AI and the Carbon Footprint

SMaiLE Project

> **Key Information**
>
> **Target Group:** 8 - 12 y.o.
>
> **Duration:** 3 Weeks (4 lessons)
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> **Key Learning Goals:**
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> 1. **Scientific Understanding:** Explain carbon footprints and AI energy consumption.
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> 2. **Digital Awareness:** Evaluate environmental impact of digital habits.
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> 3. **Critical Thinking:** Debate ethical AI use regarding the environment.
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> 4. **Creative Solutions:** Propose AI solutions for reducing ecological footprints.

Learning Outcomes

Students will be able to:

KNOWLEDGE & UNDERSTANDING:

- Explain "CO_2 equivalents" and data center energy consumption.
- Understand the water and energy costs involved in AI operations.

SKILLS & ABILITIES:

- Compare energy costs of different digital actions (e.g., streaming vs. email).
- Work in teams to simulate energy use and solve challenges.
- Present sustainable AI-based ideas clearly.

ATTITUDES & VALUES:

- Demonstrate responsibility for digital habits.
- Value innovation as a tool for sustainability.

> **European Dimension / Erasmus+ Connection**
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> - **Digital & Ecological Citizenship:** Building responsible digital citizens.
> - **Transnational Challenges:** Comparing energy data across borders.
> - **Innovation:** Encouraging creative technical solutions for green goals.

1. Resources and Tools

- **Research:** ChatGPT (Kids), WWF Footprint Calculator.

- **Creative Software:** Minecraft: Education Edition or SimCityEDU.

- **Materials:** "Data Packets" (cards/tokens), Art supplies.

- **Video:** "Can you see the cloud?" or similar about data centers.

Activity Overview

Phase	Activity	Description
Intro	The Invisible Cost	**Discussion:** Brainstorming digital habits. Video on physical infrastructure of the internet.
Research	My Digital Footprint	**Simulation:** "Data Center Game" – role-playing servers to understand energy intensity. Calculating personal footprints.
Creative	AI Eco-Builder	**Design:** Using Minecraft or paper to build an "Eco-City" optimized by AI (smart transport, green energy).
Reflection	Action Plan	**Evaluation:** Self-reflection (Att 3.1) and class discussion on changing habits.

2. The Invisible Cost of the Internet

Goal: Make the invisible visible.

- **Concept:** The "Cloud" isn't in the sky; it's in a building.

- **Activity:** Watch a video tour of a data center.

- **Discuss:** How much water and electricity does it take to cool those machines?

3. My Digital Footprint

Goal: Experience energy consumption.

- **Role-Play:** Students act as servers. The teacher sends "requests" (cards) faster and faster.

- **Observation:** Servers heat up (get tired) and need "cooling" (fans/water).

- **Calculation:** Compare the footprint of sending an email vs. training an AI model.

4. AI Eco-Builder

Goal: Creative problem solving.

- **Task:** Design a sustainable city.

- **Tools:** Minecraft, SimCity, or Art supplies.

- **Key Elements:**

  - Efficient Transport (AI traffic lights).
  - Green Energy (Solar/Wind).
  - Waste Reduction (Recycling bots).

- **Present:** Share the city design and explain the AI features.

5.   Reflection and Evaluation

Goal: Personal responsibility.

- **Self-Reflection:** Complete the reflection sheet (Att 3.1).

- **Discussion:** "What surprised you?" "What will you do differently?"

- **Action:** Pledge one eco-friendly digital habit (e.g., "I will delete old emails").