Training AI: Science & Data

SMaiLE Project

Target Group: 8 - 12 y.o.

Duration: 4-5 lessons (45 min each)

Key Learning Goals:

1. **Machine Learning:** Understand training, testing, and datasets.

2. **Scientific Inquiry:** Collect and label real-world data (traffic signs).

3. **Ethics:** Identify bias and limitations in AI models.

4. **Collaboration:** Share data internationally via eTwinning.

Learning Outcomes

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

KNOWLEDGE & UNDERSTANDING:

- Describe how machine learning works (training/testing).

- Understand AI applications in image recognition.

- Recognize ethical considerations like trust and responsibility.

SKILLS & ABILITIES:

- Use Teachable Machine to create AI models.

- Collect, label, and organize datasets.

- Analyze AI errors compared to human reasoning.

ATTITUDES & VALUES:

- Appreciate the combination of human insight and technology.

- Demonstrate openness to different cultural perspectives.

European Dimension / Erasmus+ Connection

- **Democracy & Inclusion:** Equal contribution to shared datasets.

- **Cultural Awareness:** Adapting AI to regional differences (e.g., traffic signs).

- **Digital Responsibility:** Learning GDPR and ethical data use.

1.   Resources and Tools

- **Digital Tools:** Teachable Machine, eTwinning/TwinSpace, Padlet.

- **Hardware:** Tablets/Cameras, Laptops.

- **Materials:** AI-generated face photos (Att 1.1), Traffic Sign images.

Activity Overview

Activity	Time	Description
Intro	20 min	**Motivation:** Watching AI "bloopers" (recognition fails). Discussion on why AI makes mistakes.
1	45 min	**Many Faces:** Classifying faces without tech. Discussing human vs. machine perception.
2	45 min	**Traffic Signs:** Collecting photos of local signs. Categorizing and uploading to eTwinning.
3	45 min	**Training:** Using Teachable Machine to train a model. Testing with international images.
4	45 min	**Ethics:** Debate "Can AI replace humans?". Analyzing errors. Reflection.

2.   Introduction: AI Failures

Goal: Understand AI isn't perfect.

- **Video:** "Funny Object Recognition Fails".

- **Discussion:** "Which mistake surprised you?"

- **Concept:** AI is only as good as the data you give it.

3.   Activity 1: Many Faces, One World

Goal: Compare human and machine vision.

- **Task:** Group photos of diverse people based on criteria.

- **Discussion:** Humans see "culture" or "gender"; machines see "pixels" and "patterns".

4.   Activity 2: Exploring Traffic Signs

Goal: Data collection.

- **Field Work:** Photograph local traffic signs.

- **Collaboration:** Upload to eTwinning to share with partner schools.

- **Analysis:** Are "Stop" signs the same in every country?

5. Activity 3: Training the AI Model

Goal: Practical Machine Learning.

- **Tool:** Teachable Machine.

- **Step 1:** Create classes (e.g., "Warning Signs", "Regulatory Signs").

- **Step 2:** Upload images and train.

- **Step 3:** Test with a sign from a partner country. Did it work?

6. Activity 4: Ethics & Reflection

Goal: Critical thinking.

- **Debate:** "Can AI replace a lab scientist?"

- **Reflection:** Share thoughts on Padlet.

- **Output:** Digital reflection on the importance of human judgment.