AI-GREENER

2024-1-AT01-KA220-SCH-000248327

LESSON PLAN

AI-Powered Home

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1. TITLE

AI-Powered Home: Smart Resource Management for a Sustainable Household.

2. GRADE LEVEL

ISCED Level 2 – Lower Secondary Education (ages 12–15)

3. SUBJECT AREA

Economics

4. TYPE

Lesson Plan

5. DURATION

1 x 60-minute class

6. LEARNING OBJECTIVES

- O1: Students will explain how responsible resource management (energy, water, food) in the household connects with the concept of sustainability, as defined in the Curriculum.
- O2: Students will investigate and identify specific AI applications in home appliances (Smart Home systems) that save resources, determining the economic and environmental benefits.
- O3: Students will use digital tools (spreadsheet) to calculate the potential resource savings (money/energy) from adopting an AI solution and formulate a simple business proposal.

7. Key Competences Developed

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

8. Prior Knowledge / Prerequisites

Basic understanding of the family budget and basic use of a spreadsheet program.

9. Lesson/Project Outline

Phase 1 – Introduction (Engage & Contextualize)

Instructions & Activities: Introduction focuses on the personal impact of resource waste, central to Home Economics. Students discuss the cost (economic and environmental) of energy consumption and food waste at home. The goal is to frame responsible consumption and sustainability within the household context.
Expected Output: Recognition of personal waste practices and framing of the sustainability concept in the household.

Resource (name)	Link (to the folder on Teams)
Infographic on Food Waste (PDF)	https://teams.microsoft.com/l/doc/Lesson2/Infographic_Food_Waste.pdf

Phase 2 – Exploration (Investigate & Compare)

Instructions & Activities: Students investigate specific Smart Home systems (e.g., smart thermostats) that use AI to "learn" usage patterns and automate savings. Analysis covers how AI processes data (e.g., ambient temperature, energy prices) for optimal resource management. Students evaluate the pros and cons (initial cost, privacy, convenience) of these systems.
Expected Output: Understanding of the AI-driven resource saving mechanism and evaluation of Smart Home system trade-offs.

Resource (name)	Link (to the folder on Teams)
Worksheet: Smart Home Cases	https://teams.microsoft.com/l/doc/Lesson2/Worksheet_Smart_Home_Cases.docx

Phase 3 – Application (Hands-On Practice)

Challenge: In groups, students select one Smart Home device. Using a customized spreadsheet (XLSX), they input cost and hypothetical savings percentage to accurately calculate the Return on Investment (ROI). They then formulate a brief business pitch justifying the investment as environmentally and economically sound.
Expected Output: Completed 'Smart Home Budget' Spreadsheet and a short business pitch.

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

Template: Smart Home Budget Spreadsheet (XLSX)	https://teams.microsoft.com/l/file/Lesson2/Template_Smart_Home_Budget.xlsx
Guide: Pitch Outline (DOCX)	https://teams.microsoft.com/l/doc/Lesson2/Guide_Pitch_Outline.docx

Phase 4 – Reflection & Consolidation (Present & Connect)

Instructions & Activities: Short presentation of computational results and the business message from each group. Final reflection focuses on how household management decisions, even using an AI application to reduce waste, contribute to broader social sustainable development.
Expected Output: Consolidation of the household-sustainability connection and awareness of responsible consumption..

Resource (name)	Link (to the folder on Teams)
Reflection Sheet (DOCX)	https://teams.microsoft.com/l/doc/Lesson2/Reflection_Sheet.docx

10. Assessment Criteria

Assessment checks the understanding of technology and calculation skills (O2, O3).

Portfolio: Includes: a) the completed 'Smart Home Budget' Spreadsheet (assessing STEM/Digital competence) and b) the business message (assessing Entrepreneurship competence).

Resource (name)	Link (to the folder on Teams)
Checklist: Home Economics Portfolio (DOCX)	https://teams.microsoft.com/l/doc/Lesson2/Checklist_Portfolio_HE.docx

11. Teaching Materials

Name	Type (Developed/Existing)	Link	Role in the lesson
Infographic on Food Waste	Developed (PDF)	https://teams.microsoft.com/l/doc/Lesson2/Infographic_Food_Waste.pdf	Framing the concept of responsible consumption.
Template: Smart Home Budget Spreadsheet	Developed (XLSX)	https://teams.microsoft.com/l/file/Lesson2/Template_Smart_Home_Budget.xlsx	Core tool for hands-on practice and ROI calculation.
Reflection Sheet	Developed (DOCX)	https://teams.microsoft.com/l/doc/Lesson2/Reflection_Sheet.docx	Assessment of the presentation (Phase 4).

12. External Resources and References

Resource (name)	Link (external or to the folder on Teams)
Curriculum Guidelines for Home Economics A' Gymnasio	https://drive.google.com/file/d/1xhJ-W9FUsdwMEbMAJcwdM5z3gkNbONbo/view?usp=share_link
Examples of Smart Home Systems (Videos)	https://youtube.com/playlist/SmartHomeAI_for_Students_HE



Figure 1. AI Powered Home in Fiscardo, Greece