



MODULE 05 | TEACHER GUIDE

Harbour Futures

Design a Sustainable Waterfront | English B1–B2 | Ages 15–18 | 75–90 minutes

Teams plan the future of a fictional coastal harbour. They choose three projects, respond to a budget cut and defend a revised plan at a council meeting. The challenge connects employment, ocean health and fair access. The package with the most jobs is not automatically the most sustainable.

Learning outcomes

Students can explain the blue economy, compare benefits and drawbacks, work within budget and space limits, and question an environmental claim. They use evidence from project cards to justify a choice and suggest how to check progress.

Lesson sequence

Time	Activity	Outcome
0–7 min	Introduce the harbour mission and the three sustainability questions on p. 2.	Shared purpose
7–17 min	Read the science brief and board rules on pp. 2–3.	Rules and vocabulary
17–32 min	Read cards A–F and build the first plan on p. 6.	Three-project package
32–45 min	Open G and H. Revise the budget and correct the claim.	Revised plan
45–60 min	Prepare the council pitch using p. 7.	Evidence and conditions
60–75 min	Pair teams for two council rounds; swap roles and improve one sentence.	Reasoned decision

Preparation and differentiation

Print pp. 2–7 for teams of four and retain p. 8. Print pp. 4–5 single-sided. Cut out all eight cards; keep G and H face down until the first plan is recorded. Supply pens, one A3 sheet and ten counters per team.

Roles: budget checker, jobs adviser, environment adviser and community adviser. All help choose the plan. B1: read cards in pairs and use sentence frames. B2: compare a rejected alternative and explain what extra evidence is needed.

Optional extension to 90 minutes

Write a 100–140-word public update explaining the revised plan, one unresolved problem and two indicators to review. Students should distinguish invented forecasts from guaranteed results.

All names, project costs, forecasts and scenarios are fictional. Costs and jobs are simplified classroom values. Space conflicts apply to this game's first development phase, not to every real harbour. No real investment or environmental approval is implied.

Ocean Literacy principle 6: people and the ocean are connected. Links to decent work, responsible resource use and marine protection. Scientific background and answers appear on p. 8.



STUDENT SHEET 1 | THE MISSION

A harbour for people and nature

Harbourhaven has an old warehouse, a working quay, a sheltered bank and a public square. The council wants new jobs and a healthier waterfront. Businesses, residents and wildlife need space. Your team must choose three projects and explain your decision.

What is the blue economy

The blue economy connects ocean-related work and income with healthy seas. It includes activities such as shipping, tourism and fisheries. A business beside the sea is not automatically sustainable: how it uses resources and affects people and ecosystems matters. [1]

Sustainable development considers people today and future generations. It brings together economic activity, social inclusion and environmental protection. A plan can create jobs and still cause damage or exclude people. We need to ask more than one question. [2]

Look at	Ask
Economy	Will there be useful, fairly paid work? Are the forecasts realistic?
People	Who benefits? Who pays or loses access? Can local people take part?
Environment	What happens to habitats, resources, waste and emissions?

Facts for your decision

Shore power lets suitable ships use electricity from land while they are docked. This can reduce emissions from onboard engines used for power at the quay. It does not remove emissions during the voyage. The electricity source and other onboard equipment also matter. [3]

Living shorelines use plants and other natural materials. At suitable sites, they can provide habitat and reduce erosion. Design depends on waves, tides and the shape of the shore. They are not a promise that flooding will never happen. [4]

Coastal tourism can support local work and businesses. To be sustainable, it must also consider residents, visitors and nature. The label "eco" is not enough: ask what is done and how the results are checked. [5]

Word bank

quay = a place where ships stop • emissions = substances released into the air • forecast = an estimate of a future result • stakeholder = a person or group affected • trade-off = a benefit gained while giving up something else • indicator = something measured to check progress

Start together: name one harbour activity that can create jobs. What environmental or social question should you ask about it?

STUDENT SHEET 2 | PLANNING BOARD

Four places six possibilities

 Q WORKING QUAY Choose A or C One project maximum	 W OLD WAREHOUSE Project B One project maximum
 N SHELTERED BANK Choose D or E One project maximum	 P PUBLIC SQUARE Project F One project maximum

This is a planning board, not a geographical map. Q, W, N and P are zone codes.

Round 1 rules

- 1 Read project cards A–F. Keep update cards G and H face down.
- 2 Choose exactly three projects. Start with ten budget tokens.
- 3 Use no more than one project in each zone. You cannot combine A with C, or D with E, in this phase.
- 4 Add the costs and the job forecasts. Record your plan on p. 6.
- 5 Use all three sustainability questions from p. 2 to explain it.

How to read the numbers

Costs are invented planning tokens, not euros. For this game they cover each project's start-up and first year of operation. The job numbers are invented forecasts of additional year-round full-time-equivalent jobs in year three. They are not guaranteed.

For the arithmetic only, treat job forecasts as separate and add them. Real projects would need to check whether jobs overlap, replace existing work or actually go to local people. Job totals do not tell us pay, working conditions or environmental quality.

Conditions matter

You may suggest a condition such as affordable fees or a wildlife survey. A condition is not a free improvement: its cost and feasibility would need checking before a real project could be approved. Do not change the printed game costs or claim the condition is already delivered.

A zone without a new project keeps its existing use during this phase. Selecting fewer than three projects is outside the game rules; it may be an option in real planning.

Talk as a team

- "Project ... could help ... because ..."
- "However, it may also ..."
- "Before deciding, we would need to know ..."



STUDENT SHEET 3 | CUT-OUT PROJECT CARDS

Compare the harbour projects

A



SHORE POWER

ZONE Q / COST 4 / JOBS 2

Connect visiting ships to electricity at the quay. Ships need suitable equipment.

Can reduce engine emissions while docked. It does not remove emissions at sea. Electricity sources matter.

HARBOUR FUTURES / PROJECT

B



REPAIR WORKSHOP

ZONE W / COST 3 / JOBS 6

Reuse an old warehouse for boat and equipment repairs. Offer two paid training places within the six jobs.

Repair can extend product life. Paint, chemicals and waste still need safe handling.

HARBOUR FUTURES / PROJECT

C



CRUISE TERMINAL

ZONE Q / COST 5 / JOBS 9

Build a visitor terminal for larger passenger ships. Local shops may gain customers.

More visitors can also mean traffic and waste. Spending locally and suitable working conditions are not guaranteed.

HARBOUR FUTURES / PROJECT

D



LIVING SHORELINE

ZONE N / COST 3 / JOBS 2

Create a planted shoreline and a free public path. The plan needs a survey of tides, waves and habitat.

May provide habitat and reduce erosion at a suitable site. It needs care and cannot stop every flood.

HARBOUR FUTURES / PROJECT

Cost = planning tokens. Jobs = invented additional year-round full-time-equivalent job forecasts in year three. Cut on the dashed lines; all cards are fictional proposals.



STUDENT SHEET 4 | PROJECTS AND UPDATES

New ideas changing conditions

E



KAYAK CENTRE

ZONE N / COST 3 / JOBS 4

Create a kayak rental centre with guided trips. Sessions have a fee.

Boats have no motor during use. Busy routes may disturb wildlife; prices may exclude some residents.

HARBOUR FUTURES / PROJECT

F



WATERFRONT MARKET

ZONE P / COST 2 / JOBS 3

Open stalls for local makers and food sellers. Keep the walking route open and provide refill points.

May support local businesses. Affordable stall fees, waste collection and access need planning.

HARBOUR FUTURES / PROJECT

G

BUDGET UPDATE

10 → 8

A grant is smaller than expected. Your budget falls to eight tokens. Keep exactly three projects and follow the zone rules. Change your package if needed. Explain what you gain and what you give up.

OPEN AFTER YOUR FIRST PLAN

H

CHECK THE CLAIM

A fictional campaign says: "Shore power makes every ship climate-neutral." Check this claim using the science brief on p. 2. Rewrite it in one accurate sentence. Every team completes this task, even without Project A.

OPEN AFTER YOUR FIRST PLAN

Read E and F with the other project cards. Keep G and H face down until your first package is recorded. Both updates apply to every team.



STUDENT SHEET 5 | DECISION RECORD

Build test and revise your plan

First plan Ten tokens

Project	Zone	Cost	Job forecast
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
TOTAL	3 different zones	_____ / 10	_____

One economic benefit: _____

One benefit for people: _____

One environmental benefit or concern: _____

Open update G Eight tokens

Keep exactly three projects in three different zones. Change your package if it costs more than eight tokens. If it already fits, explain why you keep it or choose a different one.

Project	Zone	Cost	Job forecast
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
TOTAL	3 different zones	_____ / 8	_____

We changed / kept: _____

We gain: _____

We give up: _____

Open update H Check the promise

Rewrite "Shore power makes every ship climate-neutral" accurately. Say where the benefit applies and give one important limit. Use the science brief on p. 2.

B2 challenge: compare the two valid eight-token packages. Is a higher job forecast enough to decide? Explain your view.



STUDENT SHEET 6 | COUNCIL MEETING

Defend a plan that can be checked

Prepare a 90-second pitch for the revised eight-token plan. Share the speaking. A partner team becomes the council and asks two questions. Then swap roles.

Pitch structure

- 1 Name the three projects, their zones, total cost and job forecast.
- 2 Explain one economic, one social and one environmental point.
- 3 Name a group that may lose out and one condition you propose.
- 4 Give two indicators to check after opening. Say when to review them.

Council perspectives

Role	Ask about
Young job-seeker	"Who can apply for the jobs? Are training and fair working conditions included?"
Local resident	"Can residents still use the waterfront? What might become more expensive or noisy?"
Nature adviser	"What could harm wildlife? What would you check before opening?"
Small business owner	"Will local businesses benefit? What happens if visitor demand is lower than expected?"

Choose useful indicators

Examples: paid local jobs and training places; hours of free public access; visitor fees; waste collected; the area and condition of habitat. Select indicators that match your projects. A visitor total alone cannot prove that a plan is sustainable.

Indicator 1: _____ Review date: _____
Indicator 2: _____ Review date: _____

Language support

"Our package costs ... and forecasts ... jobs. These are estimates."

"We chose ... instead of ... because ..."

"One group affected is ... We propose ..., but it needs checking."

"We will measure ... after ... If the result is poor, we will ..."

Improve your recommendation

After the questions, rewrite one sentence that was too certain or did not consider a stakeholder. State what information would help you make a better decision.

B2: explain why the most profitable project, the largest job forecast and the most sustainable plan may be different choices.



TEACHER SHEET | ANSWERS AND SOURCES

Decisions and suggested responses

Budget and space checks

Initial valid three-project packages within ten tokens: ABD 10/10 jobs; ABE 10/12; ABF 9/11; ADF 9/7; AEF 9/9; BCF 10/18; BDF 8/11; BEF 8/13; CDF 10/14; CEF 10/16. Each pair is cost / job forecast. Reject A+C and D+E because of the first-phase zone rules.

After G, only BDF and BEF meet all rules. Both cost eight tokens. BDF forecasts eleven jobs; BEF forecasts thirteen. BDF prioritises the planted shoreline and free access; BEF adds paid recreation with possible wildlife disturbance and access barriers. The forecasts alone cannot decide sustainability. If a team already chose a valid eight-token package, it may retain it with reasons.

Claim check and environmental reasoning

Suggested correction: "Shore power can reduce emissions from suitable ships' power engines while they are docked, but it does not remove voyage emissions and its overall benefit depends partly on the electricity source." It is not a guarantee of climate neutrality. Living-shoreline benefits also depend on site conditions. [3, 4]

Accept conditions such as affordable stall fees, safe workshop waste handling, wildlife-sensitive routes and surveys. Require learners to say the condition needs a cost and feasibility check; it does not automatically cancel an impact. Neither a blue location nor an "eco" label establishes sustainability.

Model council pitch

"We choose B, D and F in the warehouse, sheltered bank and public square. The cost is eight tokens and the forecast is eleven jobs. The workshop offers repair work and paid training. The free path and market can benefit residents. The shoreline may help wildlife, but it needs a site survey. We rejected the kayak centre even though its job forecast is higher. Kayak businesses lose this opportunity. We propose affordable market fees, subject to a cost check. After twelve months, we will review paid local jobs and the shoreline's area and condition against a baseline. Poor results will lead to a review."

Teaching and assessment

There is no single compulsory package. Award 0–2 each for correct constraints, attention to all three sustainability dimensions, realistic trade-offs, careful use of forecasts and clear B1–B2 communication. B1 learners may use the frames; B2 learners should compare alternatives. Do not award points simply for selecting the largest job forecast.

Job counts and costs are invented teaching data. The game assumes projects have separate job totals and limits each zone to one new project. Real planning would also examine demand, displacement, finance, permissions and longer-term operating costs.

Sources

[1] World Bank. PROBLUE. <https://www.worldbank.org/en/programs/problue>

[2] United Nations. Sustainable Development Goals. <https://www.un.org/sustainabledevelopment/development-goals/>

[3] US EPA. Shore Power Technology Assessment. <https://www.epa.gov/ports-initiative/shore-power-technology-assessment-us-ports>

[4] NOAA Fisheries. Understanding Living Shorelines. <https://www.fisheries.noaa.gov/insight/understanding-living-shorelines>

[5] United Nations. Sustainable tourism. <https://sdgs.un.org/topics/sustainable-tourism>

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