



STEM for Inclusive Schools

WP2 – Activities Worksheet – Machine Learning for Kids

Project Title:	STEM for inclusive Schools
Acronym:	STEMinSCH
Reference number:	2023-1-DE02-KA220-000151162
Project partners:	P1 University Paderborn (UPB), DE P2 Universitatea Dunarea de Jos din Galati (UDG), RO P3 Scoala Gimnaziala Nr. 7 Galati, RO P4 Siec Badawcza Lukasiewicz - Instytut Technologii Eksploatacji, PL <u>P5 Inovatif ve Girisimci Toplum Dernegi, TR</u> P6 Sucessos Criativos, Lda, PT



Worksheet for the Activity:

Activity Title: Machine Learning for Kids - Eco-Friendly Movements

Task Description:

This activity is designed to help students understand environmentally friendly behaviors and gain hands-on experience in creating a machine learning model using the "Machine Learning for Kids" platform. Students will explore the concepts of AI, train a text classification model for eco-friendly (Eco-Friendly) and harmful (Harmful) behaviors, and integrate the model into an interactive Scratch project. The activity promotes awareness of technology's potential in supporting sustainability and engages students in meaningful discussions about environmental protection.

Time to Finish the Task: 1 week

Supplies Needed:

- A computer with an internet connection
 - Access to Machine Learning for Kids (free platform)
 - Access to the Scratch platform
 - Notebook for jotting down observations and ideas
-

Methodology:

- 1. Introduction and Engagement (30 minutes):**
 - o Begin the session with a short documentary or video highlighting pollution and eco-friendly actions (e.g., recycling, water conservation).
 - o Engage students in a brainstorming session: "What actions do you take to protect the environment?" Write down ideas on the board.
- 2. Understanding the Basics (30 minutes):**
 - o Introduce the concept of machine learning with examples relevant to environmental protection (e.g., waste classification, water monitoring).



- o Explain how the "Machine Learning for Kids" platform works and provide a step-by-step guide to using it.
 - 3. **Data Collection and Labeling (45 minutes):**
 - o Students work in groups to collect examples of eco-friendly and harmful behaviors (e.g., "turning off lights" vs. "littering").
 - o Label data into two categories: "Eco-Friendly" and "Harmful."
 - 4. **Training the Model (30 minutes):**
 - o Guide students through the process of uploading their labeled data into the Machine Learning for Kids platform.
 - o Train the machine learning model using the data provided by each group.
 - 5. **Testing the Model (45 minutes):**
 - o Demonstrate how to input new sentences into the model and evaluate the predictions.
 - o Encourage students to test the model with their own sentences and refine their data if necessary.
 - 6. **Scratch Integration (1 hour):**
 - o Teach students to connect their trained model to a Scratch project.
 - o Assist them in creating an interactive project where a character displays different expressions based on the input (smiling for eco-friendly actions, sad for harmful actions, and neutral for unrelated text).
 - 7. **Reflection and Sharing (30 minutes):**
 - o Students present their projects to the class and discuss their experience.
 - o Facilitate a class discussion about the potential of AI and machine learning in addressing real-world challenges like environmental conservation.
-

Learning Objectives:

- Understand the concept of machine learning and its application in real-life scenarios.
 - Develop critical thinking and problem-solving skills by collecting, labeling, and training data.
 - Enhance collaboration and communication through group work and project presentations.
 - Raise awareness of environmental issues and inspire eco-friendly practices using technology.
-

Assessment Criteria:

- **Participation:** Active involvement in discussions, brainstorming, and group activities.
- **Model Accuracy:** Performance of the trained model in classifying actions correctly.
- **Creativity:** Innovation and originality in integrating the model into a Scratch project.
- **Presentation:** Clarity and engagement during project sharing sessions.



Instructions for Students:

1. Log in to the Machine Learning for Kids platform and create a new project for text classification.
 2. Collect at least 10 examples for each category ("Eco-Friendly" and "Harmful").
 3. Train the machine learning model using the platform.
 4. Test the model by inputting new sentences and verifying predictions.
 5. Integrate the model into a Scratch project to create an interactive application.
 6. Observe the behavior of your project over a week and note any improvements needed.
 7. Present your findings and project to the class for feedback.
-

Graphics and Observation Table:

N O	Da te	Input Sentence	Predicti on	Correct/ Incorrect	Commen ts
1					
2					
3					

Extensions:

- Create a third category for "Neutral Actions" and explore its integration into the model.
- Develop a poster or video campaign to raise awareness about eco-friendly behaviors, inspired by the Scratch project.
- Share the completed Scratch projects with other classes or community members to expand the impact.