

Exercise walk-through

7.1

Introduction to Air Pollution

AP Environmental Science

What we will cover

- 1 Types of pollutants
- 2 Photochemical smog
- 3 Thermal inversion
- 4 CO₂ and indoor air
- 5 Acid rain
- 6 Reducing pollution



Atmospheric CO₂ and particulates

the source

rising atmospheric CO₂ comes from burning fossil fuels

the effect

it enhances the greenhouse effect and warms the climate

particulate matter

tiny solid or liquid particles suspended in air

its sources

combustion, industry, road dust and wildfires

its effect

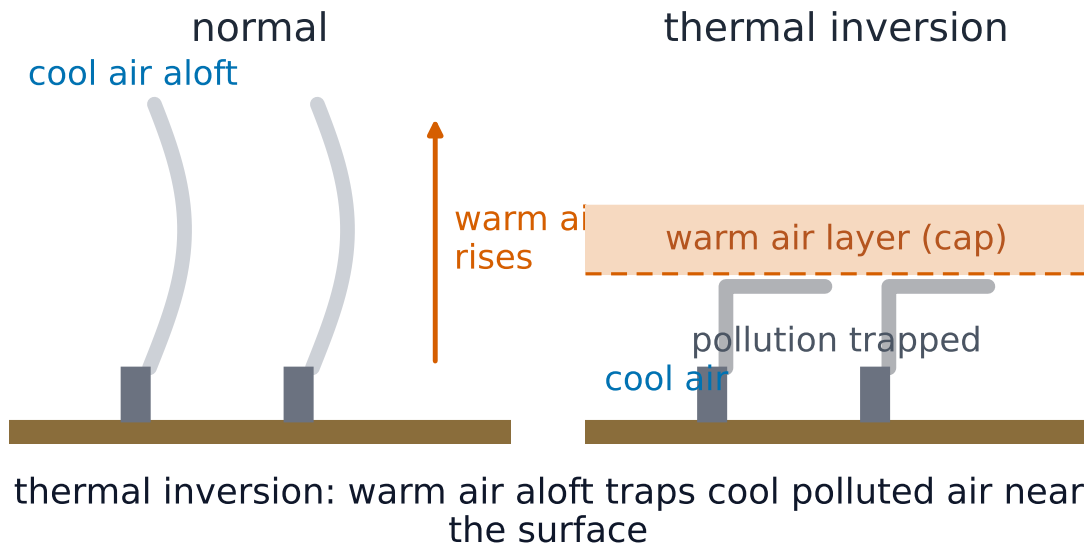
respiratory and cardiovascular disease – and PM_{2.5} penetrates deepest

and on climate

particulates can cool by reflecting sunlight, which is the opposite sign to CO₂

The two act in opposite directions, which is why cleaning up particulate pollution can unmask warming that was already there.

Thermal Inversion, continued



Normally warm air rises and disperses pollution; an inversion caps it near the ground

Exercises 2.1-2.3

2.1 Distinguish a primary from a secondary pollutant.

[2]

2.2 Name one pollutant from burning coal.

[1]

2.3 What is the main human source of air pollution?

[1]

Exercises 2.1-2.3

2.1 Distinguish a primary from a secondary pollutant. [2]

2.1

- Primary pollutants are emitted directly; secondary pollutants form in the air from primary ones

2.2 Name one pollutant from burning coal. [1]

2.2

- SO₂ (or particulates)

2.3 What is the main human source of air pollution? [1]

2.3

- Burning fossil fuels

Exercise 3.1

3.1 A secondary pollutant is one that

[1]

☐

A is emitted directly

B forms in the air from other pollutants

C is always harmless

D comes only from volcanoes

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3.1 B

- forms in the air from other pollutants

Exercise 3.2 (a)

3.2 A coal power plant emits SO_2 , which later forms sulfuric acid in the atmosphere.

(a) Classify SO_2 and sulfuric acid.

[2]

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(a)

- SO_2 = primary; sulfuric acid = secondary

Exercise 3.2 (b)

3.2 A coal power plant emits SO_2 , which later forms sulfuric acid in the atmosphere.

(b) State one environmental effect of this.

[1]

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[1]

(b)

- Acid rain

Exercise 3.3

3.3 Explain why reducing fossil-fuel combustion reduces most air pollution. [2]

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3.3

- Most primary and secondary pollutants come from burning fossil fuels, so cutting combustion cuts emissions of CO, SO₂, NO_x, and particulates at the source