



Ada's Poetry Generator

Celebrate Ada Lovelace Day, by learning how to program your own poetry generator!

Scratch



Step 1 Introduction

You are going to learn how to program your own poetry generator!



What you will learn

- Variables;
- Lists and random list items;
- Repetition (the **repeat** block).

What you will need

Hardware

- A computer capable of running Scratch 3

Software

- Scratch 3 (either **online** (<http://rpf.io/scratchon>) or **offline** (<http://rpf.io/scratchoff>))

Downloads

The starter project can be found **here** (<http://rpf.io/p/en/poetry-generator-go>).

Additional information for educators

This project has been created to celebrate **Ada Lovelace Day** (<https://findingada.com>). If you're a teacher, you can download a School Resource Pack containing which also contains an assembly plan (downloads.codeclub.org.uk/ada.zip (<http://downloads.codeclub.org.uk/ada.zip>)), to introduce children to Ada and her revolutionary ideas.

You can download the **completed project** (<http://rpf.io/p/en/poetry-generator-get>).

Step 2 Ada Lovelace

In 1842, Ada Lovelace wrote about using a machine called the 'Analytical Engine' to make calculations, and is seen as the world's first computer programmer! Ada was also the first to see that computers could be more than just big calculators.


Open the 'Poetry Generator' Scratch starter project. 

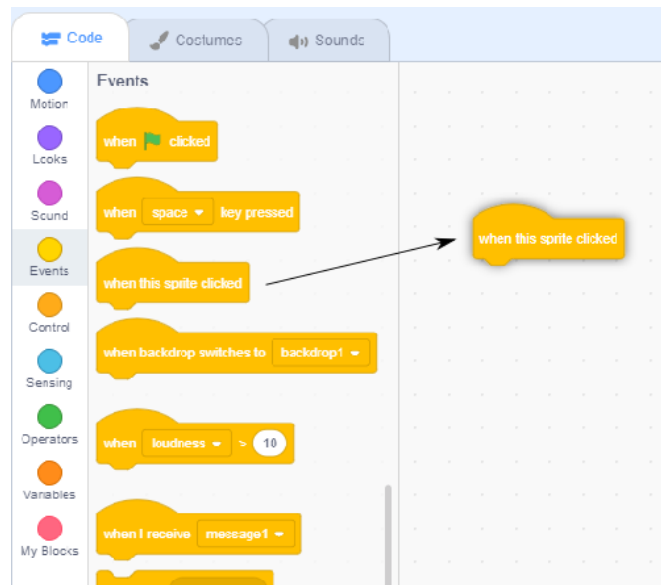
Online: open the **starter project** (<http://rpf.io/poetry-on>).

If you have a Scratch account you can make a copy by clicking **Remix**.

Offline: open the **starter project** (<http://rpf.io/p/en/beat-the-goal-ge-go>) in the offline editor.

If you need to download and install the Scratch offline editor, you can find it at **rpf.io/scratchoff** (<http://rpf.io/scratchoff>).

Click on your 'Ada' sprite, and click the **Events** tab in the 'Scripts' coding section. Drag the **when this sprite clicked** block onto the coding area on the right. 



Any code added underneath this block will run when Ada is clicked!

Click the **Looks** tab, and drag the **say Hello! for 2 secs** block underneath the **when this sprite clicked** block you've already added.



when this sprite clicked

say Hello! for 2 seconds

Click on Ada, and you should see her talk to you.



Challenge!

Challenge: Code Ada to introduce herself

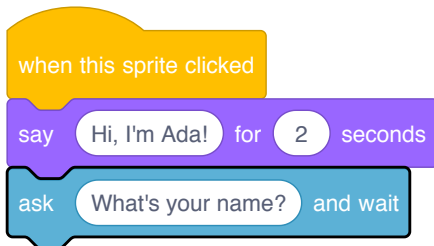
Can you change your code, so that Ada says 'Hi, I'm Ada!' when you click on her?



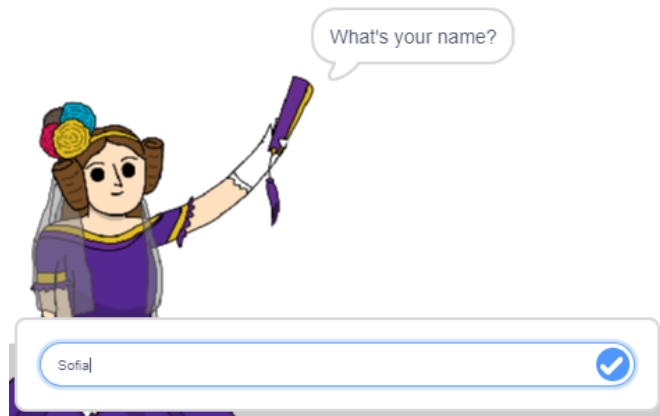
Step 3 Telling Ada your name

Ada has introduced herself, but she doesn't know your name!

Drag an **ask** block (from the **sensing** section) onto your code. Here's how your code should look:



Click on Ada to test your code. Ada should ask you your name, which you can type in!

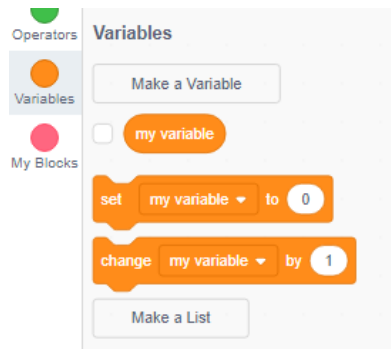


We can use a **variable** to store your name. Click **Data**, and then 'Make a Variable'. As this variable will be used to store your name, let's call the variable... **name!**

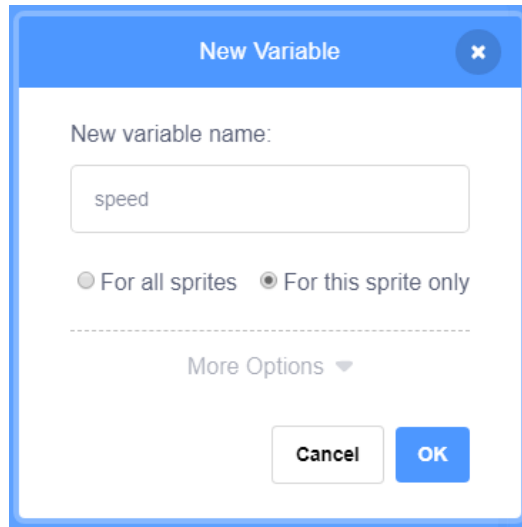


Add a variable in Scratch

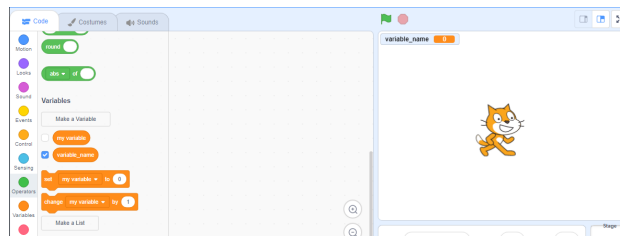
- Click on **Variables** in the Code tab, then click on **Make a Variable**.



- Type in the name of your variable. You can choose whether you would like your variable to be available to all sprites, or to only this sprite. Press **OK**.

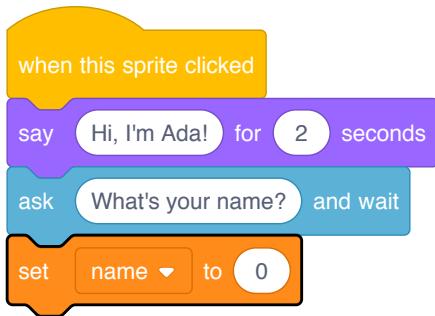


- Once you have created the variable, it will be displayed on the Stage, or you can untick the variable in the Scripts tab to hide it.

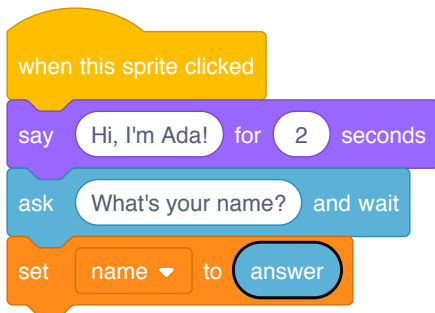


To store your name, click the **Data** tab, and then drag the **set name** block onto the end of your code.





Use the **answer** block to store the answer you type in.



Click on Ada to test your code, and enter your name when asked. You should see that your name has been stored in the **name** variable.



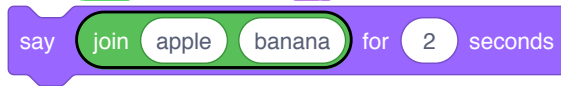
You can now make use of your name in your code. Add this code:



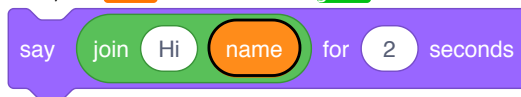


To create this code:

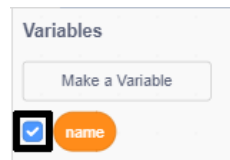
1. Drag a **join** block onto the **say** block



2. Add your **name** block onto the **join** block.



To hide your **name** variable on the stage, click the tick next to the variable.



Test your new code. Ada should say hello to you, using your name!



If there's no space between the word 'Hi' and your name, you'll need to add a space into the code yourself!

Finally, add this code to explain what to do next:



```

when this sprite clicked
  say Hi, I'm Ada! for 2 seconds
  ask What's your name? and wait
  set name to answer
  say join Hi name for 2 seconds
  say Click the computer to generate a poem. for 2 seconds
  
```

Test Ada's code one last time, to make sure that everything works.



Step 4 The Analytical Engine

Let's program Ada's computer (called the 'Analytical Engine') to generate poetry.

Add this code to your 'Computer' sprite, so that it speaks when clicked:



```

when this sprite clicked
  say Here is your poem... for 2 seconds
  
```

To create a random poem, first you'll need a **list** of words to use. To create a new list, click the **Data** tab.

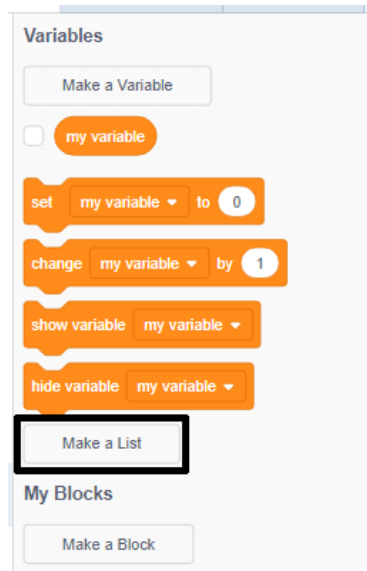


Let's use **verbs** (action words) in the first line of your poem. Create a new list called **verbs**.

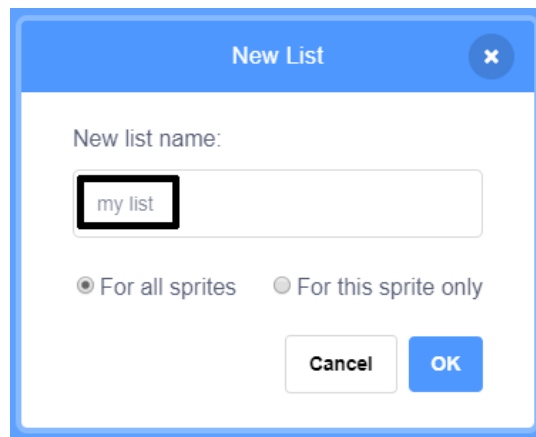


Make a list

- Click on **Make a List** under **Variables**.



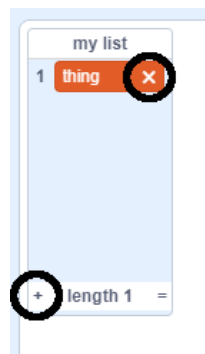
- Type in the name of your list. You can choose whether you would like your list to be available to all sprites, or to only a specific sprite. Click **OK**.



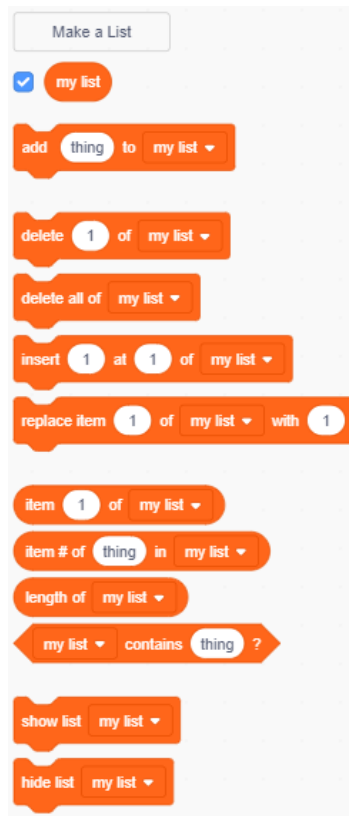
- Once you have created the list, it will be displayed on the stage, or you can untick the list in the Scripts tab to hide it.



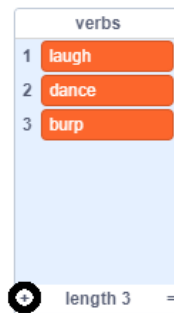
- Click the **+** at the bottom of the list to add items, and click the cross next to an item to delete it.



- New blocks will appear and allow you to use your new list in your project.



Your new list will be empty. Click the + at the bottom of your empty list and add these verbs:



The first line of your poem should be the word "I", followed by a random verb.



To create this line of poetry, you need to:

1. Pick a random number between 1 and the length of the verbs list:



2. Use this block to get a random item from the verbs list:

item pick random 1 to length of verbs of verbs

3. Join "I " with the random verb to create the first line of your poem:

join I item pick random 1 to length of verbs of verbs

4. Use a say block to display the line of poetry:

say join I item pick random 1 to length of verbs of verbs for 2 seconds

Your code should look like this:



when this sprite clicked

say Here is your poem... for 2 seconds

say join I item pick random 1 to length of verbs of verbs for 2 seconds

Test your code a few times. Your computer should choose a random word from the verbs list each time. ☒

I dance I burp I laugh

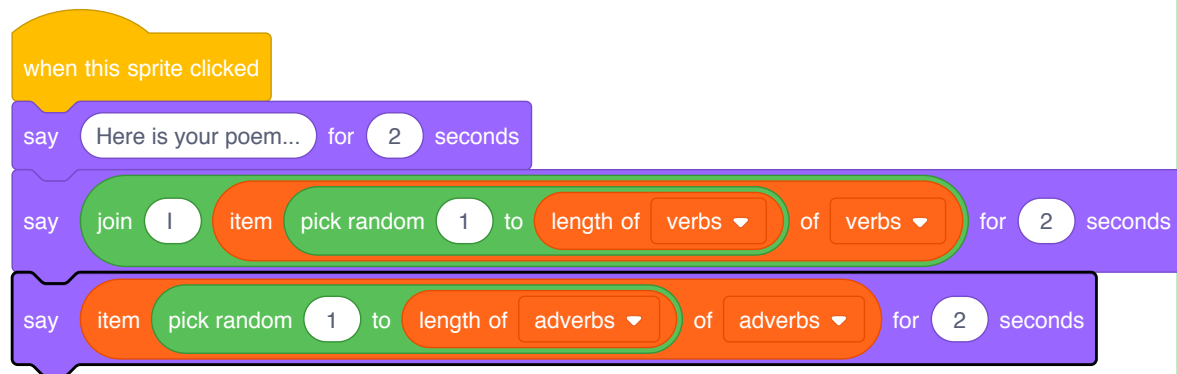
Step 5 More poetry

Your poem is quite short - let's add to it!

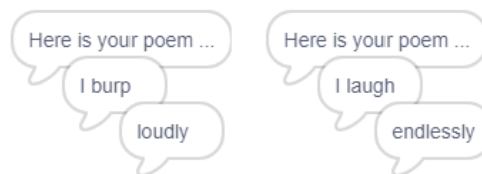
Let's use adverbs in the next line of your poem. An **adverb** is a word that describes a verb. Create another list called adverbs, and add these 3 words: ☒

adverbs	
1	loudly
2	silently
3	endlessly
+ length 3 =	

Add this line to your computer's code, to say a random adverb on the next line of your poem:



Test your code a few times. You should see a random poem each time.



Add a list of nouns to your project. A **noun** is a place or a thing.



nouns	
1	sea
2	moon
3	tree
+ length 3 =	

Add code to use the nouns in your poem.



when this sprite clicked

say Here is your poem... for 2 seconds

say join I item pick random 1 to length of verbs of verbs for 2 seconds

say item pick random 1 to length of adverbs of adverbs for 2 seconds

say join by the item pick random 1 to length of nouns of nouns for 2 seconds

Add a list of adjectives to your project. An **adjective** is a describing word.



adjectives

1	happy
2	tired
3	hungry

+ length 3 =

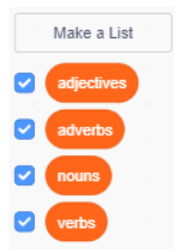
Add code to use the adjectives in your poem:



```

when this sprite clicked
say [Here is your poem...] for 2 seconds
say [join I item pick random 1 to length of verbs of verbs] for 2 seconds
say [item pick random 1 to length of adverbs of adverbs] for 2 seconds
say [join by the item pick random 1 to length of nouns of nouns] for 2 seconds
say [join I feel item pick random 1 to length of adjectives of adjectives] for 2 seconds
  
```

You can click the boxes next to your lists to hide them.



Test out your new poem.



Step 6 Animating the Analytical Engine

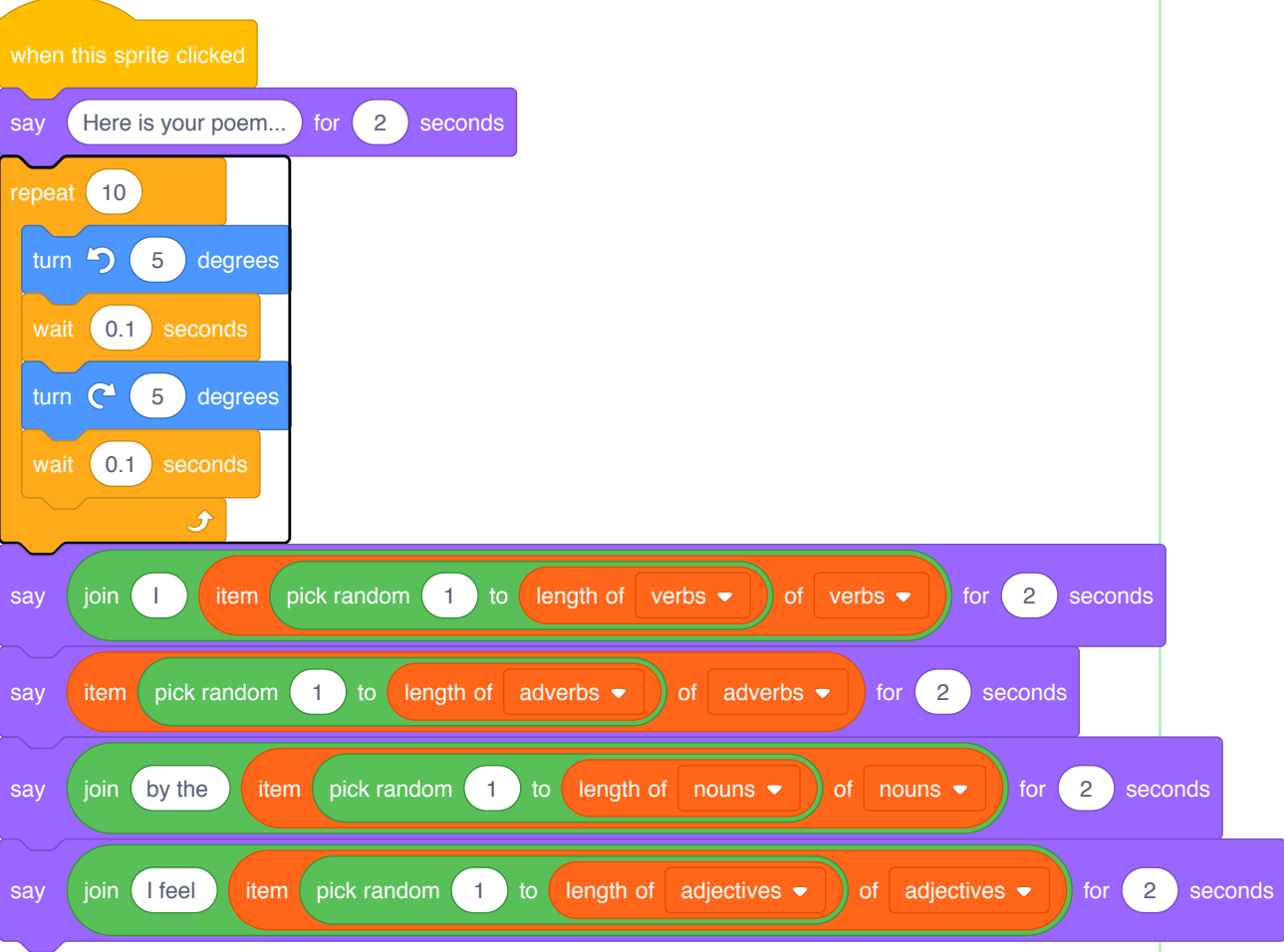
Let's animate your computer, so that it looks like it's generating poetry.

Click on your computer sprite, and add this code after the first **say** block:



You'll find the **repeat** and **wait** blocks are in the **Control** section.



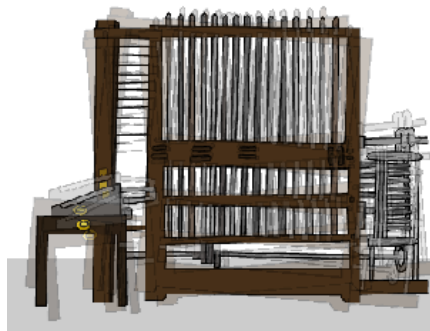


```

when this sprite clicked
  say Here is your poem... for 2 seconds
  repeat (10)
    turn 5 degrees
    wait 0.1 seconds
    turn 5 degrees
    wait 0.1 seconds
  say join I item pick random 1 to length of verbs of verbs for 2 seconds
  say item pick random 1 to length of adverbs of adverbs for 2 seconds
  say join by the item pick random 1 to length of nouns of nouns for 2 seconds
  say join I feel item pick random 1 to length of adjectives of adjectives for 2 seconds
  
```

The script starts with a 'when this sprite clicked' event. It then says 'Here is your poem...' for 2 seconds. This is followed by a loop that repeats 10 times, each time turning 5 degrees clockwise, waiting 0.1 seconds, turning 5 degrees counter-clockwise, and waiting 0.1 seconds. After the loop, it says four lines of poetry, each for 2 seconds. Each line is constructed by joining a fixed phrase with a randomly selected item from a list: 'I' from verbs, an item from adverbs, 'by the' from nouns, and 'I feel' from adjectives.

Test your project. You should see the computer shake before producing a poem!

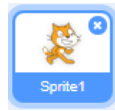


Click the 'Sounds' tab, and click the 'Choose a Sound' icon in the bottom left.

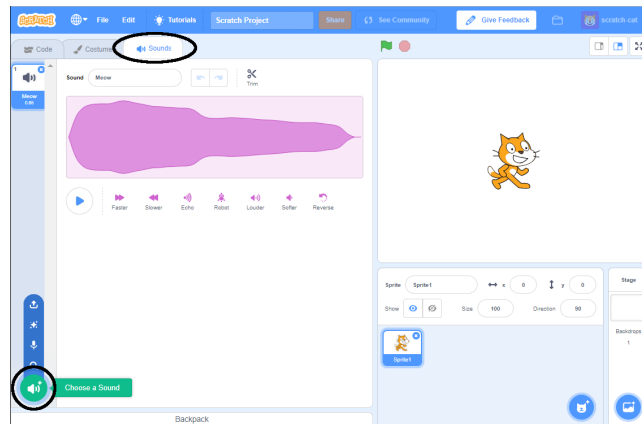


Adding a sound from the library

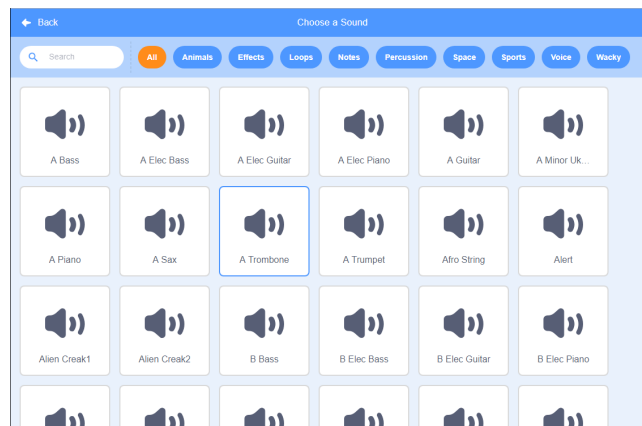
- Select the sprite you want to add the sound to.



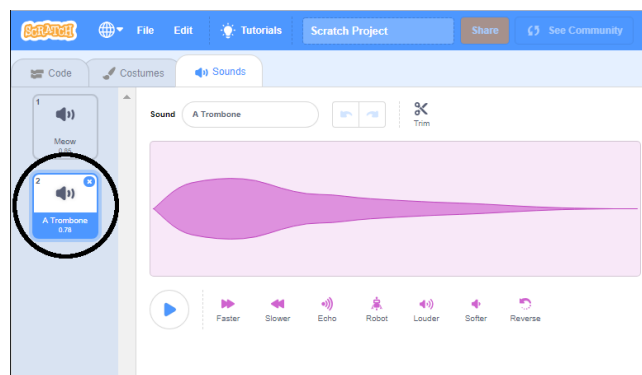
- Click the **Sounds** tab, and click **Choose a Sound**:



- Sounds are organised by category, and you can hover over the icon to hear a sound. Choose a suitable sound.

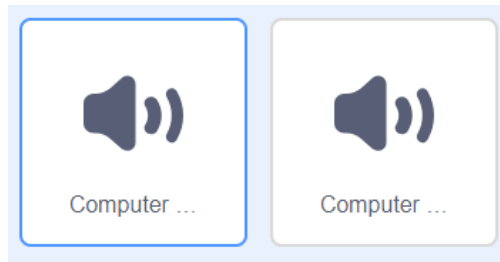


- You should then see that your sprite has your chosen sound.



Choose a 'computer beeps' sound and click OK.





Add a **start sound** block, to play your sound just before your animation starts. ✓



```

when this sprite clicked
  say Here is your poem... for 2 seconds
  start sound computer beeps1
  repeat 10
    turn 5 degrees
    wait 0.1 seconds
    turn 5 degrees
    wait 0.1 seconds
  say join I item pick random 1 to length of verbs of verbs for 2 seconds
  say item pick random 1 to length of adverbs of adverbs for 2 seconds
  say join by the item pick random 1 to length of nouns of nouns for 2 seconds
  say join I feel item pick random 1 to length of adjectives of adjectives for 2 seconds
  
```

Challenge!

Challenge: Personalise your poem

Can you use your `name` variable to personalise your poem?



Challenge!

Challenge: More words

Can you add more words to your lists, so that you can generate more poems?

Challenge!

Challenge: More poetry

Can you use your own lists to generate you own poetry?

Step 7 What next?

Take a look at the **Balloons** (<https://projects.raspberrypi.org/en/projects/balloons>) Scratch project.

Published by Raspberry Pi Foundation (<https://www.raspberrypi.org>) under a Creative Commons license (<https://creativecommons.org/licenses/by-sa/4.0/>).

View project & license on GitHub (<https://github.com/RaspberryPiLearning/poetry-generator>)