



# I Spy

In this project you will make an AI-powered “I Spy” game.

You will use a pre-trained machine learning model to recognise objects in a picture. The game will be for you to try and guess what the computer has recognised.

The image shows a Scratch project window. On the left, the script editor displays a script for a sprite named "picture". The script starts with a "when green flag clicked" hat block, followed by a "reset" block, a "choose a random picture" block, and a "repeat until" control loop. Inside the loop, there is a "make an i-spy clue" control block, which contains an "ask [i-spy clue] and wait" control block and a "change [number of guesses v] by 1" control block. After the loop, there is a "set [my last guess v] to [answer]" control block, a "show variable [thing the AI spotted v]" control block, a "show variable [my last guess v]" control block, and a "say [join [join [That's right! That took you] [number of guesses]] v]" control block. On the right, the stage shows two female soccer players on a field. A speech bubble from the player in the green jersey says "I spy something beginning with s". The script editor also shows the stage properties panel at the bottom right.

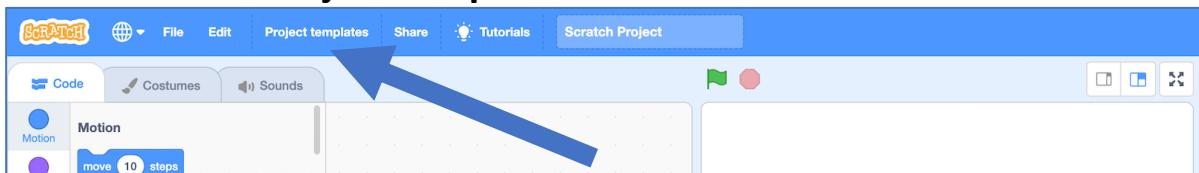


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1. Go to <https://machinelearningforkids.co.uk/pretrained/>  
*This page displays some pretrained machine learning models that are available to you. For this project, we'll use the “Imagenet” model.*

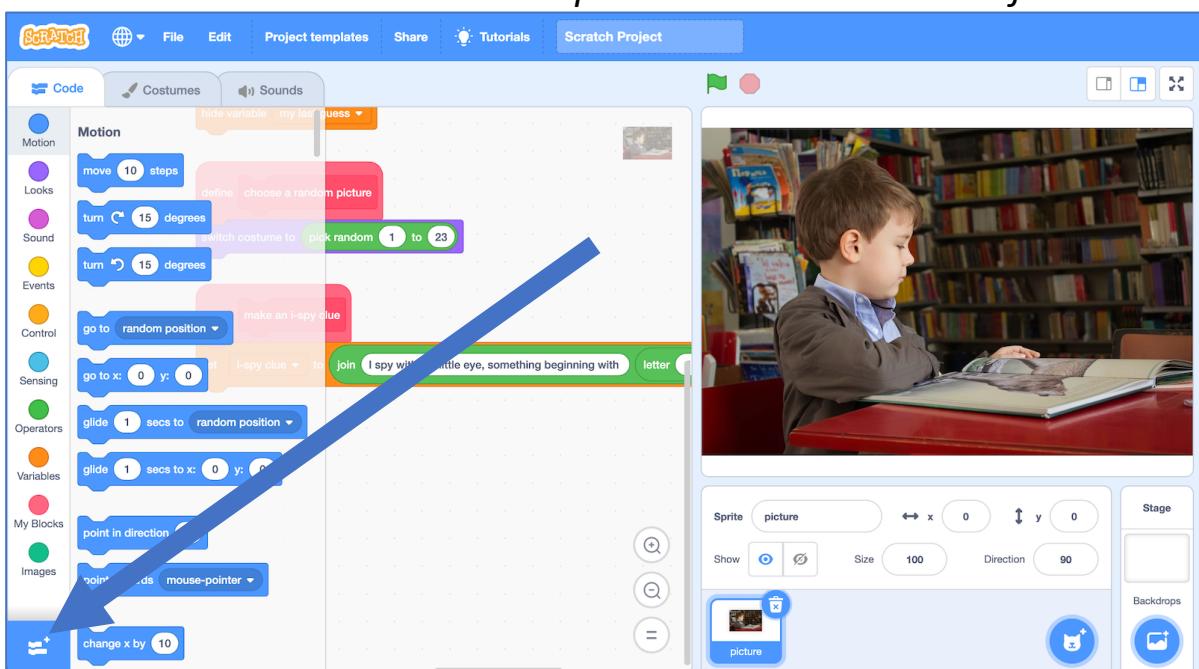
2. Click on “Get started”

3. Click on “Project templates”



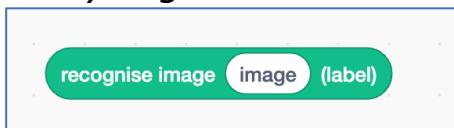
4. Open the Extensions window

*Click on the blue button with the plus icon in the bottom left.*

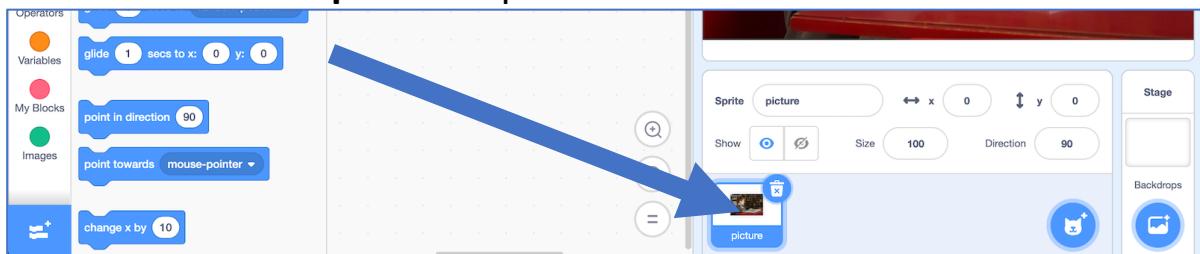


5. Click on the Imagenet extension

*This adds a new “recognise image” block to Scratch. It will use the imangenet machine learning model to recognise something in the picture that you give to it. You will use this block in Step 7.*



## 6. Click on the “picture” sprite



## 7. Create this code to make the “I Spy” game.

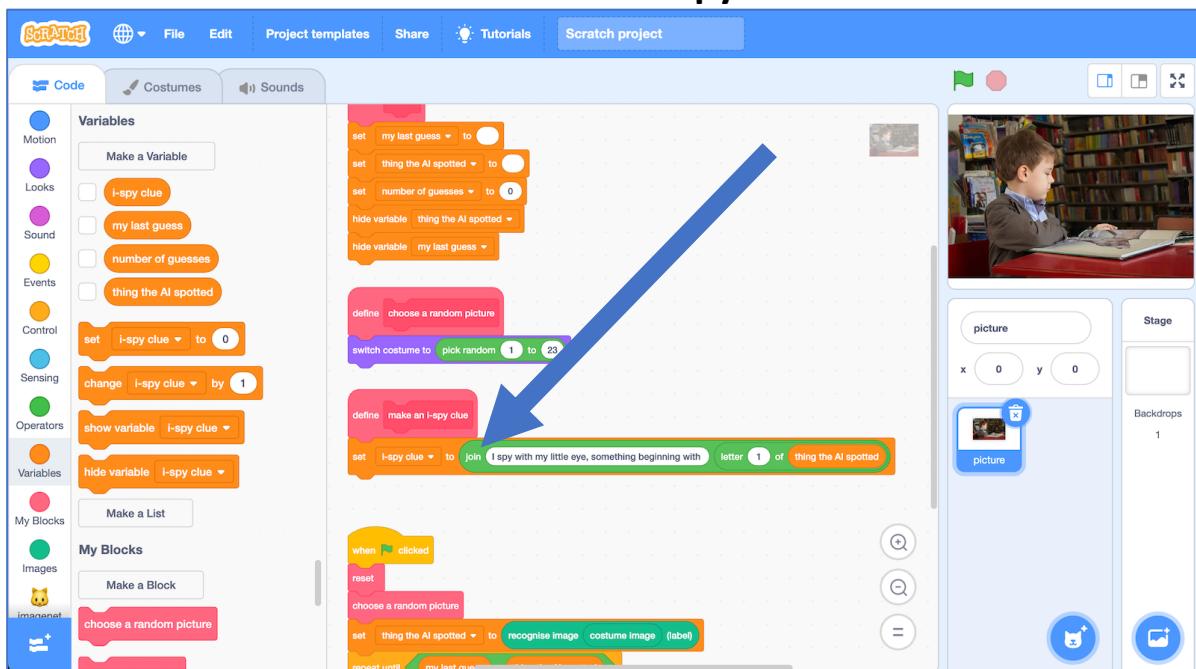
*Try to read through it first. Can you understand what it does?*



## 8. It’s time to play! Click on the Green Flag.

*How many guesses did it take you to guess what the machine learning model had recognised?*

## 9. Find the code for the “make an i-spy clue” custom block



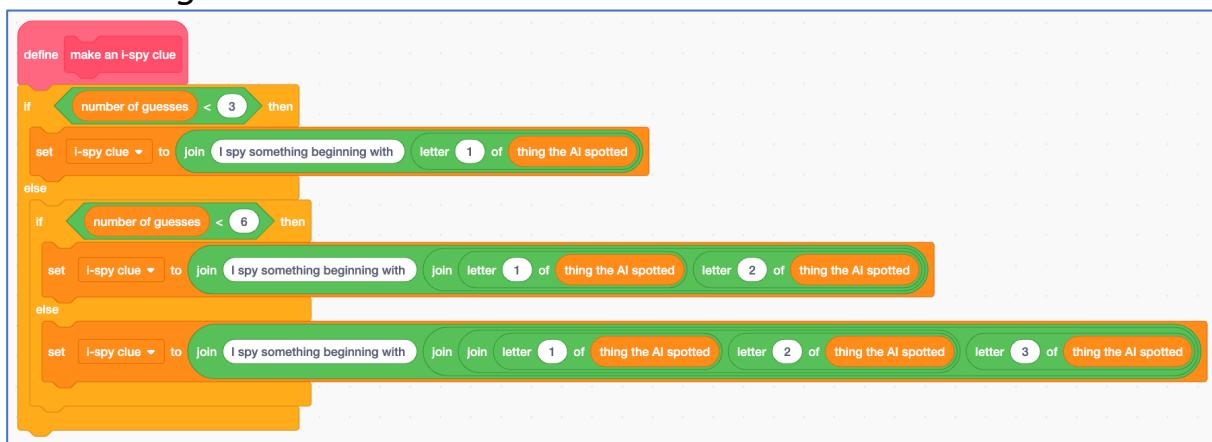
## 10. Make the game a little easier by making the clue more helpful

*This picture shows one way you could do this.*

*If the player has got it wrong three times, it gives the first two letters.*

*If the player keeps getting it wrong, the clue gives the first three letters.*

*You don't have to use this idea. Make your own clue that you think will make the game easier.*



## 11. Click on the Green Flag to test again

*Did your updated clue help? Try playing with a few of the test pictures.*

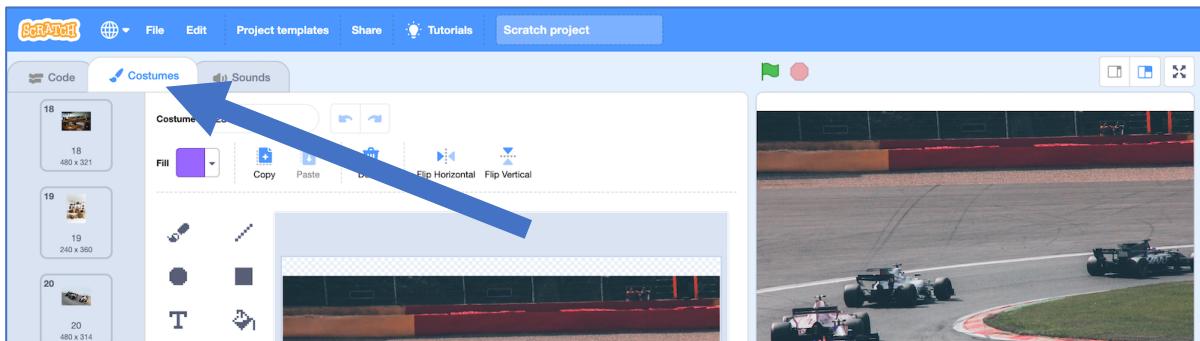
## 12. Go back to <https://machinelearningforkids.co.uk/pretrained>

*Read about the Imagenet model, and how it was created*

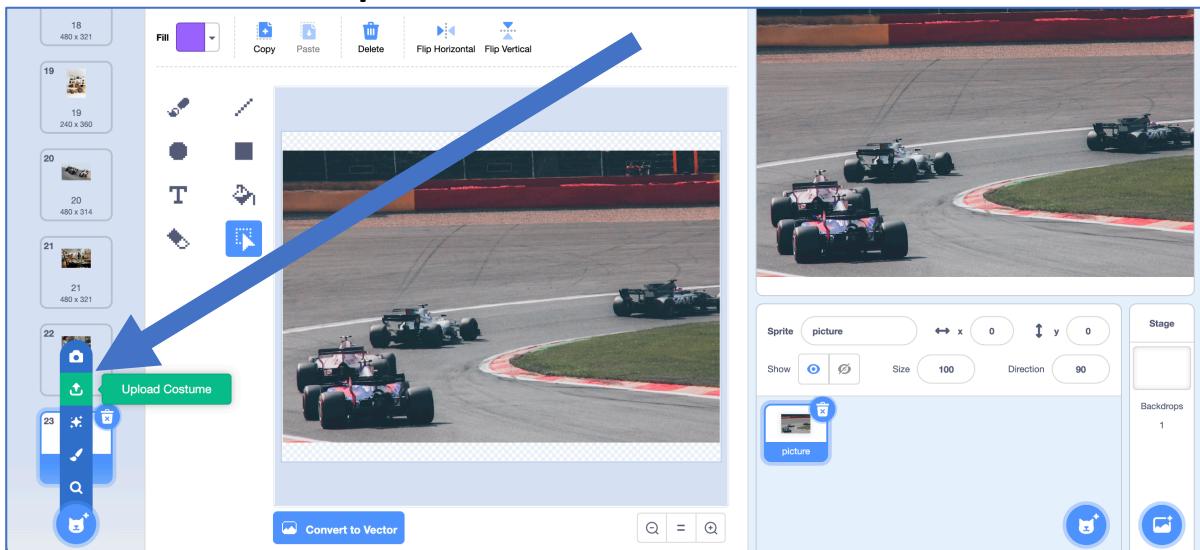
## 13. Find your own picture to test with

*Do you have any photos you can use? You can normally download a photo from a web page by right-clicking on it, and choosing “Save image” or “Save picture”.*

## 14. Click on the “Costumes” tab

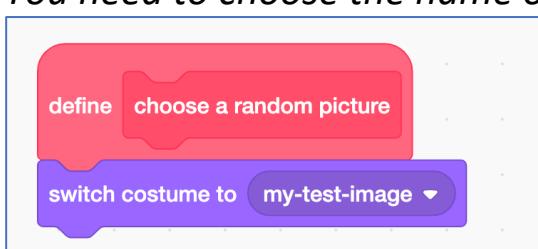


## 15. Click on the “Upload costume” button



## 16. Upload your own test photo

## 17. Change the “choose a random picture” code to use your picture *You need to choose the name of your test picture.*



**18.** Click on the **Green Flag** and try playing with your test picture  
*Did the computer recognise what you expected it to?*

## What have you done?

You've made a Scratch project to play "I Spy" against a machine learning model.

The model was trained by collecting example pictures of thousands of different objects. This took a lot of time and effort, so to save time you used a model that was already trained by someone else.

Can you think of any other ways that you could use this model?

Do you think the model is good enough at recognising photos for that?