



## Music Technology Lessons

A student favorite is the 'Experimenting with Sound Waves' Lesson. They will ask to do this again and again.

### Lesson 005

#### DATES \_\_\_\_\_

The 2nd through 5th Grade students receive one 40 minute lesson per week.

Lessons © [www.musictechteacher.com](http://www.musictechteacher.com)

#### Objectives:

- \*Students will continue to expand their own composition (ABA song form) using the notes in the C Major Scale, and the keyboard and sequencing software on the computer to playback the song.
- \*To complete pp. 20-32 in the Alfred Basic Piano Library Level 1A (varies based on student level).
- \*To complete one or more Lessons in Music Ace 1.
- \*To complete one or more quizzes on our web site and report scores to the teacher.
- \*To complete a brief study on sound waves and applications.

#### Materials:

Alfred 1A Piano Books, keyboards and related equipment, computers (with or without Internet access), printer, Sibelius or Music Time Deluxe and Music Ace 1 software and teacher's manual, computer microphones, CD-R disks.

**Procedures:** Students should learn what a sound wave is and how it is used in computer applications. Follow this link to review brief definitions. Notice the sound wave lesson graphics below. Students will use a microphone to record their voices into the Sound Recorder program on a Windows computer. Adjust the volume as needed.

Let the student experiment with the sound wave by pressing 'Effects' and 'Echo, Reverse, Increase and Decrease Speed'. The student should save their work in My Documents. Explain to the students how the digital version of their voice, the sound waves, are produced and recorded to CD's. Many times, the teacher will have to change the 'Properties' of the sound wave to CD quality audio format in order for it to be recorded to a CD-R disk. If time is available, record the voices to a CD and play it back in a regular audio CD player. Tell the students about the differences in MIDI and sound wave files. MIDI files have to be converted to sound waves using a mixer and other instrument, such as a keyboard, to record the file as a sound wave into the computer before it can be recorded to a CD.

**Wave** - (Waveform) - The shape of a sound produced by an oscillator that determines the timbre of the sound. Waveforms include sine, pulse, sawtooth, square and triangle waves. (Sound Wave) - the shape of a sound, which can be described by showing it on a graph. When something vibrates, variations in air pressure create vibrations and are transmitted as a sound wave. Different sounds have different shaped waves.

Demonstration of sound wave recorded by a student (first name only - our waves were longer than the audio files on this website).

Brittany's sound wave (normal speed 26KB).

**Volume Control**  
Computer volume and mic controls

**Properties for brittany.wav**

Details

brittany.wav

Copyright: No Copyright information

Length: 1.97 sec.

Data Size: 43490 bytes

Audio Format: **PCM 22.050 kHz, 8 Bit, Mono**

Format Conversion

To adjust the sound quality or use less space for this sound, click Convert Now.

Choose from: All formats

Convert Now...

**brittany - Sound Recorder**

Position: 0.49 sec

Length: 1.97 sec.

**Sound Wave Graphic**

brittany - Sound Recorder

File Edit Effects Help

Position: 0.49 sec

Increase Volume (by 25%)

Decrease Volume

Increase Speed (by 100%)

Decrease Speed

Add Echo

Reverse

**Audio format may have to be changed to CD quality for the sound to be recorded to a CD.**

**Sound Effects change the speed or other aspects of the sound wave.**

**Ask students to notice.....**

- What kinds of 'shapes' are made with the digital form of their voice on the computer?\_\_\_\_\_
- Does your voice sound different than you think it does when you are speaking?\_\_\_\_\_
- Does the sound wave that you made look like the sound waves that other students made?\_\_\_\_\_
- Why?\_\_\_\_\_
- What are your favorite 'effects' for changing your sound wave?\_\_\_\_\_
- What happens when you speed up / slow down the sound wave?\_\_\_\_\_
- Can a MIDI sound file be recorded to a CD like a digital sound wave?\_\_\_\_\_
- Are sound waves larger in file size than MIDI files?\_\_\_\_\_
- Can you find the starting point and ending point of your voice on the sound wave graphic?\_\_\_\_\_

 Brittany's sound wave (fast 12KB).    
  Brittany's sound wave (slow 51KB).



### Compositions

Students should continue to expand their compositions in ABA song form. Remind students that ABA means you will write one section of the composition (Part A), then write something different than your first section (Part B), then write the first section of your song again (Part A). In other words, Part A 'repeats' or is played twice. Write your composition using notes in the treble clef starting with Middle C or higher, and use notes in the C Major Scale. We will continue to have 2 staves or instrument voices playing. The students should not try to write the longest song in the world. Ask them to limit their composition, for now, to 48-60 measures.

The students should be reminded that the sounds on their Casio MIDI keyboards will NOT sound the same as the 128 General MIDI computer voices unless the sound is played back through the computer speakers. This can be confusing to the students at first, especially young students. The teacher should reinforce the differences (General MIDI / MIDI) by example if the students do not understand the concept yet.

Music Ace 1 - Students will continue to progress at their own pace through the lessons on the computer. Teacher will assist with students and their questions. Some students will have completed Lesson 5 or higher by this time.

**Alfred Basic Piano Book 1A** - If time allows, students will work individually on pages 20-32, with assistance and demonstration of notes and technique by the teacher.

### Extra Activities:

Follow this lesson with the new Sound Waves and Cartoons Lesson.

Work on musical skills through some of the quizzes and games on the Music Tech Teacher Quizzes and Games pages. Choose games according to the skill level of the students. There are several quizzes available for studying lines and spaces, rhythms, and skips, steps, repeats. There are a few 'Flash' based quizzes that use sound waves.

If students continue to complete the Music Ace Lessons successfully, they might work in the Doodle Pad section, learning to 'compose' their own melodies. These melodies can be saved but not printed. Post student compositions on the Student Work pages of this site.

**Notes:** \_\_\_\_\_



**Evaluation:**

\*Students will be able to successfully perform all of the exercises on pp. 20-32 of the Piano Level 1A Lesson Book.

\*Students will be able to name and play the notes to the C Major Scale and use those notes to complete a composition in ABA form, using 2 staves, the General MIDI sound sheet, no longer than 48-60 measures.

\*Students will successfully complete Lesson 5 or higher in Music Ace 1, and will print a Progress Report of their work to give to the teacher and to their parents.

\*Students will know how to use a microphone and the "Sound Recorder" in Windows to create a sound wave of their voice. Students will save their sounds to the computer and will demonstrate an understanding of what happens to the sound wave when they use 'effects' to change the waveform.

Notes: \_\_\_\_\_

**Lessons © [www.musictechteacher.com](http://www.musictechteacher.com)**