



IO3 – School Program for Primary Education Students

Challenge through a game of Rock-Paper-Scissors



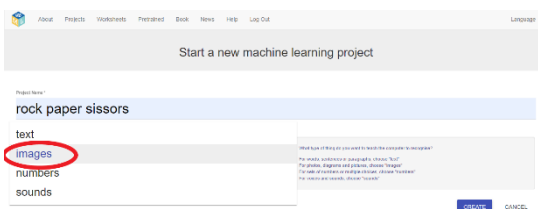
Tutorial GBL Template

Name	Rock-Paper-Scissors
Tool	<p>For this activity, we will use:</p> <ul style="list-style-type: none"> - Machine Learning for Kids (https://machinelearningforkids.co.uk/): is an educational tool about machine learning that teaches children how to train a computer to recognize different elements such as texts, pictures, or numbers. It offers a variety of worksheets (https://machinelearningforkids.co.uk/#!/worksheets) that both students and teachers can follow. The worksheet “Rock Paper Scissors” was selected as an example to create this tutorial. - Scratch (https://scratch.mit.edu/): is a programming language educational tool that allows children to create various projects, such as games, stories, and animations. Scratch also offers different tutorials (https://scratch.mit.edu/projects/editor/?tutorial=all) that can be followed by students.
Aim	<p>This activity aims to create a game of rock paper scissors that can recognize hand gestures and play with the students.</p> <p>Students will be able to teach the computer to recognize the abovementioned hand gestures (classic to the game) using the previously mentioned platforms.</p>

<p>Description</p>	<p>The outcome will consist of a game created with Scratch using the webcam that will be able to play with the students announcing the result of the game.</p>
<p>Step-by-step</p>	<p>To start the game, you should first go to the Machine Learning for Kids website: https://machinelearningforkids.co.uk/?lang=en#!/welcome and press on the “Get started” button.</p>  <p>If you want to create the game without logging in, you should press on “Try without registering”. But if you log in, you can keep your projects. This way, you will be able to access the Machine Learning Projects panel.</p> <p>To create a new Project, you have to select “+Add a new Project”</p> 

Once the project is created, you should give it a name (e.g., rock paper scissors) and select what we will teach the computer to recognize.

There are different ways to develop the training, and you can select different kinds of inputs, such as texts, images, numbers, or sounds. In our project, we will teach the computer to recognize images. Once you have chosen all these features, press “Create”.

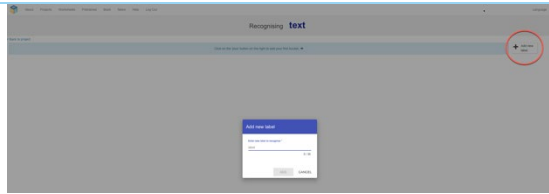


Once inside your project, the tool will offer 3 different options: Train, Learn & Test and Make.

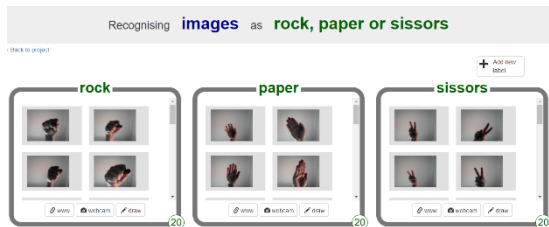
We should start by selecting the option “Train” that will allow us to create the training set that will help our game learn to see what our move is.



Then, we will have to create different labels. These labels will be essential to categorize all the images that we might use in our moves.



Our aim is that the computer knows what our move is. Therefore, the first thing that we must do, is defining the different groups and create one label for each of them (rock, paper, scissors). We will use the webcam to take at least 15 pics of each move (different angles and distance from the camera). Better use a neutral background like the ceiling or a white wall



Now, we have to select the second option “Learn & Test”.

Learn & Test

Use the examples to train the computer to recognise text

Learn & Test

Sometimes, it could be the case that the tool does not allow you to finish the training. A minimum number of images should be included in each label to proceed.

Machine learning models

What have you done?

You have collected examples of text for a computer to learn to recognise when used. Here are some. You can add more. You can also delete.

What is collected:

- Examples of Medication
- Examples of Pharmacy_Cat
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf

What's next?

Ready to go?

Go back to the "First" stage and collect more examples for each of the labels.

The more you can get, the better it should learn, but you need at least five examples of each as an absolute minimum.

Once we have 12 examples in each label, we can go back to the option “Learn & Test” and press on “Train new machine learning model” so that the machine can start to develop the training that will associate each name with its corresponding label.

Machine learning models

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- Examples of Pharmacy_Inf
- Examples of Pharmacy_Inf

What's next?

Ready to start the computer's training?

Click the button below to start training a machine learning model using the examples you have collected so far.

(You go back to the "First" page if you want to collect more more examples first.)

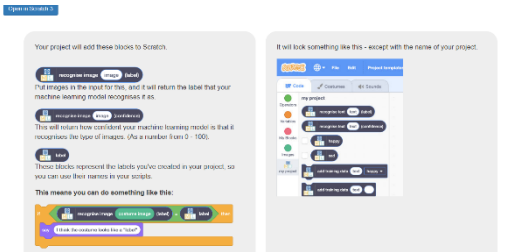
Train new machine learning model

Learn & Test

When the training process is finished, go back to the project and select the option “Make”.



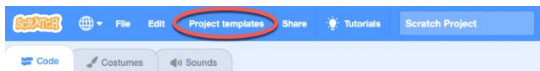
This option of the platform offers three different tools. We will use Scratch 3.0 to create our game using this previously created training.



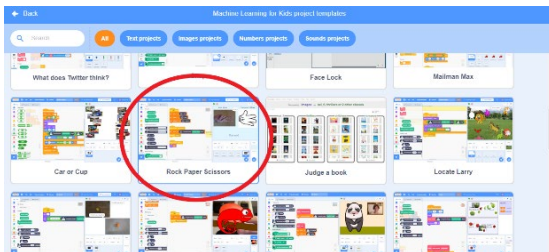
[< Back to project](#)

[Open in Scratch 3](#)

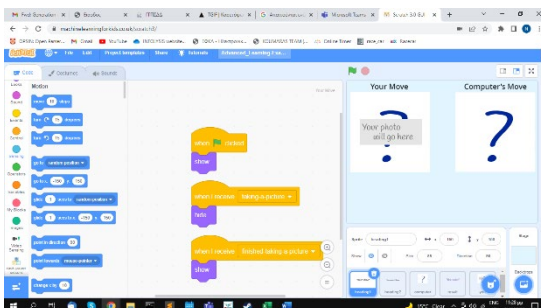
Once on Scratch, we must select the option “Project templates” that can be found on the top menu.



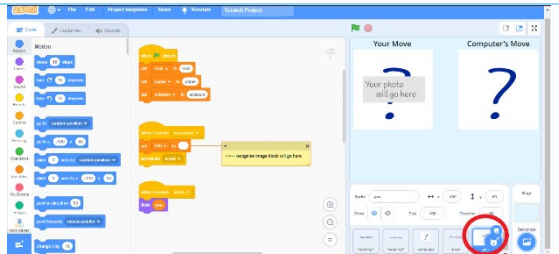
Several already programmed games will appear. To create our game, select the game “rock paper scissors”.



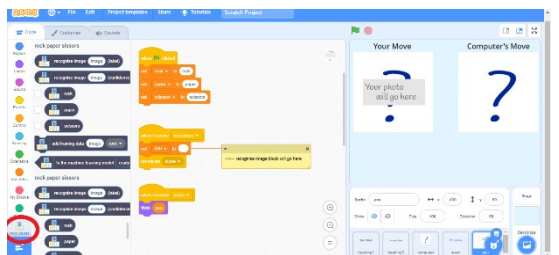
When we open the game, we will see different commands on the screen already there:



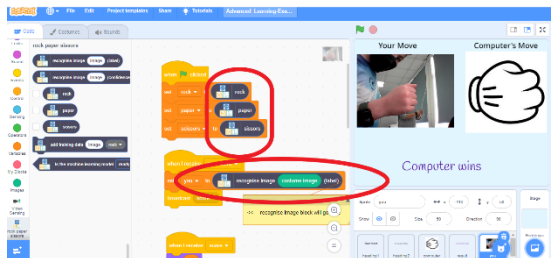
We should not modify them yet. However, we must insert some commands that will allow the computer to recognize our hand gestures. We will go to the sprite which is about our move.



Then we will select the library-model and the model we created in the previous step (rock paper scissors).



Then we must complete the commands with the correct blocks.

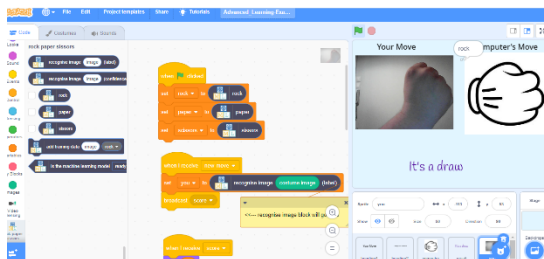


Now, our game would be set.

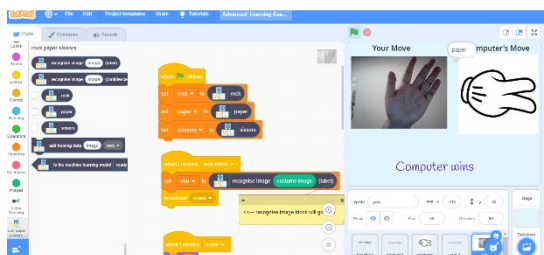
Press the green flag to start.

Then each time we are ready, we should press P, so the webcam is live and ready to record our move. Here are some results:

Rock:



Paper:



Scissors:

