

# Categorization of Bottles

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## Objective

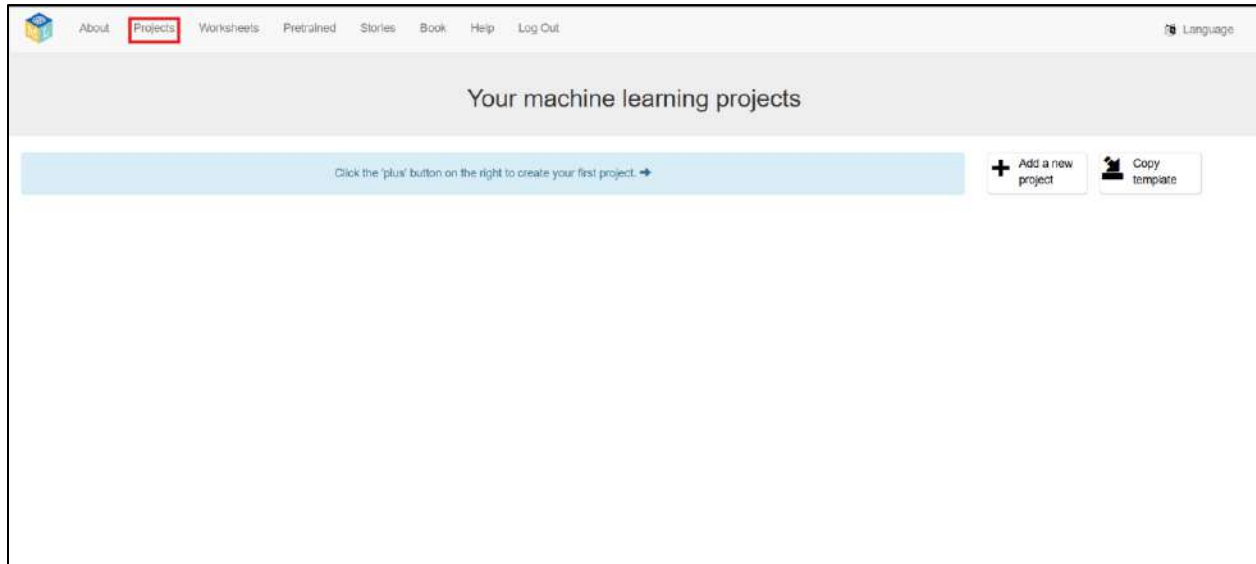
The goal of this project is to train a machine learning model to recognize different types of bottles in images with various backgrounds.

## Dataset

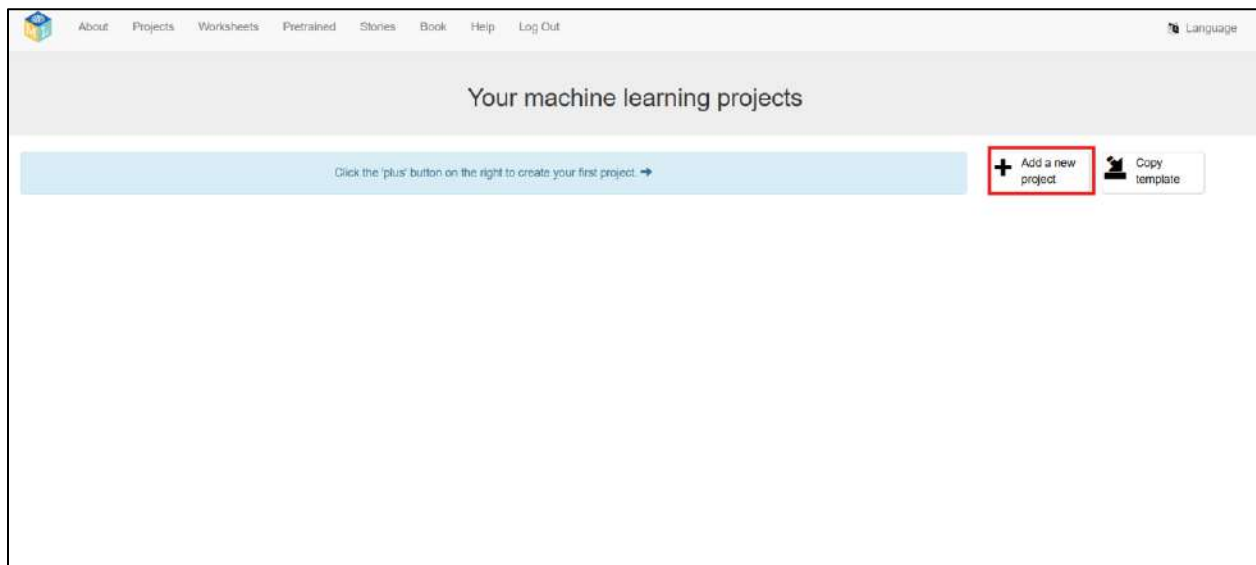
- The original dataset can be found here: [bottle-synthetic-images-dataset](#)
- Contains a folder of images for each category of bottles
- We use five available categories:
  - **Plastic bottles**
  - **Beer bottles**
  - **Soda Bottles**
  - **Water bottles**
  - **Wine bottles**
- There is also a folder with images containing more than one category of bottles in one photo
- In our app we will add one more category "**Combined Bottles**" to include these images
- You can find the dataset we will use here: [Training Dataset](#)

# Create, train, learn, and test

- Log in to ML4kids by following the link here: <https://machinelearningforkids.co.uk/>
- Click on "**Projects**"



- Click "**Add a new project**"



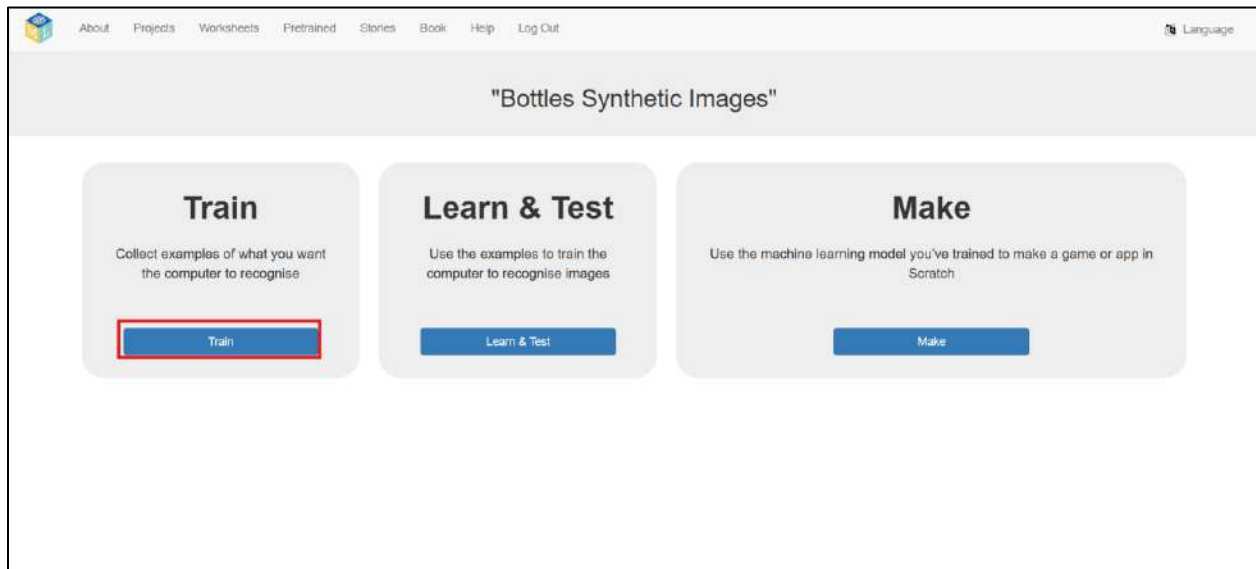
- Add project name
- Select "recognising images" as "Project Type"
- Select "Storage" -> "In your web browser"
- Click "CREATE"

The screenshot shows a web interface for creating a new machine learning project. At the top, there is a navigation bar with links for 'About', 'Projects', 'Worksheets', 'Pretrained', 'Stories', 'Book', 'Help', and 'Log Out'. The main heading is 'Start a new machine learning project'. Below this, there are three input fields: 'Project Name\*' with the value 'Bottles Synthetic Images', 'Project Type\*' with the value 'recognising images', and 'Storage\*' with the value 'In your web browser'. A tooltip is visible next to the 'Storage' field, asking 'Where do you want to store this project?' and explaining that storing in the web browser removes limits on project size, while cloud storage allows access from any computer. At the bottom right, there are 'CREATE' and 'CANCEL' buttons.

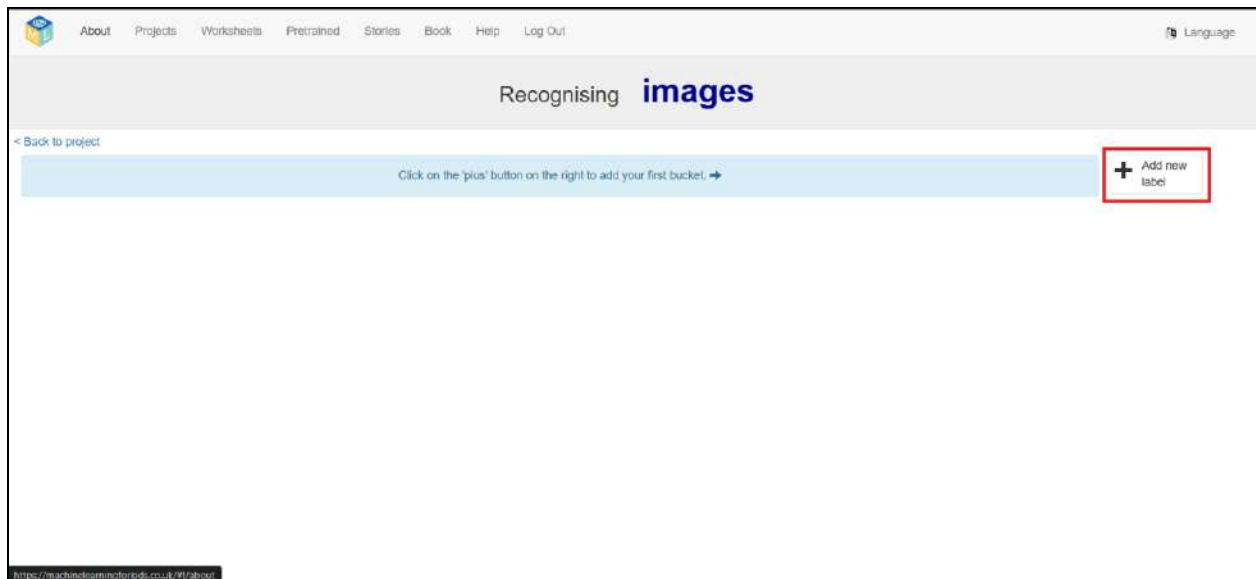
- Click on "Project Name"

The screenshot shows the 'Your machine learning projects' page. At the top, there is a navigation bar with links for 'About', 'Projects', 'Worksheets', 'Pretrained', 'Stories', 'Book', 'Help', and 'Log Out'. The main heading is 'Your machine learning projects'. Below this, there are two buttons: '+ Add a new project' and 'Copy template'. A project card is displayed with the title 'Bottles Synthetic Images' and the subtitle 'Recognising images'. A trash icon is visible to the right of the project card.

- Click "Train"

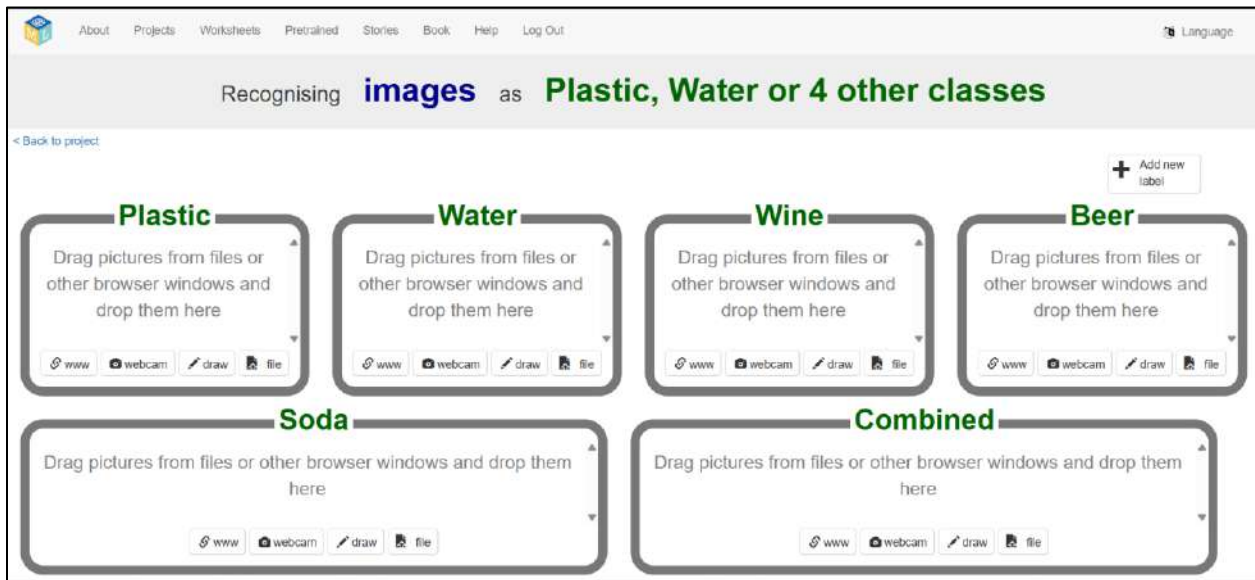


- Click on "Add new label"

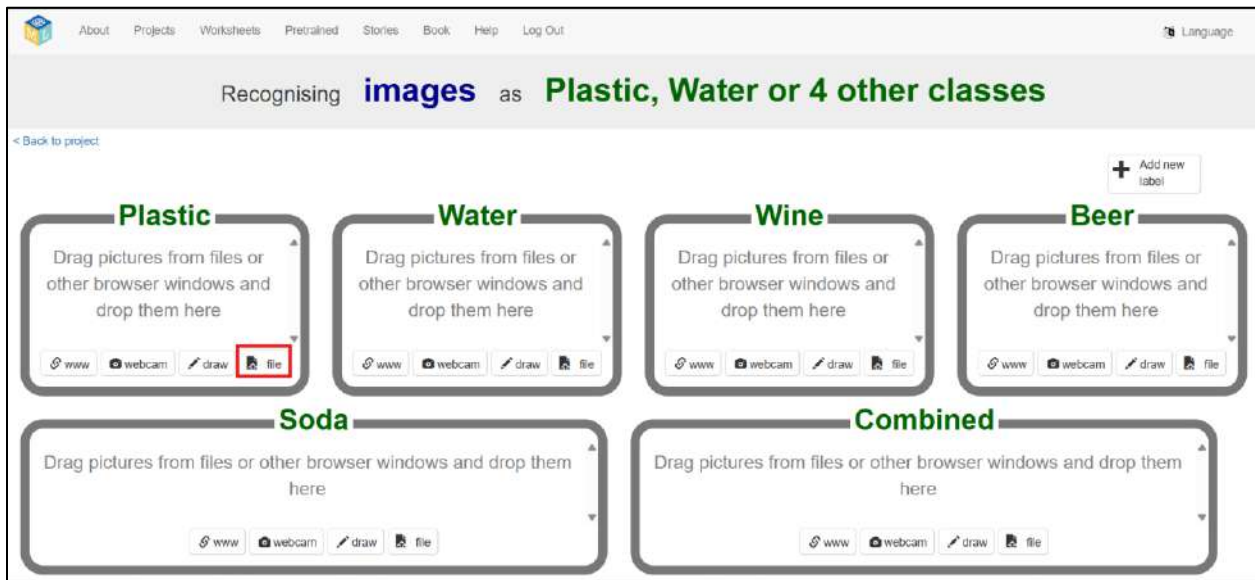


- For each category/folder in the folder dataset that creates a label, the categories are:
  - Plastic
  - Beer
  - Soda
  - Water
  - Wine
  - Combined

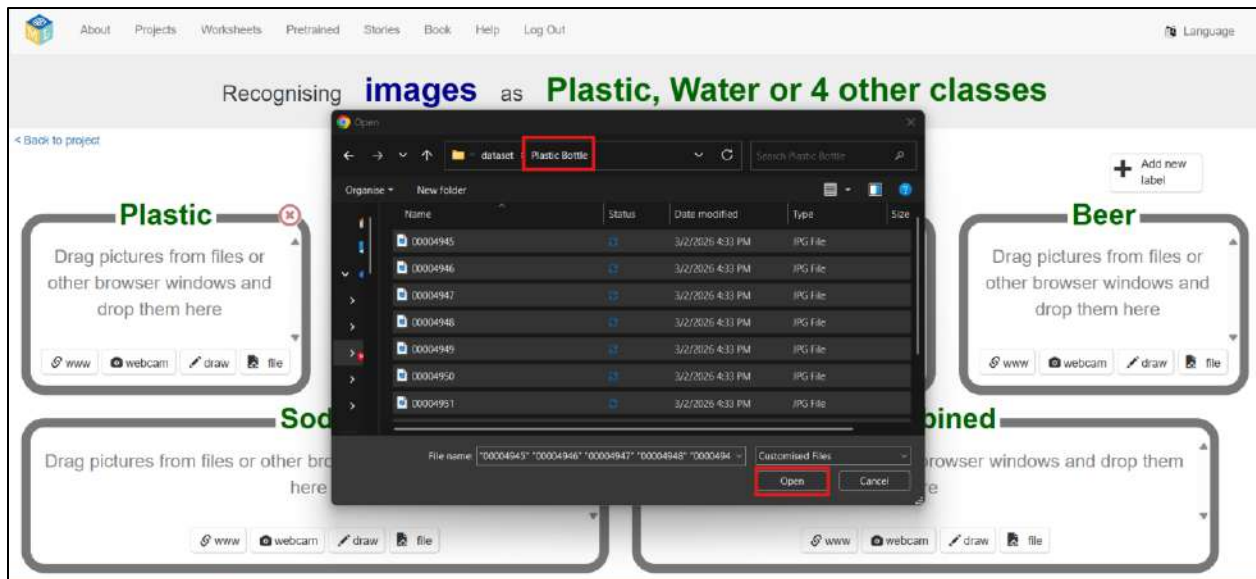
- Once you've added all the tags, your screen should look like this



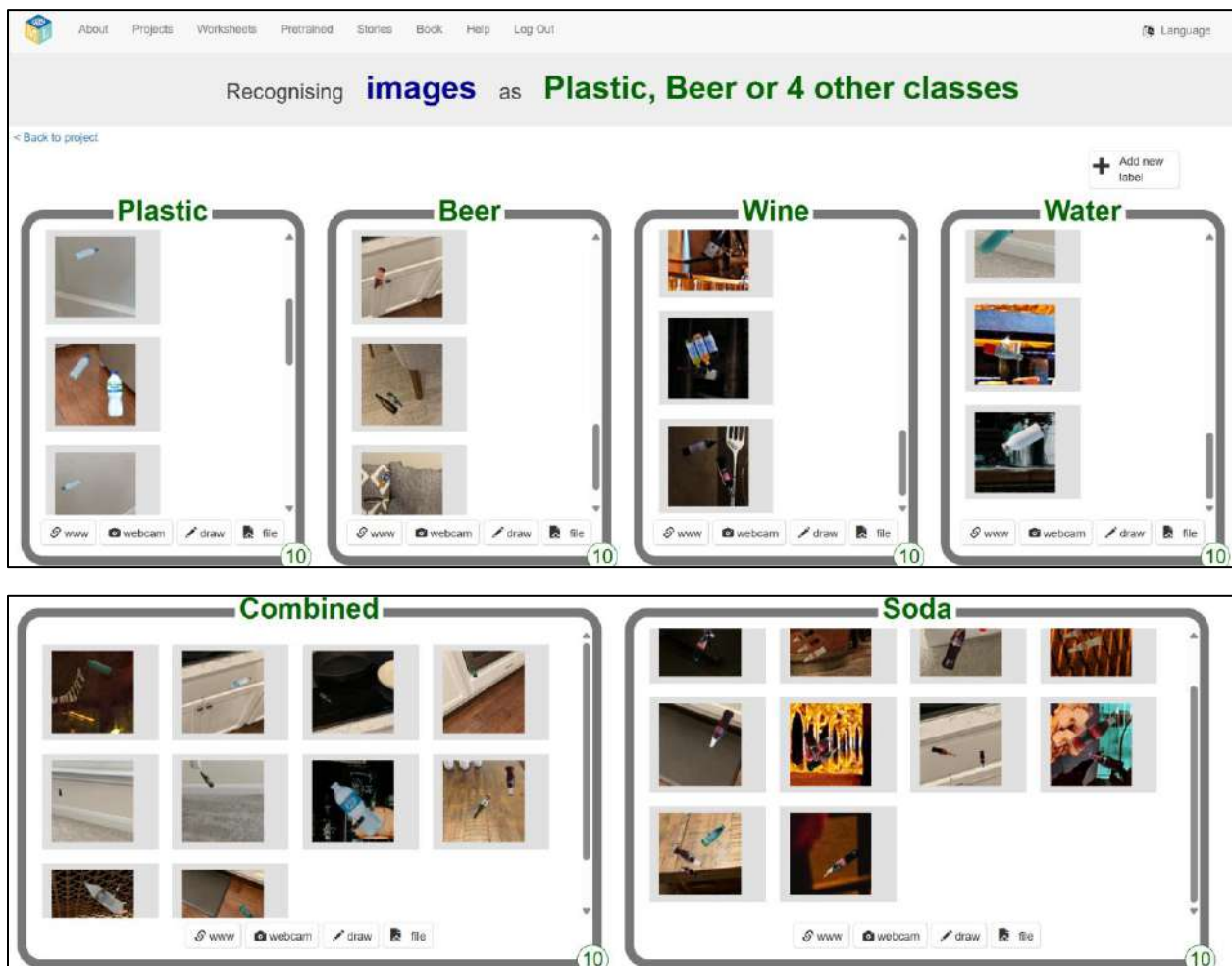
- For each tag click on "file"



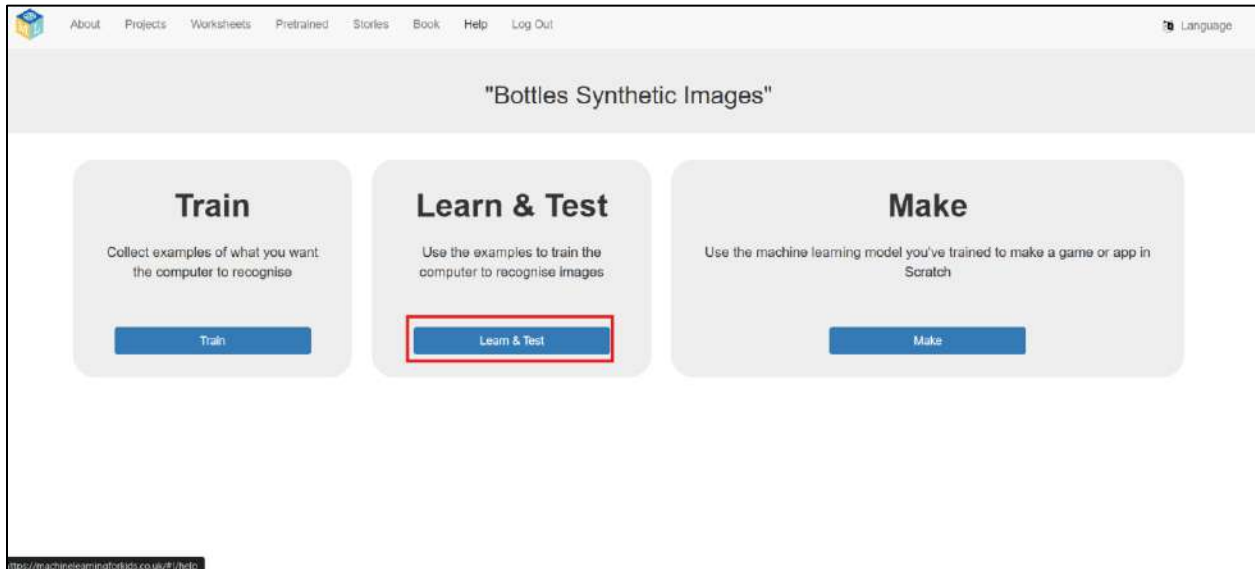
- Select all the images in the corresponding folder and click "Open"



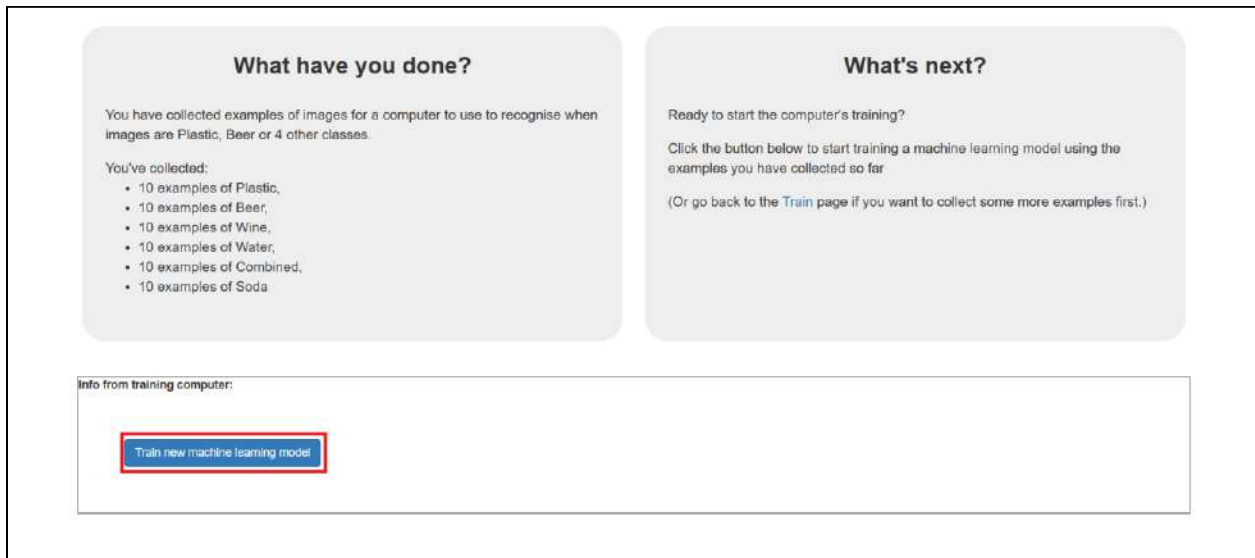
- For each label there are 10 images
- At the end of this step, your screen should look like the one below:



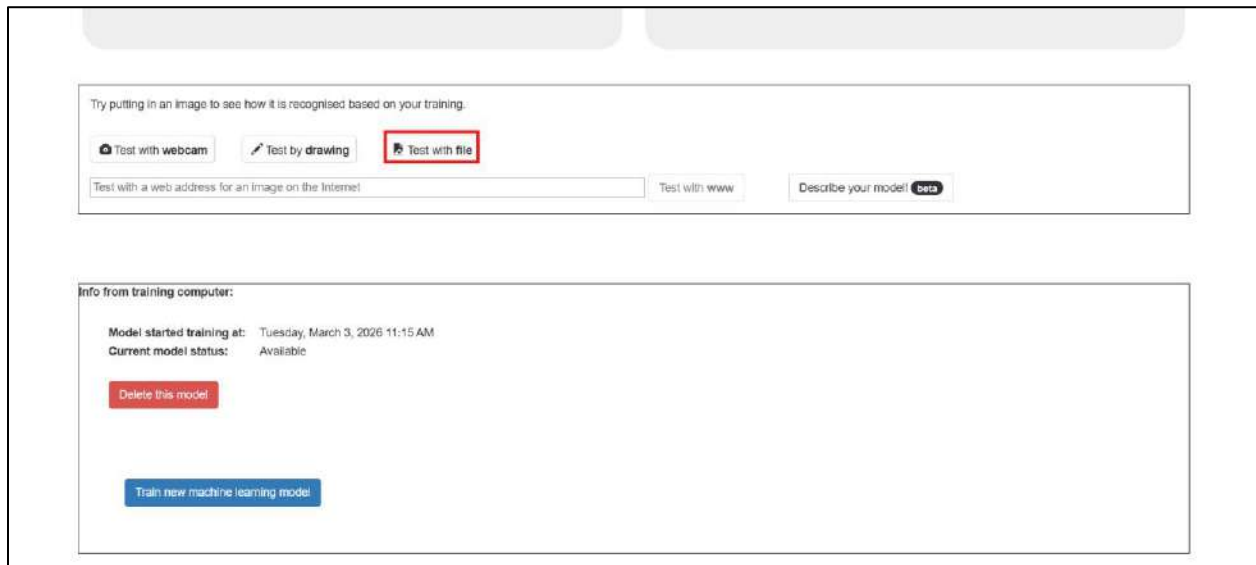
- Click on **"Back to project"** (top left)
- Click on **"Learn & Test"**



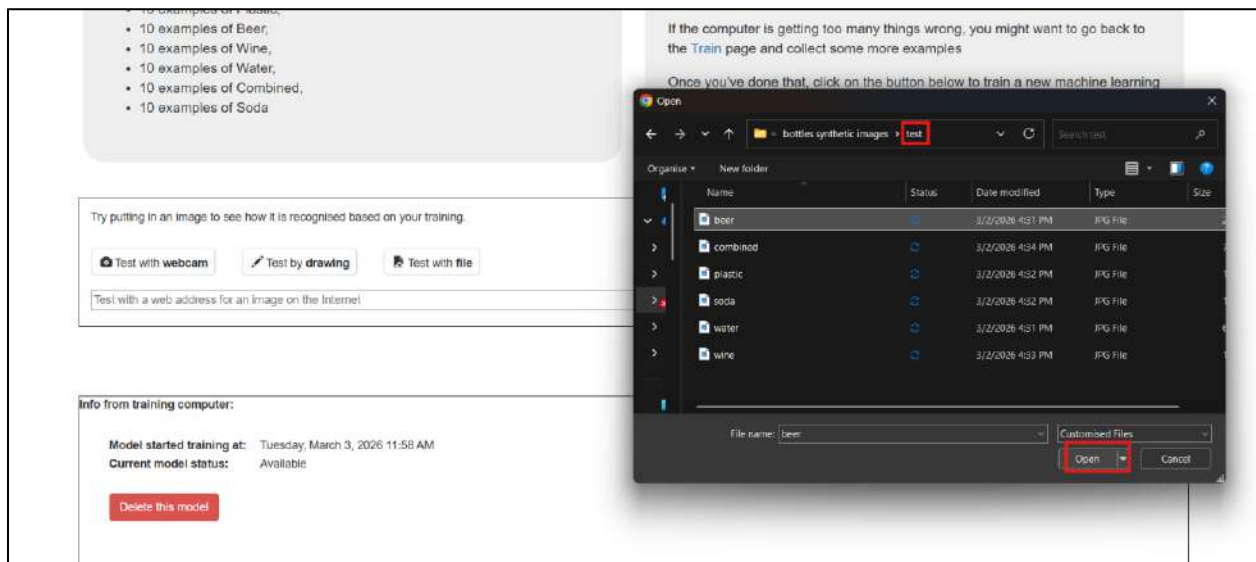
- Scroll down and click on **"Train new machine learning model"**



- After a few seconds your screen should look like the one below
- Now we can test our model by clicking on "Test with file"



- Select an image from the folder: [Test Dataset](#). This folder contains images that were not available during the model's training, and we will use them to see the accuracy of the model
- Click "Open"



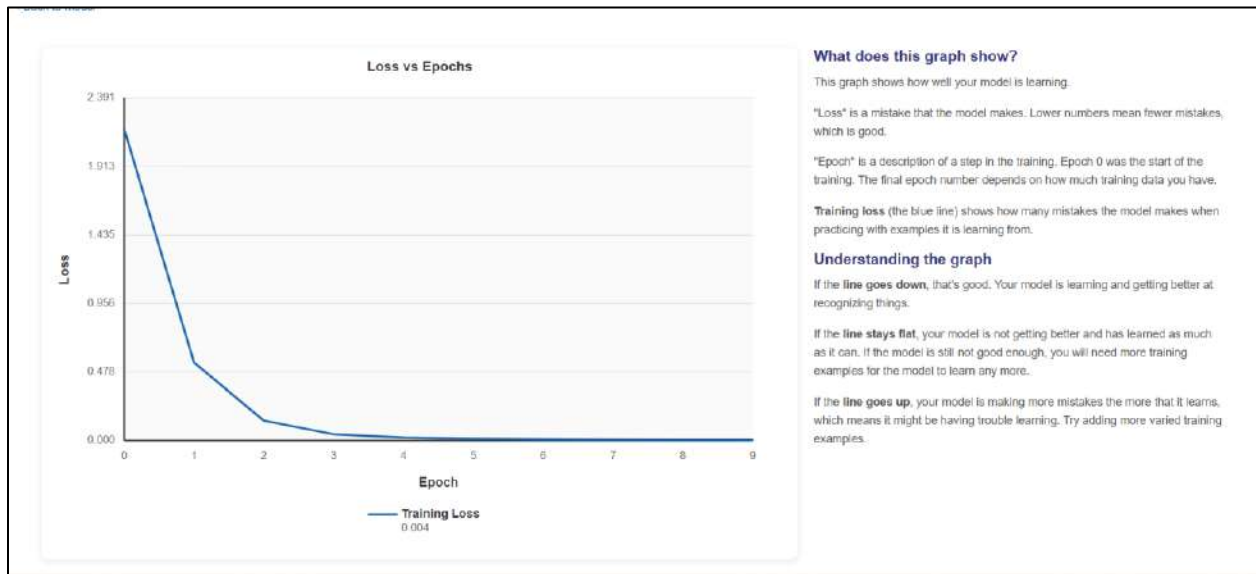
- In our example, we chose the image of beer "**beer.png**"

The screenshot shows a machine learning training interface. At the top left, it states: "You created the model on Wednesday, March 18, 2026 12:35 PM." Below this, it lists the collected examples: "You have collected: 10 examples of Plastic, 10 examples of Beer, 10 examples of Soda, 10 examples of Water, 10 examples of Wine, 10 examples of Combined". To the right, there are two instructional paragraphs: "recognises it as, and how confident it is in that." and "If the computer seems to have learned to recognise things correctly, then you can go to Scratch and use what the computer has learned to make a game!". Below these, it says: "If the computer is getting too many things wrong, you might want to go back to the Train page and collect some more examples" and "Once you've done that, click on the button below to train a new machine learning model and see what difference the extra examples will make!". The main interface area has a heading "Try putting in an image to see how it is recognised based on your training." and three buttons: "Test with webcam", "Test by drawing", and "Test with file". Below these are two input fields: "Test with a web address for an image on the Internet" and "Test with www". To the right of the second input field is a "Describe your model!" button with a "Data" dropdown. The test result is displayed as "Recognised as Soda with 38% confidence", which is highlighted with a red box. At the bottom left, there is a link "Info from training computer:".

- We can see that our model recognizes the beer bottle as soda (perhaps it differs in your case):
  - This means that something went wrong in the training phase
    - or the images in the training phase were not enough
    - or something went wrong in the learning phase

# Troubleshooting

- First of all, we will try another image, for example "**plastic.png**"
- We can see that our model correctly recognizes the image as Plastic but with a very low confidence score (58%)
- The next thing we can do is click on "**Describe your model!**", to see the learning rate of our model



- As we can see, the line drops, so the model learns us at first
- But then it flattens out which means it learned as much as it can, so we need more training data for it to learn better
- Retrain your model with these images: [Enhanced Training Dataset](#)
- Click on "**Back to project**"

[Back to project](#)

### What have you done?

You have trained a machine learning model to recognise when images are Plastic, Beer or 4 other classes.

You created the model on Wednesday, March 18, 2026 11:54 AM.

You have collected:

- 10 examples of Plastic,
- 10 examples of Beer,
- 10 examples of Soda,
- 10 examples of Water,
- 10 examples of Wine,
- 10 examples of Combined

### What's next?

Try testing the machine learning model below. Enter an example image below, that you didn't include in the examples you used to train it. It will tell you what it recognises it as, and how confident it is in that.

If the computer seems to have learned to recognise things correctly, then you can go to Scratch and use what the computer has learned to make a game!

If the computer is getting too many things wrong, you might want to go back to the [Train](#) page and collect some more examples

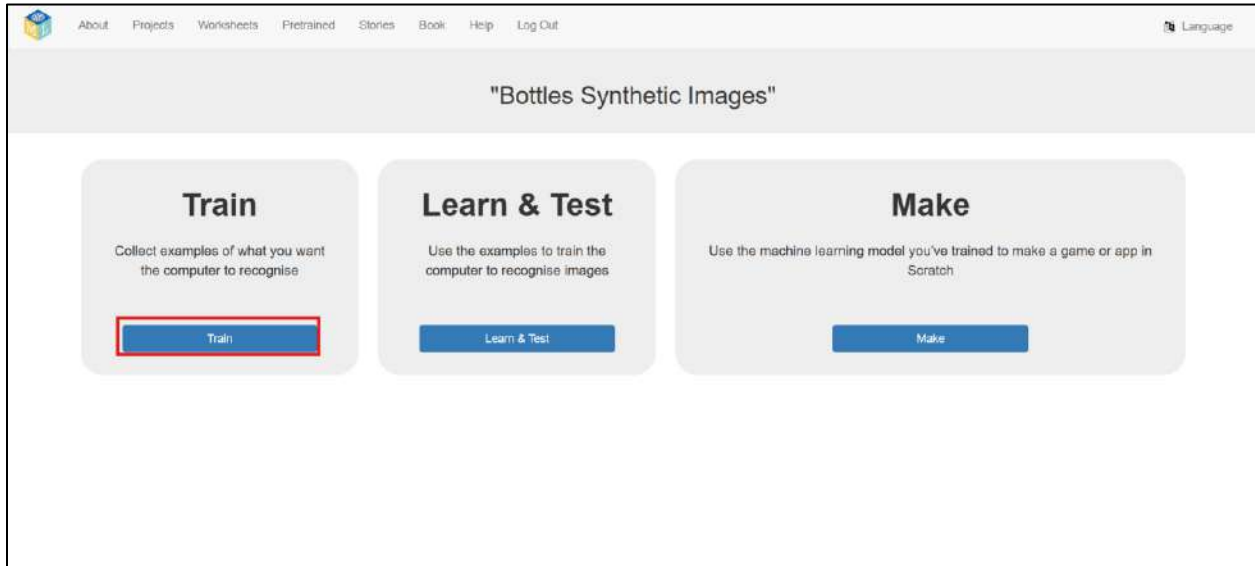
Once you've done that, click on the button below to train a new machine learning model and see what difference the extra examples will make!

Try putting in an image to see how it is recognised based on your training.

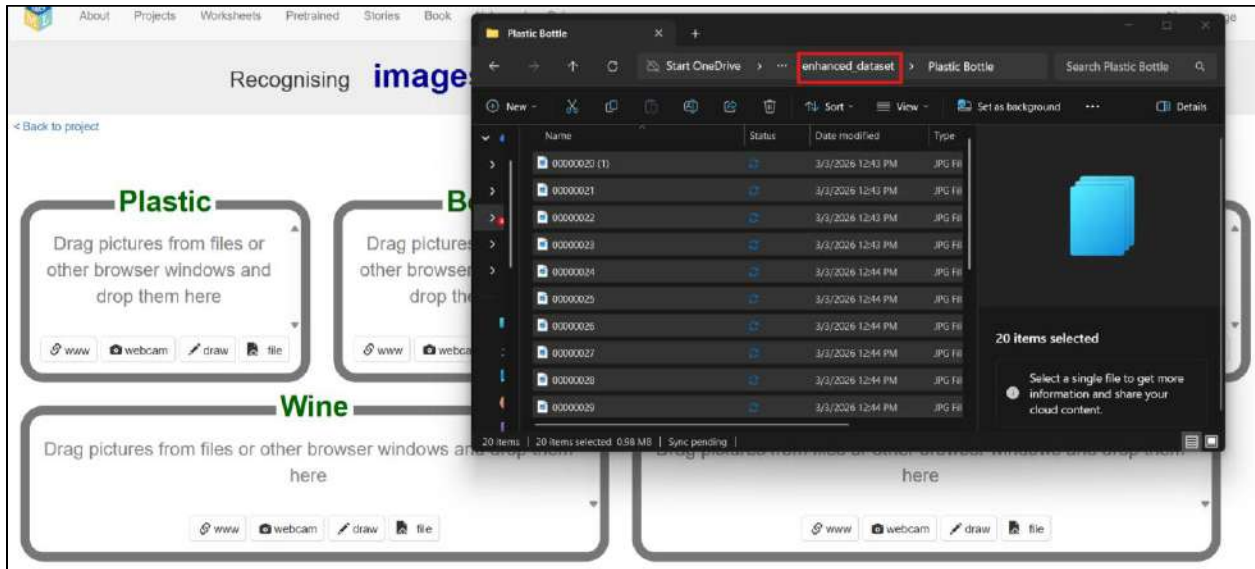
[Test with webcam](#) [Test by drawing](#) [Test with file](#)

Test with a web address for an image on the Internet:  Test with www:  [Describe your model! beta](#)

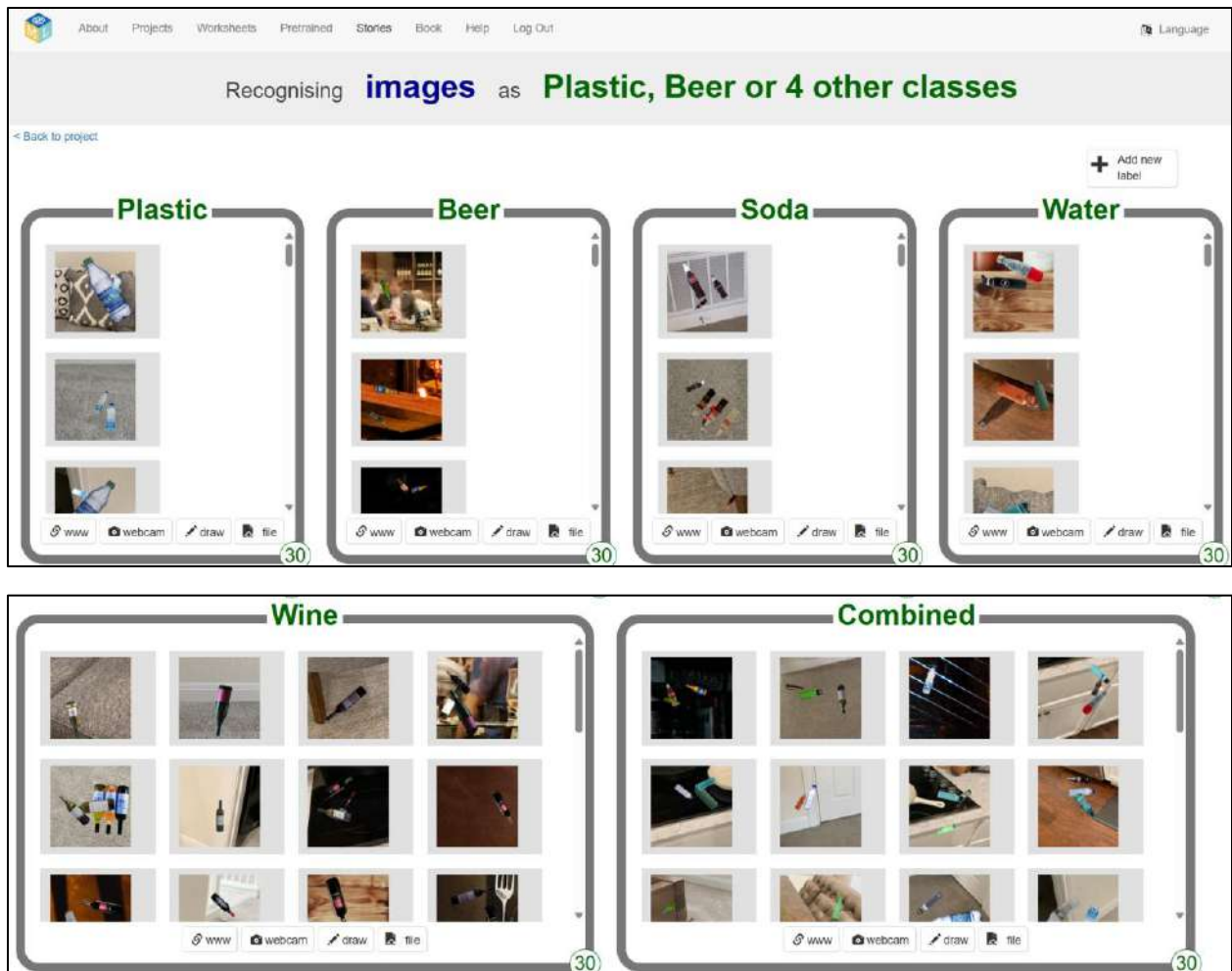
- Click "Train"



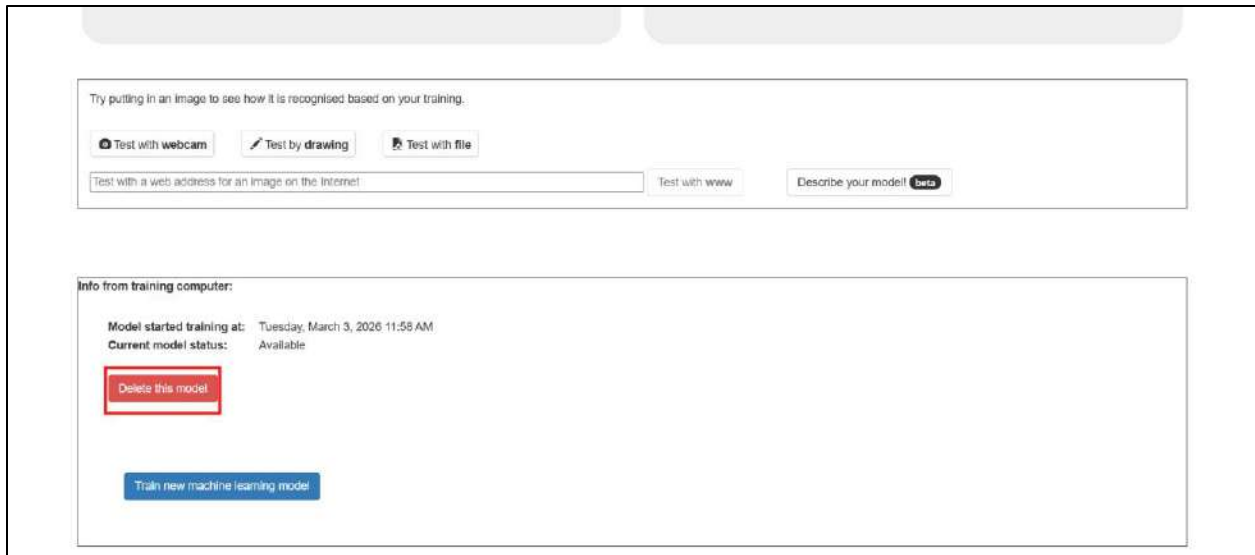
- Remove the images of each tag and upload the new images



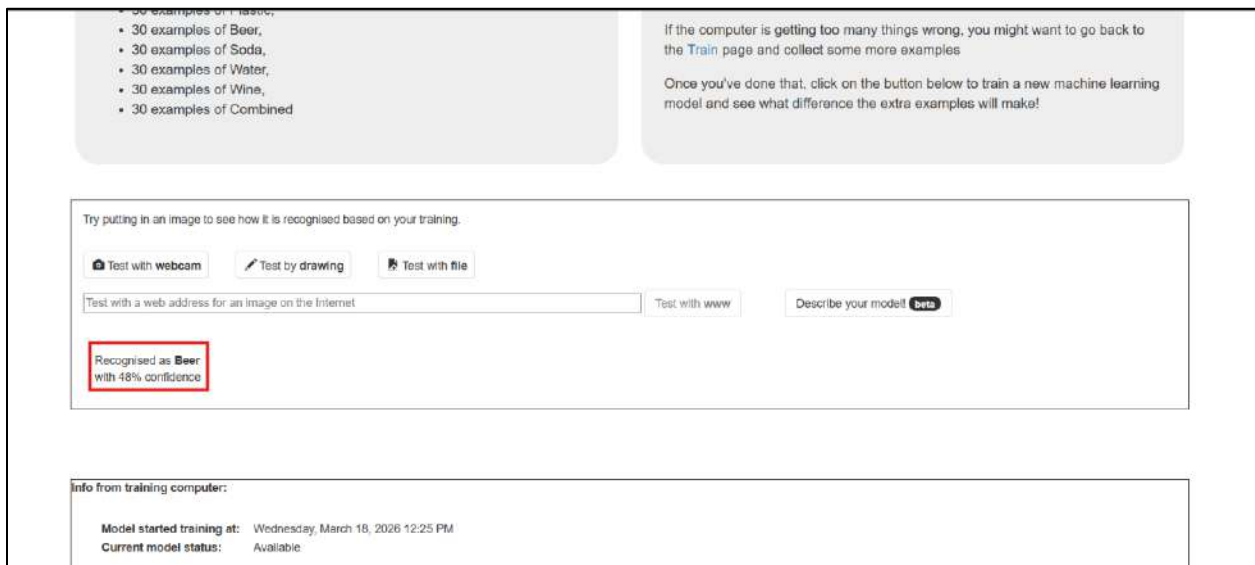
- Your screen should now look like the one below:



- Click on "Back to project" (top left)
- Go to "Learn & Test"
- Click on "Delete model"



- Click on **"Train new machine learning model"**
- When available, we will test our model
- I will try the same **"beer.png"** image again
- It correctly identifies it as a beer with a trust score of 58%



- You can test with other images as well, and you'll notice that the model makes fewer mistakes than before, so giving the model more images will train it even better
- If I click on **"Describe your model!"**, I can see a very similar line, this further strengthens the assumption that I need more data
- So the conclusion is that we need even more images and more representative