Exercise walk-through

Pollution and Human Health ▪ 8.14

eXercise

You must be able to

- distinguish **acute** 急性 and **chronic** 慢性 exposure
- classify health effects (carcinogens, neurotoxins, teratogens)
- link specific pollutants to health outcomes

Method — Acute vs chronic

- **Acute exposure** — a single, short, high-dose exposure (e.g. a chemical spill).
- **Chronic exposure** — repeated, low-dose exposure over a long time (e.g. living near a polluted site).

Method — Types of harmful agents

- **Carcinogens** — cause cancer (e.g. asbestos, some POPs).
- **Neurotoxins** — damage the nervous system (e.g. lead, mercury).
- **Teratogens** — cause birth defects (e.g. some chemicals, alcohol).

Method — Specific links

- **Lead** — brain damage, especially in children.
- **Mercury** — nervous-system damage (from contaminated fish).
- **Particulates** — respiratory and heart disease.

Method — A worked classification

Lead is a **neurotoxin**; long-term low-level exposure in old paint or pipes is **chronic** and especially harms children's brain development.

Practice 2.1 ▪ 2 marks

Distinguish acute from chronic exposure.

Solution 2.1

Method: Acute vs chronic

Worked steps

Acute is a single short high-dose exposure; chronic is repeated low-dose exposure over a long time [B1] [B1].

Practice 2.2 ▪ 1 mark

What is a carcinogen?

Solution 2.2

Worked steps

A substance that causes cancer B1.

Practice 2.3 ▪ 1 mark

Name one neurotoxin.

Solution 2.3

Worked steps

Any one: lead, mercury B1.

Exam-style 3.1 ▪ 1 mark

A substance that causes birth defects is a

A carcinogen

B neurotoxin

C teratogen

D nutrient

Solution 3.1

Method: Types of harmful agents

A carcinogen

B neurotoxin

C teratogen ✓

D nutrient

Worked steps

C — a teratogen.

Exam-style 3.2 ▪ 1 mark

Children in old housing are exposed to lead paint over many years.
(a) State whether this is acute or chronic exposure.
(b) Classify lead's health effect and explain the concern for children.

Solution 3.2

Method: A worked classification

Worked steps

(a) Chronic B1. (b) Lead is a neurotoxin; it damages the developing brain, so children are especially at risk of learning and developmental problems M1 A1.

Exam-style 3.3 ▪ 2 marks

Explain why chronic low-dose exposure can be hard to detect but still harmful.

Solution 3.3

Method: Acute vs chronic

Worked steps

The effects build up slowly and may resemble other conditions, so the cause is hard to identify, yet the accumulated damage can be serious M1 A1.