Exercise walk-through

Air quality and climate ▪ 10.3

eXercise

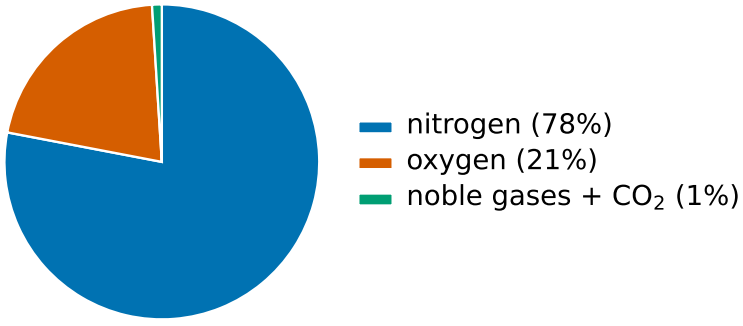
You must be able to

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

Method — Air and the greenhouse effect

- **pollutants:** CO (incomplete combustion, toxic); SO (sulfur fuels, acid rain); NO (engines, acid rain).

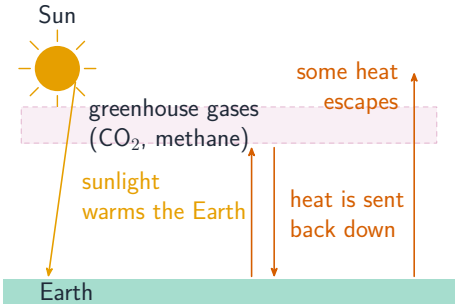
Method — Air and the greenhouse effect



clean dry air $\approx$ 78% N_2, 21% O_2, 1% Ar/CO_2/others

A pie chart of air: 78% nitrogen, 21% oxygen, 1% other

Method — Air and the greenhouse effect



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

Greenhouse gases let sunlight in but trap heat the Earth gives off

Practice 2.1 ▪ 2 marks

State the approximate percentages of nitrogen and oxygen in clean dry air.

Solution 2.1

Method: Air and the greenhouse effect

Worked steps

about 78% nitrogen B1; about 21% oxygen B1.

Practice 2.2 ▪ 1 mark

Name the gas that causes acid rain from burning sulfur-containing fuels.

Solution 2.2

Method: Air and the greenhouse effect

Worked steps

sulfur dioxide B1.

Exam-style 3.1 ▪ 1 mark

Carbon monoxide is formed by:

A complete combustion of a fuel

B incomplete combustion of a fuel

C photosynthesis

D respiration

Solution 3.1

A complete combustion of a fuel

B incomplete combustion of a fuel ✓

C photosynthesis

D respiration

Worked steps

B. Carbon monoxide comes from incomplete combustion.

Exam-style 3.2 ▪ 3 marks

Carbon dioxide and methane are greenhouse gases.
(a) Explain how greenhouse gases cause the Earth to warm up.
(b) State one way to reduce the amount of carbon dioxide in the air.

Solution 3.2

Method: Air and the greenhouse effect

Worked steps

(a) greenhouse gases let sunlight through to warm the Earth M1; they absorb the heat (thermal energy) the Earth gives off M1; and send some back down, so less heat escapes and the Earth warms A1.
(b) plant trees / burn fewer fossil fuels / use renewable energy B1.

Exam-style 3.3 ▪ 1 mark

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

Solution 3.3

Worked steps

it reduces the harmful gases (NO and CO) released, improving air quality B1.