





Audacity Tutorial

Importing and Playing Audio in Audacity

Step 1: Download Audacity at audacity.sourceforge.net and follow the download instructions.

Step 2: Launch Audacity and load the audio file of interest by selecting File → Import → Audio. The file you choose will be added to the Audacity timeline. You may select one or multiple files. If you select multiple files they will be added as separate tracks on the timeline.





Step 3: To listen to your files, press the play button . To stop the playback, press the stop button . Notice that the playback begins where the selection tool is currently located (default is at the start of the track). You can change the playback start position by clicking directly on a specific part of the track. Note that if you have multiple tracks loaded it will play both tracks simultaneously. To play a specific track, click the solo button on the track you want to hear (button located on the left toolbar).

Step 4: To play specific sections of a track, click on the track and select a portion by holding down the mouse button and moving the cursor. Additionally, you can delete portions of a track by selecting in the same manner and then hitting the delete key on your keyboard.

Exploring Audio Files

Once you have loaded in the audio files, you can use several tools in audacity to explore them in more detail. Many of these tools are located in the top center of the window.



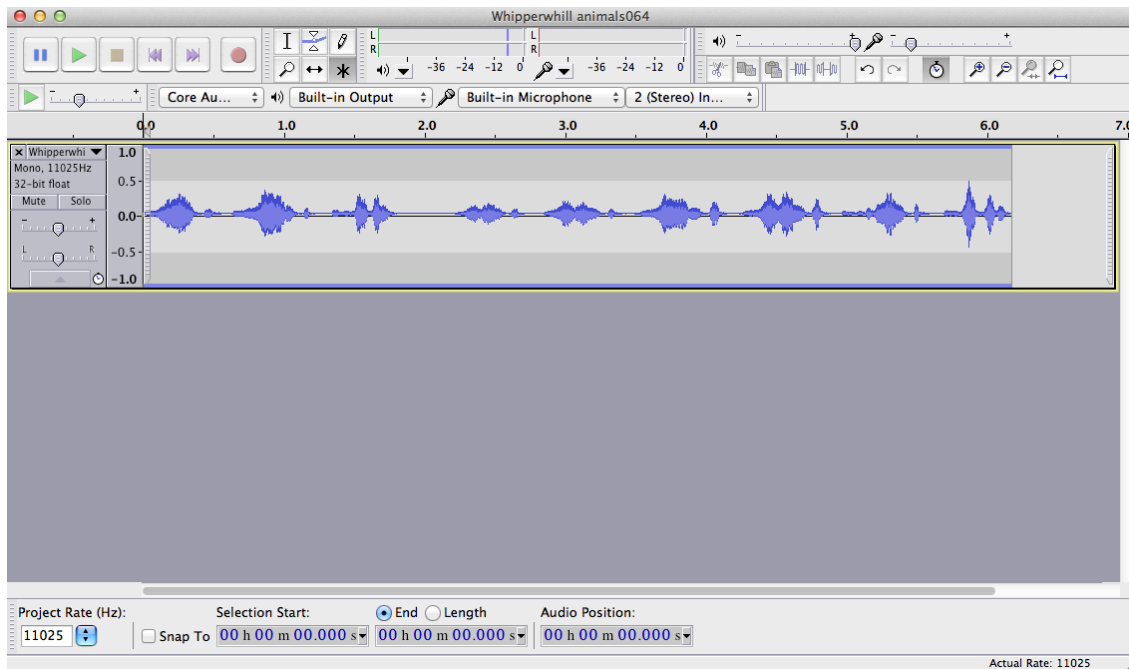
The default is the cursor tool : when this is selected it allows you to select sections of your audio track. You can use the magnifying glass  to zoom in on specific sections of the track. The envelope tool  allows you to expand your track in the vertical direction. The time shift tool  allows you to shift your track in the horizontal direction (time). Additional information on all the Audacity tools can be found at ([link to http://audacity.sourceforge.net/help/](http://audacity.sourceforge.net/help/)).

Analyzing Audio Files

There are several useful analysis tools in Audacity, all found under the Analysis tab on the main menu. The main tool used in the classroom activities is Plot Spectrum. This shows you the frequency analysis for the section you selected (or, if you haven't selected any sections, it shows you the frequency analysis for the entire track). Although there are several options to customize the frequency analysis, the default values are recommended (you can read more about customization options in Audacity documentation at <http://audacity.sourceforge.net/help/>).

Example Tutorial

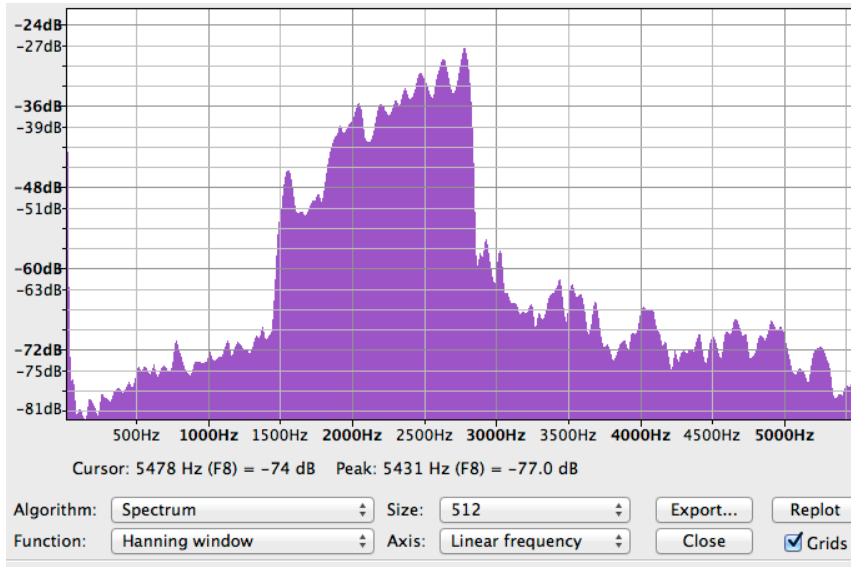
To begin, download the Whipperwhill sound from <http://www.animal-sounds.org/air-animal-sounds.html> and load it into Audacity. Your screen should look like this:



Play the sound and notice the repetition of patterns. Sound 1 is the first sound in this track. Select it using the cursor and look at the Selection Start and End times at the bottom of your screen. Notice it lasts approximately from 0 to 0.6 seconds. Use the cursor to select all 9 sounds in this file. Compare your start and end times to the following approximate times:

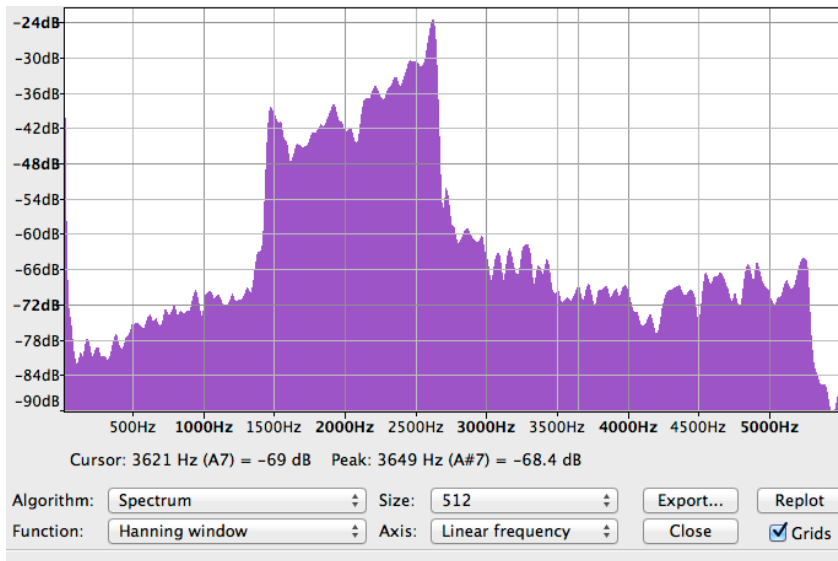
Sound Number	Start Time	End Time
1	0s	0.6s
2	0.6s	1.2s
3	1.3s	1.8s
4	2.2s	2.7s
5	2.8s	3.4s
6	3.5s	4.2s
7	4.2s	4.8s
8	4.9s	5.6s
9	5.6s	6.1s

Now play the sound again. Notice that sounds 1 and 2 sound similar to sounds 4 and 5, and that sounds 3 and 9 sound different from the others. Let's use the Plot Spectrum to investigate this further. Use the cursor to select sound 1 and then go to Analyze ->Plot Spectrum. You should see a spectrum that looks similar to this:



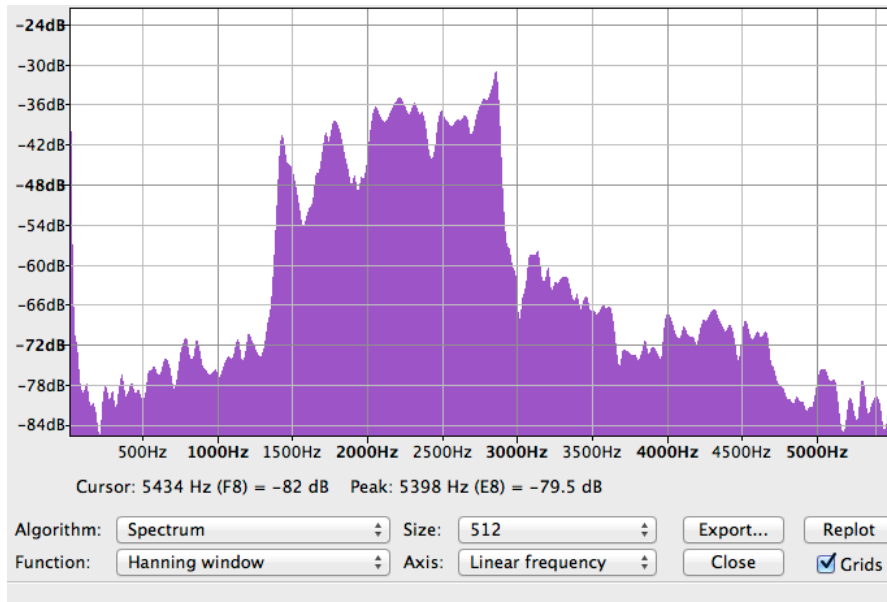
Use the cursor to determine the peak frequency. Note that it is approximately 2779 Hz.

Now repeat the same for sound 2. You should get a plot that looks like this:



Use the cursor to determine the peak frequency. Note that it is approximately 2623 Hz. Also notice how the frequency spectrum plots for sound 1 and sound 2 are similar.

Now repeat the same for sound 3. You should get a plot that looks like this:



Use the cursor to determine the peak frequency. Note that it is approximately 2853 Hz. The peak frequency of this sound is more than 230 Hz greater than the peak frequency of sounds 1 and 2, which is why sound 3 sounds different than sounds 1 and 2.

The Plot Spectrum tool allows you to investigate similarities and differences in the frequency structure of sounds. What do you notice that is the same among all three sounds? What is different among all three sounds?

Next Steps

Now that you have learned the basics of using Audacity, explore sounds and have fun! Record your own sounds or download sounds. Use the tools to measure and plot characteristics of sounds. Can you think of hypotheses you'd like to test using these methods?