

# 8.9 Solid Waste Disposal

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 10 marks

## Objective

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Build the skills to answer exam questions on **solid waste disposal**.

**You must be able to:**

- describe **sanitary landfills** 卫生填埋场 and **incineration** 焚烧
- state the pros and cons of each
- explain **leachate** 渗滤液 and methane

## 1 Worked examples

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Study these first. Each one shows the method for a question type used later —follow the steps and you can do the Practice and Exam-style questions yourself.

### ■ Sanitary landfills

A **sanitary landfill** buries waste with a **liner** (to stop leaks) and daily soil cover. Concerns:

- **Leachate** —liquid that seeps through waste, which can contaminate groundwater if the liner fails.
- **Methane** —produced as waste decomposes (a greenhouse gas; can be captured for energy).

### ■ Incineration

**Incineration** burns waste, **reducing its volume** and able to generate energy, but releases **air pollutants** and leaves toxic **ash**.

### ■ Trade-offs

- **Landfill** —cheaper, but uses land and risks leachate/methane.
- **Incineration** —less volume/land, but air pollution and cost.

### ■ A worked judgement

A landfill saves money but must be lined and monitored to prevent leachate polluting groundwater and to capture methane.

## 2 Practice

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Now apply the methods above.

**2.1** What is leachate? [1]

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**2.2** What gas is produced as landfill waste decomposes? [1]

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**2.3** State one advantage of incineration. [1]

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### 3 Exam-style questions

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**3.1** A liner is placed at the bottom of a landfill to [1]

- **A** produce methane
  - **B** stop leachate contaminating groundwater
  - **C** burn the waste
  - **D** add nutrients
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**3.2** A city debates a landfill vs an incinerator.

(a) State one advantage and one disadvantage of the landfill. [2]

(b) State one advantage and one disadvantage of the incinerator. [2]

**3.3** Explain how landfill methane can be turned from a problem into a resource. [2]

### 4 Go further

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You are now ready for the real exam questions on this subtopic:

- work through the **8.9 Solid Waste Disposal** lesson on the **Learn** page;
- read the **Solid Waste Disposal** section of the AP Environmental Science handout on the **Know** page.

## Solutions

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**2.1** Liquid that seeps through waste and can pollute groundwater.

**2.2** Methane.

**2.3** Any one: reduces waste volume, can generate energy.

**3.1 B** —stop leachate contaminating groundwater.

**3.2** (a) Landfill —advantage: cheap; disadvantage: uses land / leachate / methane. (b) Incinerator —advantage: reduces volume / energy; disadvantage: air pollution / toxic ash / cost.

**3.3** The methane can be **captured** and burned as fuel to generate electricity, turning a greenhouse-gas problem into an energy source.