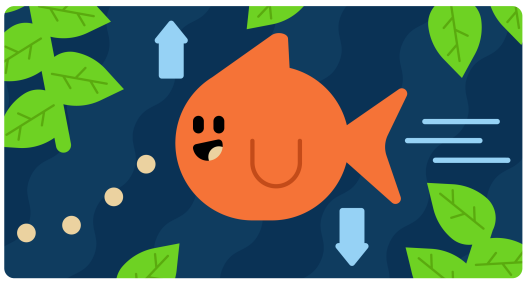
Fish food

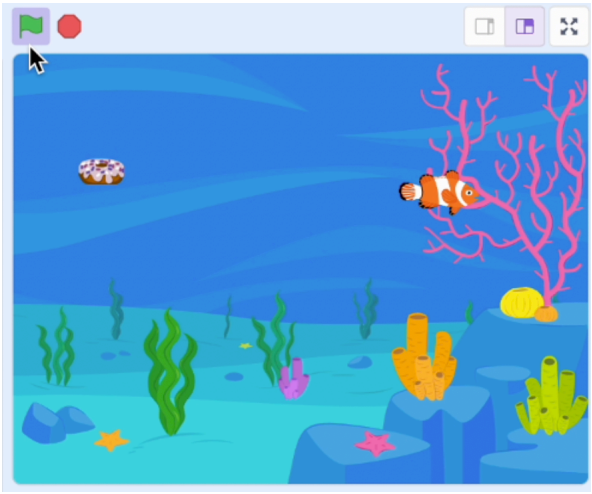
Control a fish using only your voice and direct it to the food



Step 1 Introduction

Train a machine learning model to recognise voice commands ‘up’, ‘down’, ‘left’, and ‘right’, and use them to control a fish in a fun game.

You will need a **microphone**.



Where are my voice commands stored?

- This project uses a technology called ‘machine learning’. Machine learning systems are trained using a large amount of data.
- This project does not require you to create an account or log in. For this project, the examples you use to make the model are only stored temporarily in your browser (only on your machine).

No YouTube? Download the videos!

You can download all the videos for this project (https://rpf.io/p/en/fish-food-go).

Step 2 Set up the project

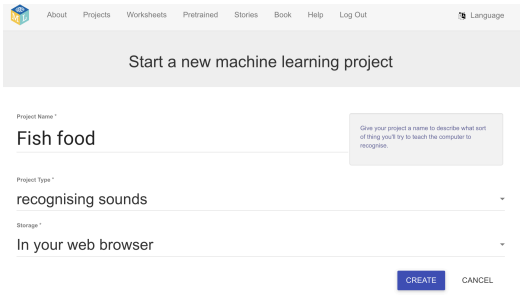
Go to machinelearningforkids.co.uk (https://machinelearningforkids.co.uk/#!/login) in a web browser.

Click on **Try it now**.

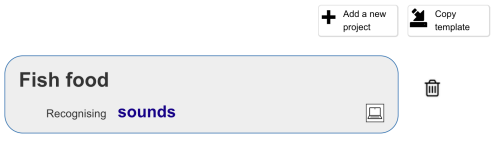
Click on **Projects** in the menu bar at the top.

Click on the **+ Add a new project** button.

Name your project `Fish food` and set it to learn to recognise **sounds**, and store data **in your web browser**. Then click on **Create**.



You should now see 'Fish food' in the projects list. Click on the project.



Click on the **Train** button.

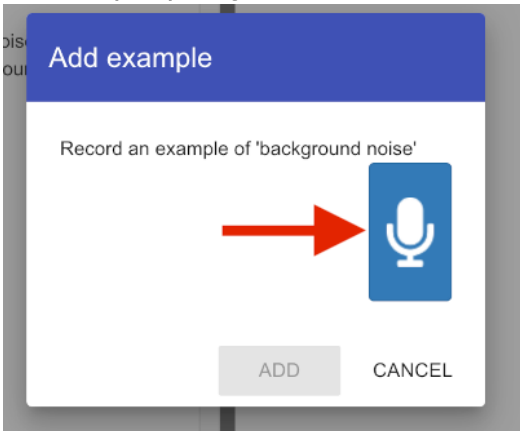
If you see a pop-up message asking to use the microphone, click on **Allow on every visit.**

Step 3 Background noise

First, you will collect samples of background noise. This will help your machine learning model to tell the difference between your voice commands, and the background noise where you are.

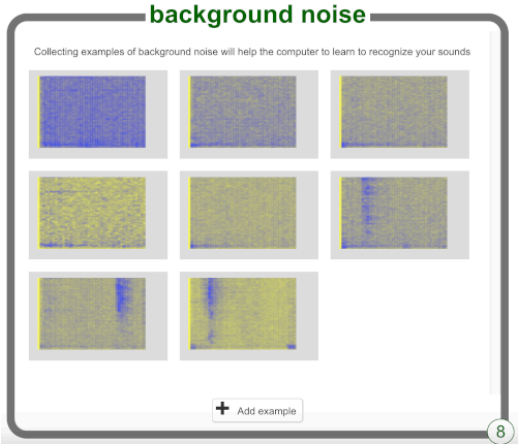
Click the **+ Add example** button in **background noise**.

Click on the microphone but don't say anything to record 2 seconds of background noise.



Click the **Add** button to save your recording.

Repeat those steps until you have **at least 8 examples** of background noise.



Step 4 Record the directions

Now you will record 8 examples of each word (‘up’, ‘down’, ‘left’, and ‘right’) so that your machine learning model can learn to recognise them.

Click on **+ Add new label** on the top right of the screen and add a label called `left`.

Click on **+ Add example** inside the box for the new `left` label, and record yourself saying “left”.

Repeat until you have recorded **at least 8 examples**.

+ Add new label to create another label called `right` and record 8 examples of you saying “right”.

+ Add new label to create another label called `up` and record 8 examples of you saying “up”.

+ Add new label to create another label called `down` and record 8 examples of you saying “down”.

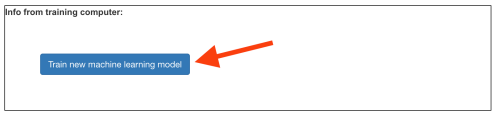
Step 5 Train the model

You have gathered the examples you need, now you will use these examples to train your machine learning model.

Click on < **Back to project** in the top left-hand corner.

Click on **Learn & Test**.

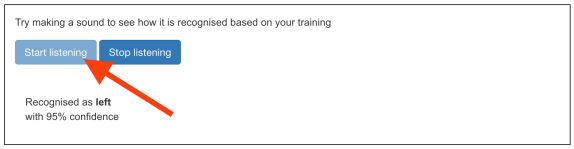
Click on the button labelled **Train new machine learning model**. This may take a few minutes to complete.



Once the training has finished, you can test how well your model recognises your voice commands.

Click the **Start listening** button, then say “left”.

If your machine learning model recognises it, it will display what it predicts you said.



Test whether the model recognises “up”, “down”, and “right” as well.

If you are not happy with how the model works, go back to the **Train** page and add more examples, then train your model again.

Step 6 Move the fish

Now that your model can distinguish between words, you can use it in a Scratch program to move a fish around the screen.

Click on the **< Back to project** link.

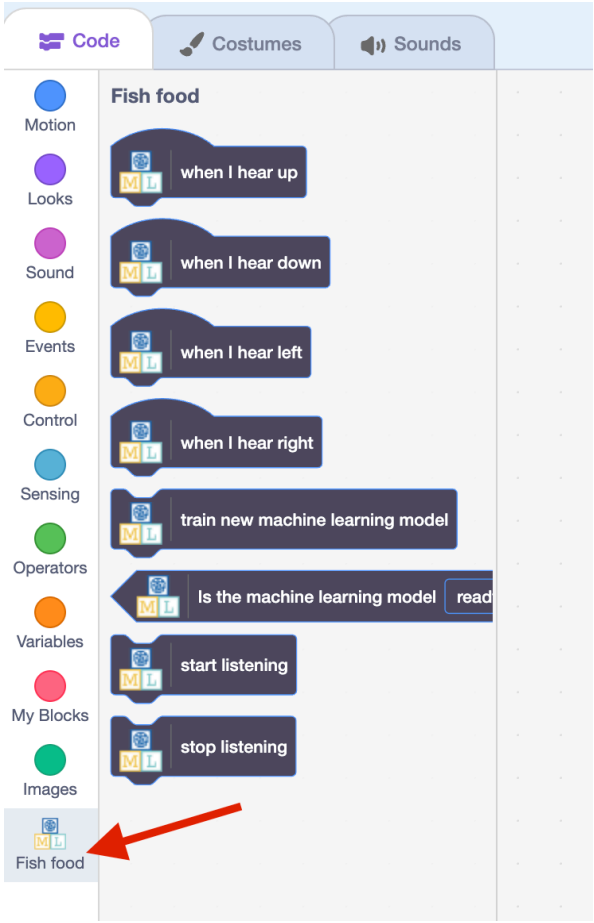
Click on **Make**.

Click on **Scratch 3**.

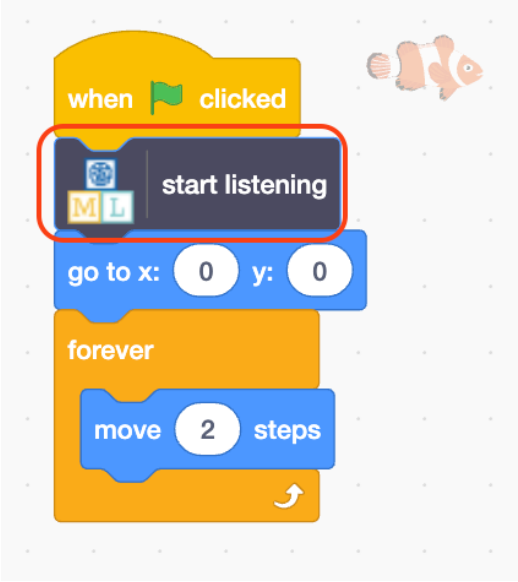
Click on **Open in Scratch 3**.

Click on **Project templates** at the top and select the 'Fish food' project to load the fish sprite, which has some code already added to it.

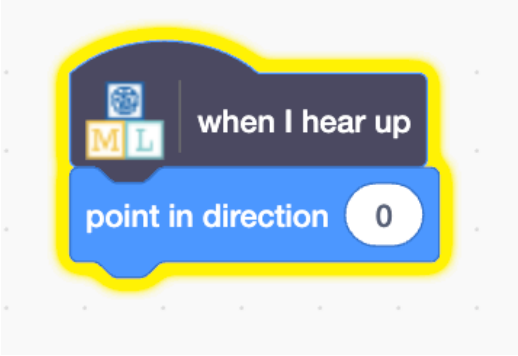
Machine Learning for Kids has added some special blocks to Scratch to allow you to use the model you just trained. Find them at the bottom of the blocks list.



With the **fish** sprite selected, click on the **Code** tab. Find the right place in the code and add a special block to tell the model to start listening.



Add the code for ‘up’ to the **Fish** sprite.



Look at the code you have to move the fish up, then see if you can work out the code for down, left, and right.

Show me how

Click the **green flag** and say up, down, left, or right. Check that the fish moves in the direction you expected.

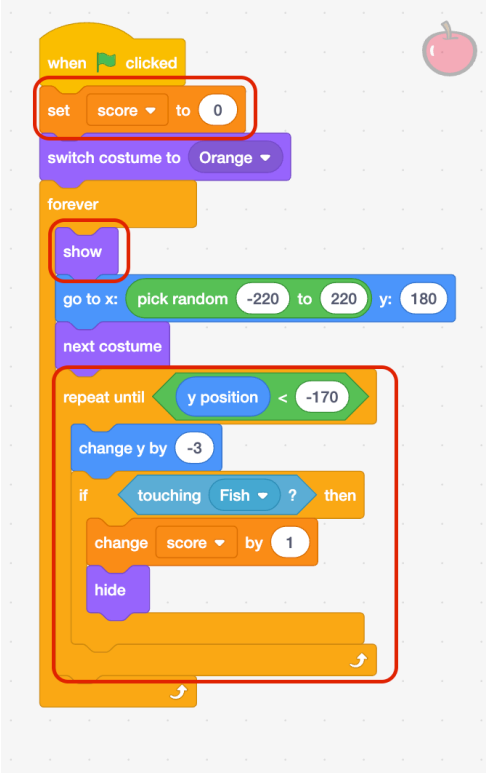
Challenge!

Challenge

Add a variable to keep track of the score, and add a point each time the fish eats some food.

Show me how

Add the circled code to the **Food** sprite.



Add a new sprite that is not food, and deduct points if the fish eats it.

Make the food fall at different random speeds.

Or, if you prefer, make a completely different game that uses voice commands to control a character!

Step 7 What can you do now?

There are lots of other machine learning and AI projects in the Machine learning with Scratch (https://projects.raspberrypi.org/en/pathways/scratch-machine-learning) pathway.