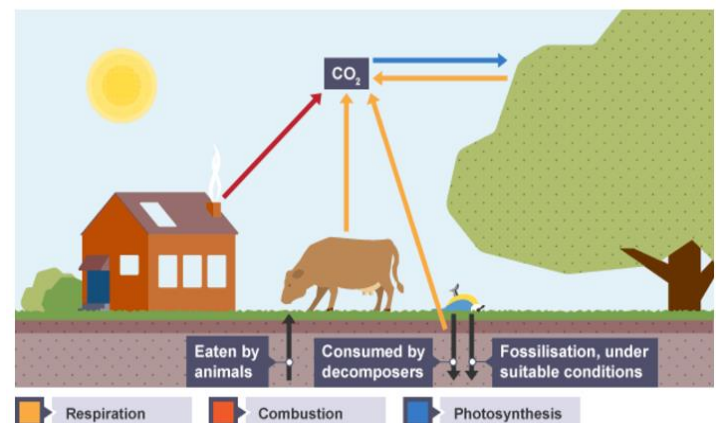
1. **Transport:** A river carries pieces of broken rock as it flows along.
2. **Deposit:** When the river reaches a lake/sea, it settles at the bottom.
3. **Sedimentation:** The deposited rocks build up in layers, called sediments.
4. **Compaction:** Weight of sediments on top squashes sediments at bottom.
5. **Cementation:** Water is squeezed out from between pieces of rock and crystals of different salts form. The crystals stick the pieces of rock together.
6. **Magma:** molten rock
7. **Brittle:** will smash when broken with force
8. **Properties:** ways of describing a material / object
9. **Climate:** weather patterns of an area over a long period of time
10. **The greenhouse effect:** the natural effect of our atmosphere keeping the planet warm
11. **Global warming:** the accelerated warming of the Earth by human activity
12. **Photosynthesis:** chemical reaction by plants using carbon dioxide and producing oxygen
13. **Respiration:** chemical reaction by all organisms using oxygen and releasing carbon dioxide
14. **Combustion:** burning fuels in oxygen

## Diagrams

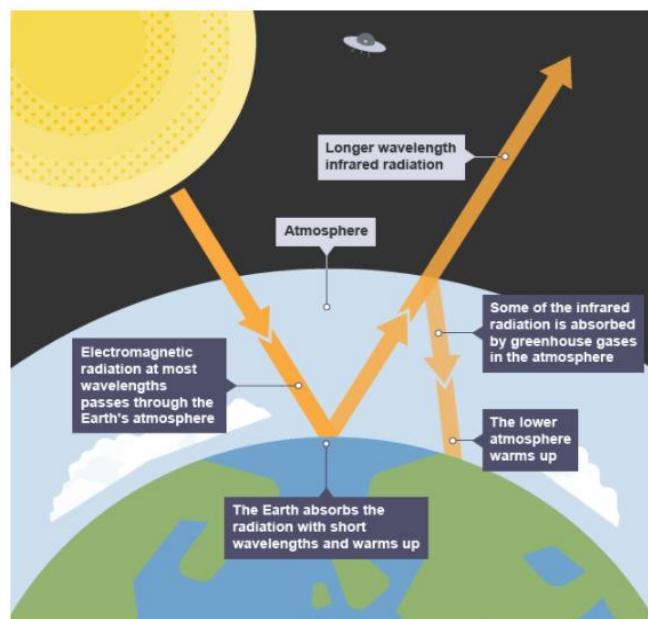
The Rock Cycle:



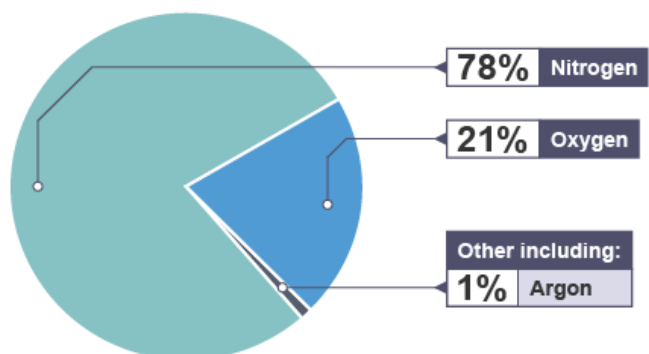
The Carbon Cycle:



The Greenhouse Effect:



The Earth's Atmosphere:



## **Potential misconceptions to avoid / errors students often make**

### **1. Magma vs lava**

Magma is molten lava found inside the Earth's crust; lava is molten rock that erupts from a volcano

### **2. Atmospheric gases**

Although oxygen is the gas essential for life on Earth, it only accounts for 21% of our atmosphere; the most abundant gas is nitrogen (78%)

### **3. The greenhouse effect vs global warming**

The greenhouse effect is a natural phenomenon, whereby the Sun's radiation is absorbed by the atmosphere and maintains the Earth's temperature; global warming is the acceleration of this warming effect due to human activity. The greenhouse effect is **vital** for life on Earth, but global warming is **damaging** the environment.

### **4. Global warming vs climate change**

Global warming is the acceleration of warming of the Earth due to human activity, which has many far-reaching environmental effects; climate change (a change in weather patterns, usually resulting in extreme weather) is one of these effects!

### **5. Plants carry out both photosynthesis and respiration!**

Plants photosynthesise to make their own food, using the Sun's energy. This uses carbon dioxide and releases oxygen. Plants ALSO respire (because they are living!), which uses oxygen and releases carbon dioxide.