



What does Twitter think?

In this project you will use machine learning to estimate what people think about a topical issue of your choice.

You'll train a machine learning model to recognise positive and negative comments about your topic, by collecting examples from social media.

You'll use your machine learning model in Scratch to analyze public discussion and represent this in a live graph.

The image shows a Scratch project titled "project-twitter". The stage area displays a live graph with three bars: "Likes" (green), "Dislikes" (red), and a third bar labeled "?" (blue). The script area contains the following code:

```
when green flag clicked
  set num to (0)
  repeat (50)
    get tweet num
    analyze tweet
    wait (2) seconds
    change num by (1)
    broadcast finished
  end
end

define analyze tweet
  set opinion to (recognise text [tweet label])
  if (opinion = [likes v]) then
    broadcast like and wait
  else
    if (opinion = [dislikes v]) then
      broadcast dislike and wait
    else
      broadcast neither and wait
    end
  end
end

define get tweet [num]
  set tweet to (get the [num] most recent tweet about [Stormzy])
  say tweet
end
```

The script area also includes a "Variables" section with variables "num" and "opinion", and a "My Blocks" section with "analyze tweet" and "get tweet" blocks. The stage properties for the "display-tweet" sprite are set to x: -226, y: -161, size: 100, direction: 90.



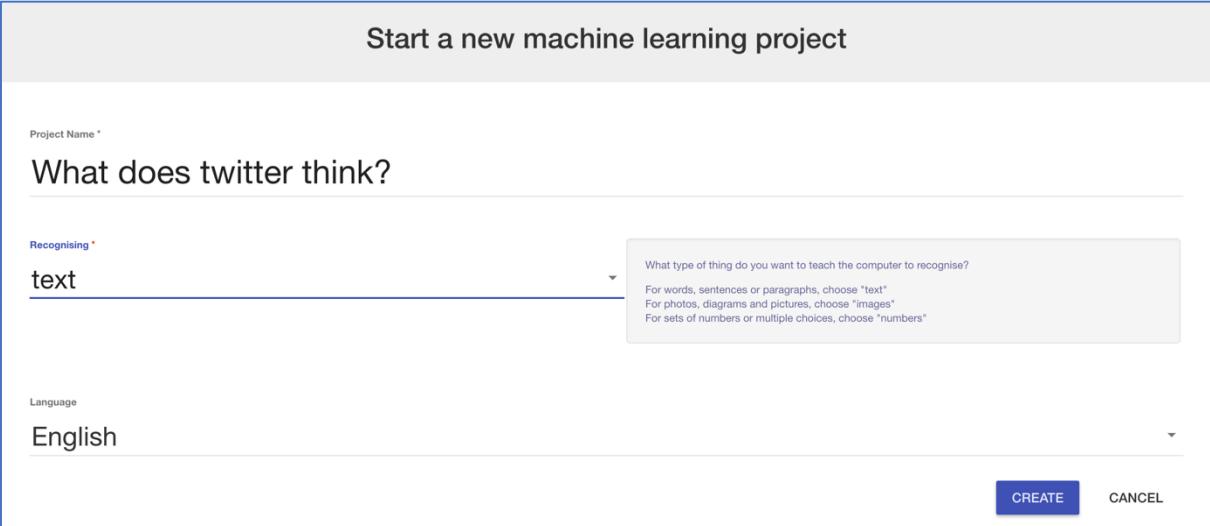
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1. Choose a topic that you'll use for the project
In this project, you'll be analysing what people on Twitter think about something.

Choose something topical that you think people will be talking about. It could be a new movie, a TV show, or something that is in the news.

Check your idea with your teacher or group leader before continuing.
(For the rest of the screenshots in this worksheet, I'll be using Stormzy as I wrote this soon after Stormzy was announced as headlining the music festival Glastonbury).

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
5. Click on “Projects” on the top menu bar
6. Click the “+ Add a new project” button.
7. Name your project “What does twitter think?” and set it to learn how to recognise “text”.
Click the “Create” button



The screenshot shows a web-based form for creating a new machine learning project. The title at the top is "Start a new machine learning project".

Project Name *: What does twitter think?

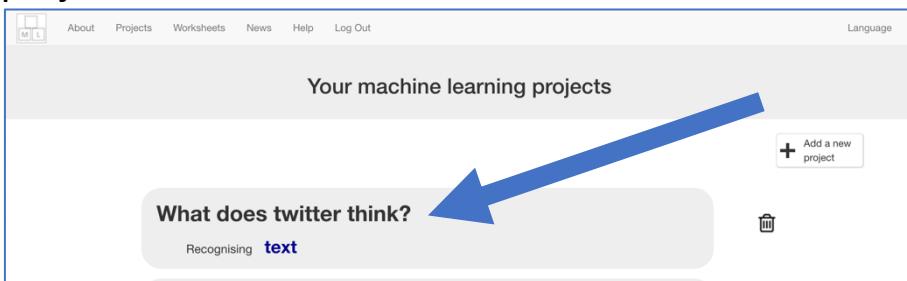
Recognising *: text

A tooltip for "Recognising" provides the following information:
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".

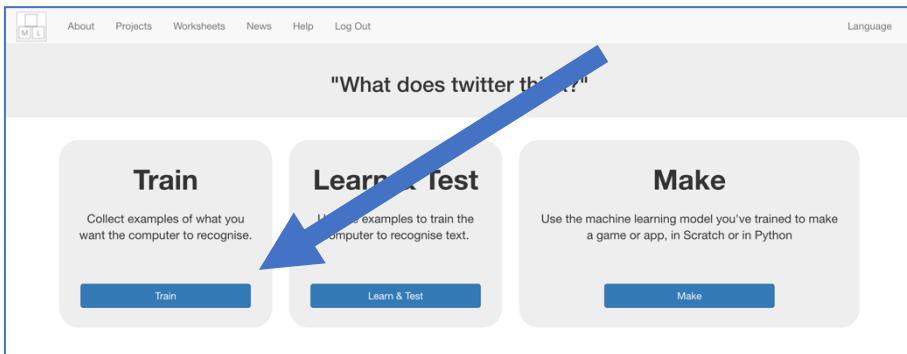
Language: English

At the bottom right are two buttons: "CREATE" (in blue) and "CANCEL".

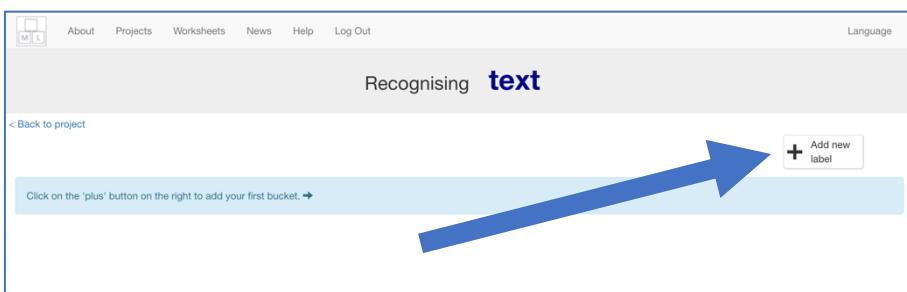
- 8.** You should now see “**What does twitter think?**” in the list of your projects. Click on it.



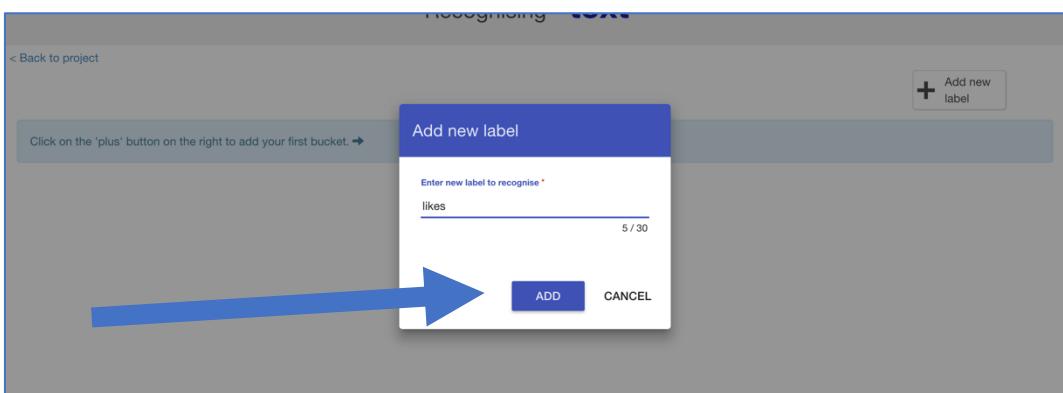
- 9.** Start by collecting training examples. Click “**Train**”



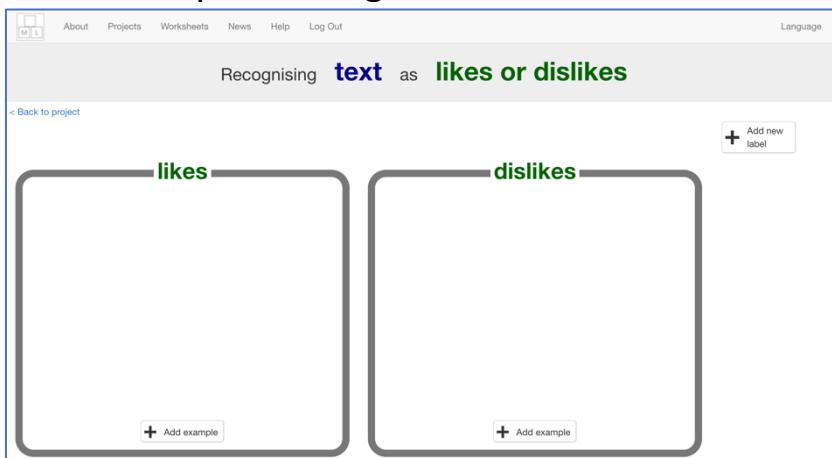
- 10.** First, create a space to store examples of positive comments. Click “**+ Add new label**”



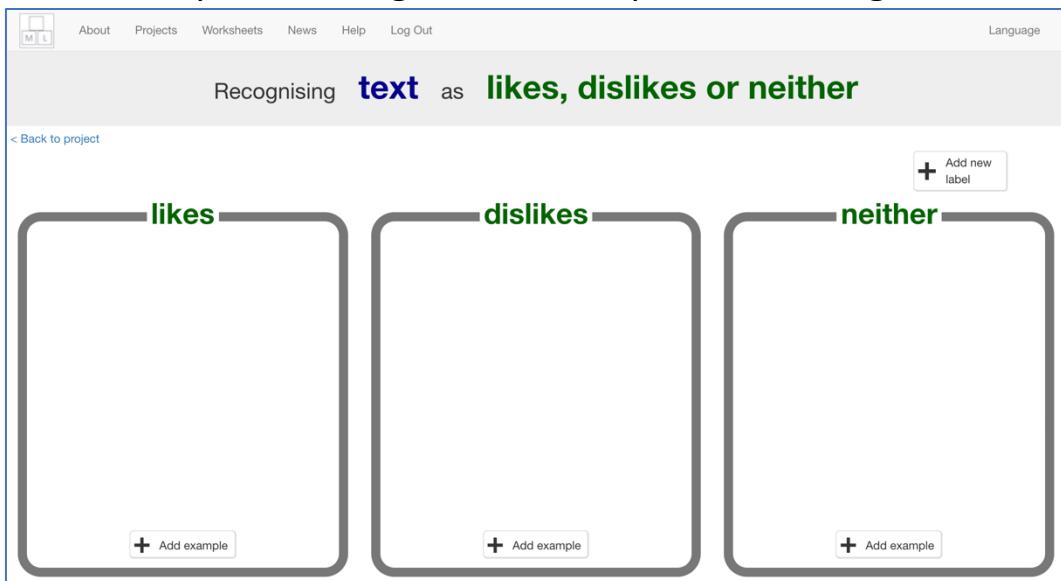
- 11.** Call this bucket “**likes**” and click “**Add**”



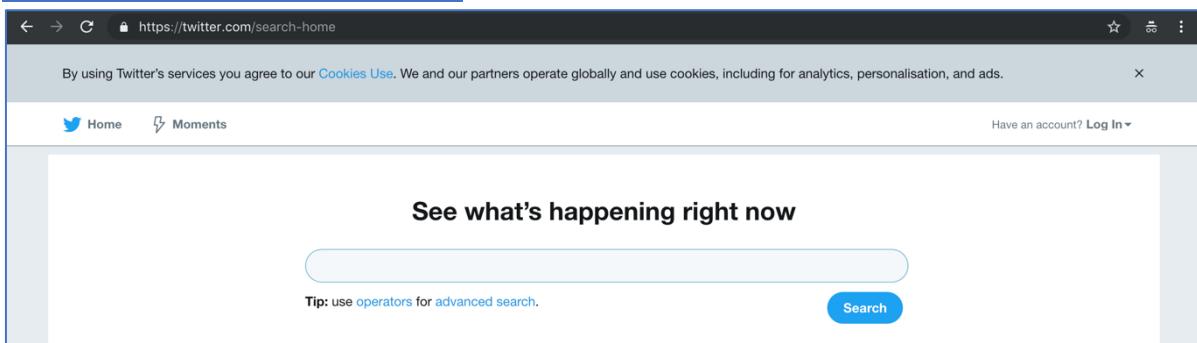
- 12.** Click the “+ Add a new label” button again, and create a space to store examples of negative comments, called “**dislikes**”



- 13.** Click the “+ Add a new label” button again, and create a space to store examples of things that aren’t positive or negative, called “**neither**”



- 14.** Open a new web browser window and go to
<http://search.twitter.com>



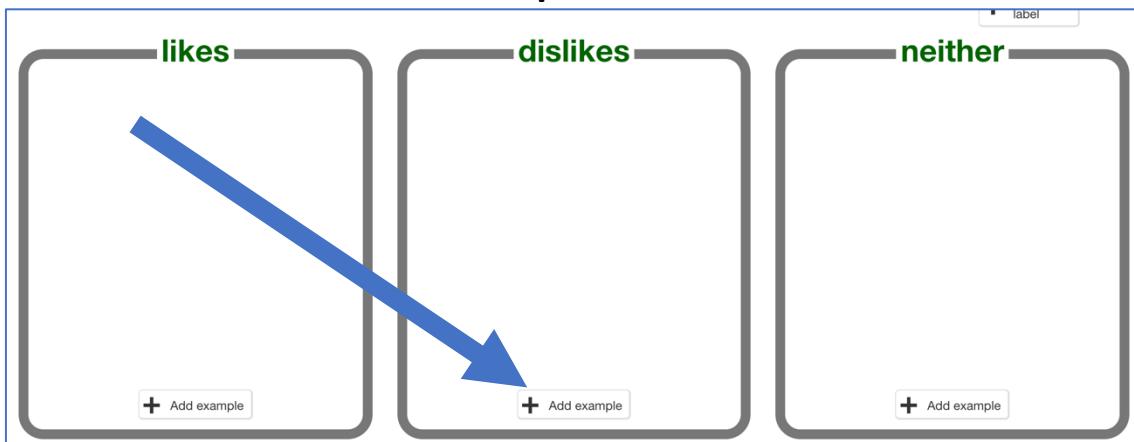
15. Search for the topic you're using for this project

The screenshot shows a web browser window with the URL <https://twitter.com/search?vertical=news&q=stormzy&src=typd>. The search term 'stormzy' is entered in the search bar. The results page has a blue header with the word 'stormzy'. Below the header, there are tabs for 'Top', 'Latest', 'People', 'Photos', 'Videos', 'News', and 'Broadcasts'. On the left, there's a sidebar with 'Search filters' (Show), 'Related searches' (@glastofest), 'New to Twitter?' (Sign up), and 'Worldwide trends' (#IREvNZL, Ohio State, #شعر_لأصناد_أبدا, Urban Meyer). The main content area shows a 'People' section with a profile for 'Glastonbury Festival' (@GlastoFest) featuring a colorful illustration of a festival scene. Below it, a tweet from 'ROB @RKELLAS' (@Nov 15) says 'Stormzy headlining Glasto. You have got to be joking?' with 24 replies, 34 retweets, and 371 likes. Another tweet from 'jamie cairney @tombsjay' (@Nov 15) is partially visible below it.

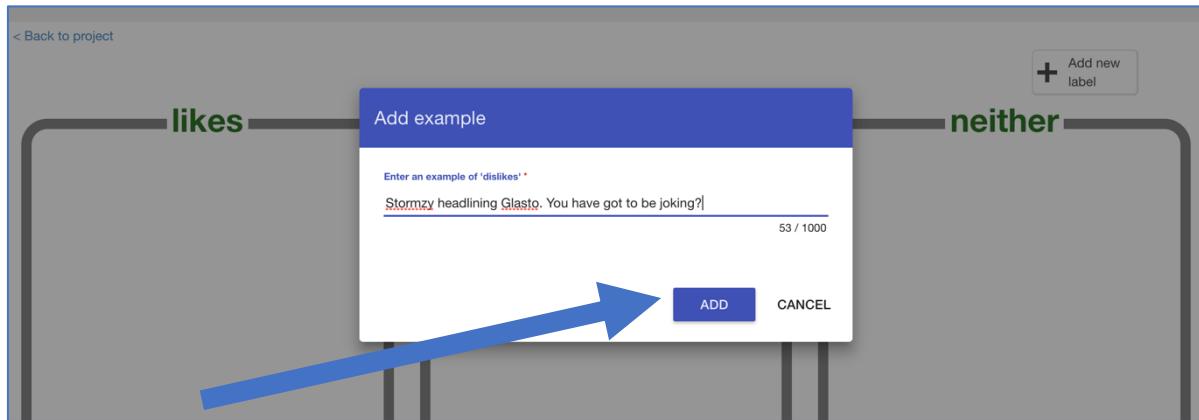
16. Find an example of someone saying something negative about your topic, and copy it to the clipboard

This screenshot shows a tweet from 'ROB @RKELLAS' (@Nov 15) that reads 'Stormzy headlining Glasto. You have got to be joking?'. The tweet has 24 replies, 34 retweets, and 371 likes. The background of the page includes a sidebar with 'Worldwide trends' and a main content area with a link to 'glastonburyfestivals.co.uk'.

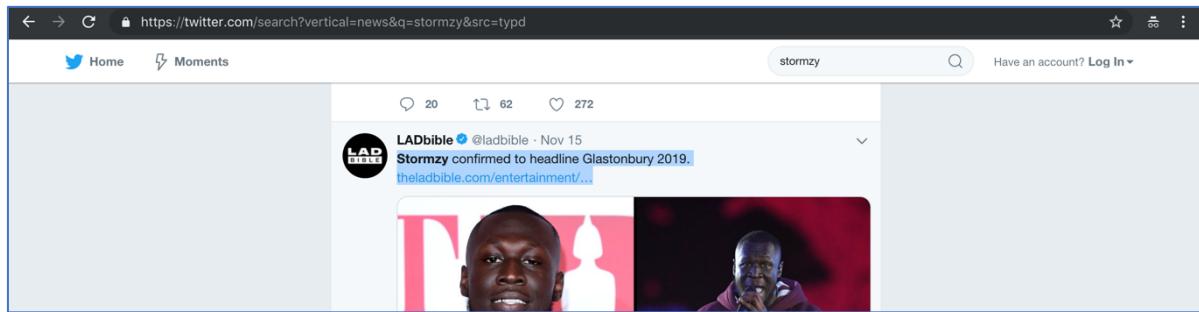
17. Click on the “+ Add example” button in the “dislikes” bucket



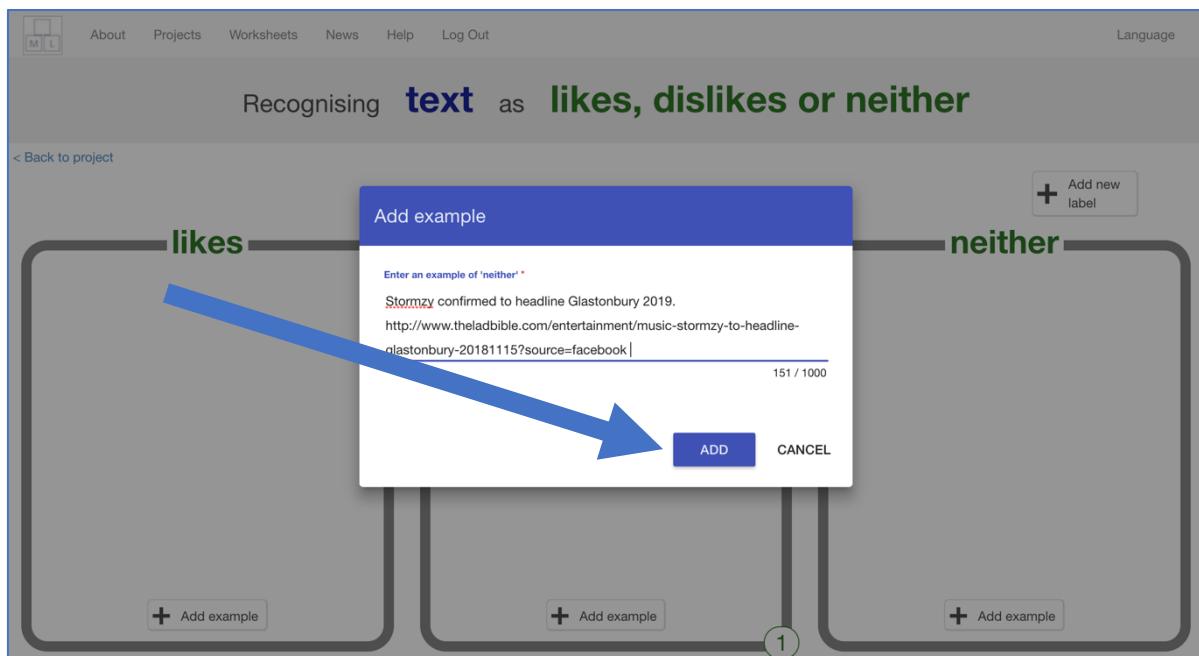
18. Paste the negative comment in the box, and click “Add”



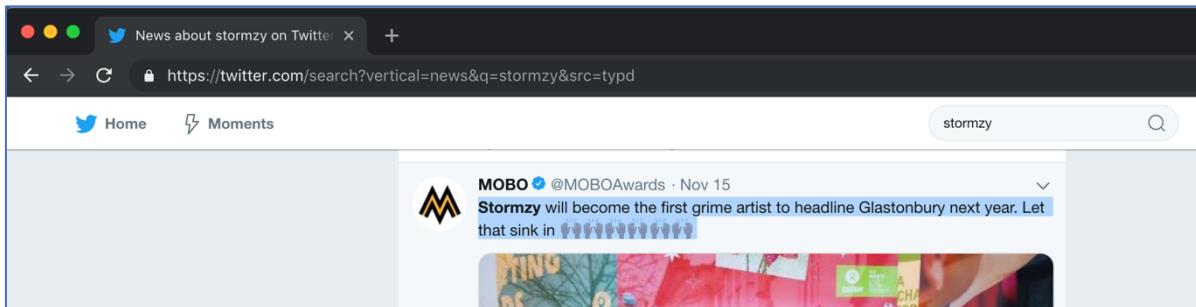
19. Find an example of someone mentioning your topic, that isn't really positive or negative, and copy it to the clipboard



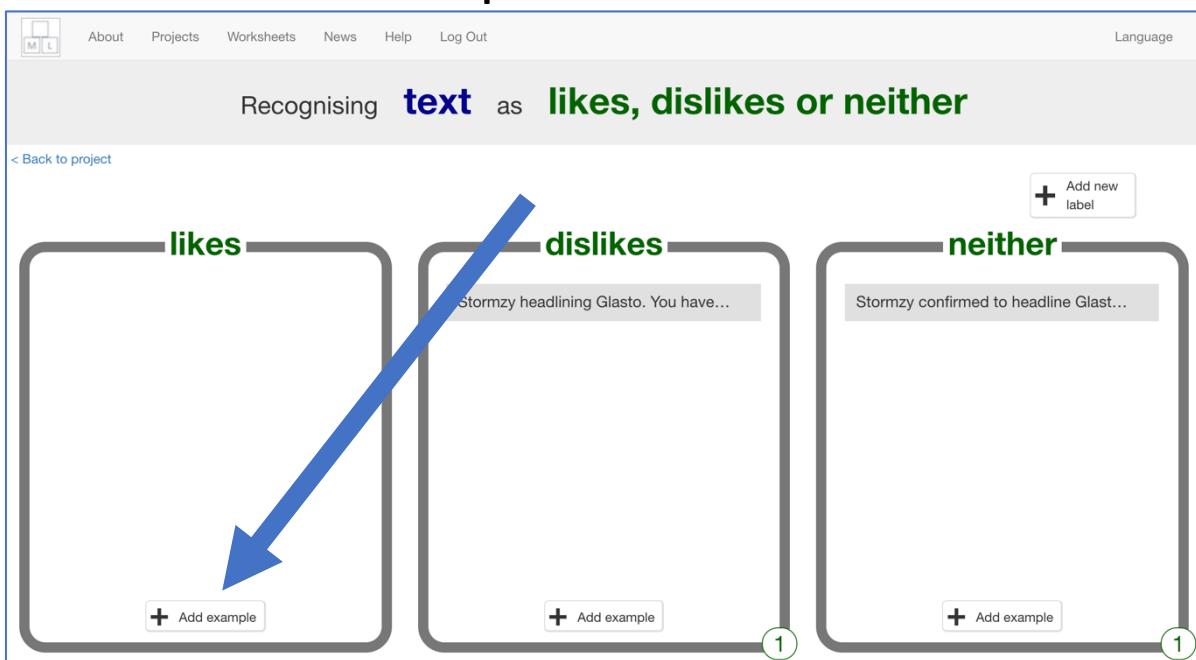
20. Click on the “+ Add example” button in the “neither” bucket Paste the comment in the box, and click “Add”



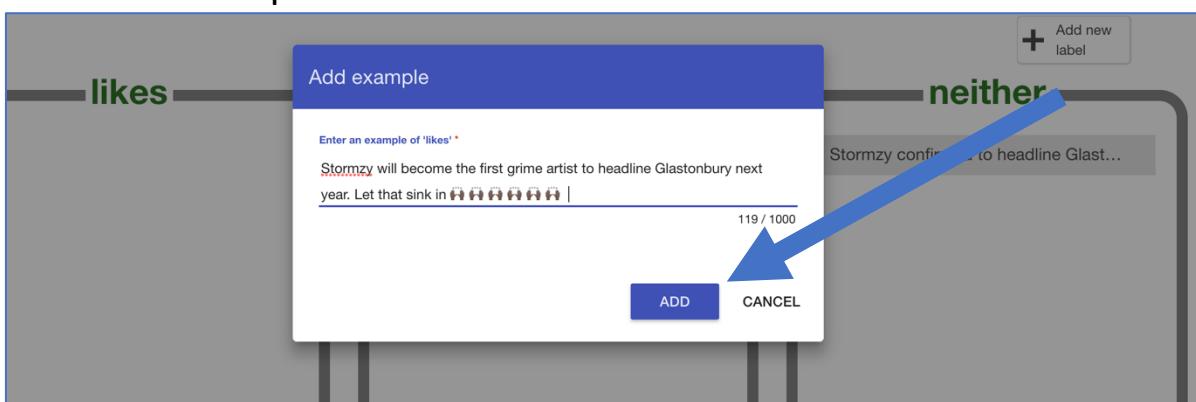
21. Find an example of a positive comment about your topic and copy it



22. Click the “+ Add example” button in the “likes” bucket



23. Paste the positive comment in the box and click “Add”



24. Repeat to fill all three buckets with examples

The more examples, the better your project will work, but the minimum for a working project is about 5 in each bucket.

The screenshot shows a web application for collecting examples of text classification. At the top, there's a navigation bar with links for About, Projects, Worksheets, News, Help, Log Out, and Language. Below the navigation, the title "Recognising **text** as **likes, dislikes or neither**" is displayed. There are three main sections: "likes", "dislikes", and "neither". Each section contains 12 examples. At the bottom of each section, there's a button labeled "+ Add example".

Bucket	Example 1	Example 2	Example 3	Example 4	Example 5	Example 6	Example 7	Example 8	Example 9	Example 10	Example 11	Example 12
likes	Stormzy will become the first grime artist to headli...	Your Friday night Pyramid headliner is the mighty ...	Yassss - Stormzy for Glastonbury a great booking	We're delighted to announce that Stormzy is confi...	Find it hilarious that people are moaning about St...	Stormzy as glasto headliner is a class idea and if y...	So thrilled about Stormzy at Glasto. I really love hi...	Stormzy headlining glasto is a good thing he's by f...	Imagine being genuinely upset that Stormzy is the...	Stormzy headlining Glasto is boss. Grime is organi...	Clever pick. Grime is uniquely British and political ...	Big Congrats #Stormzy 🎉 Much Deserved ❤ ...
dislikes	Stormzy headlining Glasto. You have got to be joki...	How Stormzy qualifies to be a headliner, I do not k...	Stormzy apparently headlining #Glastonbury is ter...	If stormzy headlines glasto i want a refund	Stormzy is not Glasto headline level	Stormzy headlining Glasto 🤷.NO	Stormzy headlining Glastonbury! Oh dear. Was ho...	When you spend £250 on a glasto ticket and they ...	thank god i didn't get a glasto ticket looooo storm...	Stormzy headlining glastonbury is a joke, he's liter...	Went to all the effort of getting Glastonbury tickets...	I knew #Glastonbury would be shit and #Stormzy ...
neither	Stormzy confirmed to headline Glastonbury 2019.	Looks like Stormzy is Glastonbury's Friday night h...	Is Stormzy big enough to headline #Glasto #Glast...	Sounding likely now that pyramid stage Glastonbu...	Looks like Stormzy is Glastonbury's Friday night h...	With rumours that Stormzy is to headline Glaston...	Stormzy confirmed as headliner at Glastonbury 20...	Grime star Stormzy announced as Glastonbury's fi...	Stormzy announced as historic Glastonbury headli...	Grime star Stormzy announced as Glastonbury's ...	Stormzy has been confirmed as the first headliner ...	Stormzy announced as first Glastonbury 2019 hea...

25. Click the “< Back to project” link

26. Next, use the examples you've collected to train a machine learning model. Click “Learn & Test”

The screenshot shows a web application for training a machine learning model. At the top, there's a navigation bar with links for About, Projects, Worksheets, News, Help, Log Out, and Language. Below the navigation, the title "'What does twitter think?'" is displayed. There are three main buttons: "Train", "Learn & Test", and "Make". The "Learn & Test" button is highlighted with a blue arrow pointing to it. Each button has a corresponding description below it.

Button	Description
Train	Collect examples of what you want the computer to recognise.
Learn & Test	Use the examples to train the computer to recognise text.
Make	Create the machine learning model you've trained to make a game or app, in Scratch or in Python

27. Click on the “Train new machine learning model” button

This will take a minute or two to train. While you’re waiting, you could try the multi-choice quiz at the bottom of the page.

The screenshot shows a web page titled "Machine learning models". It has two main sections: "What have you done?" and "What's next?". The "What have you done?" section indicates that 12 examples of likes, dislikes, and neither have been collected. The "What's next?" section is titled "Ready to start your computer's training?". A blue arrow points to the "Train new machine learning model" button at the bottom of the "What's next?" section.

28. Click on the “< Back to project” link

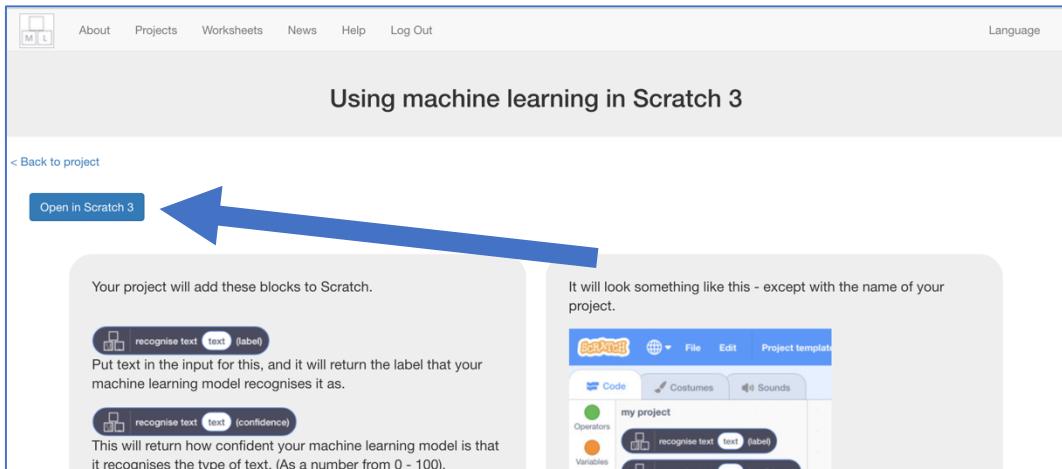
29. Next, we'll use Scratch to analyze tweets. Click “Make”

The screenshot shows a page titled "What does twitter think?". It features three main buttons: "Train", "Learn & Test", and "Make". A blue arrow points to the "Make" button.

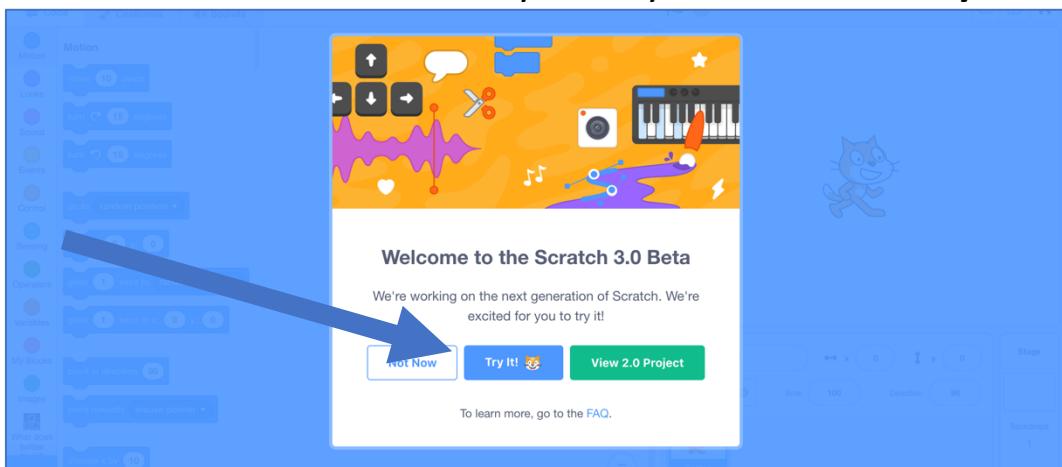
30. Click “Scratch 3”

The screenshot shows a page titled "Make something with your machine learning model". It features three options: "Scratch", "Scratch 3", and "Python". A blue arrow points to the "Scratch 3" button.

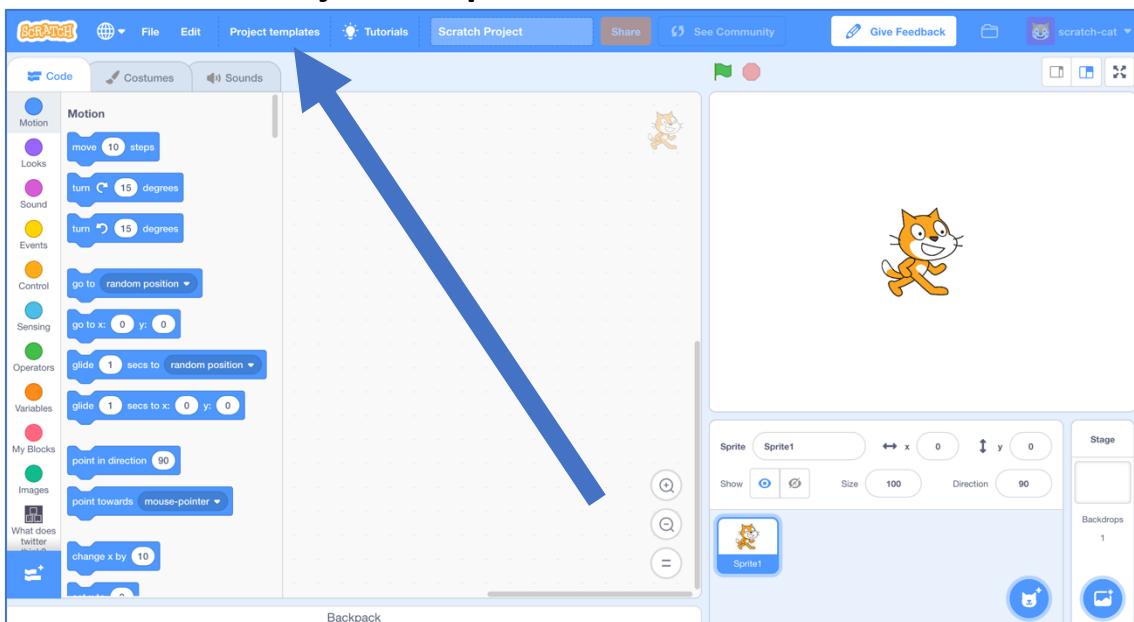
31. Click “Open in Scratch 3”



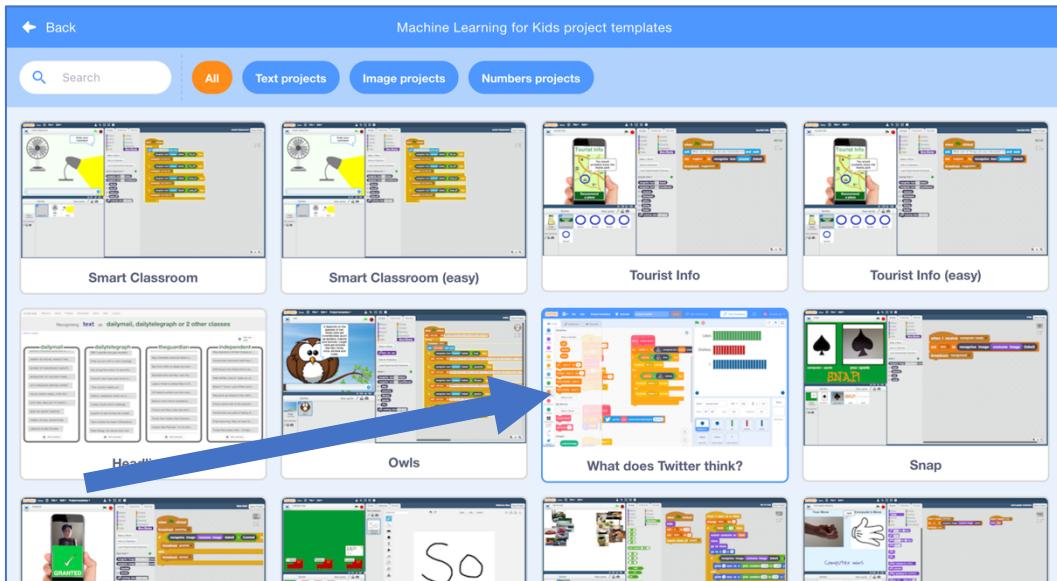
32. Scratch 3 is still new, so you may need to click “Try it!”



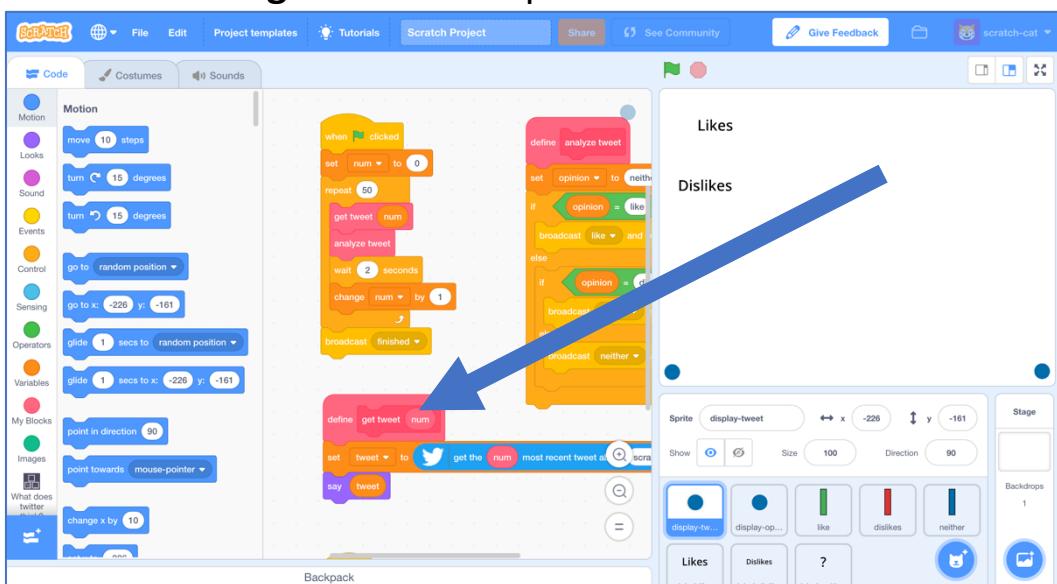
33. Click on “Project templates”



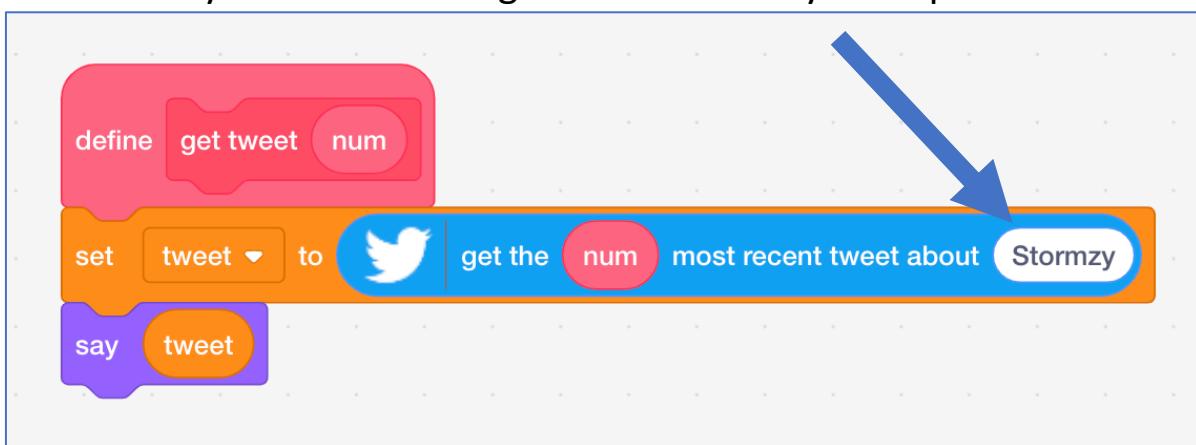
34. Find the “What does Twitter think?” project template and click on it



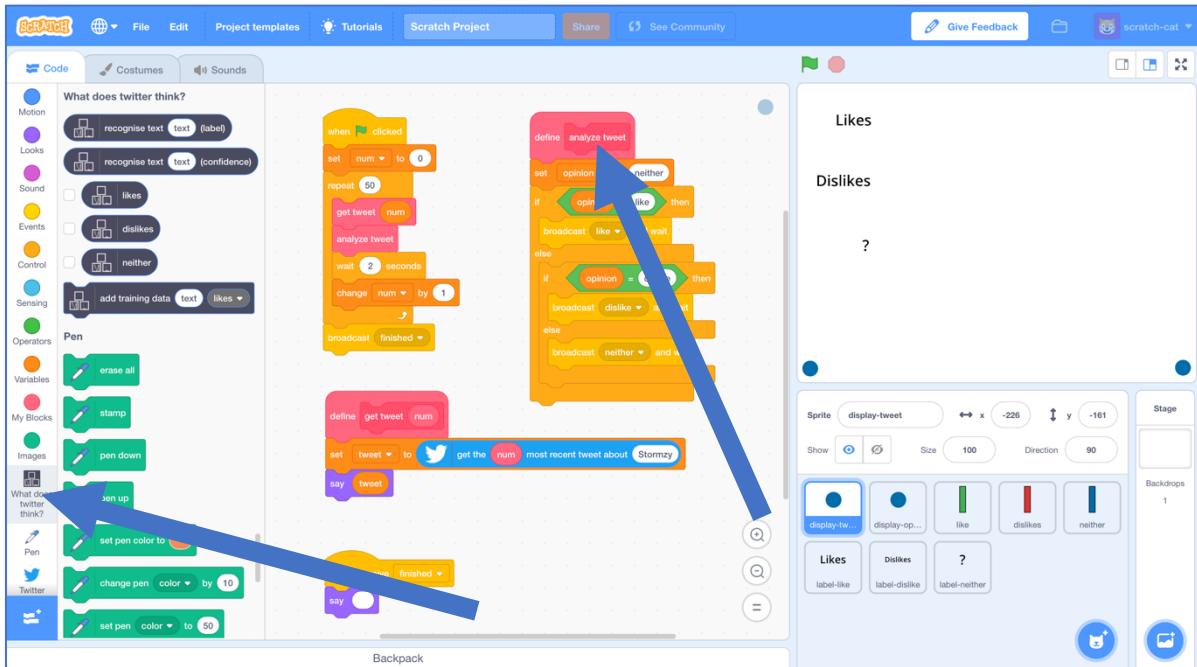
35. Find the “get tweet” script



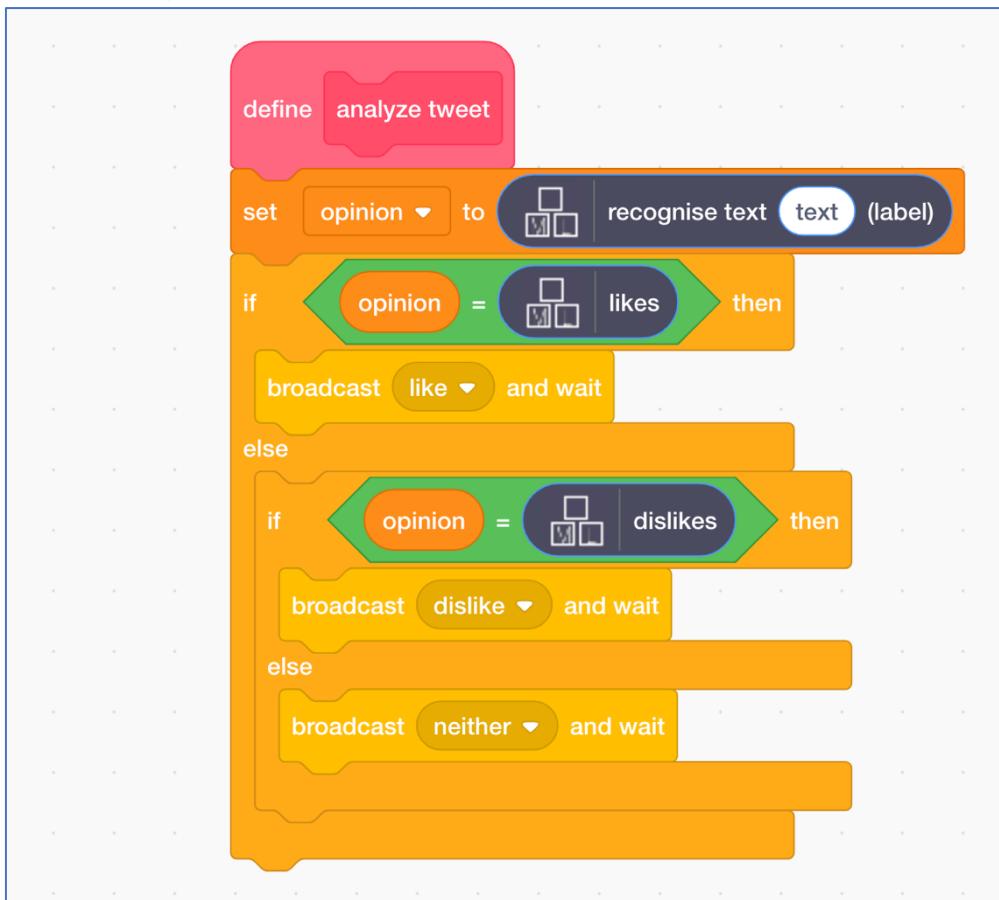
36. Modify it so that it will get tweets about your topic



- 37.** Find the “analyze tweet” script and the blocks from your project
Clicking on your project name in the left-hand side will scroll to your project blocks in the toolbox



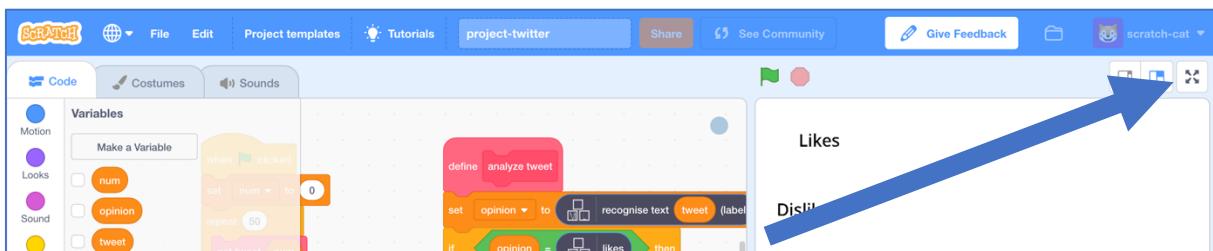
- 38.** Drag blocks from your project into the script



39. Click on “Variables” in the left-hand side, and drag “tweet” into the “recognise text” block so that your machine learning model will analyze the next tweet

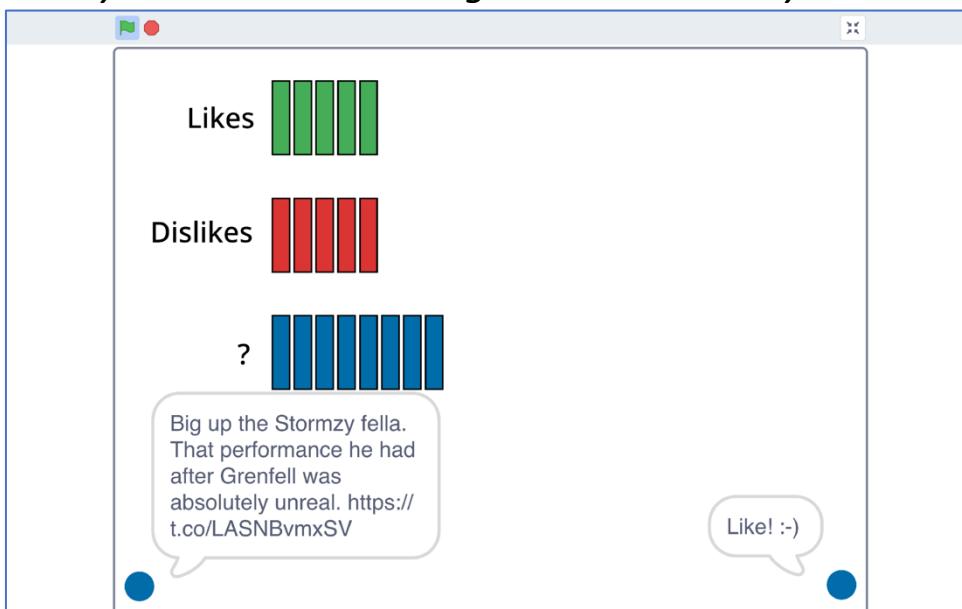


40. Time to test! Click the full-screen button.

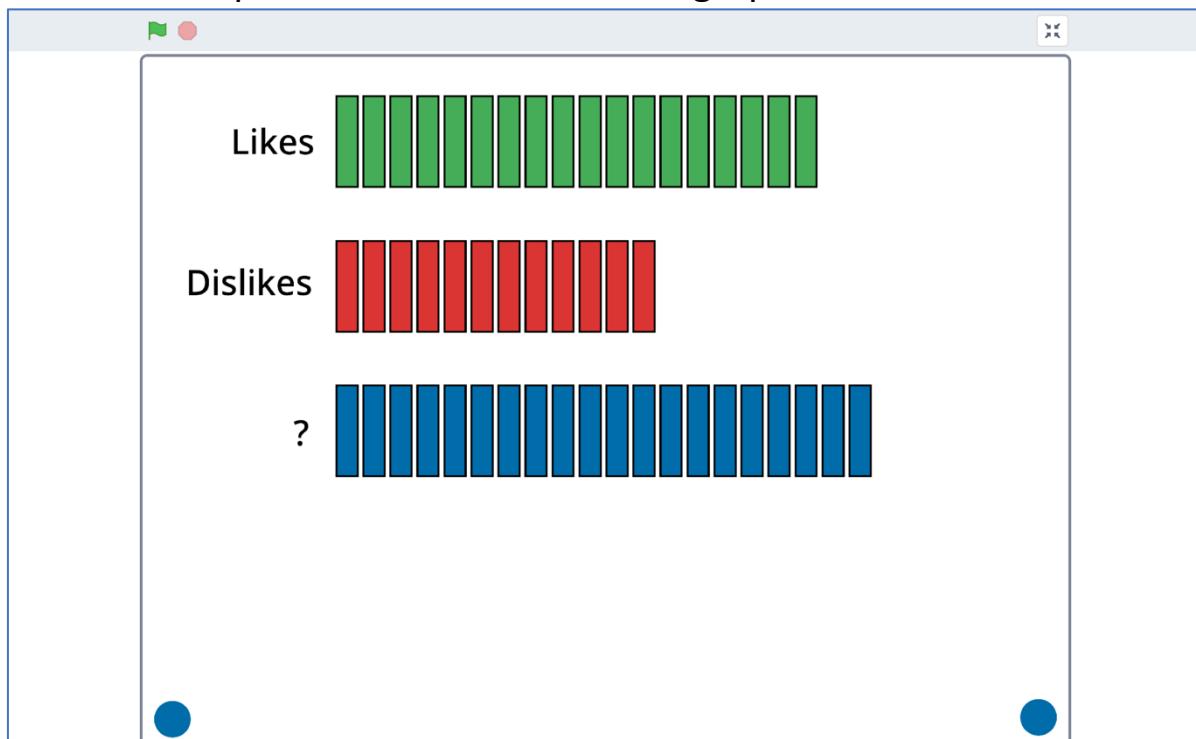


41. Click the green flag

The script will fetch 50 tweets about the topic, and draw a graph based on what your machine learning model thinks they are



42. The script will finish with the final graph



43. Save your project.

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

What have you done?

You're using a type of natural language processing called sentiment analysis to measure the discussion about a topic on social media.

This is a very common usage of machine learning, to analyze what people think about everything from companies, retail products, and world issues.

With a small number of examples, your project will get a lot wrong, but the more examples you give it, the better it should get.

Even then, it will still make mistakes, but by making it easier to measure a very large number of messages quickly, this technique is still useful to give a quick estimate of the public mood.

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?

Make your model more accurate

As the Scratch script plays, it displays what your machine learning model thought of each tweet. You'll probably disagree with some decisions your model makes.

Try to improve this by adding more examples in the "**Train**" page. Make sure you click the "**Train new machine learning model**" button again, to use those new examples. Then run your Scratch script again to see what difference it makes.

Write a Scratch script to train your model

Copying examples from another web browser is slow. Can you write a Scratch project to make this easier?

Use the "**get tweets**" block and the "**add training data**" block to make a project that will show you tweets, and if you press the "L" add them to the "likes" bucket and if you press the "D" add them to the "dislikes" bucket.

This will make it easier for you to collect training examples.

Use confidence scores

The confidence score block will tell you how sure your machine learning model is that it has correctly measured a tweet. You could use this so that the graph isn't updated unless the model is very confident.