

How to measure the length of a breath

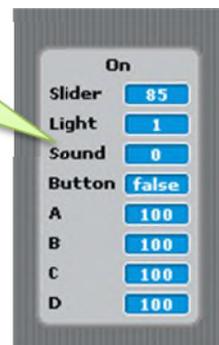
The microphone can be used to measure breath control, timing how long someone can slowly breath out in a controlled manner. It uses the microphone on the picoboard.



Connect the picoboard to the computer and start scratch. To see the readings on the picoboard, right click on a blue sensor block and select 'show Scratch Board Watcher'

1. Right click on the *sensor value* box and select 'Show ScratchBoard watcher'

2. Get readings from the microphone (Sound)



The microphone gives readings between 0 (quiet) and 100 (noisy). Check the Sound reading given by the picoboard when its quiet and compare this to when you blow gently onto the microphone.

Make a note of the two values given by the microphone, and pick a value in the middle of the two readings. This value will be the 'Threshold'.

- When the microphone gives a reading above the Threshold value, keep counting breath length
- When it gives a reading below the Threshold value, stop counting.

Safety: Please note that you use these resources at your own risk. Correct use of some components requires care.

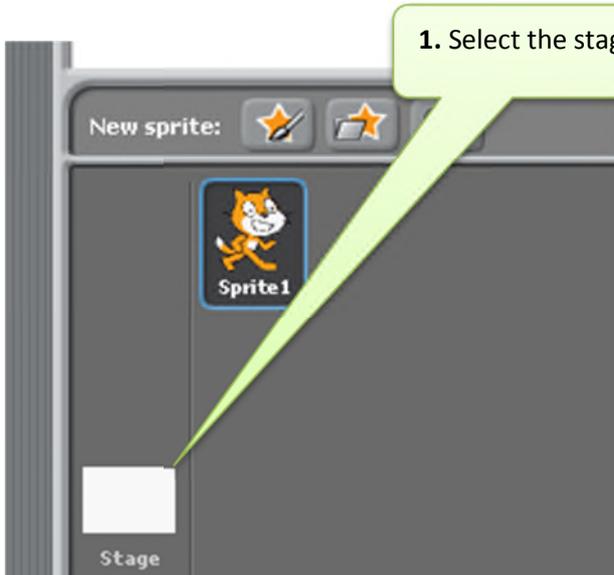
Lets' now look at how to how this can be expressed in Scratch. First create two variables, one is the Threshold value, the second is to count the length of breath as detected by the microphone.



1. Select 'Make a Variable' and create a variable called 'Threshold'

2. Do this again and create the variable 'BreathLength'

When the program runs by clicking on the Green Flag, these variables need to have starting values.



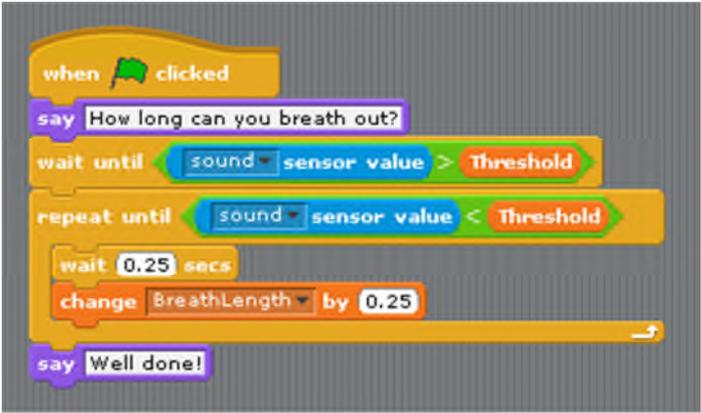
1. Select the stage



2. Enter the code below.

3. Enter your Threshold value.

The final step is to click on the Cat sprite and enter the example code below. This will count the number how long the microphone detects a breath.



The program waits till a sound is detected that exceeds the threshold value, and then counts quarter seconds until the sound detected by the microphone falls below the threshold value. Finally the program displays the number of seconds that the breath has lasted.