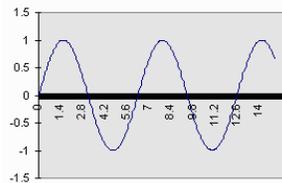


## Creating Audio for the Classroom

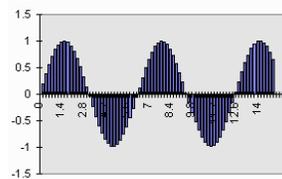
Incorporating sound into a classroom involves recording the original sound and digitizing it into an appropriate format for importing.

Sound fills the air all around us, and our ear is working all the time to filter out unimportant sound from our consciousness so we can pay attention to the important information. This means that we are largely unaware of how much sound surrounds us at all times. If you concentrate on what you hear, you will find that silence is very hard to find.

All sounds we hear with our ears are pressure waves in air. These waves can be captured when they vibrate the membrane of a microphone and can be re-created by the amplified vibrations of the membrane in a speaker. An analog recording of sound, such as on a phonographic record or cassette tape looks like this:



Digital recordings take a sample of information from the wave at regular time intervals. The more samples the more precise the recordings, the higher the digital quality. It would look like this:



*Sample rates* are measured in hertz (Hz) or cycles per second. The most common sample rates measured in Hz are 8000, 16000, 22050, 44100, 48000, 96000 and 192000 or 8Hz, 16Hz, etc. The rate most frequently used in recordings is 44.1Hz and computer sound cards tend to default to this rate. Next the sample is represented in bits of information such as 8 bits or 16 bits per sample. As you can imagine this sampling creates a huge sized file. An hour audio file might have 6 billion bits of information or 800 MB. A raw WAV file (Microsoft creation) like this can be compressed into something smaller by different compression techniques. An MP3 file compresses the bits by removing sounds bits not heard by the human ear and connecting the samples together.

For example, for a 5 minute recording: WAV =52.4 MB    MP3=4.7MB.

The WAV file has lots of details and more pure sound.

The MP3 file is a more universal file for all the different devices students might use to view Blackboard.

## Microphones

A microphone does not have an intelligent filter, so it will pick up every bit of sound in the area (depending on how sensitive it is). By carefully preparing your recording environment, you can eliminate a lot of the background noise that might otherwise spoil your soundtrack. Getting a clean recording at the outset will mean less work trying to fix problems later. Your microphone should be suited to your recording equipment and to the sort of recording you are doing. Poor quality equipment or a noisy environment will introduce **noise** into your recording, interfering with the **signal** that you are trying to capture. Basically, **signal** is what you want, **noise** is the sound you don't want.

Microphones can be **omni-directional** (would pick up several people talking), or **uni-directional** to pick up a person in one general area (such as a laptop microphone). **Clip-on** microphones can do a great job recording individuals in conversations because they are placed so close to the person's mouth but can cause "p's and b's" to include a popping sound on the recording. **Table** microphones can pick up the sound of someone touching or bumping into the table, shuffling papers, etc., so subjects need to take care if you use these.

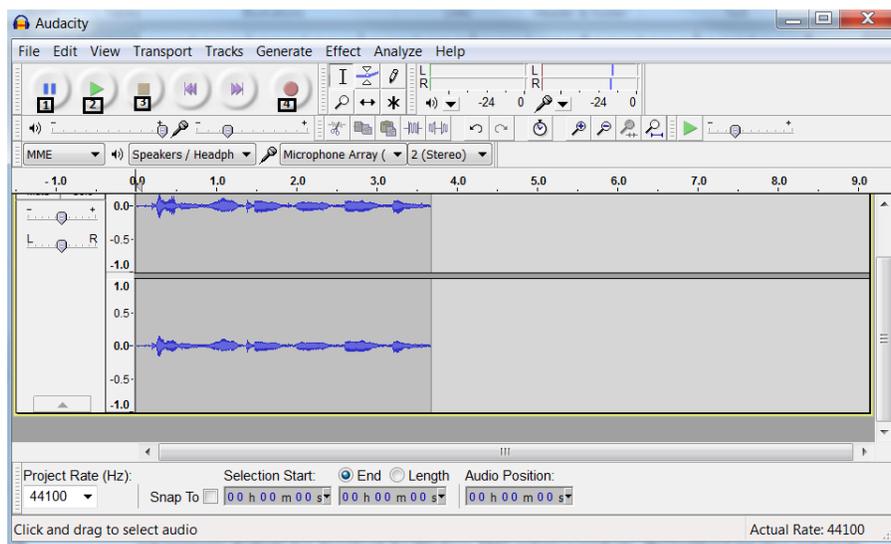
A good headset with microphone using a USB input is one of the best devices for recording.



If a microphone's specifications include "signal to noise ratio", a high signal to noise ratio will produce better sound.

### Recording the Audio

For the recording of basic classroom lectures, comments, or simple music, **Audacity**, a free ware product is a good choice. There are several different software products that will cost you \$\$\$ to record audio but spending money is not necessary. Audacity has downloads for Windows, MAC and Linux products. The tool bar is intuitive and simple to learn. Download [here](#).



You can get started almost immediately. It usually picks up your microphone and speaker settings on the computer automatically. You can change those options if you have several to choose from.

It is a good idea to type out what you want to say in transcript form. There are several reasons.

- If you are reading you don't put in 'umms and ohhs';
- you tend to speak smoothly;
- By SACS and DOE standards all classrooms [face to face and online] must provide transcripts for audio to any student with accessibility issues. Not just hearing impaired, but those who have an auditory processing issue (so they hear but confuse words). Over time we will start to require this.

On the audacity page:

1. Click #4 to record
2. click #1 to pause in mid recording
3. Click #3 to stop
4. Then Click #2 to play and listen to what you recorded. The tracing seen in purple above is the voice tracing. This tracing is less than 4 seconds long. (numbers above the tracing).

Once you like the recording you have made you want to save the original recording as an Audacity project (AUP). Then 'export' the recording as either a WAV or a MP3 file. You can name this file for easy recognition.



14000Welcome.wav

Example:

