AP ENVIRONMENTAL SCIENCE • EXERCISE SHEET

6.9 Hydroelectric Power

Name: _____ Class: _____ Date: _____ **Total: 10 marks**

Objective

Build the skills to answer exam questions on **hydroelectric power**.

You must be able to:

- describe how a **dam** 大坝 generates electricity
- state advantages (renewable, no CO_2) and disadvantages (habitat, displacement)
- explain effects on rivers and fish

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.

How it works

Hydroelectric power uses falling or flowing water (usually from a **dam**) to spin turbines and generate electricity. It is **renewable** and emits no CO_2 during operation.

Advantages

- Renewable, low-carbon, reliable.
- Reservoirs provide water storage and flood control.

Disadvantages

- The **reservoir floods** land, destroying habitat and displacing people.
- **Blocks fish migration** (e.g. salmon) unless fish ladders are built.
- **Traps sediment**, starving downstream areas of nutrients.
- Changes river flow and temperature.

A worked judgement

A large dam gives clean, reliable power but floods a valley, blocks fish, and traps sediment —significant ecological trade-offs.

2 Practice

Now apply the methods above.

2.1 What spins the turbines in a hydroelectric plant? [1]

2.2 State one advantage of hydroelectric power. [1]

2.3 State one disadvantage. [1]

3 Exam-style questions

3.1 A major ecological drawback of a large dam is that it [1]

- **A** produces CO_2
- **B** blocks fish migration and floods habitat
- **C** uses fossil fuels
- **D** cannot store water

3.2 A country builds a large dam for electricity.

(a) State one benefit and one environmental cost. [2]

(b) Explain how the dam affects fish and sediment. [2]

3.3 Explain why hydroelectric power is renewable and low-carbon. [2]

4 Go further

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

- work through the **6.9 Hydroelectric Power** lesson on the **Learn** page;
- read the **Hydroelectric Power** section of the AP Environmental Science handout on the **Know** page.

Solutions

2.1 Falling/flowing water (from the dam).

2.2 Any one: renewable, no CO_2, reliable, water storage/flood control.

2.3 Any one: floods habitat, displaces people, blocks fish, traps sediment.

3.1 B —blocks fish migration and floods habitat.

3.2 (a) Benefit: clean, reliable, renewable power; cost: flooded habitat / displaced people / blocked fish. (b) The dam blocks migrating fish (unless fish ladders exist) and traps sediment, starving downstream areas of nutrients.

3.3 It uses the water cycle (endlessly replenished by rainfall) to generate power and burns no fuel, so it emits no CO_2 during operation.