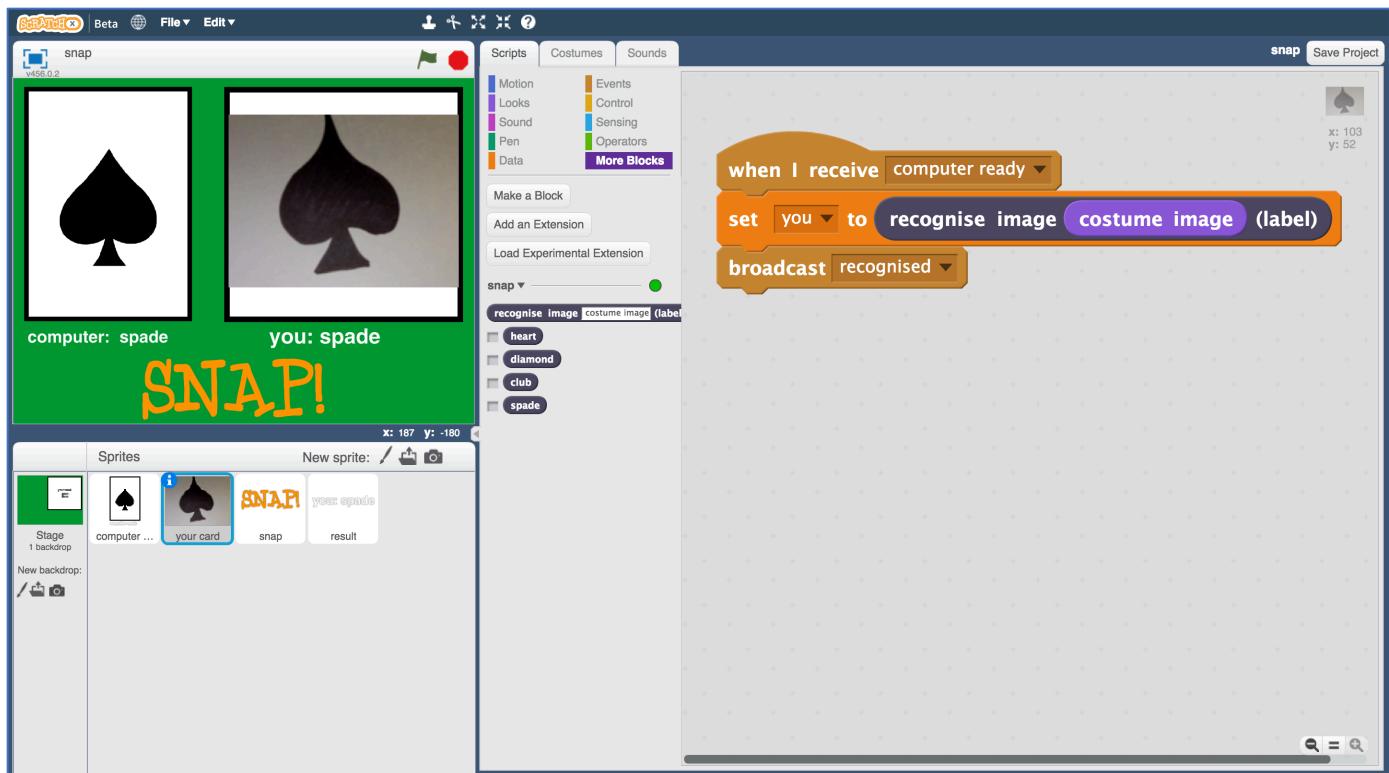


# Snap!

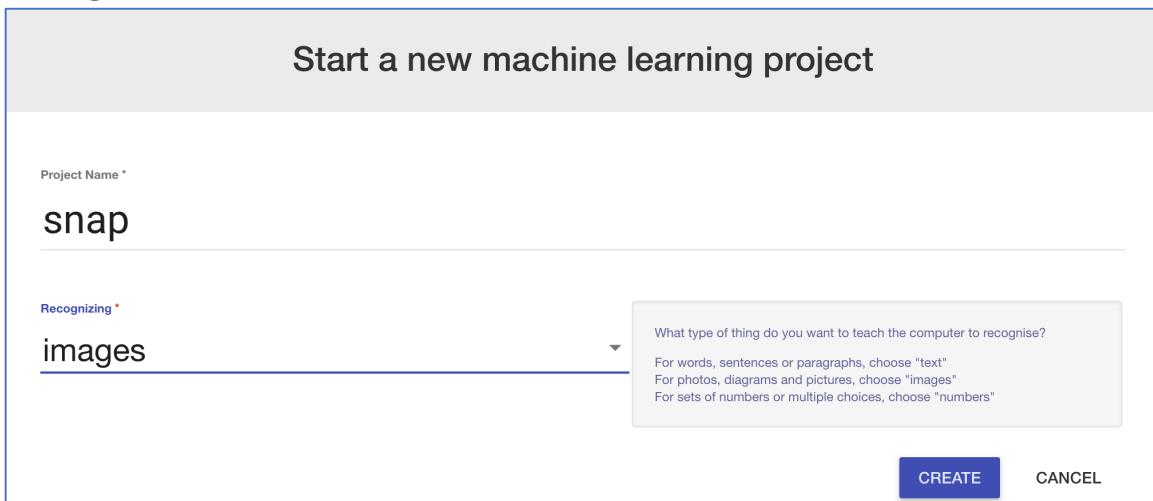
In this project you will make a simple version of the card game “Snap!” in Scratch.

To have your move, you’ll take a photo of your card.

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



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



The screenshot shows a dialog box titled "Start a new machine learning project". It has two main input fields: "Project Name \*" containing "snap" and "Recognizing \*" containing "images". To the right of these fields is a tooltip asking "What type of thing do you want to teach the computer to recognise? For words, sentences or paragraphs, choose "text". For photos, diagrams and pictures, choose "images". For sets of numbers or multiple choices, choose "numbers"." At the bottom right are "CREATE" and "CANCEL" buttons.

Start a new machine learning project

Project Name \*

snap

Recognizing \*

images

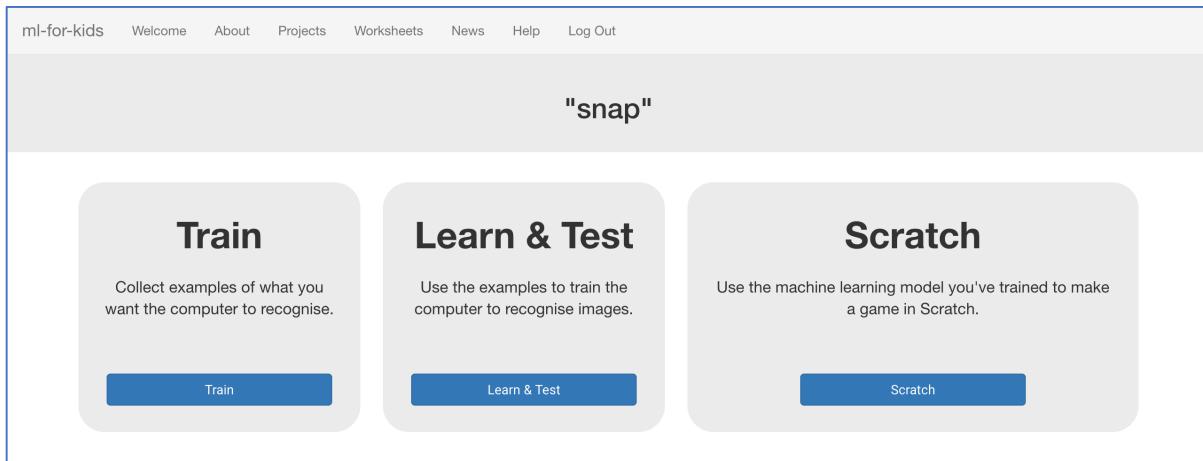
What type of thing do you want to teach the computer to recognise?  
For words, sentences or paragraphs, choose "text"  
For photos, diagrams and pictures, choose "images"  
For sets of numbers or multiple choices, choose "numbers"

CREATE CANCEL

- 9.** Click the “**Create**” button

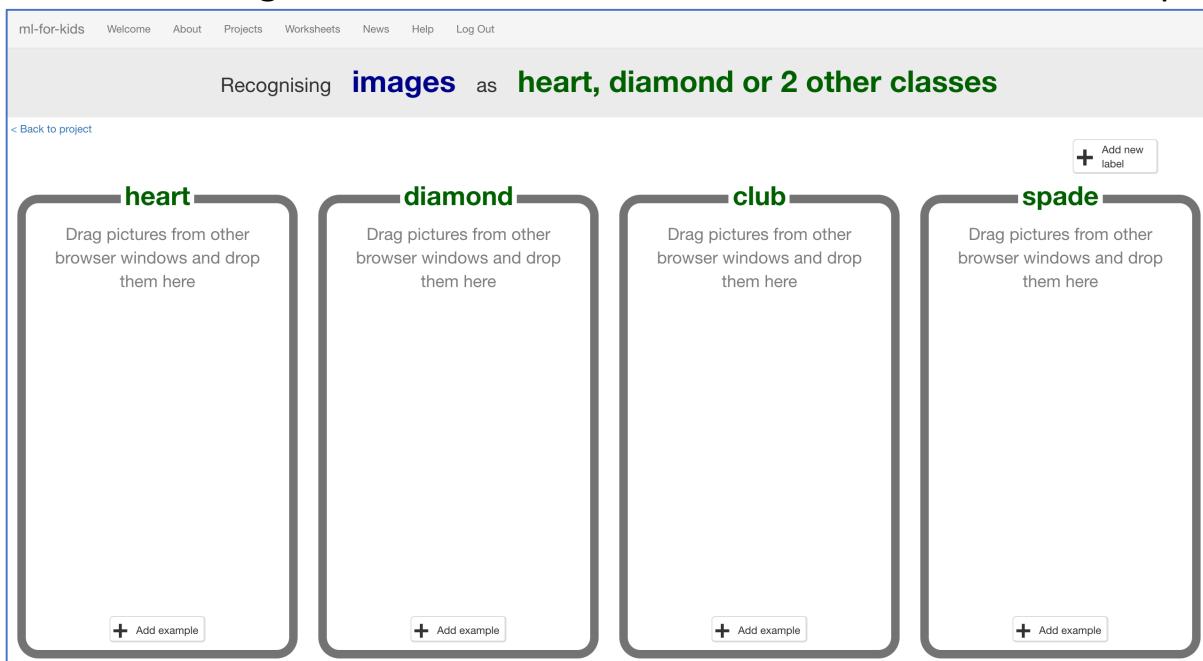
**10.** You should see “snap” in the projects list. Click on it.

**11.** Click the “Train” button



**12.** Click the “+ Add new label” button. Create a bucket called “heart”.

**13.** Do that again, to create buckets for “diamond”, “club” and “spade”.



---

We need to collect example of photos of your cards.

This means taking photos of them, and uploading them to a photo sharing site on the Internet.

The next few steps will explain how to do this using **your computer webcam** and the website **imagebin.ca**. But any digital camera and any photo sharing website would work just as well.

---

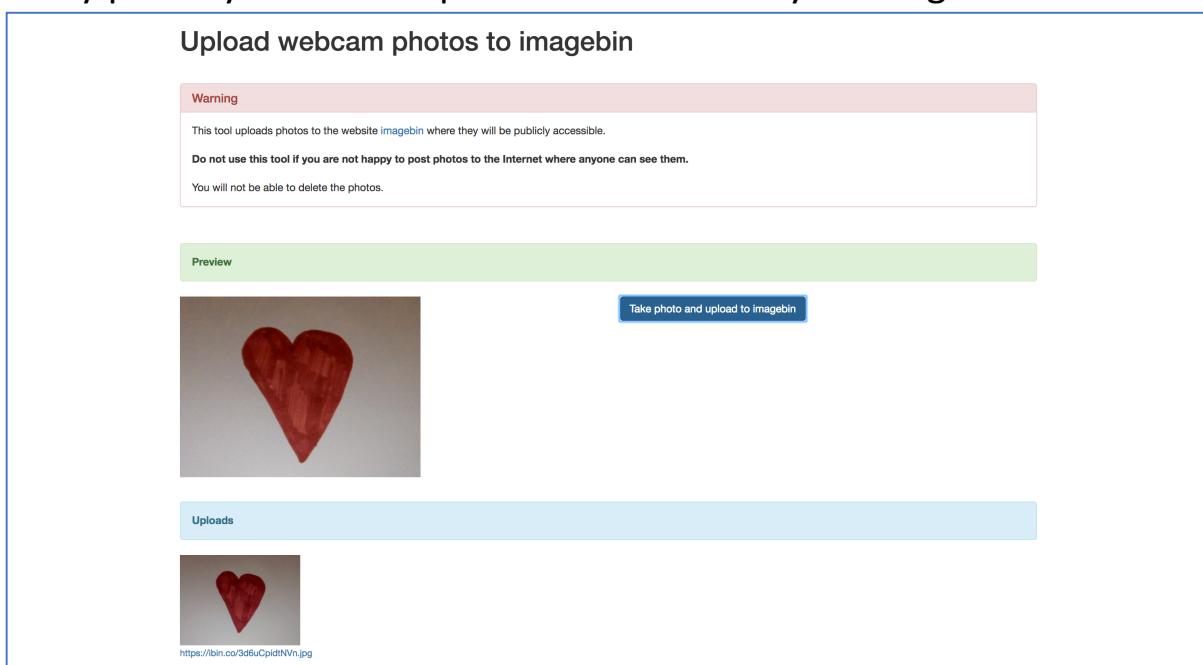
Skip to step 18 if you use a different site to upload your photos to.

**14.** Open a new browser window or tab, and go to  
<https://dalelane.github.io/webcam-to-imagebin/>

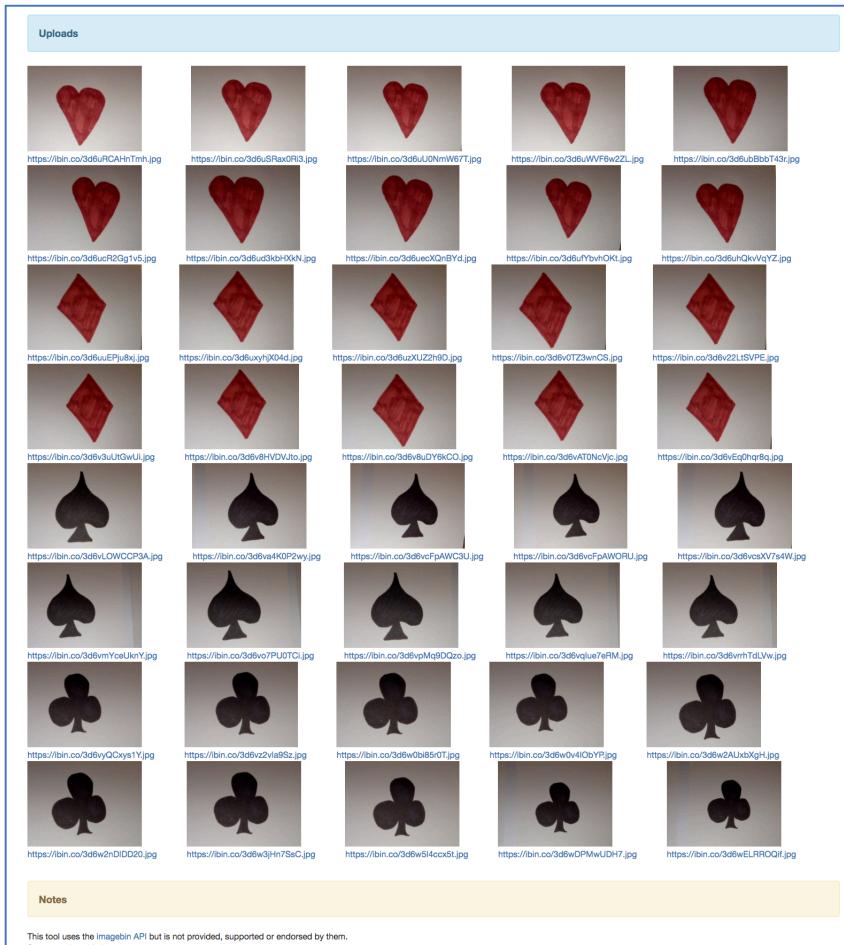
**15.** The Preview window shows the current view from your webcam.  
*You will need to click “Approve” or “Allow” if your web browser asks permission to use your webcam.*

**16.** Hold one of your cards to the webcam and click the “**Take photo and upload to imagebin**” button.

Every photo you take is uploaded immediately to imagebin.ca.



## 17. Take 10 photos of each of your cards.



Notes

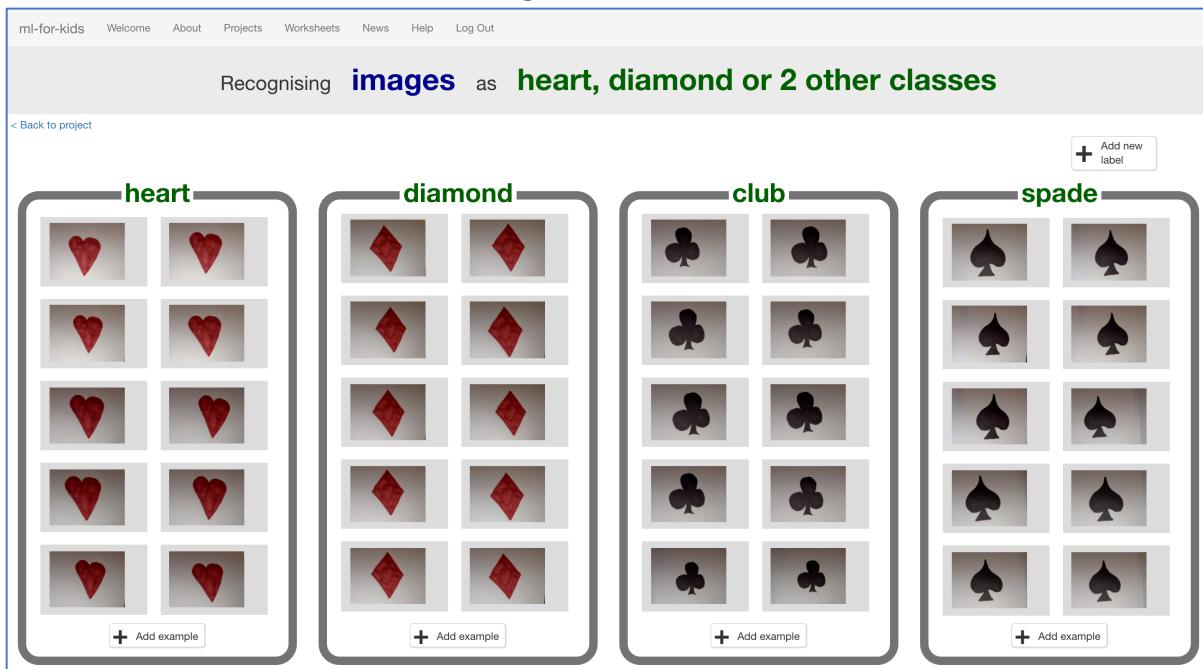
This tool uses the [imagebin API](#) but is not provided, supported or endorsed by them.  
[Source code available here](#)

## 18. Arrange your windows so both web browser windows (the machine learning training buckets and the photos you've taken) are side by side.

The screenshot shows a machine learning training interface for identifying playing cards. It includes four categories: 'heart', 'diamond', 'club', and 'spade', each with a placeholder for dragging and dropping images. To the right, a separate window displays a grid of 50 uploaded card images with their URLs.

Category	Placeholder Description
heart	Drag pictures from other browser windows and drop them here
diamond	Drag pictures from other browser windows and drop them here
club	Drag pictures from other browser windows and drop them here
spade	Drag pictures from other browser windows and drop them here

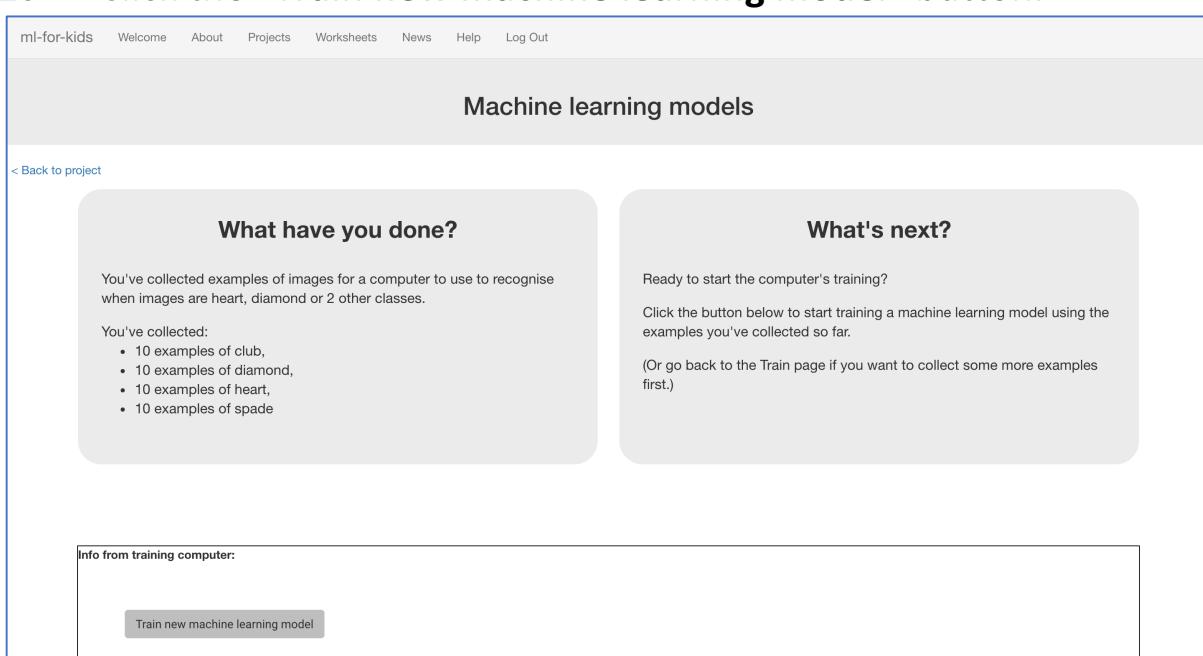
- 19.** Drag the photos from the photo site and drop them in the correct bucket in the machine learning tool.



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

- 21.** Click the “Learn & Test” button.

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



**23.** Wait for the training to complete. This might take a few minutes.  
*While waiting, try the machine-learning quiz at the bottom of the page.*

## 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.

**24.** Click the "< Back to project" link, then click the "**Open in Scratch**" button.

*This page has instructions on how to use the new blocks in Scratch from your project.*

< Back to project

Your project will add these blocks to the **More Blocks** tab in Scripts.

**recognise images [costume image :label]**  
Put images in the input for this, and it will return the label that your machine learning model recognises it as.

**recognise images [costume image :confidence]**  
This will return how confident your machine learning model is that it recognises the type of images. (As a number from 0 - 100).

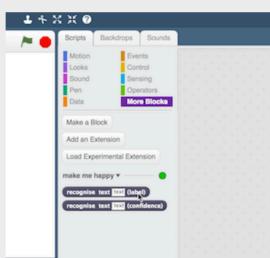
**heart diamond club spade**  
These blocks represent the labels you've created in your project, so you can use their names in your scripts.

**costume image**  
This block is in the Looks palette for Sprites and will return the image of the currently selected costume.

**This means you can do something like this:**



It will look something like this - except with the name of your project.



The coloured circle next to your project name tells you if your machine learning model is okay.

- **green** means your model is trained and ready to go
- **yellow** means your model hasn't finished training yet
- **red** means something went wrong. Go back to the [Learn & Test](#) page to see what went wrong with training.

**Open in Scratch**

## 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.

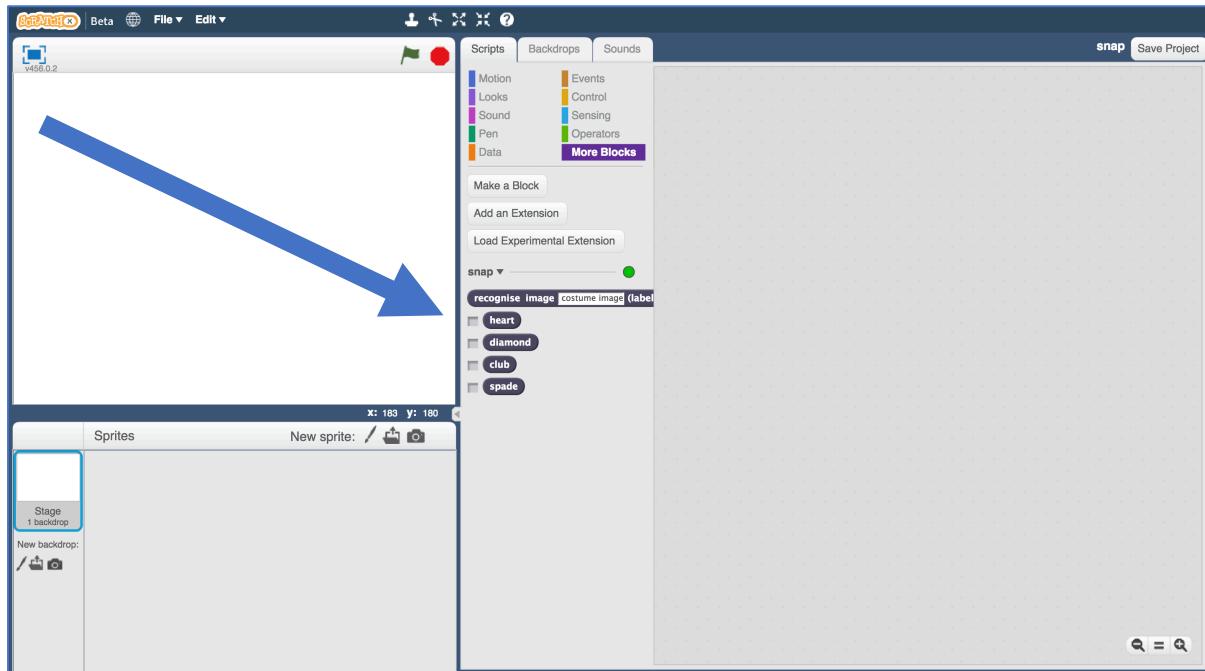
If you have a lot of examples for one type, and not the other, the computer might learn that type is more likely, so you'll affect the way that it learns to recognise photos.

### If you'd rather use imgur.com than imagebin...

use <https://dalelane.github.io/webcam-to-imgur> instead

**25.** Click the “Open in Scratch” button at the bottom to launch the Scratch editor.

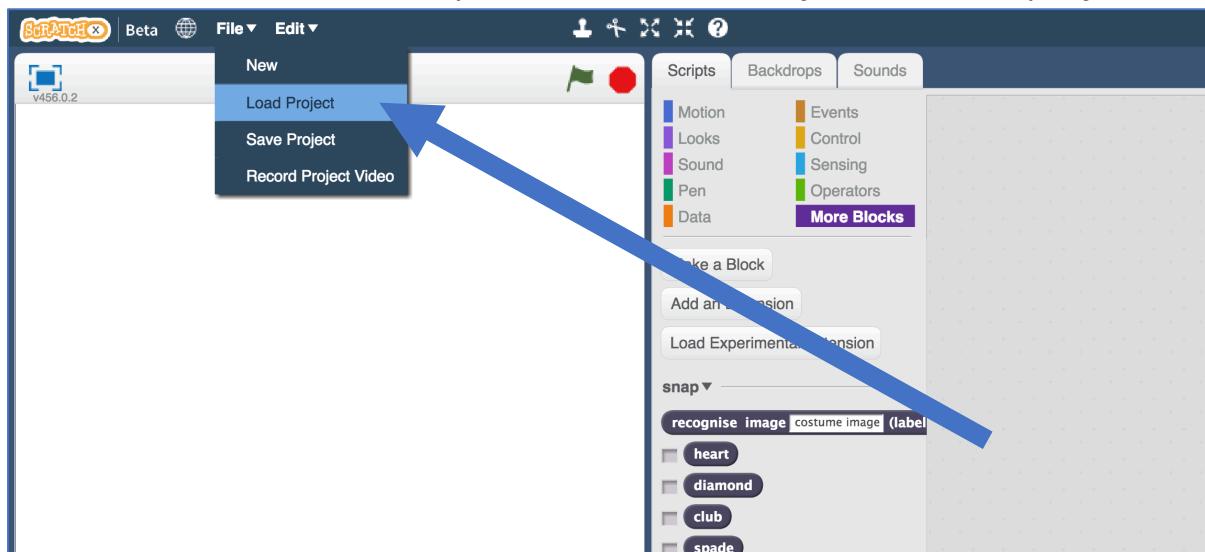
*You should see five new blocks in the “More blocks” section from your “snap” project.*



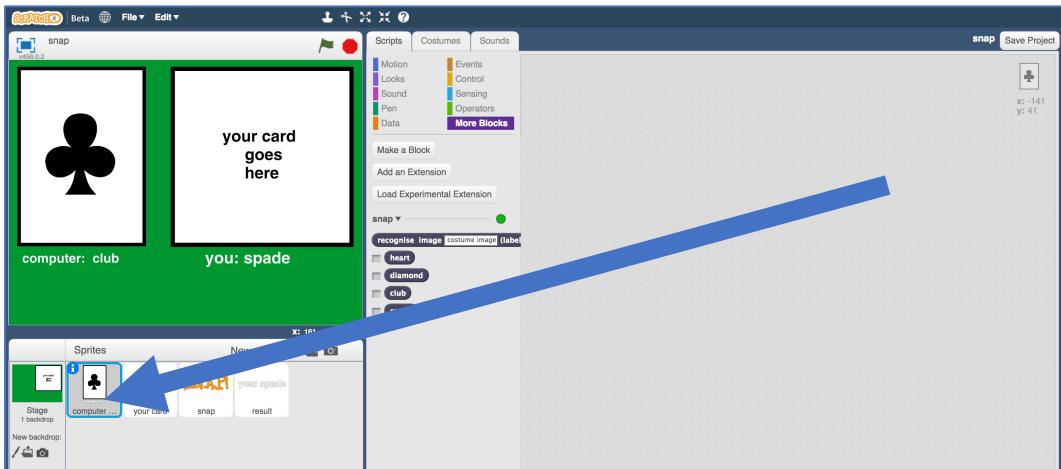
**26.** Open the “snap.sbx” project file.

Click **File -> Load Project**

Click **OK** when it asks to replace the contents of the current project.



## 27. Click on the “computer card” sprite

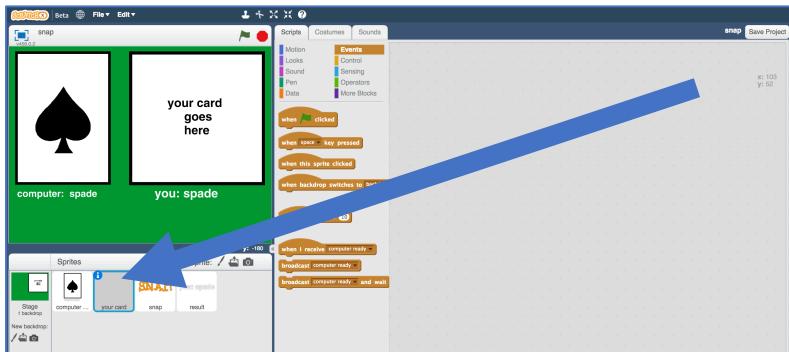


## 28. Create this script

*This script will let the computer pick a random card.*

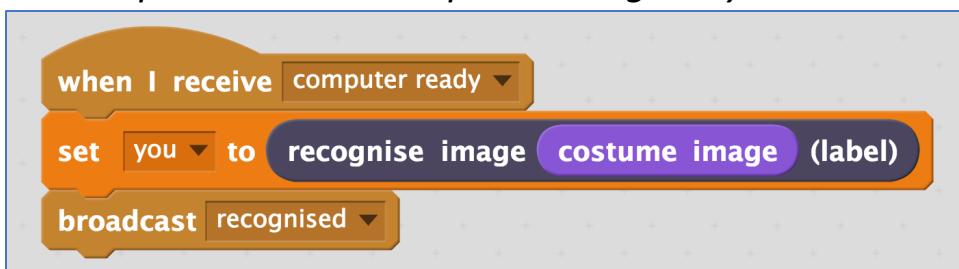


## 29. Click on the “your card” sprite

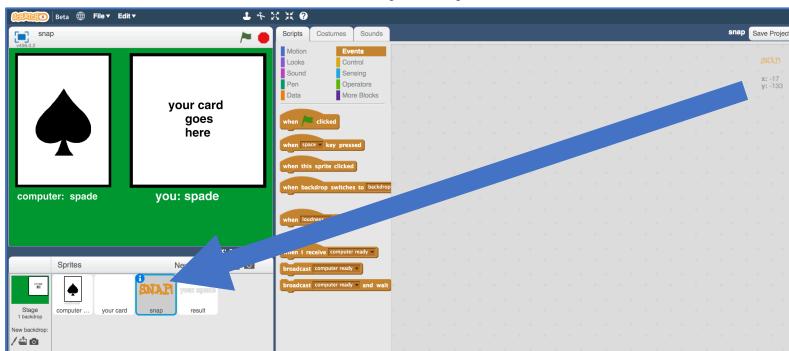


## 30. Create this script

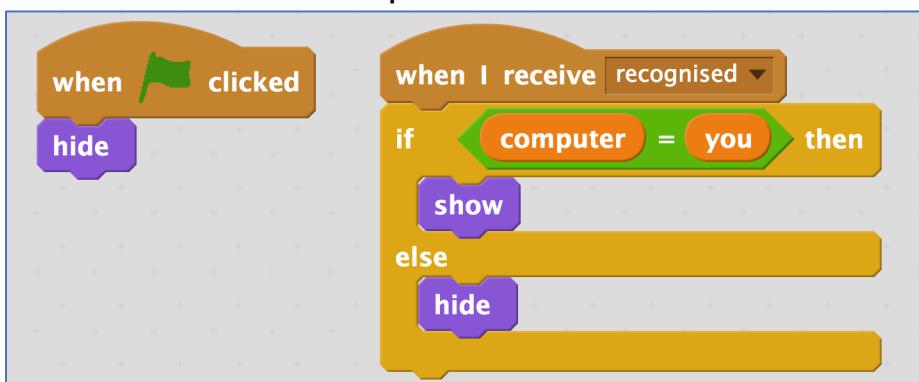
*This script will let the computer recognise your card.*



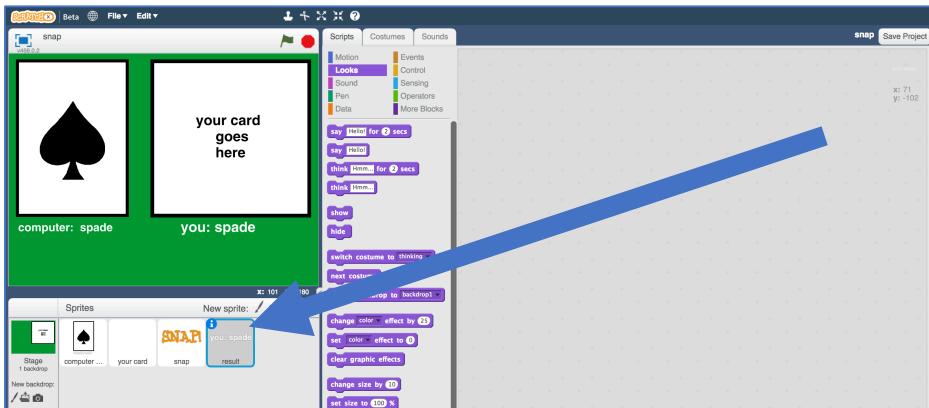
## 31. Click on the “snap” sprite



## 32. Create these scripts

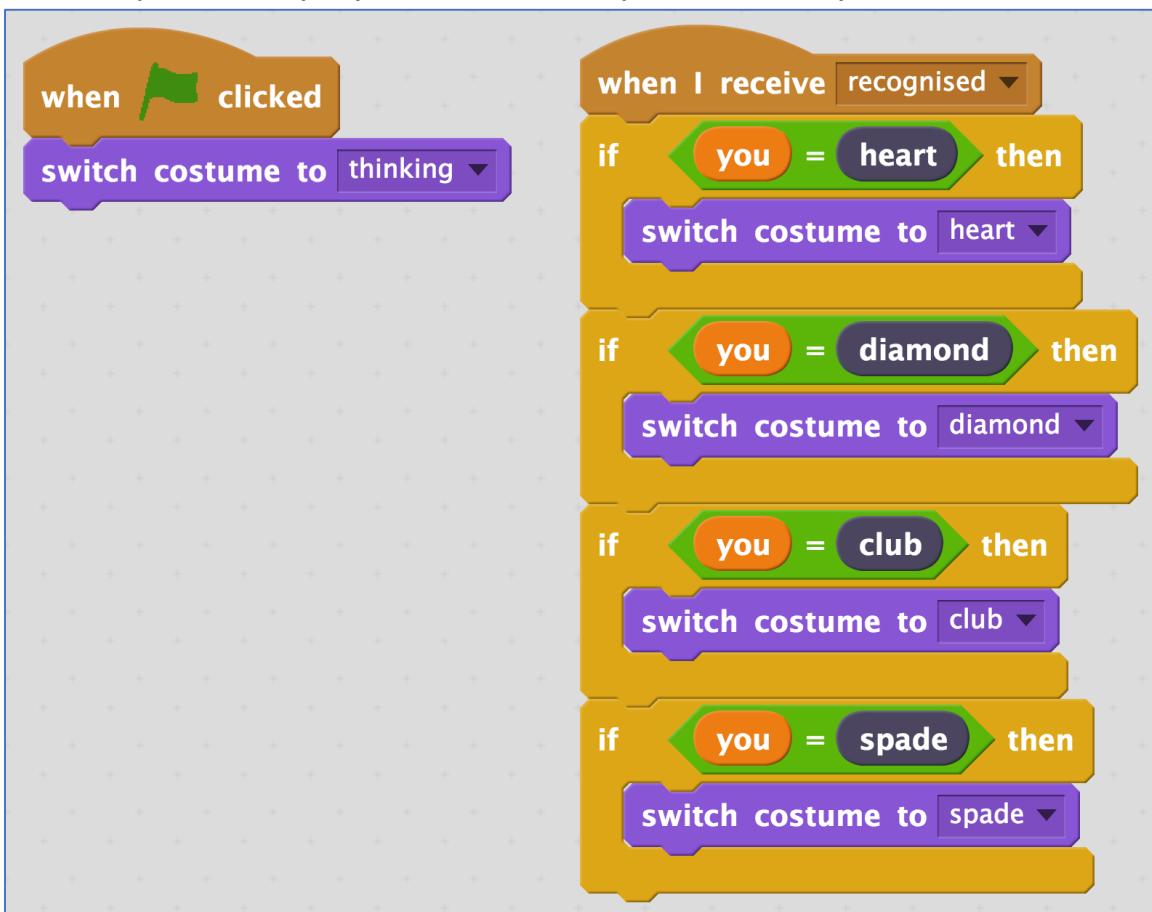


### 33. Click on the “result” sprite



### 34. Create these scripts

*This script will display what the computer thinks your card looks like*



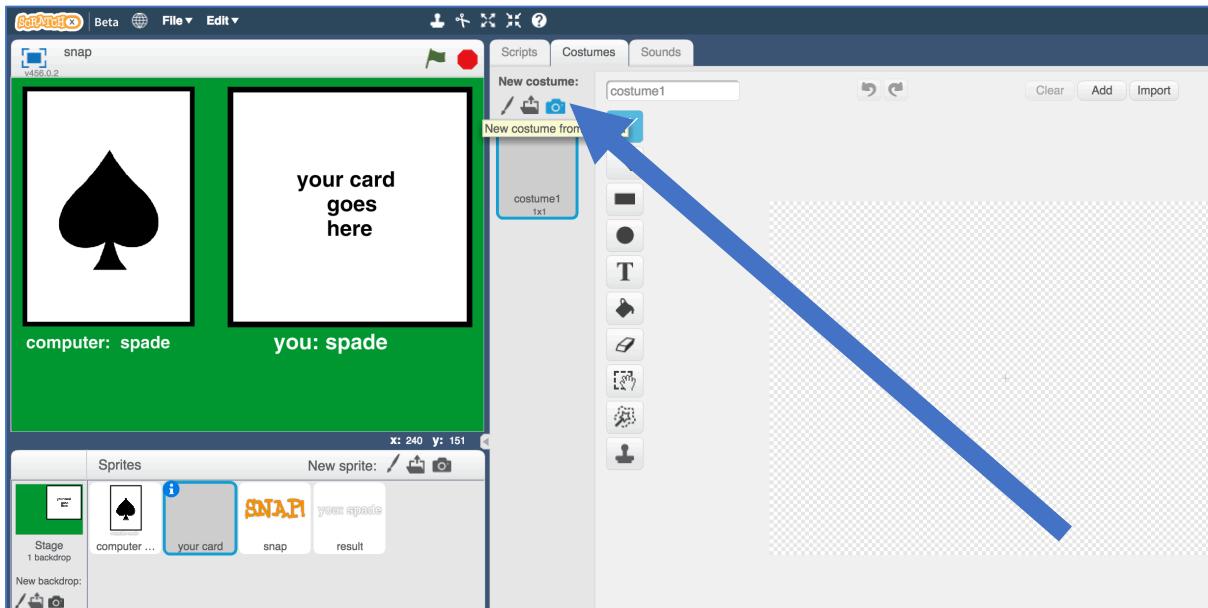
### 35. Save your project

*Click File -> Save Project*

**36.** Shuffle your paper cards and pick one at random

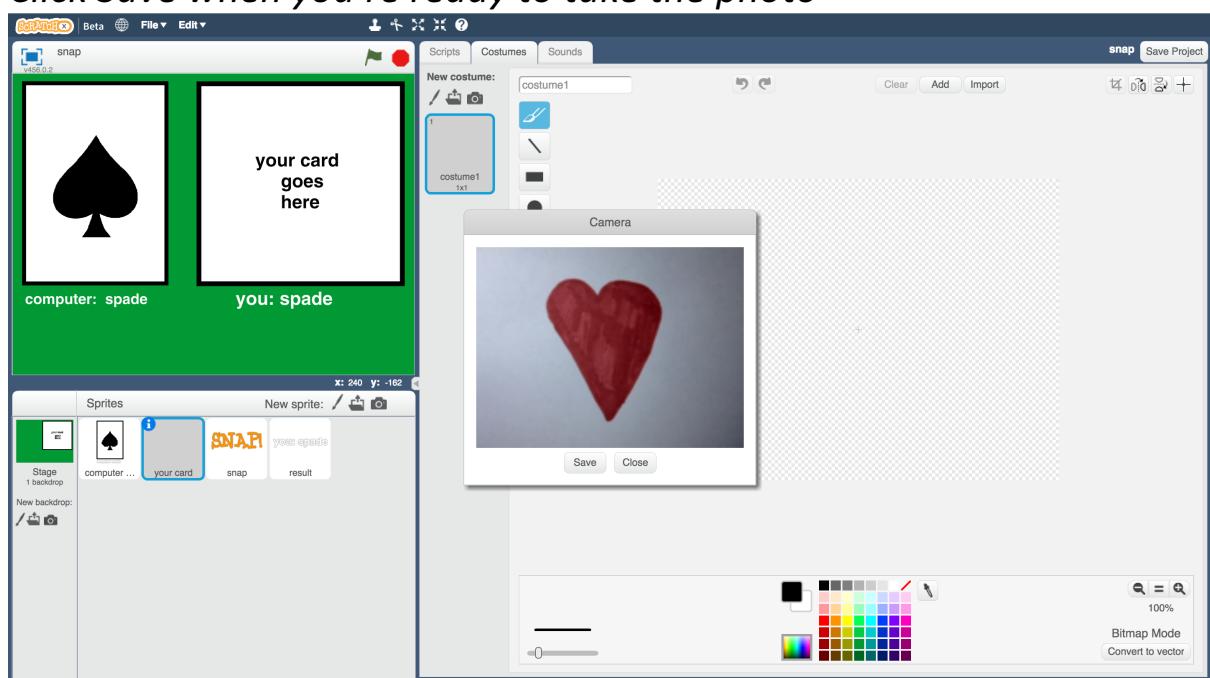
**37.** Click on the “your card” sprite, then the costumes tab.

Click on the “New costume from camera” button



**38.** Use the webcam to take a photo of the card you picked

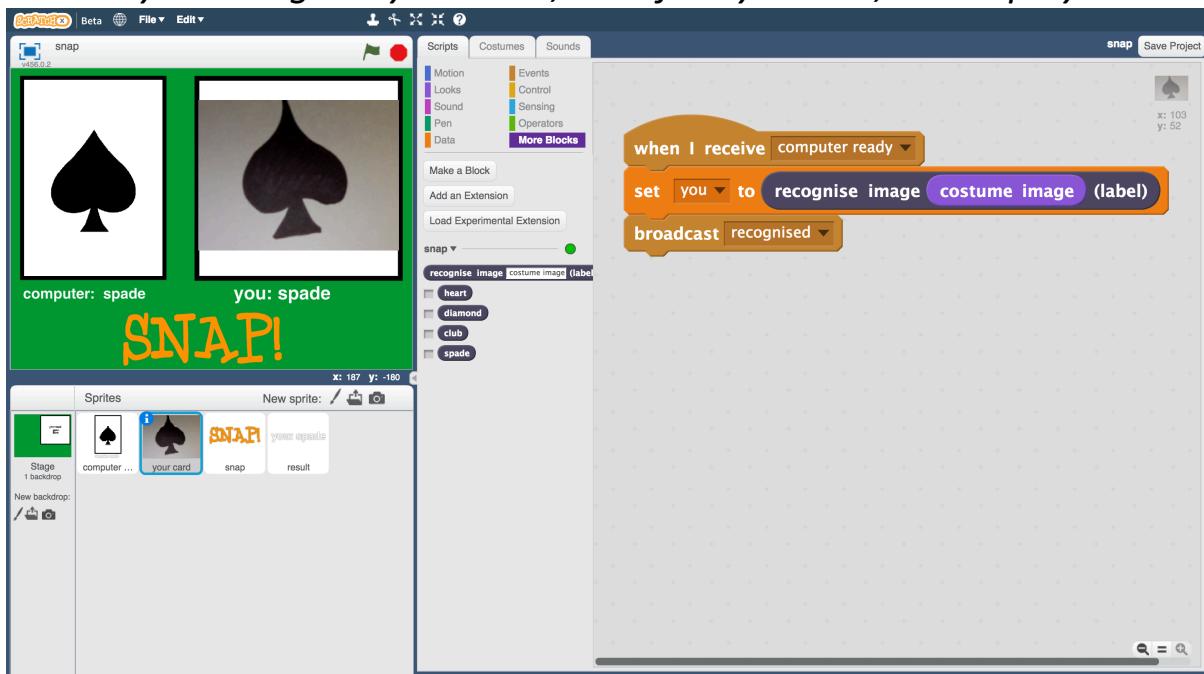
*Click Save when you're ready to take the photo*



## 39. Click the Green Flag

The computer will choose a random card for its side.

It will try to recognise your card, and if they match, it'll display "SNAP!"



## 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?

### **Make the game competitive**

Modify the game so it doesn't display the computer's card at first. Let it display the card at the same time it starts to recognise yours.

Who is quicker at saying “snap”? You or the computer?