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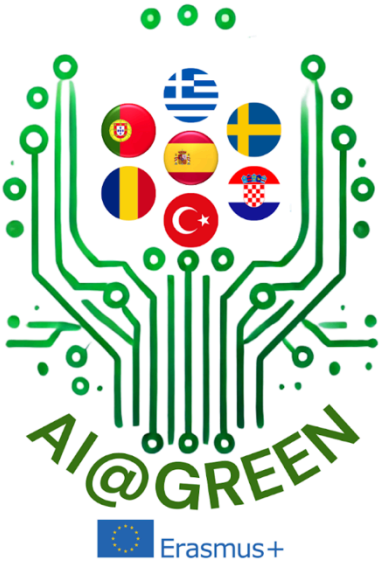

Plastic and the Environment - Recognize, Educate, and Act

Q1A2: Pedagogical methodology Planning

2025

Tackling the eco-sustainability as theory and practice...

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

(World Commission on Environment and Development, 1987)

Introduction

The course aims to raise awareness about the growing issue of plastic pollution and its effects on the environment, human health, and communities. It equips participants with the tools and skills to identify sustainable solutions and encourages proactive involvement in individual and group initiatives. The target audience includes primary and secondary school students, aged 12 to 15, as well as teachers and educators interested in incorporating these topics into their teaching practices.

By the end of the course, participants will be able to understand the causes and consequences of plastic pollution, develop practical strategies to reduce plastic consumption, engage in designing and implementing local actions, and effectively use digital tools and AI technologies to promote awareness.

Program Specification

This e-module is designed for individuals interested in ecology and sustainability, teachers aiming to enhance their teaching methods, and students ready to actively participate in projects. The primary educational goals include enhancing understanding of plastic waste issues, providing methods to promote sustainability, encouraging critical thinking, and developing collaboration and project-based skills.

The e-module consists of five modules:

1. History of Plastics and Their Environmental Impacts.
2. Plastics' Impact on Health and the Food Chain.
3. Strategies for Sustainability and Innovative Solutions.
4. Organizing Local Actions and Campaigns.
5. Creating an Action Plan for the Future.

The learning process combines interactive lessons such as videos, quizzes, and discussions, with practical activities like weekly challenges and campaigns. Assessment involves reflections, portfolios, and a final project.

Learning Goals Vs Learning Objectives

Learning Goals

1. To empower teachers with knowledge and skills to address the global challenges of recycling and waste management in their classrooms.
2. To promote critical thinking and environmental awareness among educators and their students.
3. To inspire the integration of sustainable practices into educational settings, encouraging positive actions for the environment.

Learning Objectives

By the end of this e-module, teachers will be able to:

1. **Explain** the causes, effects, and global implications of waste generation and the role of recycling in reducing environmental impacts.

2. **Identify** practical strategies to introduce recycling and waste management topics in engaging and age-appropriate ways for their students.

3. **Analyze** real-world case studies that connect recycling, waste reduction, and circular economy practices.

4. **Develop** lesson plans and classroom activities that encourage students to think critically about waste, consumption, and sustainability.

5. **Facilitate** meaningful discussions and projects to inspire student-led initiatives for responsible consumption, waste reduction, and community-based recycling solutions.

Detailed Module Description

Module 1: Understanding the Problem of Plastic Pollution

Goal: This module aims to provide a comprehensive understanding of the origins, usage, and environmental consequences of plastics. By examining the historical development and modern dependence on plastics, participants will critically evaluate their role in plastic pollution and identify actionable solutions.

Lesson 1: History and Types of Plastics

Objective:
Participants will understand the history and evolution of plastics, identify different types of plastics, and explore their applications in daily life.

Duration: 45 minutes

Materials:

- Computer or tablet with internet access
- Interactive timeline tool: https://www.sciencelearn.org.nz/interactive_timeline/14-plastics-innovations-and-impacts-timeline
- Examples of plastic items (e.g., bottles, packaging, containers)
- Labels or cards for categorizing plastics
- Kahoot quiz link or printed quiz
- Projector or screen

Activities:

1. Introduction (5 minutes)

- Brief discussion: “What do you know about plastics?”
- Teacher introduces the topic and explains the goal of the lesson.

2. Interactive Timeline (10 minutes)

- Participants explore an interactive timeline (https://www.sciencelearn.org.nz/interactive_timeline/14-plastics-innovations-and-impacts-timeline) showing key developments in plastics, from Bakelite (1907) to modern polymers.
- Timeline includes: invention dates, inventors, major technological breakthroughs, and societal impacts.
- Short discussion after exploration to highlight key points.

3. Hands-on Activity: Plastic Identification (20 minutes)

- Participants work in small groups.
- Each group receives a set of plastic items or photos.
- They identify the type of plastic (e.g., PET, HDPE, PVC) and its main use.
- Groups label the items and share their findings.
- The teacher facilitates by explaining the properties of each plastic type.

4. Knowledge Check: Kahoot Quiz (5 minutes)

- Participants take part in a Kahoot quiz to test knowledge of plastic types, history, and applications.
- Discussion of quiz results to reinforce learning.

Wrap-Up & Reflection (5 minutes):

- Participants reflect on what they learned.
- The teacher asks: “How has plastic changed our lives? What are the challenges of plastic use today?”
- Participants share one thing they learned and one idea to reduce plastic use in everyday life.

Outcome:
Participants will gain foundational knowledge about plastics, their history, and their wide range of applications, and will develop awareness of the environmental impact of plastic use.

Lesson 2: Environmental Impact of Plastics

Objective:
Participants will understand the ecological consequences of plastics, learn about microplastics, and explore real-world case studies on plastic pollution.

Duration: 45 minutes

Materials:

- Computer or tablet with internet access
- Google Earth
- Access to case study materials (articles, videos, reports)
- Padlet account or board
- Examples or images of polluted environments
- Projector or screen

Activities:

1. Introduction (5 minutes)

- The teacher introduces the topic and asks participants: “What do you think happens to plastic waste in the environment?”
- Short discussion to activate prior knowledge.

2. Google Earth Exploration (10 minutes)

- Participants explore global hotspots of plastic pollution in Google Earth.
- The teacher provides a list of locations to investigate (e.g., Great Pacific Garbage Patch, coastlines, rivers).
- https://theoceancleanup.com/plastic-tracker/
- Participants take notes on location, type of pollution, and possible causes.

3. Case Study Analysis (15 minutes)

- Participants work in small groups.
- Each group receives a case study (e.g., coral reefs affected by plastic waste, river pollution, microplastic accumulation).
- Groups research their case using provided resources.
- Findings are summarized and added to a collaborative **Padlet board** with text, images, and videos.

4. Interactive Simulation (10 minutes)

- Participants explore an interactive simulation showing how plastics break down over time and enter food chains: https://youtu.be/sAnbJCAYQw0
- The teacher facilitates discussion on the timeline of plastic degradation and the impact of microplastics on ecosystems.

Wrap-Up & Reflection (5 minutes):

- Groups share one key insight from their case study.
- The teacher asks: “What surprised you the most about plastic pollution?”
- Participants write a short reflection in Padlet summarizing what they learned and suggesting one action to reduce plastic pollution.

Outcome:
Participants will develop a deeper understanding of the ecological impact of plastics, including microplastic pollution, and will become aware of real-world consequences and factors contributing to environmental degradation.

Lesson 3: Personal Plastic Footprint

Objective:

Participants will track and analyze their personal plastic consumption, use an online calculator for comparison, and identify strategies to reduce their plastic footprint.

Duration: 45 minutes (plus logging activity over one week**4)**

Materials:

- Personal plastic log template (paper/digital)
- Computer/tablet with internet access
- Shared Google Sheet
- Access to **Plastic Bank's Plastic Footprint Calculator** (https://plasticbank.com/plastic-footprint-calculator/) Plastic Bank
- Data visualization tools (Google Sheets charts, Canva)
- Projector or screen
- Markers, sticky notes or Padlet for brainstorming

Activities:

1. Introduction (5 minutes)

- The teacher introduces the concept of a "plastic footprint" and its relevance.
- Show the **Plastic Bank calculator** interface, explain how it works, and discuss what kind of data users input (lifestyle, consumption habits). Plastic Bank
- Ask: "Why might using a calculator like this help you understand your personal impact more clearly?"

2. Plastic Use Logging (10 minutes)

- Participants receive a log template to record all plastic items they use over the next week (type, quantity, context).
- The teacher clarifies categories (packaging, disposable items, bottles, bags, etc.).

3. Calculator Comparison & Data Entry (10 minutes)

- After a few days of logging, participants (individually or in pairs) fill in Plastic Bank's Plastic Footprint Calculator with their lifestyle data. Plastic Bank
- They compare the results from the calculator with their own log data.
- Participants then input their logged data into a shared Google Sheet, which automatically generates graphs (pie charts, bar charts) showing individual and group consumption patterns.

4. Group Discussion & Brainstorming (15 minutes)

- In small groups, participants compare their calculator output and their own logs:

    - Where are the major differences?
    - What surprised them about the numbers?
- Each group brainstorms realistic strategies for reducing plastic use based on where their biggest consumption comes from.
- They record ideas on sticky notes or a collaborative Padlet board.

Wrap-Up & Reflection (5 minutes):

- Each participant shares one insight: either from the calculator comparison or from their log data.
- Write a quick personal pledge: one specific behavior they'll change in the coming week to lower their plastic footprint.

Outcome:

Participants will:

- Become more aware of their plastic consumption through both self-logging and calculator benchmarking
- Understand how their lifestyle compares to broader estimates provided by Plastic Bank's calculator
- Be motivated to adopt concrete habits to reduce plastic use in their daily routines.

Lesson 4: Societal Dependence on Plastics

Objective:
Participants will analyze the societal and economic reasons behind the heavy reliance on plastics, evaluate stakeholder perspectives, and explore realistic alternatives to plastic use.

Duration: 45 minutes

Materials:

- Computers or tablets with internet access
- **Miro** (or Jamboard / Canva as alternatives)
- Role cards for stakeholders (manufacturers, consumers, environmentalists, policymakers, retailers, etc.)
- Projector or screen
- Markers and sticky notes (optional, for hybrid sessions)

Activities:

1. Introduction (5 minutes)

- The teacher introduces the topic and explains how plastics became an essential part of modern society due to affordability, versatility, and durability.
- Short discussion: *“Can you imagine a world without plastics?”*

2. Role-Playing Debate (20 minutes)

- Participants are divided into small groups, each representing a stakeholder:
    - Manufacturers (emphasize cost efficiency and production)
    - Consumers (focus on convenience and accessibility)
    - Environmentalists (advocate for sustainability and alternatives)
    - Policymakers (consider regulations and economic impact)
    - Retailers (balance customer demand and eco-friendly products)
- Each group receives a role card describing their perspective and goals.
- Groups prepare short arguments, then participate in a structured debate on the topic: “Should society reduce its reliance on plastics immediately, or gradually?”

3. Creating a Plastic Dependency Map (15 minutes)

- After the debate, groups collaborate on Miro to create a “Plastic Dependency Map.”
- The map has two sections:
    - Essential Uses of Plastics (e.g., medicine, technology, food preservation)
    - Non-Essential Uses (e.g., packaging, decorations, single-use items)
- Participants use icons, arrows, and labels to visualize where plastic is most and least necessary in daily life.
- The teacher guides reflection: *“What patterns do you notice? Which sectors depend most on plastic?”*

4. Class Discussion: Finding Alternatives (5 minutes)

- Whole-class discussion on feasible alternatives to plastic in common industries.
- Participants brainstorm possible substitutes (e.g., biodegradable materials, glass, metal, reusable textiles).
- Teacher summarizes main takeaways.

5. Wrap-Up & Reflection (5 minutes)

- Participants reflect individually:
  “Which stakeholder’s perspective was most convincing to you, and why?”
- Each student writes one sentence on Miro or Padlet:
  “One change society could make to reduce plastic dependence is…”

Outcome:
Participants will critically assess the balance between the advantages and disadvantages of plastics in modern society, recognize the complex factors influencing plastic dependency, and identify realistic alternatives for a more sustainable future.

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Lesson 5: Time machine - A World Without Plastic

Objective:
Participants will imagine and visualize an alternative reality where plastics were never invented, using creative writing and AI-generated images to explore how society, technology, and the environment might differ.

Duration: 45 minutes

Materials:

- Computers or tablets with internet access
- AI image generation tools (e.g., DALL·E, Bing Image Creator, or Canva's AI Image Generator)
- Google Docs (for writing visions)
- Projector or screen for presentations
- Padlet or Miro board for showcasing results

Activities:

1. Introduction (5 minutes)

- The teacher introduces the concept: *"Imagine a time machine that takes you to a world where plastic was never invented."*
- Short discussion: *"How might everyday life be different? What would we use instead of plastic?"*
- The teacher shows one or two visual examples of everyday plastic items replaced with natural materials.

2. Creative Writing – Imagining a World Without Plastic (15 minutes)

- Students write a short text (5–10 sentences) in Google Docs describing:
    - What daily life looks like (homes, schools, transport, packaging)
    - How products are made and transported
    - What environmental conditions are like (oceans, cities, forests)
- They give their text a title, e.g., *"The Wooden Future"*, *"Life in the Glass Age"*, or *"Nature City 2050"*.

3. AI Visualization (15 minutes)

- Students use AI tools (such as DALL·E or Canva AI) to create 1–2 images based on their written vision.
  Example prompt: *"A futuristic city where all materials are biodegradable and there is no plastic."*
- They upload their generated images to a shared Padlet or Miro board next to their text.
- Students compare how the AI visualized their ideas versus what they imagined.

4. Group Comparison & Discussion (5 minutes)

- In small groups, students discuss:
    - How similar or different were the AI images from their own ideas?
    - What materials replaced plastic in their imagined world?
    - Would life be easier or harder without plastic?

Wrap-Up & Reflection (5 minutes)

- Each student shares one sentence in class or on Padlet:
  "If there were no plastic, the world would be…"
- The teacher concludes with reflection on the importance of innovation and responsible plastic use rather than total elimination.

Outcome:
Participants will use creative and critical thinking to envision a sustainable world without plastic, develop writing and digital skills, and reflect on the complex role of plastics in human progress and environmental health.

Assessment and Reflection

- Detailed Activity: At the end of the module, participants will:
    - Take an interactive quiz via Quizizz summarizing key concepts from all lessons.
    - Write a reflective essay on the topic: "What steps can I take to reduce my plastic footprint and inspire change in my community?"
    - Present a short video (1-2 minutes) showcasing their insights and personal commitments to reducing plastic usage.
- Outcome: Participants will consolidate their learning, articulate actionable solutions, and demonstrate their understanding of the plastic pollution crisis.

Module 2: Plastics and Health

Lesson 1: Plastics and Health

Objective:
Participants will understand what microplastics are, how they enter water and food systems, and the potential health risks associated with their accumulation in living organisms.

Duration: 45 minutes

Materials:

- Computers or tablets with internet access
- Plastic pollution: https://www.unep.org/topics/chemicals-and-pollution-action/plastic-pollution
- Access to simplified scientific data or charts (microplastics in fish, salt, bottled water, etc.)
- Canva or Piktochart for creating infographics
- Miro board for sharing group work
- Projector or screen for class discussion

Activities:

1. Introduction (5 minutes)

- The teacher introduces the term *microplastics* and shows a short video or image illustrating their size and sources (e.g., synthetic fabrics, packaging breakdown, personal care products).
- Brief discussion: *"Where do you think microplastics come from, and how might they reach our food?"*

2. Data Analysis: Microplastics in Everyday Foods (10 minutes)

- Participants review real-world data or simplified research charts showing microplastic concentrations in items such as fish, salt, or bottled water.
- In pairs, they identify trends and discuss:
  - Which foods are most affected?
  - What might explain these patterns?
- Groups note key findings in a shared Google Doc or Padlet.

3. Journey of Microplastics (15 minutes)

- Participants explore: UNEP Plastic Pollution
- Exploration (5 minutes): Students visit the UNEP Plastic Pollution page and review key sections, such as "From Pollution to Solution" and "Marine Litter and Plastic Waste Vital Graphics."
- Guiding Questions (5 minutes): As students explore, prompt them with questions like:
  - What are the main sources of plastic pollution?
  - How do plastics break down into microplastics?
  - What ecosystems are most affected by plastic pollution?
- Reflection (5 minutes): Conclude with a class discussion:
  - At which stage could we intervene to prevent microplastics from entering the environment?
  - What actions can individuals take to reduce plastic pollution?

4. Creating Infographics (10 minutes)

- In small groups, participants summarize their understanding by designing a visual infographic using Canva or Piktochart.
- The infographic includes:
  - Definition of microplastics
  - Key data from analysis
  - Health and environmental impacts

    - Suggested preventive actions
- Groups upload their infographics to a shared Miro board for display.

Wrap-Up & Reflection (5 minutes)

- Each group presents one key message from their infographic.
- Teacher prompts reflection:
  "What surprised you most about microplastics in our food?"
  "How can individuals help reduce microplastic pollution?"
- Optional: Conduct a quick Kahoot quiz to check understanding.

Outcome:
Participants will understand the pathways of microplastics into the human body, recognize their environmental persistence, and discuss possible health and ecological consequences. They will also learn how to communicate scientific findings visually and effectively.

Lesson 2: Health Impacts of Plastics

Objective:
Understand the potential health effects of plastics and explore preventive measures.

Duration: 45 min

Materials:

- Short documentary/video (e.g., YouTube, TED Talk) about plastics and health
    - https://youtu.be/aiEBEGKQp_I?si=mblq1Yt_qpqQNfL_
    - https://youtu.be/UqVM1BoGJOs?si=WO3680Oe1WaKNWFO
    - https://youtu.be/7vSMcb9X3kU?si=-4G_sgBR5FagpCzS
- Canva (for poster creation)
- Internet access
- Discussion guide/questions

Activities:

1. Introduction (5 min)
   The teacher briefly explains the health risks linked to plastics (e.g., endocrine disruption, toxicity, BPA, phthalates).

2. Video Viewing (10 min)
   Participants watch a short documentary/video on plastics and health.

3. Group Work – Poster Creation (15 min)
    - Divide participants into small groups.

    - Assign each group a specific topic (e.g., BPA toxicity, phthalates, microplastics, long-term exposure risks).
    - Using Canva, groups create a visual poster explaining their topic, including causes, effects, and preventive measures.

4. Debate and Discussion (10 min)
   Groups present their posters.
   Discussion prompts:
    - Should specific chemicals be banned in plastic production?
    - How can policy influence safer plastic use?

Wrap-Up & Reflection (5 min)
Teacher facilitates a reflection:
"What is the most surprising thing you learned about plastics and health?"
"What action can you take to reduce health risks from plastics?"

Outcome:
Participants will understand the health risks associated with plastics and will develop critical thinking about solutions and policies to prevent harm.

Lesson 3: Plastics and Animal Health

Objective:
Explore how plastic pollution affects animal health and develop empathy through creative expression.

Duration: 45 min

Materials:

- Internet access
- Padlet
- Genially
- Research materials (articles, videos, case studies)

Activities:

1. Introduction (5 min)
   The teacher introduces the topic of plastics and their impact on wildlife, mentioning examples such as sea turtles ingesting plastic bags and seabirds trapped in plastic waste.

2. Case Study Research (10 min)

    - Participants are divided into small groups.
    - Each group researches a case study on an animal species affected by plastic pollution.

    - They collect and share data on Padlet, including photos, videos, and facts.

3. Creative Writing Task (10 min)

    - Groups write a short “letter from the animal” describing how plastic pollution has impacted their life.
    - The letter should express feelings, challenges, and calls for action.

4. Video Creation (15 min)

    - Using Genially, groups transform their letter and case study findings into a short animated video.
    - The video should highlight the animal’s perspective and raise awareness.

Wrap-Up & Reflection (5 min)
Teacher facilitates discussion:

- “How does plastic pollution impact animal life differently than human life?”
- “What steps can we take to protect wildlife from plastics?”

Outcome:
Participants will empathize with the plight of wildlife and develop an understanding of the broader ecological consequences of plastic pollution.

Assessment and Reflection

- Detailed Activity: At the end of this module, participants will:
    - Create a digital presentation summarizing their insights on plastics and health.
    - Take a Quizizz assessment covering key topics.
    - Write a reflective piece: "How does plastic pollution affect not just humans but the entire planet?"
- Outcome: Participants will synthesize their knowledge and propose steps to mitigate the health impacts of plastics.

Module 3: Solutions and Sustainability

Goal: This module equips participants with strategies to reduce plastic waste, introduces the 5R model, and explores innovative materials and technologies for sustainability. Participants will collaborate to design actionable solutions for reducing plastic dependency.

Lesson 1: The 5R Model

Objective:
Participants will understand the 5R framework (Refuse, Reduce, Reuse, Recycle, Rot) and be able to apply it in daily life. They will identify practical actions to reduce waste in homes, schools, and communities.

Duration: 45 minutes

Materials:

- Digital device (computer, tablet)
- Internet access
- Access to Genially
- Whiteboard or shared digital brainstorming board

Activities:

1. Introduction & Brainstorming (10 minutes)
   The teacher briefly introduces the 5R framework and shows examples of successful zero-waste initiatives.
   Participants brainstorm in teams ways to apply the 5Rs in their homes, schools, and communities. Ideas are added to a shared whiteboard or Genially brainstorming page.

2. Interactive Genially Activity – “Sort the Waste” (15 minutes)

   - The teacher shares a Genially presentation containing interactive cards/slides with images of different waste items.
   - Each card asks: *"Which ‘R’ does this item belong to?"*
   - Options: Refuse, Reduce, Reuse, Recycle, Rot.
   - Participants work individually or in pairs to sort items correctly.
   - Genially provides immediate feedback and explanations for each item.

3. Creating a 5R Action Plan (15 minutes)

   - In small groups, participants use Genially to create a digital "5R Action Plan" tailored to their local context.
   - Plans include visuals, text, and examples of concrete actions.
   - Groups present their plans to the class.

Wrap-Up & Reflection (5 minutes):

- Teacher leads a group reflection:
  "Which of the 5Rs do you think is easiest to apply in your daily life? Which is the hardest? Why?"
- Participants share their thoughts verbally or add reflections to the Genially board.

Outcome:
Participants will understand the importance of the 5Rs and identify practical ways to integrate them into their routines, supported by an interactive Genially activity that reinforces learning.

Lesson 2: Innovative Materials

Objective:
Participants will explore innovative, biodegradable, and sustainable alternatives to traditional plastics and understand their real-world potential for replacing conventional materials.

Duration: 45 minutes

Materials:

- Computers or tablets with internet access
- Canva (or PowerPoint) for poster creation
- Access to articles or short videos about sustainable materials
- Zoom (for optional guest lecture)

Activities:

1. Introduction (5 min)

The teacher introduces the concept of *innovative materials* and their importance in reducing plastic pollution.
Short video or slideshow example: "Bioplastics Explained": https://youtu.be/7A2tDv79NqE

Discussion prompt: "Why do we still use so much plastic if we already have eco-friendly alternatives?"

2. Research Activity (15 min)

Divide participants into small groups, each researching one sustainable material:

- PLA (polylactic acid)
- Mushroom-based packaging
- Seaweed-based bioplastics
- Recycled paper composites
- Bamboo or hemp fibers

Each group answers these questions:

1. What is the material made from?
2. How is it produced?
3. What are its main advantages?
4. What are its limitations?
5. Where is it already being used?

3. Creative Task – Poster Creation (15 min)

Using Canva, each group creates an informative digital poster that includes:

- Title and short description of the material
- Photos or icons
- Table of pros and cons
  Example of one real-life company or product using it

4. Guest Lecture (5–7 min)

Invite a local sustainability expert, science teacher, or engineer (via Zoom or in person) to share practical insights.
Suggested talking points:

- How are bioplastics being used in industry?
- What are current challenges in production or recycling?
- How can young people contribute to material innovation?

5. Wrap-Up & Reflection (3–5 min)

- Groups briefly present their posters (1 minute each).
- Class discussion question: “Which material do you think has the most potential to replace plastic — and why?”
- Optional mini poll using **Mentimeter** or **Google Forms** to vote for the most promising material.

Outcome:

Participants will understand the science and purpose behind sustainable materials, be able to compare various bioplastics based on advantages and limitations and recognize real-world applications and innovations in sustainable material production.

Lesson 3: Designing Sustainable Solutions

Objective:

Participants will use creativity and AI tools to design practical ideas for reducing plastic waste in their school or community.

Duration: 45 minutes

Materials:

- Computers/tablets with internet access
- AI tools such as ChatGPT (for brainstorming) or DALL·E / Canva AI (for visuals)
- Optional: Padlet or Trello (for sharing ideas)

Activities:

1. Introduction (5 min)

Teacher opens discussion: "If you could invent one thing that helps reduce plastic waste, what would it be?"
Briefly review examples of upcycling or eco-friendly designs (e.g., plastic-free lunch kits, recycled art, refill stations).

2. AI Brainstorm (10 min)

Each group uses ChatGPT (or another AI assistant) to generate ideas for reducing plastic use.
Prompt example: "Give us 5 creative ideas to reduce plastic waste in schools."
Students discuss the suggestions and select one idea they like most.

3. Design a Prototype (20 min)

Groups develop their chosen idea by creating:

- A short description (What is it? How does it help?)
- A simple sketch or AI-generated image using DALL·E or Canva AI
- Optional: a slogan or campaign title (e.g., *"Refill, Don't Landfill!"*)

The teacher supports by guiding the discussion and helping refine realistic ideas.

4. Mini Pitch Presentations (7–8 min)

Each group presents their idea in 2 minutes:
What problem does it solve?
How would it work in our school or community?
Show your AI-generated image or poster!

Classmates vote for the most creative and most practical idea.

5. Wrap-Up (2–3 min)

Reflection question:
"How can AI help us design more sustainable ideas in the future?"

Optionally, students upload their project visuals and descriptions to a shared Padlet board titled "AI for a Greener World."

Outcome:

By the end of the lesson, participants will understand how AI can support creative thinking and sustainability. They will design practical ideas to reduce plastic waste, strengthen teamwork skills, and realize how technology can inspire real environmental change.

Assessment and Reflection

- Detailed Activity: At the end of this module, participants will:
    - Submit a written proposal outlining their sustainability solution.

    - Take a quiz on Quizizz covering the 5R model and innovative materials.
    - Reflect on their learning in a blog post: "What innovative solution inspired me the most, and how can I apply it?"
- Outcome: Participants will articulate and evaluate actionable solutions to reduce plastic dependency.

Module 4: Community Action

Goal: This module encourages participants to take initiative and lead community-based projects that address plastic pollution. It focuses on planning, executing, and evaluating impactful actions that engage local stakeholders.

Lesson 1: Planning Environmental Cleanup Actions

Objective:

Participants will learn how to plan, organize, and promote a local cleanup event while developing teamwork and leadership skills.

Duration: 45 minutes

Materials:

- Computers/tablets with internet access
- Trello (for task planning)
- Canva (for promotional design)
- Google Maps (for identifying cleanup areas)

Activities:

1. Introduction (5 min)
The teacher introduces the idea of environmental cleanup events and discusses why community involvement is important.
Short discussion: “What places in our town or school area could benefit from a cleanup?”

2. Team Planning in Trello (15 min)

Students form small groups.
Each group creates a Trello board for a *hypothetical cleanup event* including:

- To-Do List (tasks before the event)
- Roles (organizer, safety officer, promotion, supplies manager)
- Timeline (planning, event day, follow-up)

Teacher can share a ready-made Trello template with these lists already created.

3. Design and Promotion (15 min)

Groups use Canva to create one or two promotional materials for their event:

- Poster or flyer with date, location, and slogan (“Clean Today, Green Tomorrow!”)
- Social media post encouraging community participation

4. Mapping the Action (5–7 min)

Using Google Maps, teams mark potential cleanup locations and identify *“plastic hotspots”* — areas with visible or likely waste accumulation (parks, parking lots, riverbanks, school surroundings).

Wrap-Up & Reflection (3–5 min)

Groups briefly present their cleanup plan to the class.
Reflection prompt: “What would be the biggest challenge in organizing a real cleanup — and how could we solve it?”

Outcome:

By the end of the lesson, participants will understand how to organize and promote a community cleanup. They will strengthen their leadership and teamwork skills, learn to plan tasks using Trello, design effective environmental messages with Canva, and apply digital tools to real-world sustainability challenges.

Trello Template: Environmental Cleanup Event

List 1: To-Do Before the Event

- Choose the cleanup location (use Google Maps).
- Pick a date and time.
- Contact local authorities or the school administration for approval.
- Prepare a list of needed materials (gloves, trash bags, recycling bins).
- Create promotional materials in Canva.

List 2: Roles & Responsibilities

- Team Leader: coordinates all activities.
- Logistics Manager: organizes tools and transportation.
- Safety Officer: ensures all participants follow safety guidelines.
- Media & Promotion Team: designs flyers and social media posts.
- Data Recorder: documents results (amount of collected waste, participants, photos).

List 3: Event Day Tasks

- Meet at the agreed location and set up a check-in point.
- Distribute materials and assign zones for cleanup.
- Take before-and-after photos.

- Sort and record types of collected waste (plastic, glass, metal, paper).
- Ensure waste is properly disposed of or recycled.

List 4: After the Event

- Thank participants and volunteers.
- Share results and photos on social media or school website.
- Write a short report: what worked well, what could be improved.
- Plan the next cleanup event or awareness campaign.

List 5: Notes & Ideas

- Ideas for future locations
- Eco slogans for posters (e.g., *"Small Steps, Big Change"*, *"Join the Green Team"*)
- Contacts for local environmental organizations

Lesson 2: Creating Social Media Campaigns

Objective:
Participants will learn how to design and promote an environmental awareness campaign using digital tools while developing creativity, communication, and teamwork skills.

Duration: 45 minutes

Materials:

- Computers/tablets with internet access
- Canva or Powtoon (for creating campaign visuals/videos)
- AI tools such as ChatGPT or Canva AI (for brainstorming slogans, scripts, and ideas)

Activities:

1. Introduction (5 min)
   The teacher introduces the role of social media in raising awareness and mobilizing action for environmental causes.
   Short discussion: "What social media campaigns about the environment have you noticed and liked?"

2. Case Study Analysis (5 min)
   Groups review examples of successful campaigns (e.g., *#BeatPlasticPollution*, *#RefuseSingleUsePlastic*).
   Discussion on what made these campaigns impactful — slogans, visuals, hashtags, storytelling.

3. Creative Campaign Planning (15 min)
   Groups choose a specific environmental issue related to plastic pollution.
   Using Canva, Powtoon, or an AI content generator, they create a campaign element such as:

   - A short video (30–60 sec)
   - An infographic
   - A social media post
     AI prompts examples:
     - "Generate a catchy slogan for a plastic waste reduction campaign."
     - "Write a short, engaging caption for Instagram about reducing single-use plastics."
     - "Create a storyboard for a 30-second video about plastic pollution."

4. Presentation & Feedback (10 min)
   Groups present their campaign materials to the class. Class gives constructive feedback focusing on clarity, creativity, and impact.

Wrap-Up & Reflection (5 min)
Reflection prompt: "How can social media be used to inspire real change in reducing plastic waste?"

Outcome:
By the end of the lesson, participants will know how to use digital tools and AI creatively to design effective social media campaigns for environmental causes. They will develop teamwork, creativity, and communication skills while understanding how to leverage digital platforms for advocacy.

Lesson 3: Organizing Community Workshops

Objective:
Participants will learn how to plan, design, and facilitate educational workshops on reducing plastic use, developing communication, creativity, and leadership skills.

Duration: 45 minutes

Materials:

- Computers/tablets with internet access
- Padlet (for brainstorming ideas)
- Canva or Google Slides (for workshop materials)
- AI tools such as ChatGPT (for idea generation and script writing)

Activities:

1. Introduction (5 min)
   The teacher introduces the idea of community workshops and their importance in

promoting sustainable practices.
Short discussion: "What topics could be interesting for a workshop about reducing plastic use?"

2. Brainstorming Workshop Themes (10 min)
   Participants work in small groups using **Padlet** to brainstorm possible workshop themes and activities.
   Example prompts:

   - How to reduce plastic use in everyday life
   - Upcycling ideas
   - Environmental storytelling for children
   - Plastic-free shopping tips

3. Workshop Design (15 min)
   Groups choose one theme and design a simple workshop plan including:

   - A short presentation or poster (using Canva or Google Slides)
   - A hands-on activity or interactive element
   - A slogan or message for their workshop
     AI prompts examples:
     - "Suggest fun and engaging activities for a workshop on reducing single-use plastics."
     - "Write a short introduction for a workshop about upcycling materials."

4. Presentations (10 min)
   Groups take turns presenting their workshop to the class (3–5 minutes). Other participants act as the audience and give constructive feedback.

Wrap-Up & Reflection (5 min)
Reflection prompt: "What would make your workshop most engaging for your target audience?"

Outcome:
By the end of the lesson, participants will know how to plan and facilitate a workshop about reducing plastic use. They will build public speaking, teamwork, and facilitation skills while gaining confidence to educate others about sustainability.

Assessment and Reflection

- Detailed Activity: At the end of this module, participants will:
  - Submit a portfolio documenting their community action plans and promotional materials.
  - Take a final quiz evaluating their understanding of community engagement strategies.

    - Write a reflection: "What impact can small community actions have on solving global problems like plastic pollution?"
- Outcome: Participants will demonstrate their ability to lead community initiatives and inspire collective action.

Module 5: A Future Without Plastic

In the final module, participants apply what they have learned by designing and presenting realistic action plans to reduce plastic use in their schools and communities.
Working in teams, they identify local challenges, propose sustainable solutions, and visualize their ideas through Google Slides presentations.
A final Quizizz challenge revisits key environmental concepts in an engaging, gamified way, reinforcing knowledge and reflection.
The module concludes with open discussions on long-term sustainability goals and how digital and AI tools can support future eco-actions.
Participants also receive peer and mentor feedback, encouraging continuous improvement and a sense of shared responsibility for environmental change.

Lesson 1: A Future Without Plastic

1. Creating Action Plans

- Participants are divided into small groups (3–5 people).
- Each group selects one area where they want to reduce plastic use (school, home, local community, events, stores, etc.).
- Using a provided action plan template (Google Docs), groups include:
    - problem description
    - objectives and expected impact
    - concrete measures
    - timeline
    - required resources
- Groups create a visual version of their plan using Canva or Google Slides.

2. Project Presentations

- Each group presents their action plan using Google Slides.

- Presentations should include images, charts, short videos, and visuals from the local community.
- Participants give peer feedback via comments in Google Slides or Padlet.

3. Quizizz Challenge

- A quiz is organized via Quizizz covering:
    - plastics and environmental impact
    - sustainable development concepts
    - digital tools used during the module
- The quiz contains multiple-choice questions, true/false statements, and short answer questions.
- The aim is to revisit key concepts and reinforce knowledge.

4. Discussion and Long-term Goal Planning

- A moderated discussion (in person or online) where participants exchange ideas about:
    - long-term strategies to reduce plastic use
    - roles of individuals and communities
    - how AI tools can support sustainability
- Participants create a **visual idea map** on Miro or Padlet.

5. Digital Report / Portfolio

- Each group creates a short digital report or portfolio using Google Sites or Padlet.
- The portfolio includes:
    - photos and video documentation of activities
    - action plans and presentations
    - participant reflections
    - evaluation of the project's impact.

Work Methodology

The e-module is designed to provide an engaging and practical learning experience through a combination of interactive, collaborative, and reflective activities. Below is a detailed description of the methodologies used:

Interactive Learning

Interactive learning is a cornerstone of this course. Participants will engage with video materials, infographics, and animations to visually understand the key concepts of plastic pollution. Quizzes, such as those created with Kahoot or H5P, will be used throughout the course to assess understanding and reinforce knowledge. For instance, after learning about the types of plastics, participants will take part in a gamified quiz to test their identification skills.

Project-Based Learning

Participants will actively apply their knowledge by working on real-world projects. For example, they will design solutions to reduce plastic use in their schools or communities. These projects will include tasks such as mapping out community hotspots for plastic waste or creating actionable plans based on the 5R model. Tools like Trello and Miro will facilitate the organization and collaboration required for these projects.

Collaborative Activities

Group work is emphasized throughout the course to develop teamwork and communication skills. Participants will collaborate on creating digital posters, infographics, and videos using platforms like Canva and Powtoon. They will also use Padlet for brainstorming sessions and Google Docs for co-writing assignments. For example, when exploring the environmental impact of plastics, participants will analyze case studies in small groups and present their findings.

Reflective Practices

Reflection is integrated into the learning process to help participants internalize their experiences and develop critical thinking skills. At the end of each module, participants will write short reflective essays or blog posts, such as "What did I learn about my plastic footprint, and how can I reduce it?" These reflections will be stored in a digital portfolio on platforms like Google Sites or Padlet, allowing participants to track their growth.

Use of Digital Tools and AI

Participants will gain hands-on experience with a variety of digital tools and AI technologies to enhance their learning. For instance, ChatGPT will be used for generating ideas during brainstorming sessions, while DALL-E will help in creating visuals for presentations. Other tools like H5P will enable the creation of interactive content, such as drag-and-drop activities to categorize plastics based on their recyclability.

Guest Lectures and Real-World Insights

To provide practical insights, the course will include virtual guest lectures from experts in sustainability and environmental science. These sessions will allow participants to ask questions and learn about cutting-edge innovations in reducing plastic pollution.

Simulation Exercises

Simulations will be used to provide experiential learning opportunities. For example, participants will take part in a digital simulation showing the journey of a plastic bottle from

production to becoming microplastic in the ocean. This will help them visualize complex processes and understand their global impact.

Evaluation and Feedback

Frequent evaluations and constructive feedback will be provided to ensure participants stay on track and continuously improve. This includes peer reviews, mentor feedback on projects, and automated quiz scoring. For example, after creating social media campaigns, participants will receive feedback from peers and mentors on how to refine their messaging and visuals.

By combining these methodologies, we ensures that participants not only gain theoretical knowledge but also practical skills and experiences that they can apply in their daily lives and communities.

Progress Monitoring and Assessment

Progress is monitored through a combination of digital tools, self-reflection, and mentor evaluation.

- **Automated quizzes** on Kahoot and Quizizz are used after each module to assess knowledge acquisition and understanding in a playful, motivating way.
- Participants maintain **digital portfolios** on Google Sites or Padlet, where they collect evidence of learning, such as reflections, visuals, videos, and group work outcomes.
- After each module, learners complete a **reflection task** to evaluate their progress, challenges, and personal growth.
- **Group projects** are assessed through online presentations, peer feedback surveys, mentor observations, and reports on the results of local eco-actions.
- Instructors and mentors use **rubrics** to ensure fair and transparent evaluation, focusing on creativity, teamwork, digital competence, and environmental impact.

This approach allows for continuous feedback, supports autonomy, and highlights each participant’s learning journey and contribution to the community.

List of Tasks and Activities

Weekly challenges encourage participants to reduce plastic use at home and monitor their personal "plastic footprint." Virtual actions involve designing online campaigns and utilizing

social media for awareness. The final project requires participants to create actionable plans for reducing plastic usage within their communities and to present their work through videos and presentations.

WEEK 1: Plastic-Free Week Challenge

Theme: *“Rethink Plastic – One Week, One Change!”*

Goals:

- Raise awareness about daily plastic use.
- Encourage practical alternatives to single-use plastics.
- Promote creativity and teamwork through eco-actions.

Daily Challenges

Day 1 – Plastic Detective
Task: Keep a diary of every plastic item you use during the day (food packaging, bottles, pens, etc.).
Think: Which items could be replaced by reusable or eco-friendly options?

Day 2 – Swap It Out!
Task: Replace at least three single-use plastic items at home with reusable alternatives (e.g. metal bottle, fabric bag, lunch box).
Optional: Take photos of your eco-swaps to share online.

Day 3 – Kitchen Challenge
Task: Prepare a “plastic-free meal.” Avoid ingredients in plastic packaging.
Share: Post a photo and short recipe idea on the project’s shared Padlet or Teams channel.

Day 4 – Awareness Action
Task: Create a short digital poster or Instagram story encouraging others to reduce plastic use.
Tool suggestion: Canva or Adobe Express.

Day 5 – Reflect & Share
Task: Write a short reflection (5–7 sentences) about what was easy or difficult during the Plastic-Free Week.

Optional group activity: Record a short 1-minute video summarizing your experience and tips for others.

Virtual / Online Activity: “#AIatGreenPlasticFree” Campaign

- Students create posts, posters, or short reels promoting plastic reduction.
- They use the hashtag #AIatGreenPlasticFree and share their work on the project’s online space (Padlet, Teams, Instagram, etc.).
- Posts are later compiled into a digital exhibition or video collage.

Reflection & Follow-Up

At the end of the week, participants:

- Compare their *Day 1* and *Day 5* “plastic footprint” lists.
- Discuss what changes were realistic and what was challenging.
- Suggest ideas for school- or community-level improvements (e.g., refill stations, awareness boards, eco workshops).

Materials for the Week

- “Plastic Diary” worksheet (for Day 1)
- “Eco-Swap List” template (for Day 2)
- Canva or Padlet access link (for Days 3–4)
- Reflection form (Day 5)

Worksheet 1: Plastic Diary

Task: Keep track of all plastic items you use during one day. Write them down and think about possible reusable or eco-friendly alternatives.

Example:
Item: Plastic water bottle → Alternative: Reusable metal bottle

Plastic Item Used	Purpose / Where Used	Possible Alternative

Worksheet 2: Eco-Swap List

Task: Identify items you can replace with eco-friendly alternatives this week. Tick the box once you have made the swap!

Plastic Item	Eco-Friendly Alternative	Done (✔)
Plastic bottle	Reusable bottle	
Plastic bag	Cloth bag	
Plastic straw	Metal or bamboo straw	
Plastic food wrap	Beeswax wrap	
Plastic cutlery	Wooden or metal cutlery	

Worksheet 3: Reflection Form

Answer the following questions in complete sentences:

1) Which plastic items were the hardest to avoid?
2) Which eco-friendly swaps worked best for you?
3) How did reducing plastic make you feel?
4) What will you continue doing after this project?
5) What could your school/community do to reduce plastic waste?

List of Tools and Resources

Table: Digital and AI Tools Used in the e-Module

Tool	Purpose	Example Activity	Expected Outcome
ChatGPT	Idea generation, text creation, language support	Students use ChatGPT to brainstorm ideas for eco-challenges or write short articles about reducing plastic use.	Improved writing skills, creativity, and confidence in using AI responsibly.
DALL·E	Visual creation and storytelling	Participants design digital posters or illustrations that promote environmental awareness.	Development of visual literacy and creative communication skills.
Google Docs	Collaborative writing and editing	Teams co-write reflection reports, share feedback, and track group tasks in real time.	Strengthened collaboration and communication skills.
Trello	Project management and task organization	Each team creates a Trello board to plan weekly tasks and assign responsibilities.	Enhanced organization, planning, and teamwork.
Miro	Brainstorming and mind mapping	Groups create mind maps of ideas for reducing plastic in their community.	Visual thinking and collaborative problem-solving.
Canva	Graphic design and content creation	Students design infographics or social media posts for the #AIatGreenPlasticFree campaign.	Ability to communicate messages visually and effectively.
Powtoon	Animation and video storytelling	Teams produce short animated videos summarizing their eco-projects.	Creativity and digital storytelling competence.

Kahoot / Quizizz	Knowledge testing and gamification	Quizzes are used after each module to review learning content in a fun, interactive way.	Increased motivation, engagement, and knowledge retention.