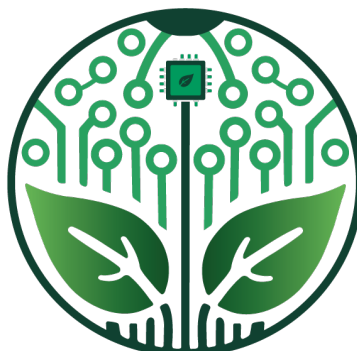




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LESSON PLAN

INTRODUCTION TO AI AND SUSTAINABILITY

 <p>QUADRAT HAK & HAW Bundeshandelsakademie Wolfsberg Austria</p>	 <p>Darica İlçe Milli Eğitim Müdürlüğü Turkey</p>	 <p>Campus 02 Fachhochschule der Wirtschaft GmbH Austria</p>	 <p>ΔΙΕΥΘΥΝΣΗ ΔΕΥΤΕΡΙΑΣ ΕΚΠΑΙΔΕΥΣΗΣ ΚΕΦΑΛΛΙΝΙΑΣ Directorate of Secondary Education of Kefallinia Greece</p>	 <p>Jaunpiebalgas vidusskola Latvia</p>	 <p>sucessos criativos Sucessos Criativos, Lda Portugal</p>	 <p>Sredno obshtobrazovatelno uchilishte Lyuben Karavelov Bulgaria</p>
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Disclaimer



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1. TITLE

– Introduction to AI and Sustainability

2. GRADE LEVEL

■ ISCED Level 3 – Upper Secondary Education (ages 15–18)

3. SUBJECT AREA

- Environmental Studies
- Computer Science
- Technology and Design
- Social Studies

4. TYPE

■ Lesson Plan

5. DURATION

2 x 40-minute classes

6. LEARNING OBJECTIVES

- O1 – Understand how Artificial Intelligence can support environmental sustainability.
O2 – Analyze sustainability challenges related to environmental sustainability.
O3 – Develop collaborative and critical thinking skills.
O4 – Reflect on responsible and ethical AI use.



7. Key Competences Developed

- Mathematical competence and competence in STEM
- Digital competence
- Personal, social and learning to learn competence
- Citizenship competence

8. Prior Knowledge / Prerequisites

Basic environmental awareness. No prior AI knowledge required.

9. Lesson/Project Outline

Phase 1 – Introduction (Engage & Contextualize)

To raise students' interest in environmental sustainability issues and introduce the concept of Artificial Intelligence (AI) by placing the topic within a real-life context.

Teacher's role:

- Introduces environmental problems from everyday life (waste, energy consumption, water use, climate change, etc.).
- Explains the basics of Artificial Intelligence using simple videos, news examples, or interactive activities (e.g. AI-based waste sorting systems, energy efficiency sensors).
- Poses the guiding question: "How can Artificial Intelligence help protect the environment?"

Student activities:

- Brainstorm and list current environmental problems.
- Discuss examples where AI is connected to environmental solutions.
- In groups, create a short poster or digital presentation to introduce a selected environmental issue to the class.

Output:

- Students gain a general understanding of environmental challenges and the potential role of AI in addressing them.



Resource (name)	Link (to the folder on Teams)
AI for Good: How AI is Leading the Way in Environmental Sustainability https://www.youtube.com/watch?v=9v3Vqz2VQ-w	

Phase 2 – Exploration (Investigate & Compare)

Purpose:

To enable students to understand how AI is applied in environmental sustainability through research and comparison.

Teacher's role:

- Provides guiding research questions, such as:
- How is AI used to improve energy efficiency?
- How can AI help reduce waste?
- What are examples of AI applications in smart cities?
- Supplies learning resources (videos, articles, websites).
- Offers guidance and support during group work.

Student activities:

- Work in groups to research a selected topic.
- Compare the impact of AI across different environmental areas (water, energy, waste, transportation, etc.).
- Present findings using a table, chart, or mind map.

Output:

- Students are able to explain the link between AI and sustainability using concrete examples.

Phase 3 – Application (Hands-On Practice)

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Groups design a simple AI-supported solution addressing an environmental sustainability problem in their school.

Purpose:

To apply acquired knowledge by designing a simple and feasible AI-supported environmental solution.

Teacher's role:

- Facilitates the creative thinking process.
- Provides guiding questions:
 - What environmental problem exists in our school?
 - How could AI contribute to solving this problem?
 - What type of data or sensors would be needed?
- Supports and monitors group work, providing technical and conceptual assistance.

Student activities:

- In groups, identify an environmental issue within the school context (e.g. unnecessary use of lights, monitoring the fullness of recycling bins).
- Develop a simple prototype, algorithm concept, or model.
- Prepare a presentation poster or a short digital report.

Output:

- Each group develops its own “AI-Supported Environmental Solution” project.

Phase 4 – Reflection & Consolidation (Present & Connect)

Groups present solutions, receive peer feedback, and reflect on AI's environmental impact.

Purpose:

To consolidate learning by sharing projects and critically reflecting on the impact of AI on the environment.

Teacher's role:

- Organizes the presentation session and introduces peer assessment criteria.
- Facilitates discussion by addressing questions such as:
 - What are the benefits and risks of using AI?
 - What ethical responsibilities do humans have when using AI?
- Summarizes key learning outcomes at the end of the session.



Student activities:

- Groups present their projects to the class.
- Provide constructive feedback to peers (e.g. “suggestions for improvement”, “strengths”, “feasibility comments”).
- Write a short individual reflection: “What did this project process teach me?”

Output:

- Students develop both teamwork skills and critical thinking abilities.

10. Assessment Criteria

Criterion	Description	Scoring Scale
Quality of Group Work	Collaboration, task distribution, communication skills	1–5
Understanding of AI and Sustainability	Ability to explain concepts accurately and establish meaningful connections	1–5
Creativity and Feasibility	Originality of ideas and ability to develop realistic solutions	1–5
Presentation, Reflection, and Participation	Effective expression, openness to feedback, awareness of learning process	1–5

11. Teaching Materials



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Name	Type (Developed/Existing)	Link	Role in the lesson
AI for Good: How AI is Leading the Way in Environmental Sustainability	An existing video on youtube	https://www.youtube.com/watch?v=9v3Vqz2VQ-w	Phase 1

12. External Resources and References

Resource (name)	Link (external or to the folder on Teams)