AP ENVIRONMENTAL SCIENCE • EXERCISE SHEET

8.6 Thermal Pollution

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

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]

4 Go further

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

- work through the **8.6 Thermal Pollution** lesson on the **Learn** page;
- read the **Thermal Pollution** section of the AP Environmental Science handout on the **Know** page.

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.