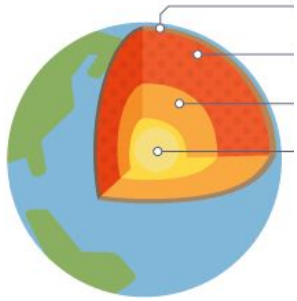


Earth and atmosphere (CHEM5)

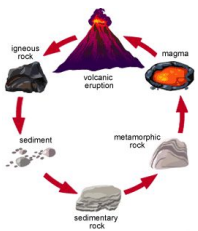
Key Terms:

Label the Earth. Describe each layer.



(C5.1) the composition of the Earth (C5.2) the structure of the Earth

Describe the stages in the rock cycle. Use the diagram to help.

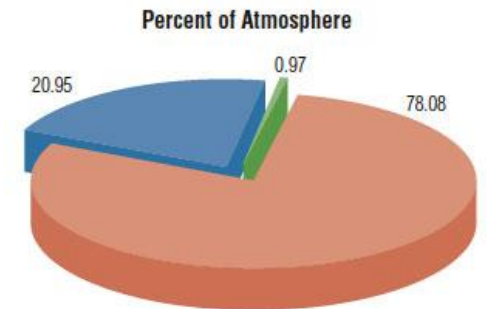


(C5.3) the rock cycle and the formation of igneous, sedimentary and metamorphic rocks

Recycling

(C5.4) Earth as a source of limited resources and the efficacy of recycling

The atmosphere: label this pie chart



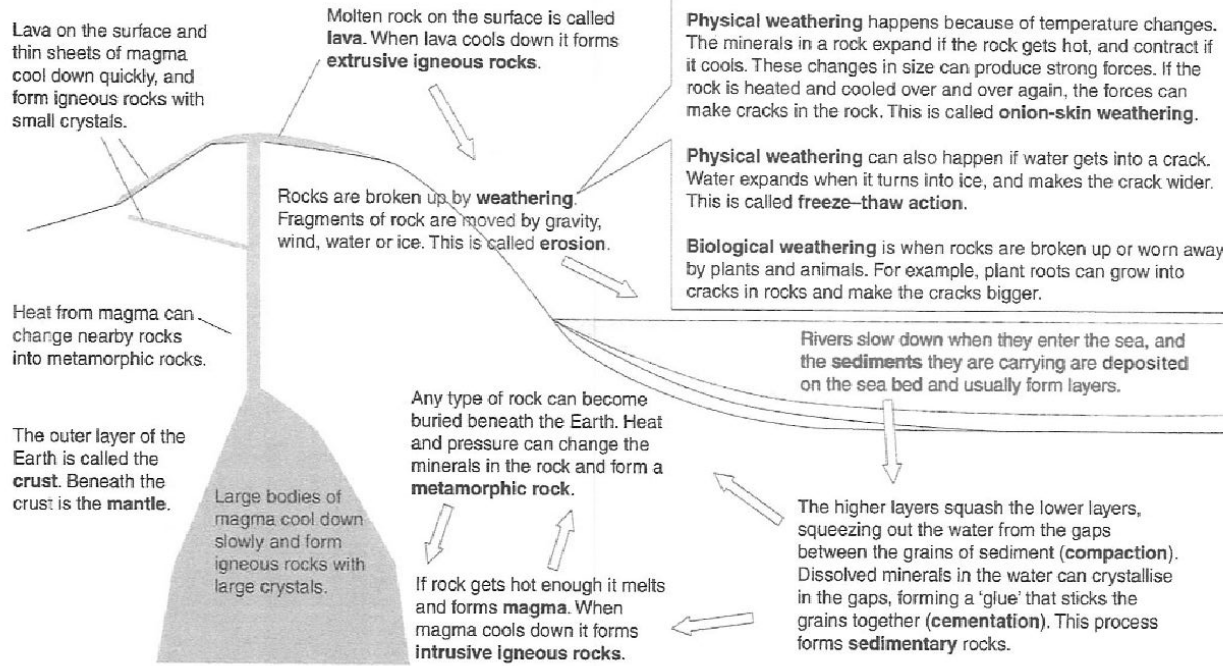
(C5.5) the composition of the atmosphere

SUMMARISE the Carbon cycle

(C5.6) the carbon cycle (C5.7) the production of carbon dioxide by human activity and the impact on climate.

Rocks

The rock cycle



Materials from the Earth

Many of the materials we use are obtained from the Earth. We use stone for building. **Cement** is made from **limestone**, and **concrete** is made by mixing cement, sand and **gravel** with water.

We also obtain metals from the Earth. Unreactive metals like gold and silver are found in their **native states**. Other metals are found as parts of minerals. An **ore** is a rock with enough of a particular mineral in it to make it worth mining. Pure metals are obtained from minerals using chemical reactions.

Mining for metals can destroy habitats and cause pollution.

If we **recycle** metals we will:

- make supplies of metals last longer
- reduce amounts of mining (and so reduce the pollution and environmental damage this causes)
- reduce pollution caused by putting metals in landfill sites.

Sorting and presenting data

The way data is sorted and presented depends on the type of variable and what you want to show.

Tables — show values and order.

Bar charts — compare differences between qualitative/discrete variables.

Line graphs — shows trends between variables.

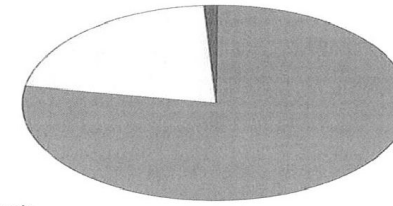
Scatter graphs — look for relationships between quantitative variables.

Pie charts — shows proportions of a total.

Note: Qualitative data = words. Quantitative data = numbers.

Discrete data = only certain number values.

Gases in air	%
nitrogen	78
oxygen	21
other gases	1

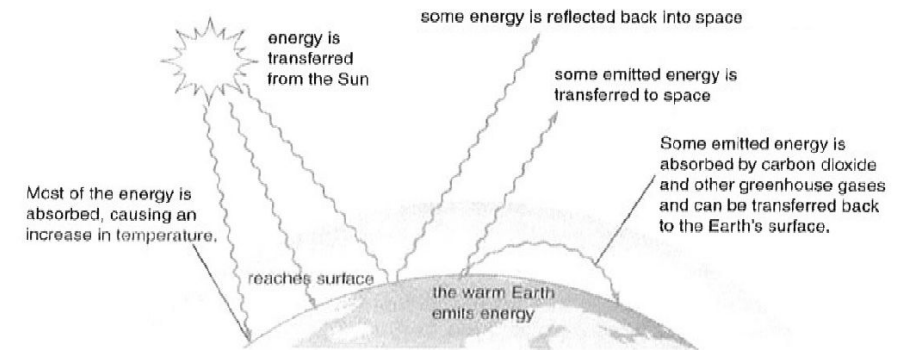


■ nitrogen
□ oxygen
■ other gases

Pie chart of gases in air

Greenhouse effect and global warming

Greenhouse gases in the Earth's atmosphere keep the Earth's surface warm. This is the **greenhouse effect**.



Carbon dioxide is a greenhouse gas. Most scientists think that the extra carbon dioxide released from burning fossil fuels has increased the temperature of the Earth's surface (**global warming**).

Scientists predict that global warming will cause **climate change**. The best way to control global warming is probably to reduce the amount of carbon dioxide we release into the air.

Problems with making and using materials

Burning fossil fuels provides the energy needed to make materials but is also linked to:

- acid rain from production of sulfur dioxide
- increase in carbon dioxide levels and the greenhouse effect
- soot dirtying buildings and damaging health.

Toxic substances released in waste get into food chains.

As large animals eat lots of smaller animals, toxin levels increase (biomagnification) and can reach harmful levels in humans.

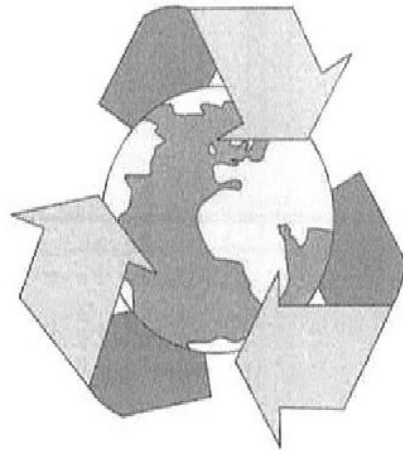
Non-biodegradable polymer waste causes pollution problems and dangers to animals for years.

Solutions to these problems include ...

- removal of sulfur from fuels
- reduction in the use of fossil fuels and use of more renewable energy sources
- control of hazardous waste from factories
- use of biodegradable polymers, which break down in the soil, so they disappear more quickly.

Recycling materials to use again ...

- reduces our use of landfill sites
- reduces the need to burn fossil fuels
- reduces pollution from manufacturing process
- saves our resources of raw materials, e.g. metal ores for metals and wood for paper.



Recycling saves the Earth's resources.

Examples of materials that can be recycled

Metals – by separating and melting.

Glass – by separating colours and melting.

Polymers – by using recycle labels.

Paper – by removing ink and adding water to make a pulp.

Concrete – by crushing and grading.

The carbon cycle

Many unicellular microorganisms are **decomposers** and play an important part in the **carbon cycle**.

