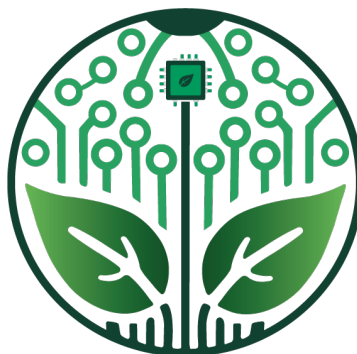


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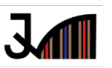


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LESSON PLAN

Energy Efficiency and Green Entrepreneurship: Applying Physics and Artificial Intelligence for Sustainable Solutions

 QUADRAT HAK x HLW Bundeshandelsakademie Wolfsberg Austria	 DARICA İLÇE MİLLÎ EĞİTİM MÜDÜRLÜĞÜ Turkey	 CAMPUS 02 Fachhochschule der Wirtschaft GmbH Austria	 ΔΙΕΥΘΥΝΣΗ ΔΕΥΤΕΡΙΑΣ ΕΚΠΑΙΔΕΥΣΗΣ ΚΕΦΑΛΛΙΝΙΑΣ Directorate of Secondary Education of Kefallinia Greece	 Jaunpiebalgas vidusskola Latvia	 sucessos criativos Sucessos Criativos, Lda Portugal	 Sredno obshchobrazovatelno uchilishte Lyuben Karavelov Bulgaria
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Disclaimer



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1. Energy Efficiency and Green Entrepreneurship: Applying Physics and Artificial Intelligence for Sustainable Solutions.

2. GRADE LEVEL

☒ ISCED Level 3 – Upper Secondary Education (ages 15–18)
(First Grade of Upper Secondary School – Physics)

3. SUBJECT AREA

Physics

- ☒ Sciences
- ☒ Environmental Studies
- ☒ Economics
- ☒ Computer Science

TYPE

Lesson Plan

4. DURATION

2 x 45-minute classes

5. LEARNING OBJECTIVES

By the end of the lesson, students will be able to:

1. Lesson/Project Outline

O1 – Explain fundamental Physics concepts related to energy, power, and efficiency.

O2 – Analyze the relationship between energy efficiency and environmental sustainability.



O3 – Describe how Artificial Intelligence supports energy optimization and green innovation.

O4 – Propose a simple green business idea based on Physics principles and AI applications

6. Key Competences Developed

Mathematical competence and competence in STEM

Digital competence

Entrepreneurship competence

Personal, social and learning to learn competence

Citizenship competence

7. Prior knowledge/ Prerequisites

Basic understanding of energy and forces from lower secondary education

No prior knowledge of Artificial Intelligence is required.

8. Lesson/ Project Outline

Phase 1 – Introduction (Engage & Contextualize)

Purpose

To introduce students to the concepts of energy consumption and sustainability, highlighting how Physics and Artificial Intelligence can contribute to reducing energy waste and supporting sustainable and green business practices.

Activities

Short discussion on energy consumption in everyday life (homes, schools, transport).

Presentation of real-life examples of green businesses and energy-efficient technologies.

Guiding question: “How can Physics and AI help reduce energy waste and support sustainable business?”

Expected Outputs

Students identify the importance of energy efficiency for the environment and economy.

Resource



Introductory Presentation: Energy, Sustainability and Green Business

Resource (name)	Link (to the folder on Teams)
International Energy Agency (IEA) – Energy Efficiency	https://www.iea.org/topics/energy-efficiency

Phase 2 – Exploration (Investigate & Compare)

Purpose

To help students apply the concept of energy efficiency through hands-on calculations and comparisons, and to understand how Physics principles combined with Artificial Intelligence contribute to optimized energy use in modern technological systems.

Activities:

Group work using a worksheet to calculate energy efficiency of simple systems (e.g. lighting, appliances).

Comparison between conventional and energy-efficient solutions.

Teacher-led explanation of how AI is used in smart grids, smart buildings, and energy management systems.

Expected Outputs

Completed calculations and comparison tables.

Improved understanding of efficiency as a key Physics concept.

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Resource (name)	Link (to the folder on Teams)
European Commission – Smart Grids and Digital Energy	https://energy.ec.europa.eu/topics/markets-and-consumers/smart-grids-and-digitalisation_en

Phase 3 – Application (Hands-On Practice)

**Purpose**

To enable students to apply Physics concepts related to energy efficiency and explore the practical use of Artificial Intelligence in developing innovative and sustainable green business solutions.

Activities

Students work in groups to design a simple green business idea, such as:

an energy-efficient school building

smart lighting controlled by sensors

AI-based energy monitoring systems

Use of an AI tool (e.g. ChatGPT) to refine and improve their idea.

Expected Outputs

A short written description or concept poster of a green business idea.

Resource (name)	Link (to the folder on Teams)
OECD – Artificial Intelligence for Sustainable Development	https://www.oecd.org/digital/artificial-intelligence/ai-for-sustainable-development/

Phase 4 – Reflection & Consolidation (Present & Connect)**Purpose**

To encourage students to reflect on their learning, connect Physics concepts with sustainable development and career pathways, and recognize the role of Artificial Intelligence in shaping future green jobs.

Activities

Short group presentations of business ideas.

Class discussion on green careers and future skills related to sustainability and AI.

Expected Outputs



Reflection on how Physics knowledge can be applied in real-life and entrepreneurial contexts.

Resource

Reflection Sheet – Physics, AI and My Future

Resource (name)	Link (to the folder on Teams)
World Economic Forum – Green Jobs and Skills for the Future	https://www.weforum.org/stories/2023/01/green-jobs-skills-sustainability/

9.Assessment Criteria

Assessment is based on:

Accuracy of Physics calculations (Worksheet 1)

Quality and feasibility of the green business idea

Ability to explain the role of AI and sustainability

Student self-assessment and peer feedback

10.Teaching Materials

Name	Type (Developed/Existing)	Link	Role in the lesson
Introductory Presentation (PPT)	Developed		Conceptual introduction



Worksheet 1 – Energy Efficiency	Developed		Physics calculations
Worksheet 2 – Green Business Design	Developed		Application & entrepreneurship
AI Tool (ChatGPT or similar)	Existing	https://chat.openai.com	Idea development & optimization

11.External Resources and References

This section includes optional references for students who wish to explore the topic beyond the scope of the lesson.

Resource (name)	Link (external or to the folder on Teams)
European Commission – Energy Efficiency	https://energy.ec.europa.eu/topics/energy-efficiency_en
European Commission – Green Deal	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
OECD – Artificial Intelligence for Sustainable Development	https://www.oecd.org/digital/artificial-intelligence/
UNESCO – Education for Sustainable Development	https://www.unesco.org/en/education/sustainable-development
International Energy Agency – Energy Efficiency	https://www.iea.org/topics/energy-efficiency