

Google Teachable Machine






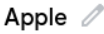


Google Teachable Machine is a machine learning program that you can train to classify images or sounds into categories.

In this task, you will use Google Teachable Machine to classify images of fruit. You will do this by providing it with example images for each category.

Task 1 Gather

First, you will specify the categories of images that you want Google Teachable Machine to recognise, e.g. apples and oranges, and then gather example images for each category.

You can watch this [tutorial video](https://youtu.be/DFBbSTvtpy4) (youtu.be/DFBbSTvtpy4) for a quick overview of what you will be doing in this task.

| Steps | Further instructions |
|---|---|
| 1. Visit the Google Teachable Machine website. | Open a browser and visit g.co/teachablemachine . Click on  |
| 2. Specify that you will train the machine to classify images . | Select Image Project . |
| 3. Specify that, initially, there will be two categories of images. Every image will be classified as either an Apple or an Orange . | There are already two classes in the project, so you will only need to rename them. Rename Class 1  to Apple  Rename Class 2  to Orange  |
| 4. Specify that you will be providing example images for the Apple class using the webcam. | In the Apple class, under 'Add Image Samples', select Webcam .  Add Image Samples:   |

Steps

5. Provide examples of images for the **Apple** class.

You may need to adjust the settings.

Tip: A large number and variety of training examples will improve the machine's accuracy. However, limit yourself to no more than a few dozen images for each class, otherwise the training phase will take longer.

Further instructions

Click the button below to capture images. Releasing the button will stop recording images.



If it is inconvenient for you to hold the button while capturing images, click the 'Settings' (gear) button and turn off **Hold-to-record**. This will allow you to capture images for a set amount of time.



Try minimising background 'noise' in your pictures. Use the 'Crop' icon to zoom in on the fruit as much as possible.



6. Repeat steps 4 and 5 to provide example images for the **Orange** class.

Task 2 Train

You can watch this [tutorial video](https://youtu.be/CO67EQ0ZWgA) (youtu.be/CO67EQ0ZWgA) for a quick overview of what you will be doing in this task.

Steps

7. Train your machine, using the examples that you have provided.

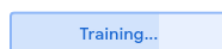
Further instructions

Locate the **Training** rectangle.

Click on 

A progress bar will inform you of the time remaining until training is complete.

Training



00:14 - 34 / 50

Note: Training may take some time. Make sure that you don't switch tabs during the process.

Task 3 Test

You can watch this [tutorial video](https://youtu.be/n-zeeRLBgD0) (youtu.be/n-zeeRLBgD0) for a quick overview of what you will be doing in this task.

Steps

8. Use the trained machine to classify images as either **Apples** or **Oranges**.

Further instructions

Locate the **Preview** rectangle.

The 'Output' will display how confident the machine is that the current image can be classified as an **Apple** or an **Orange**.

Example: Definitely an **Apple**

Output



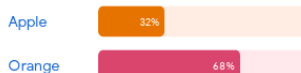
Example: Definitely an **Orange**

Output



Example: Inconclusive

Output



Explorer task Retrain

You can make your model more accurate by providing additional examples. Go back to each one of your classes and **Gather** additional example images. Make sure to **Train** your machine again, before you **Test** it.

Explorer task Add categories

Provide your machine with the ability to recognise additional classes of images. Add an additional fruit category, like **Banana**, or a **Neutral** class for when no fruit is contained in the image.

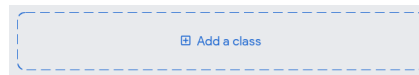
Steps

9. Add a **Banana** or **Neutral** category, into which images can be classified.

Further instructions

Locate the existing **Apple** and **Orange** image classes, towards the left-hand side of your browser window. Below, you will find the **Add a class** button.

Click on



Repeat the process from Task 1 (**Gather**) to add example images for the new classes.

Make sure to **Train** your machine again, before you **Test** it.

This resource is available online at ncce.io/cmpps-5-a4-w. Resources are updated regularly — please check that you are using the latest version.

This resource is licensed under the Open Government Licence, version 3. For more information on this licence, see ncce.io/oql.