

8.6 Thermal Pollution

Name: _____ Class: _____ Date: _____

Total: 9 marks

KEY WORDS dissolved oxygen 溶解氧 • thermal pollution 热污染

Objective

Build the skills to answer exam questions on **thermal pollution**.

You must be able to:

- define **thermal pollution** 热污染
- explain how warm water lowers **dissolved oxygen** 溶解氧
- give sources and solutions

1 Worked examples

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.

■ What it is

Thermal pollution is a harmful rise (or sometimes drop) in water temperature caused by human activity — most often **warm water discharged** from power plants used for cooling.

■ Warm water holds less oxygen

Warmer water holds less dissolved oxygen. So thermal pollution lowers oxygen just when fish (whose metabolism speeds up in warm water) need more — stressing or killing aquatic life.

■ Sources

Power plants and factories using water for **cooling**; also runoff from hot pavement.

■ Solutions

Cooling towers or **cooling ponds** let the water cool before release; releasing water gradually reduces the shock.

■ A worked link

A power plant discharges hot water into a river → the river warms → dissolved oxygen falls → fish are stressed or die.

2 Practice

Now apply the methods above.

2.1 What is thermal pollution? [1]

2.2 How does warm water affect dissolved oxygen? [1]

2.3 Name one source of thermal pollution. [1]

3 Exam-style questions

3.1 Warm water harms aquatic life mainly because it [1]

- **A** holds more oxygen
 - **B** holds less dissolved oxygen
 - **C** adds nutrients
 - **D** freezes
-

3.2 A power plant releases hot cooling water into a lake.

(a) Explain how this can kill fish. [2]

(b) Suggest one way to reduce the thermal pollution. [1]

3.3 Explain why the effect is worse in summer. [2]

Solutions

2.1 A harmful change (usually rise) in water temperature from human activity.

2.2 Warm water holds less dissolved oxygen.

2.3 Any one: power plant/factory cooling discharge, hot pavement runoff.

3.1 B — holds less dissolved oxygen.

3.2 (a) The hot water warms the lake, lowering dissolved oxygen while raising fish metabolism (higher oxygen demand), so fish suffocate. (b) Use a cooling tower/pond before releasing the water.

3.3 In summer the water is already warm with low oxygen, so extra heat pushes oxygen even lower, more easily killing fish.