10.3 Air quality and climate

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS carbon dioxide • sulfur • acid rain • carbon monoxide • methane

Objective

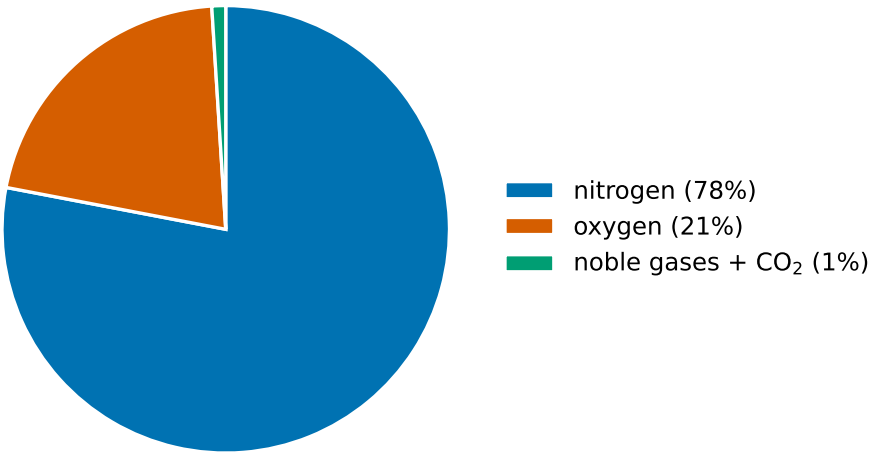
Build the skills to answer exam questions on **air quality and climate** – air composition, **pollutants** and their sources/effects, the **greenhouse effect**, and ways to reduce pollution.

You must be able to:

- state the composition of clean dry air
- give the sources and effects of the common pollutants
- explain the greenhouse effect and pollution-reducing measures

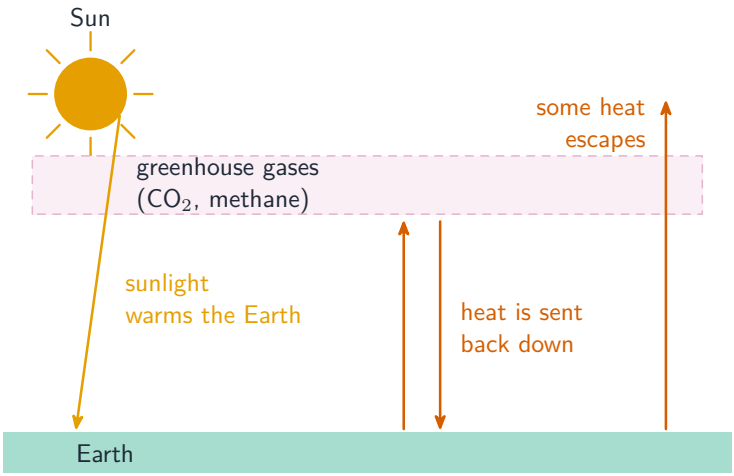
1 Key knowledge and worked examples

Air and the greenhouse effect



clean dry air ≈ 78% N_2, 21% O_2, 1% Ar/CO_2/others

Clean dry air ≈ 78% nitrogen, 21% oxygen, 1% other (noble gases + CO_2)



greenhouse gases trap some of the Earth's heat, so less escapes to space and the Earth warms up

Greenhouse gases (CO_2, methane) absorb heat radiated by the Earth, warming it

- **pollutants:** CO (incomplete combustion, toxic); SO_2 (sulfur fuels, acid rain); NO_x (engines, acid rain).

2 Practice

2.1 State the approximate percentages of nitrogen and oxygen in clean dry air. [2]

2.2 Name the gas that causes acid rain from burning sulfur-containing fuels. [1]

3 Exam-style questions

3.1 Carbon monoxide is formed by: [1]

- ☐ **A** complete combustion of a fuel
- **B** incomplete combustion of a fuel
- **C** photosynthesis
- **D** respiration

3.2 Carbon dioxide and methane are greenhouse gases.

(a) Explain how greenhouse gases cause the Earth to warm up. [3]

(b) State one way to reduce the amount of carbon dioxide in the air. [1]

3.3 A catalytic converter removes oxides of nitrogen and carbon monoxide. Give one benefit of fitting one to a car. [1]