

## IO3 – School Program for Primary Education Students

Tutor Handbook

Digital Content Creation

*(Advanced: Ages 9-11)*



## Introduction to the Tutor Handbook

The aim of this short handbook is to support you, as an experienced tutor, to use the Generation AI Lesson Plans with learners in your group. If you are currently working as a Primary Education Teacher, this handbook will help you to introduce the Generation AI Lesson Plans in your workplace. When developing these Lesson Plans, the focus has been to support young learners in developing an evidence-based understanding of the complexities and basic principles of AI, computational thinking, and how they can be integrated in teaching learning to promote creative problem solving, resilience, and design thinking.

This Lesson Plan belongs to the “**Digital Content Creation**” topic and is targeted to children between **Ages 9-11**. This topic aims to provide learners with the basic knowledge of this competence and how AI can be used to solve daily life problems related to this skill.

### Introduction to the Competence

The “**Digital Content Creation**” is the third topic located in the last competence of the DigCompEdu Area 6: *Facilitating Learners’ Digital Competence*.

It aims to incorporate learning activities, assignments and assessments which require learners to express themselves through digital means, and to modify and create digital content in different formats. To teach learners how copyright and licenses apply to digital content, how to reference sources and attribute licenses. (DigCompEdu, 2016).

*This Lesson Plan is aimed to develop some of these skills in young learners through Artificial Intelligence tools, such as the modification and creation of digital content and their expression through digital means. In this case the main activities are the recognition of drawings, gestures, pictures, images and sounds of our physical world, using datasets - libraries of digital objects which are either ready-made or created by the students. These datasets are*

*used to train Artificial intelligence (AI) models with tools that may or may not require coding skills.*

## *Elements of the Lesson Plan*

### **Video**

This video is an explanation of how **we train machine to recognize images and play with us**. This video is the first element of the Lesson Plan, and you can find it in the platform of Generation AI project as an embedded video of YouTube. It helps to contextualize the following **two activities** the lesson plan:

- 1. How we can teach the computer to play rock-paper-scissors with us we will train it to recognize our moves via camera.**
- 2. How we can create a filter or mask for our face in the video camera of our computer.**

### **Learning Activity**

The second element that you will find in the Lesson Plan is a learning activity with a problem-based task. This task consists of a guided activity that aims to help students come up with a reflection about questions/problem proposed. This question/problem aim to give learners the opportunity to know how AI can affect their daily lives in a simple and ludic way.

In this lesson plan the main question/problem is:

- ***Can a machine learn to recognize images and play with you?***

This question is related to how machine can see us:

- 1. Can we teach a machine to recognize our gestures or images?*

## 2. *Can a machine recognize our eyes, our nose, and our mouth?*

As this is a guided learning activity, you will need to ensure that students follow each of the steps and links provided in the activity.

### Challenge

This last element of the Lesson Plan is a Challenge which takes the form of an **AI based game**. It aims to develop the **rock-paper-scissors game**.

The game is related to the “**Digital Content Creation**” and is developed using **Machine Learning for Kids**.

The tutorial is a step-by-step guide about how to create an AI game. It is presented in a **Scratch format (Advanced\_Learning-Example-RPS.sb3)**, and you can find it in the platform as the last activity of the lesson plan.

## APPENDIX

*(Common with the Appendix of the Basic Tutor Handbook - Ages 6-8)*

### Artificial Intelligence applications for recognition of images and sounds

The recognition of drawings, gestures, pictures, images and sounds of our physical world, is possible using datasets - libraries of digital objects which are either ready-made or created by us. These datasets are used to train Artificial intelligence (AI) models with tools that may or may not require coding skills (all the following apps and tools are free).

#### What Is a Dataset?

Dataset is defined as *“a collection of data that is treated as a single unit by a computer”*. This means that a dataset contains a lot of separate pieces of data but can be used to train an algorithm with the goal of finding predictable patterns inside the whole dataset. The data collected should be made uniform and understandable for a machine that doesn't see data the same way as humans do. For example we can train an AI Model to identify a specific animal in a picture if there is a data set of pictures of that animal. [Coco](#) is a large-scale object detection, segmentation, and captioning dataset, containing an [explorer](#) that can help us understanding what a data set is, and how machines see the data. This is achieved by gathering images of complex everyday scenes containing common objects in their natural context.

COCO Common Objects in Context info@cocodataset.org  
Home People Dataset- Tasks- Evaluate-

### COCO Explorer

COCO 2017 train/val browser (123,287 images, 886,284 instances). Crowd labels not shown.



cat search

4298 results



There also a sound dataset like in this [google experiment](#) which uses machine learning to organize thousands of bird sounds. The computer wasn't given tags, only the audio of a bird name.



## What is AI training?

When you train AI, you're teaching it to properly interpret data and learn from it in order to perform a task with accuracy. Just like with humans, this takes time and patience (just consider all of those worksheets you had to complete when learning your multiplication tables back in grade school). Only by training AI to correctly perceive information and make accurate decisions based on the information provided, can you ensure your AI will perform the way it's intended. You need three ingredients to train AI well: high-quality data, accurate data annotation and a culture of experimentation.

## Examples of Pre-trained AI models

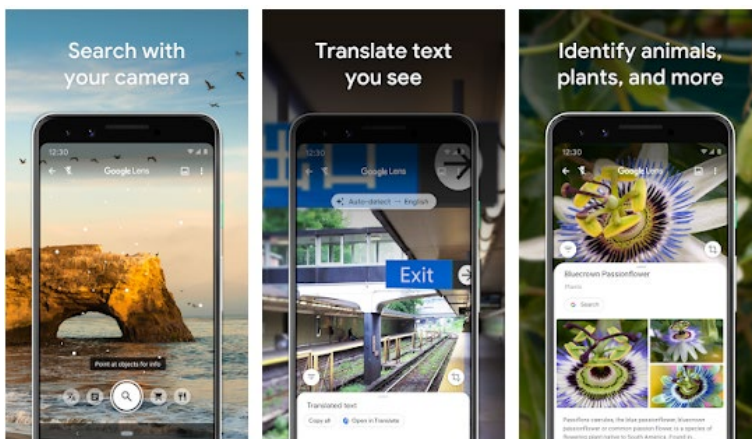
[AutoDraw](#) uses data sets to recognise user's drawings. It pairs machine learning with drawings from talented artists to help everyone create anything visual, fast without any download or payment and it works at any device. It can guess hundreds of drawings and will help make drawing and creating a little more accessible and fun for everyone.

Do you mean: A row of six small icons representing different bicycle models, with the third icon (a blue bicycle) highlighted with a blue border.



Start doodling and the **AutoDraw** suggestion tool will start guessing.

[Google Lens](#) is a mobile app with a set of vision-based computing capabilities that can understand what you're looking at and use that information to copy or translate text, identify plants and animals, explore locales or menus, discover products, find visually similar images, and take other useful actions.



## Tools for training the AI models (without coding skills)

[Cognimates](#) is platform which uses artificial intelligence, teaches young students to build games, programme robots and train their own AI models. In this platform you can use the dataset but also train the AI Model depending on your project. You can play with a pre-trained model, create your own custom text model to predict the categories you want or learn how to use the models you create in a project.

### Husky or Malamute?

What categories should your model have? +

**happy**

I am feeling re!

there's a dog in the library I'm so excited!

I love singing so much

this is the best fried chicken I've ever had

I had a really amazing day

**sad**

Enter 10 words for sad

Happy Add Category

Train Model

Can you create a project that can identify a husky and a malamute? They look very similar, so train your classifier well! Put your Train AI keys into the blocks in codelab to check them out.

Download Project Launch Codelab



#### Project Guide

Step 1: Download the project. If you have not trained an image project that can huskies or malamutes, you can [use this data](#) and [train a new model](#). Use the categories "husky" and "malamute".



## AI Training with coding tools

[Machine Learning for Kids](#) is a tool that introduces machine learning by providing hands-on experiences to train machine learning systems and build things with them. It provides an easy-to-use guided environment for training machine learning models to recognise text, numbers, images, or sounds. This builds on existing by adding models to educational coding platforms Scratch and App-Inventor, and helping children create projects and games with the machine learning models they train. The tool is entirely web-based and requires no installs. It was designed for use in the classroom by schools and volunteer-run coding groups for children. It provided an admin page for teachers or group leaders to manage and administer access for their students. You can find a lot of projects at the [Worksheets of the ML for Kids!](#)

[PictoBlox](#) is a graphical programming environment based on the latest version of Scratch. With a user-friendly interface and drag-and-drop functionality, you can start your first coding projects. One can make interactive animations and games, projects based on IoT, program actions for robots, and much more! PictoBlox is available for Windows, Mac & Android. There are many [PictoBlox Scratch Tutorials](#) and projects available on the STEMpedia website.

## More AI tools and apps

There are many software and tools involving teaching students about AI. [Generation AI](#) offers a large variety of these kind of tools to help teachers educate their students in this subject. The opportunities given to the teachers are a combination of structured guidelines, online tutorials, courses and software tools. Specifically, there are different programming projects (games, animations etc.), platforms based on augmented reality, 3D-simulations and virtual reality, inquiry-based and project-based learning approaches, machine-learning tools, programming lessons using algorithms and computational thinking, online STEM training facilities and digital hubs. All these activities can be used as the starting point for an established

appropriate pedagogical framework for AI technology in education. Examples of mobile apps (except the 1st) using datasets that recognize living organisms are the following:

- [Pl@ntNet](#) is a web-based tool to help to identify plants with pictures. It is organized in different thematic and geographical floras.
- [Cat Scanner: Breed Recognition](#) app can identify your cat's breed reliably.
- [Dog Scanner: Breed Recognition](#) app can identify your dog's breed reliably.
- [BirdNET](#) can recognize the sound of more than 3,000 of the most common birds worldwide.
- [Merlin Bird ID](#) Sound ID listens to the birds around you and shows real-time suggestions for who's singing. Available for birds in the US and Canada.