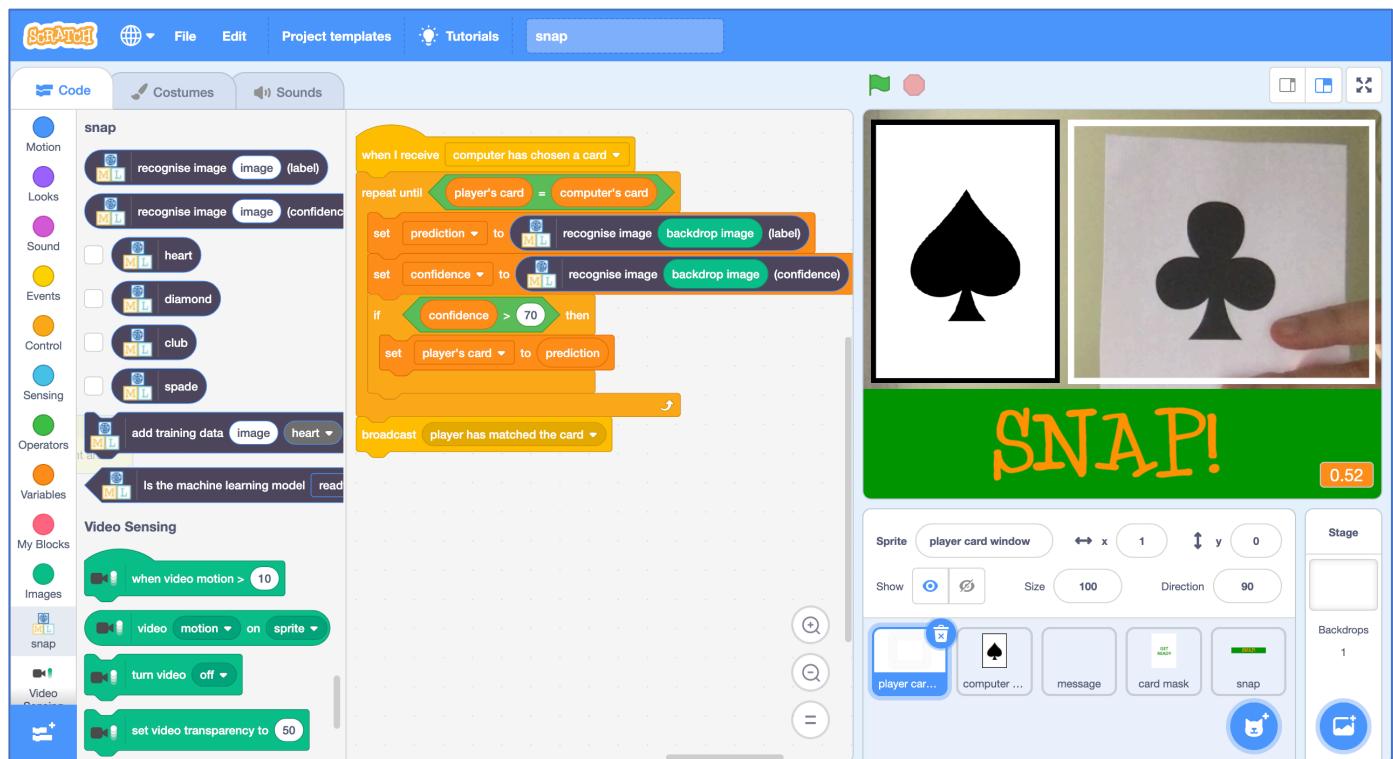


# Snap!

In this project you will make a simple version of the card game “Snap!” in Scratch.

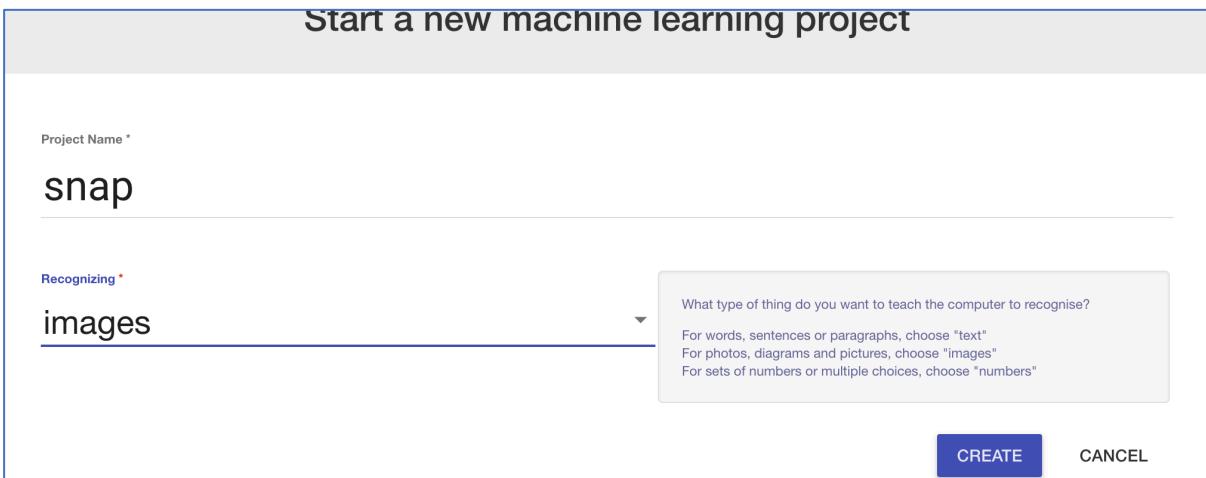
To have your move, you’ll hold your card up to the webcam, and a timer will see how quickly you can hold up the right card.

But first, you’ll need to train the computer to look at your photos and recognise the different cards in your pack.



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<http://creativecommons.org/licenses/by-nc-sa/4.0/>

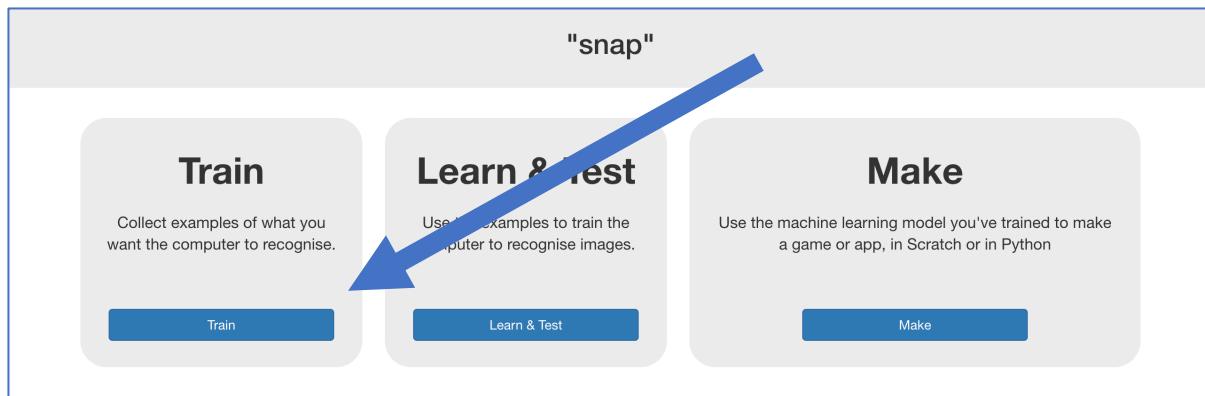
1. You'll need four cards for this project  
*Ask your group leader for a club, spade, heart and diamond.*
2. Go to <https://machinelearningforkids.co.uk/> in a web browser
3. Click on “Get started”
4. Click on “Log In” and type in your username and password  
*If you don't have a username, ask your teacher to create one.*  
*If you can't remember your username or password, ask your teacher or group leader to reset it for you.*
5. Click on “Projects” on the top menu bar
6. Click the “+ Add a new project” button.
7. Name your project “snap” and set it to learn to recognise “images”.  
*If the form asks where to train the model, choose “on your computer”*



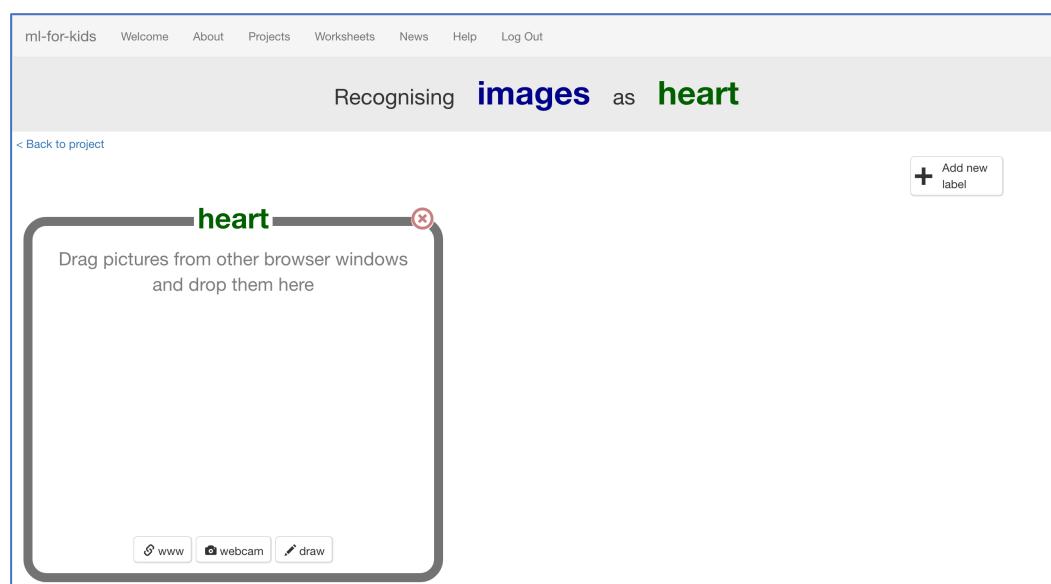
8. Click the “Create” button

9. You should see “snap” in the projects list. Click on it.

## 10. Click on “Train”



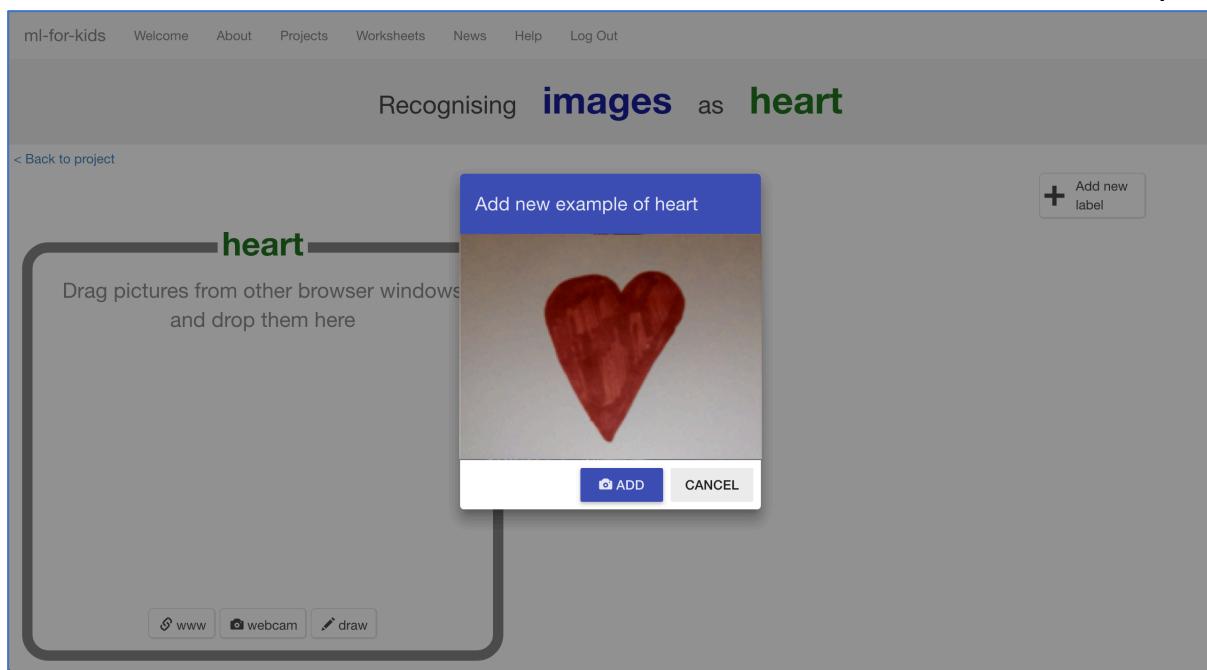
## 11. Click on “+ Add new label” and create a bucket called “heart”.



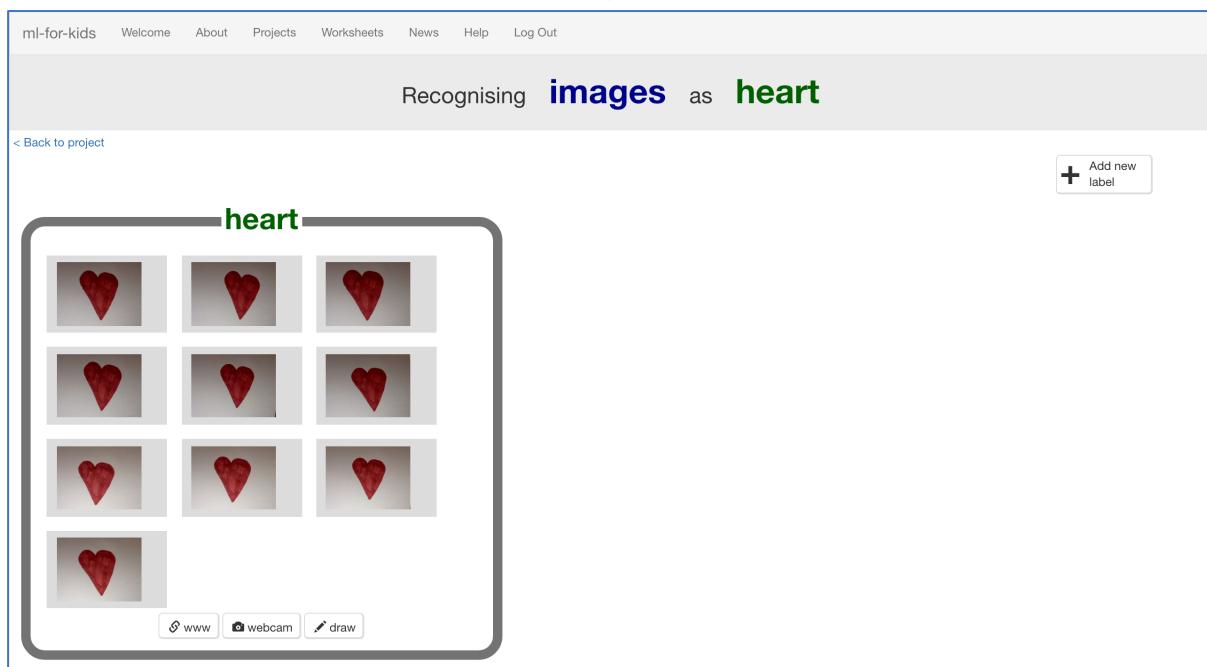
## 12. Click the “webcam” button

The Preview window shows the current view from your webcam.  
*You will need to click “Approve” or “Allow” if your web browser asks permission to use your webcam.*

- 13.** Hold the Heart card to the webcam and click “Add” to take a photo



- 14.** Repeat until you've taken 10 photos of the Heart card

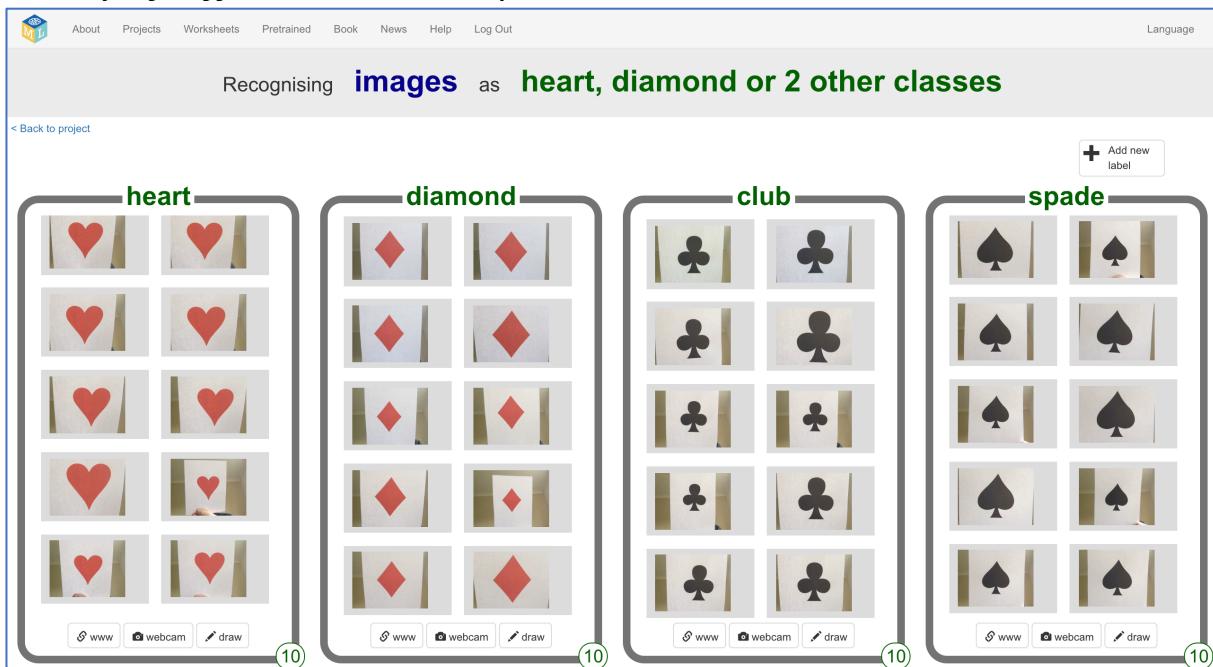


- 15.** Click “+ Add new label” and create one called “diamond”

- 16.** Use the “webcam” button in the “diamond” bucket to take 10 photos of your Diamond card

**17.** Repeat for “club” and “spade”.

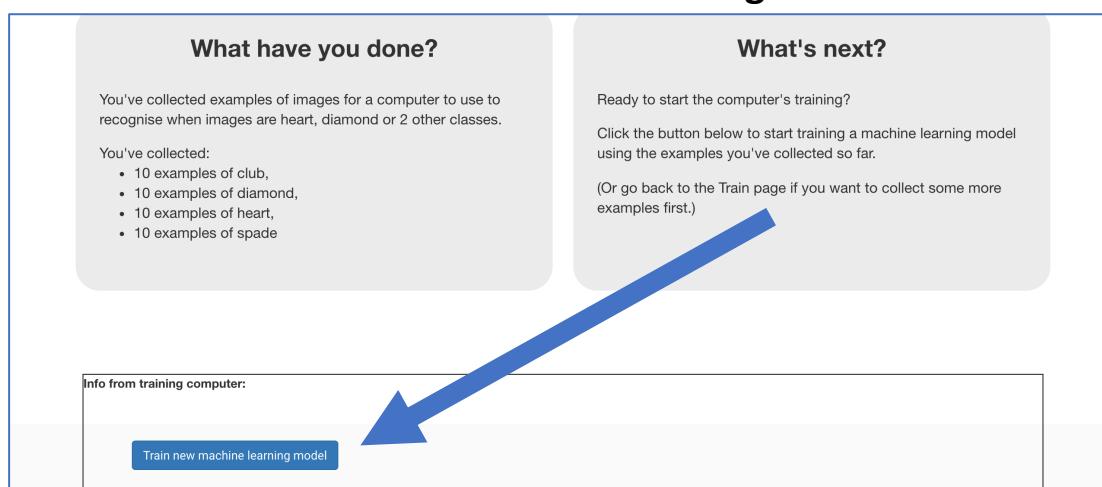
*The machine learning model will likely work better if you get pictures in a variety of different sizes and positions.*



**18.** Click on the “< Back to project” link.

**19.** Click the “Learn & Test” button.

**20.** Click the “Train new machine learning model” button.



**21.** Wait for the training to complete. This might take a few minutes.

## What have you done so far?

You've started to train a computer to recognise cards as being heart, diamond, club or spades. You are doing it by collecting example photos. These examples are being used to train a machine learning "model".

This is called "supervised learning" because of the way you are supervising the computer's training.

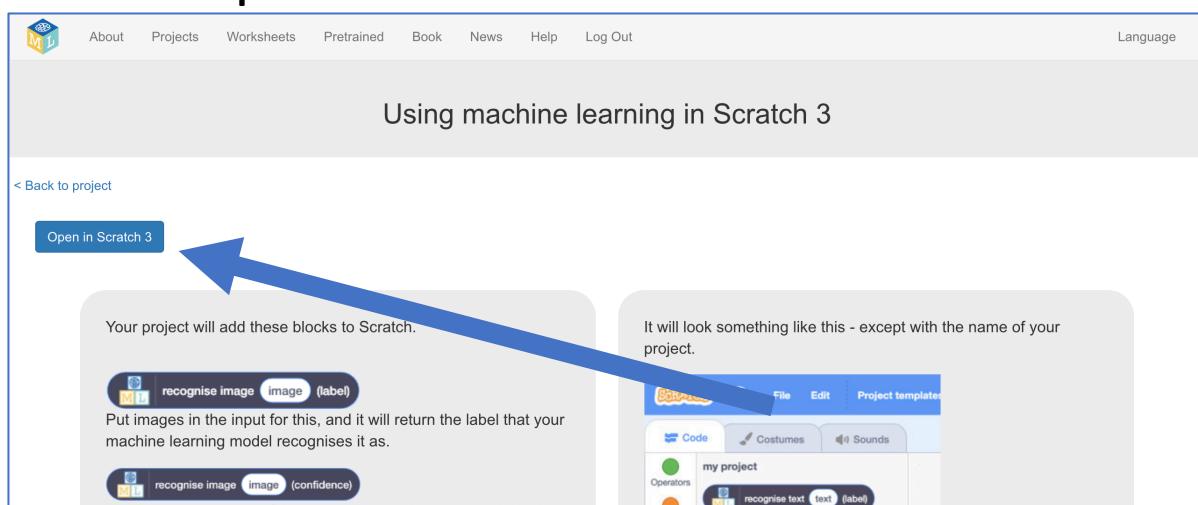
The computer will learn from patterns in the colours and shapes from each of the photos you've given it. These will be used to be able to recognise new photos.

**22.** Click the "**< Back to project**" link

**23.** Click the "**Make**" button

**24.** Click the "**Scratch 3**" button.

**25.** Click "**Open in Scratch 3**"



## Tips

### More examples!

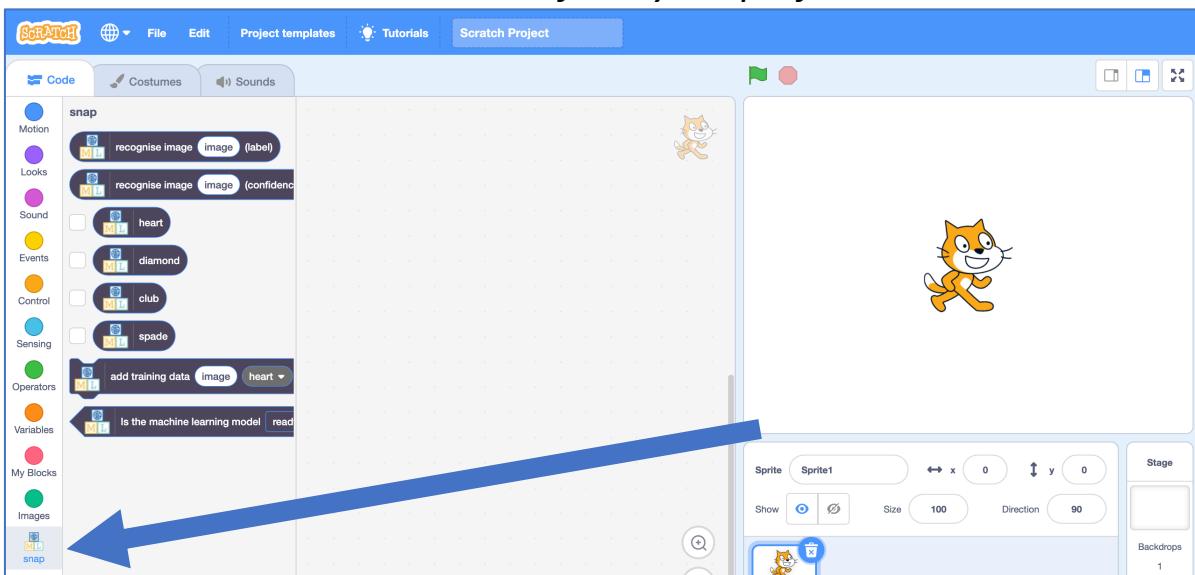
The more examples you give it, the better the computer should get at recognising whether a card is heart, diamond, club or spades.

### Try and be even

Try and come up with roughly the same number of examples for each shape.

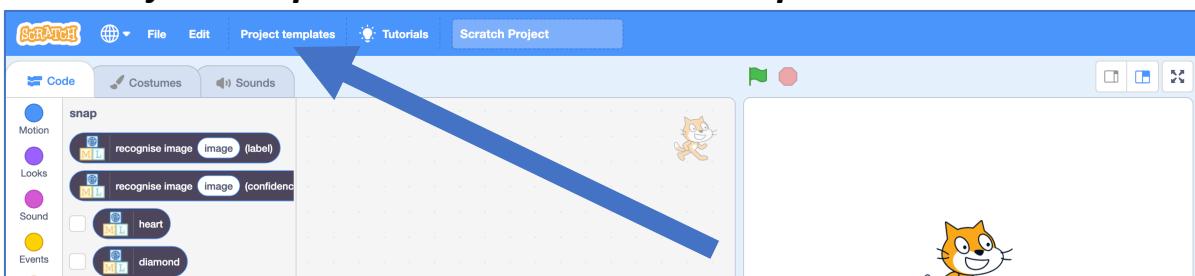
If you have a lot of examples for one type, and not the other, the computer might learn that type is more likely, so you'll affect the way that it learns to recognise photos.

**26.** You should see new blocks from your project.

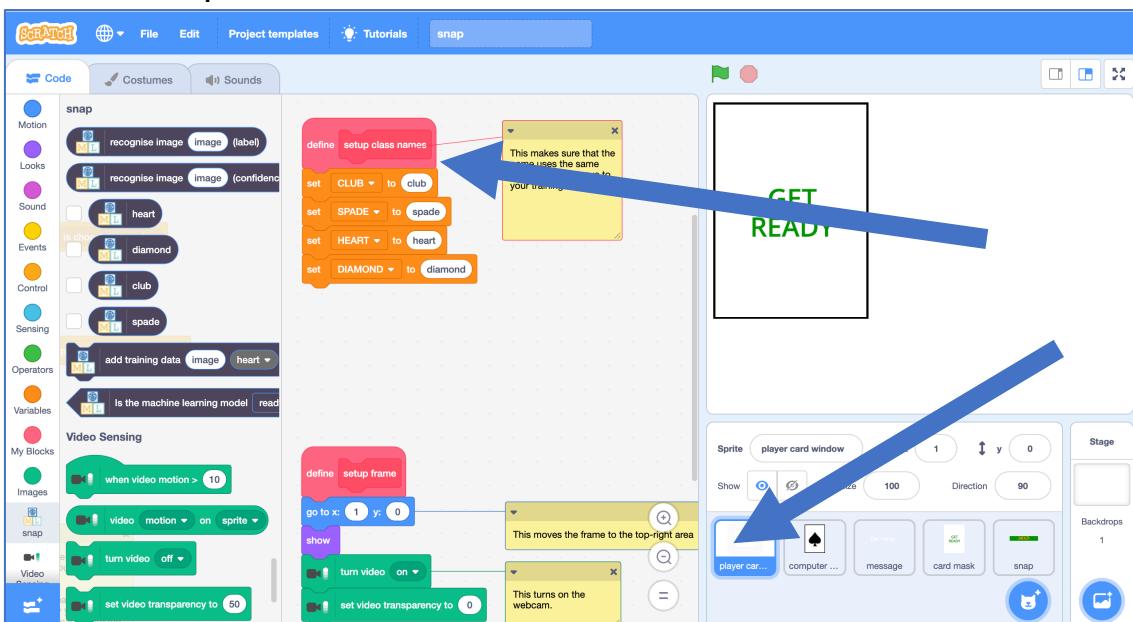


**27.** Open the Snap project template.

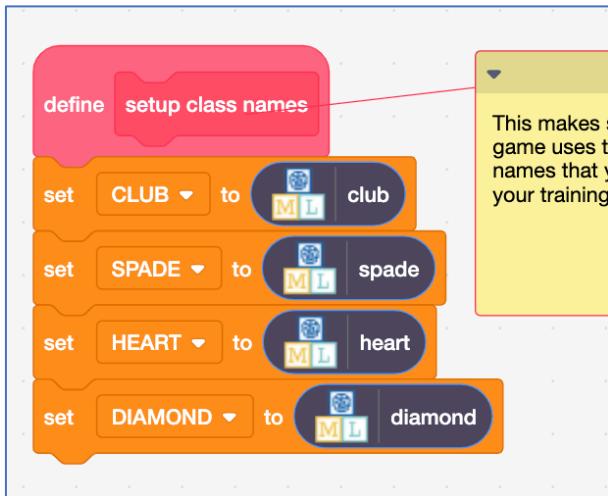
Click **Project templates** and then click on **Snap**



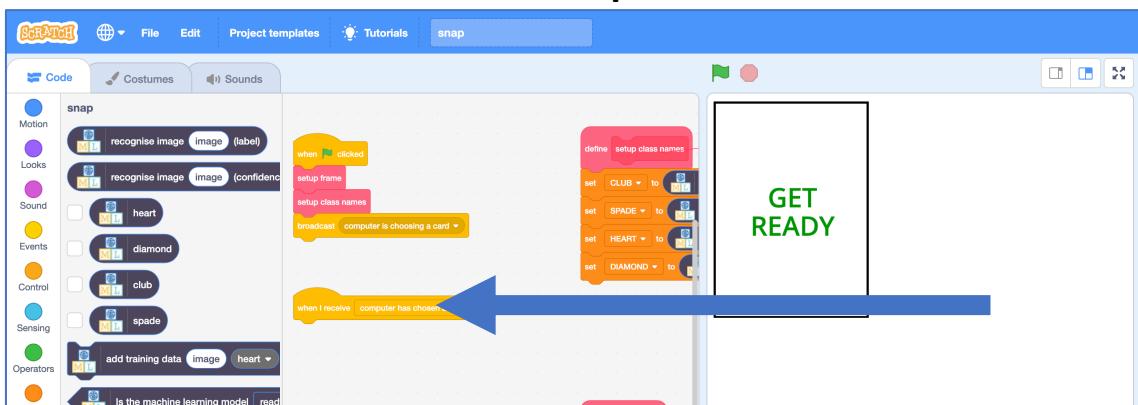
**28.** Click on the “player card window” sprite and find the “setup class names” script



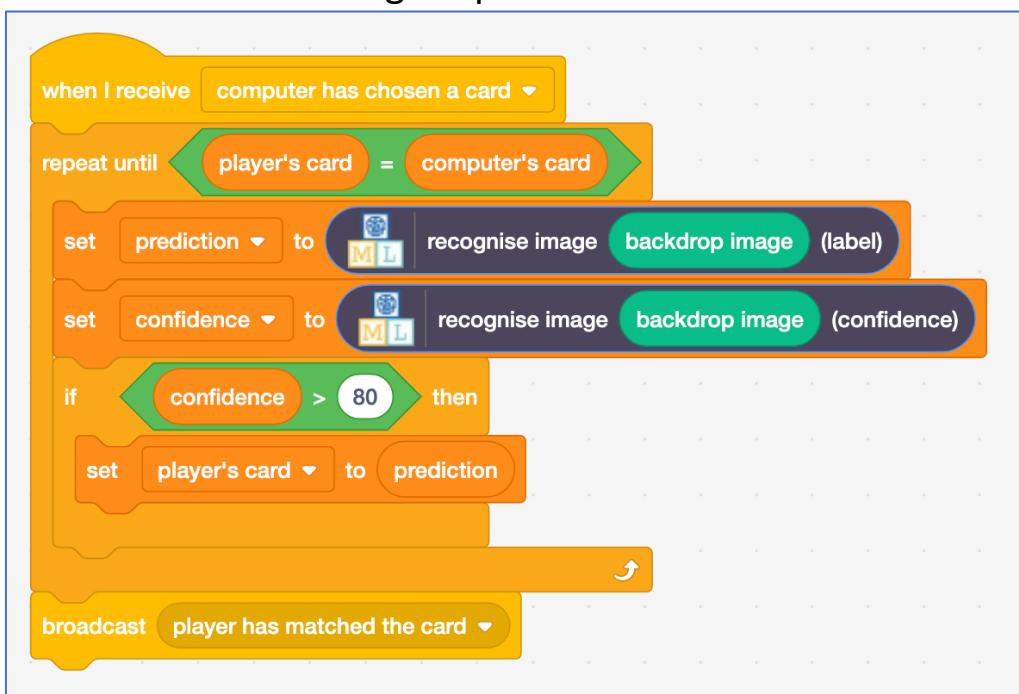
## 29. Update the script using blocks from your project



## 30. Find the “when I receive computer has chosen a card” block



## 31. Add the following script to it



## **32.** Save your project

*Click **File** -> **Save to your computer***

## **33.** Click the Green Flag

*The computer will choose a random card for its side, and then start a timer.*

*You need to hold the matching card up to your webcam so it's visible in the top-right corner, as quickly as you can.*

### **What have you done?**

You've made a simple card game in Scratch. The game uses a webcam to take pictures of your card, and uses machine learning to recognise the card in the photo.

This is “image recognition” – teaching a computer to recognise images.

## Ideas and Extensions

Now that you've finished, why not give one of these ideas a try?

Or come up with one of your own?

### **Design your own cards**

Instead of hearts, spades, clubs and diamonds, why not make your own cards?

### **Shout “snap!”**

Instead of just displaying “SNAP!” can you record yourself shouting “Snap!” and get your Scratch project to play that when the cards match?

### **Keep score**

Challenge a friend to see which of you is quickest at picking the correct card.

Modify the game so that it keeps score.

### **See what the computer is thinking**

Tick the “prediction” and “confidence” variables so that they show up on the stage. That will show you what the computer is thinking!