Natural resources

International Baccalaureate · IB Diploma · Environmental Systems and Societies · HL

Scope and prerequisites

This handout covers selected HL topics for the course first assessed in 2026; it is not the whole syllabus.

Prerequisites: read the stated quantities and units, and use arithmetic and the model conditions below.

The examples are original and fictional: they are not real measurements or real student investigations.

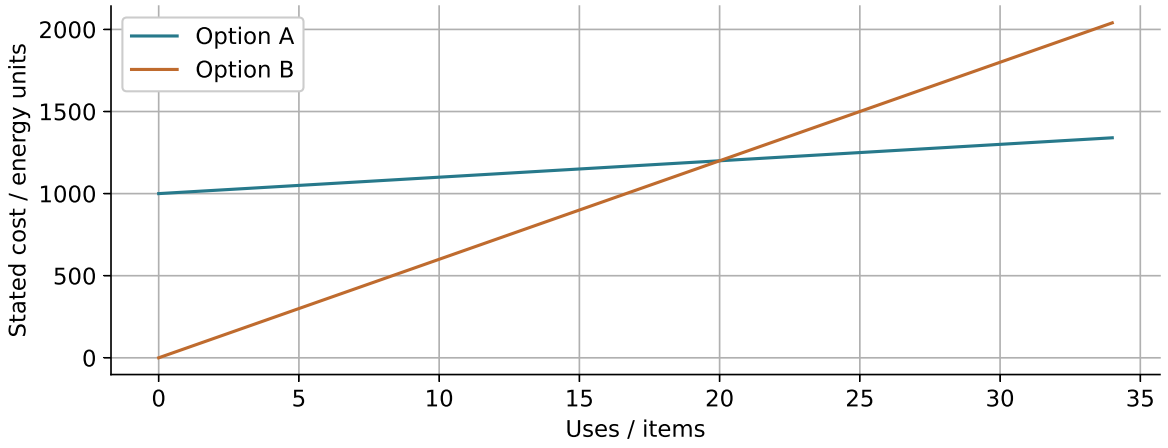
Natural resources: soils, yields and trade-offs

What would explain this observation?

- Two farms report the same total harvest. The one using half the land is not automatically more sustainable: **natural resources** regenerate at their own rates.

Build the model

- Soil is a resource: its removal and transport, by water, wind or gravity, is a loss measured beyond one season.
- Sustainable management weighs total **yield** per area and per energy input against regeneration rates and impacts beyond the farm boundary.
- Different stakeholders may rank food security, biodiversity and income differently.
- yield: The useful output of a managed system, per stated basis.
- natural resources: Materials and energy sources supplied by ecosystems and used by people.



The reusable item wins after 20 uses: 1,000 + 10n = 60n

Choose evidence that can test it

- Compare management options using a stated **functional unit** and the same timescale.
- Use approved secondary datasets or non-destructive soil observations.
- Explain trade-offs: no method is without disadvantages.

In the lab: State the functional unit (per hectare, per tonne, per gigajoule) before comparing, and keep the timescale identical.

Work from known quantities

- Known: farm A harvests 12 t from 4 ha (3 t per ha) using 40 GJ; farm B harvests 12 t from 2 ha (6 t per ha) using 25 GJ.

Your turn: A third farm matches B's per-hectare yield but feeds its soil nothing back. Which basis of comparison is still missing?

Check the conclusion and its limits

- A comparison is only as good as its stated functional unit and timescale.
- Stakeholder priorities differ: a food-security ministry and a conservation body can rank the same data differently, both correctly.

Not true: The higher-yielding farm is automatically the more sustainable one: regeneration and beyond-boundary impacts decide otherwise.

Key:

- State the functional unit and the timescale before comparing.
- Total yield, yield per area and per energy input are different claims.
- Watch for: impacts beyond the farm boundary and differing stakeholder priorities.

Write from a functional unit

- Two farms are compared per farm and per 1 000 kg of grain.
- Per farm compares whole farms; per 1 000 kg of grain compares equal food output. Choose a functional unit that matches the stated question, with equivalent function and the same timescale.

Write from three yield claims

- A farm yields 12 t on 2 ha with 40 GJ of energy input.
- Total 12 t; per area $12 \div 2 = 6$ t per ha; per energy $12 \div 40 = 0.3$ t per GJ – three different claims from one farm.

Write from a boundary stakeholder

- Irrigation water leaves the farm boundary and reaches downstream users.
- Name them in the trade-off: an impact beyond the boundary is still an impact of the system.