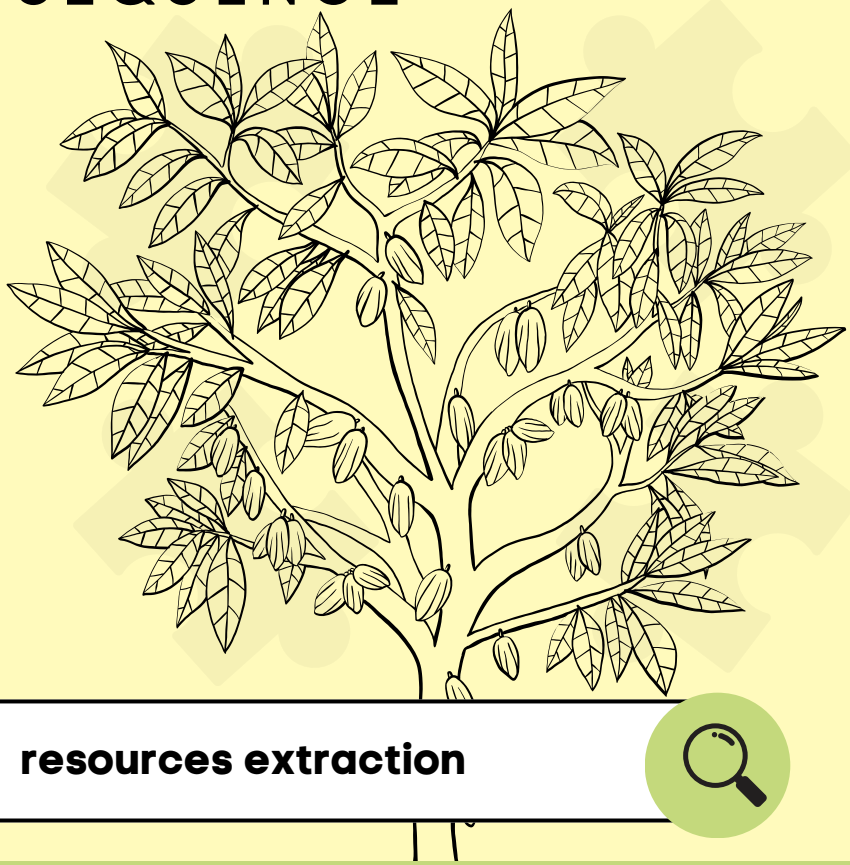
Escape Rooms for Green Entrepreneurship

PEDAGOGICAL SEQUENCE

The Invisible Chain



KEY TOPICS

environmental impact | resources extraction

Target group: learners aged 16+

Duration: 4-5 sessions (approx. 45 - 60 minutes each)

Introduction

Global supply chains do not only affect workers and labor conditions — they also shape ecosystems, resource availability and environmental sustainability. From raw material extraction to manufacturing, transport and disposal, each stage of production has environmental consequences that are often hidden from consumers. Many environmental impacts remain invisible due to geographical distance, complex production systems and limited transparency. Understanding how products are linked to resource extraction, pollution and waste is essential for responsible decision-making.

This preparatory pedagogical sequence introduces learners to the core concepts of environmental impact, resource extraction, sustainability and ecological responsibility within global supply chains. It prepares them to take part in the escape room "The Invisible Chain", in which players investigate everyday products and uncover their hidden environmental footprint. As a result, learners will develop a foundational understanding of how global production systems affect natural resources, how environmental harm can remain concealed within supply chains, and how transparency and responsibility contribute to more sustainable practices.

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Escape Rooms for Green Entrepreneurship

Overview of the pedagogical sequence

SESSION	THEME	MAIN FOCUS	KEY METHODS
1	Resource extraction	Raw material and environmental impact	Presentation, mapping, discussion
2	Environmental costs of production	Pollution and ecological damage	Case analysis, scenario work
3	Waste, lifecycle and circularity	Product lifespan and disposal	Lifecycle mapping, comparison tasks
4	Sustainable supply chains and gameplay preparation	Synthesis and application	Discussion, model-building, review



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SESSION 1: Understanding supply chains

Focus

Introduce the environmental implications of raw material extraction and its connection to global supply chains.

Learning outcomes

Learners will be able to:

- Define resource extraction
- Identify environmental impacts of raw material sourcing
- Explain how global demand drives extraction practices
- Connect everyday products to natural resource use

Key concepts, definitions and examples

Resource extraction

The process of removing natural resources from the Earth for economic use.

Concrete example: Mining for lithium used in electronic devices.

Environmental degradation

Damage to ecosystems caused by industrial or extraction activities.

Concrete example: Deforestation linked to agricultural production.

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Global demand

Consumer demand across international markets that influences production levels.

Concrete example: High demand for fast fashion increasing cotton and synthetic fiber production

Activities

- Introduction of key concepts using global production examples
- Mapping exercise: Identify raw materials in everyday products
- Discussion: Where do these materials come from?
- Reflection on visible vs invisible environmental impacts

Mapping exercise: Raw materials in everyday products

Divide learners into small groups. Each group receives one of the following products:

- Smartphone
- Pair of jeans
- Chocolate bar
- Plastic water bottle

Learners identify the main raw materials required to produce the product.

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Example guidance

- Smartphone → lithium, cobalt, copper, rare earth metals
- Jeans → cotton, synthetic fibers, dyes
- Chocolate → cocoa beans, sugar, palm oil
- Plastic bottle → crude oil

Discussion prompts

- Which resources are renewable and which are non-renewable?
- Which resources require large-scale extraction?

Evaluation

Exit slip: Name one environmental impact connected to a product you use daily.

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SESSION 2: Environmental costs of production

Focus

Build awareness of pollution, emissions and ecological damage embedded in manufacturing and transport systems.

Learning outcomes

Learners will be able to:

- Define environmental externalities
- Identify common forms of industrial pollution
- Explain why environmental costs are often hidden
- Recognise trade-offs between cost and sustainability

Key concepts, definitions and examples

Environmental externalities

Costs of production that are not reflected in the final price of a product.

Concrete example: Factory emissions contributing to air pollution without being included in product pricing.

Carbon footprint

The total greenhouse gas emissions associated with a product or activity.

Concrete example: Emissions generated during global shipping.

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Industrial pollution

Release of harmful substances into air, water or soil during production.

Concrete example: Chemical discharge from textile dyeing facilities.

Activities

- Case analysis of a manufacturing process with environmental impact
- Scenario discussion: Who pays for environmental damage?
- Mapping transport routes and estimating emissions
- Group discussion on price vs environmental responsibility

Case analysis: Environmental impact of textile production

Learners analyse a short scenario describing environmental impacts connected to manufacturing.

Scenario: Textile dyeing pollution

A factory producing clothing for international fashion brands dyes large quantities of fabric using chemical dyes. During the dyeing process, wastewater containing chemicals and microfibers is released into nearby waterways. Treating this wastewater would increase production costs, so the factory only applies minimal filtration.

Local communities depend on the river for agriculture and fishing.

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Discussion prompts

- What environmental impacts might result from this situation?
- Who is affected by the pollution?
- Who should be responsible for addressing these impacts?
- Why might companies continue such practices?

Transport emissions mapping

Learners examine how global transport contributes to the environmental footprint of products.
In small groups, learners estimate emissions from transporting goods internationally.
Educators may use a simple online CO2 calculator such as:

Carbon Footprint - Shipping emissions calculator
https://footprint.wwf.org.uk/
Learners select a product (for example clothing, electronics or food) and estimate emissions for transporting it between continents.

Discussion prompts

- How does transport distance affect a product's environmental footprint?
- Why might companies choose long-distance production despite environmental costs?
- How could supply chains reduce transport emissions?

Evaluation

Short written reflection: Why are environmental costs often invisible to consumers?

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SESSION 3: Transparency and traceability

Focus

Explore product lifecycles, waste management and the transition from linear to circular production models.

Learning outcomes

Learners will be able to:

- Define product lifecycle
- Distinguish between linear and circular economy models
- Identify environmental consequences of waste
- Explain the importance of durability and reuse

Key concepts, definitions and examples

Product lifecycle

The stages a product goes through from design to disposal.

Concrete example: Extraction → Production → Distribution → Consumption → Disposal.

Linear economy

A "take-make-dispose" production model.

Concrete example: Single-use plastic packaging.

Circular economy

A production system aimed at reducing waste through reuse, repair and recycling.

Concrete example: Refurbishing electronics to extend lifespan.

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Activities

- Lifecycle mapping of a common product
- Comparison task: linear vs circular production model
- Identification of waste hotspots in supply chains
- Discussion: How can products be designed for sustainability?

Lifecycle mapping activity

Learners analyse the lifecycle of one of the following products:

- Smartphone
- T-shirt
- Plastic bottle
- Laptop

Learners map the lifecycle stages:

1. Raw material extraction
2. Manufacturing
3. Transport and distribution
4. Consumer use
5. Disposal or recycling

Worksheet task

For each stage, learners identify:

- Resource use
- Possible pollution
- Waste generation

Evaluation

Group task: Propose one change to make a product's lifecycle more sustainable

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SESSION 4: Sustainable supply chains and gameplay preparation

Focus

Synthesize environmental concepts and prepare learners to apply them during the escape room experience.

Learning outcomes

Learners will be able to:

- Identify characteristics of environmentally responsible supply chains
- Connect lifecycle thinking to sustainability
- Apply environmental analysis during game-play
- Recognise hidden ecological impacts in product investigations

Key concepts, definitions and examples

Sustainable supply chain

A production system that reduces environmental harm while maintaining economic viability.

Concrete example: Companies reducing emissions and sourcing certified sustainable materials.

Environmental responsibility

The obligation to minimise ecological harm across production stages.

Concrete example: Transparent reporting on emissions and waste management.

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Activities

- Synthesis discussion linking extraction, production and waste
- Model-building exercise: Designing a sustainable supply chain
- Review of key vocabulary
- Explanation of how environmental themes appear in the escape room

Model-building exercise: Designing a sustainable supply chain

Learners redesign the supply chain of a T-shirt to reduce environmental impact.

Groups should consider:

- Sustainable material sourcing (e.g. organic cotton)
- Reduced transport emissions
- Cleaner manufacturing processes
- Product durability
- Recycling or repair options

Each group draws a simplified supply chain model showing their improvements.

Evaluation

Short checklist quiz covering environmental supply chain concepts.

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Checklist quiz: Environmental supply chain concepts

Learners answer the following questions individually or in pairs. The quiz reviews key environmental concepts introduced during the pedagogical sequence.

Questions

1. What is resource extraction?

a) Transporting products between countries
b) Removing natural resources from the Earth for economic use
c) Recycling used products

Correct answer: b

2. Which of the following is an example of environmental degradation?

a) Recycling plastic bottles
b) Deforestation caused by agricultural expansion
c) Repairing electronic devices

Correct answer: b

3. What is meant by environmental externalities?

a) Environmental costs that are not included in the price of a product
b) Environmental laws created by governments
c) Environmental benefits provided by companies

Correct answer: a

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4. What does a product's lifecycle describe?

a) The marketing strategy used to sell a product
b) The stages a product goes through from design and production to disposal
c) The time it takes to ship a product to customers

Correct answer: b

5. What is a linear economy?

a) A system where products are reused and repaired
b) A production model based on take-make-dispose
c) A system where all products are biodegradable

Correct answer: b

6. What is the main goal of a circular economy?

a) To increase product prices
b) To reduce waste through reuse, repair and recycling
c) To transport products more quickly

Correct answer: b

7. Which of the following actions can help reduce a product's environmental impact?

a) Increasing single-use packaging
b) Designing products that can be repaired or recycled
c) Producing products with shorter lifespans

Correct answer: b

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8. What characterises a sustainable supply chain?
a) A supply chain that focuses only on profit
b) A supply chain that reduces environmental harm and improves resource efficiency
c) A supply chain that produces goods as quickly as possible

Correct answer: b

Facilitator note (optional)
Review the answers together and clarify any misunderstandings before learners begin the escape room activity.

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