



Lesson 012

DATES _____

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

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SoundTree provided a microKORG to the Music Technology Lab at Central Park School for the 2003-2004 school year. Our PTA purchased the synthesizer for us at the end of the school year. The microKORG is a synthesizer offering a variety of tools for performers, producers, computer musicians and beginners alike. The microKORG delivers modeling synthesis, vocoding, real-time control, on-board effects, and external audio processing. The microKORG's 37-mini-key compact chassis also makes it ideal for the musician or DJ working in a limited-space environment. Students at Central Park using the vocoder for the first time will leave saying "so THAT'S how it's done!"...in reference to sound effects in contemporary songs on the radio. Thank you to the Central Park PTA for purchasing the microKorg for our lab in May, 2004!



Objectives:

- *To learn the definition and characteristics / features of a synthesizer / vocoder.
- *To learn how to connect the synthesizer to speakers and the computer.
- *To learn how to record the sounds and their voices into the computer using software and the synthesizer.
- *To continue the study of sound waves and applications through a synthesizer / vocoder.
- *To continue Lessons in Music Ace 1 and Piano Lessons in the Alfred Basic Piano Lesson Book (individual progress).

Materials:

Alfred 1A Piano Books, Music Ace 1, keyboards and related equipment, computers (with or without Internet access), printer, computer microphones, microKORG keyboard, editing software (Data Becker Music Center Live or Sony Acid Music Studio).

Procedures:

Articles and other resources about using these instruments in education are available through The Resource Guide from SoundTree. One of our lessons using a synthesizer included making a recording of the Central Park Creed using the vocoder. (Click here to view / hear the original version of the Creed.)

Describe and demonstrate the features of the microKORG and how to connect the cables for various recordings.



Synthesizer - an instrument that generates sound by the creation and manipulation of artificial waveforms.
Vocoder - A vocoder is an audio processor that captures the characteristic elements of an audio signal and then uses this characteristic signal to affect other audio signals. The technology behind the vocoder effect was initially used in attempts to synthesize speech.


Students should review the definition of a sound wave and how it is used in computer applications. (Brief definitions.) Notice the sound waves in the graphics below. Students will use the microphone (to vocoder) to record their voices into the Data Becker Music Live or Sony Acid Music Studio program on the computer. Adjust the volume as needed. Let each student record their voice using the microKORG vocoder. They can experiment with the sound by changing the knobs on the keyboard for modulation, pan, attack, reverb, release, etc.

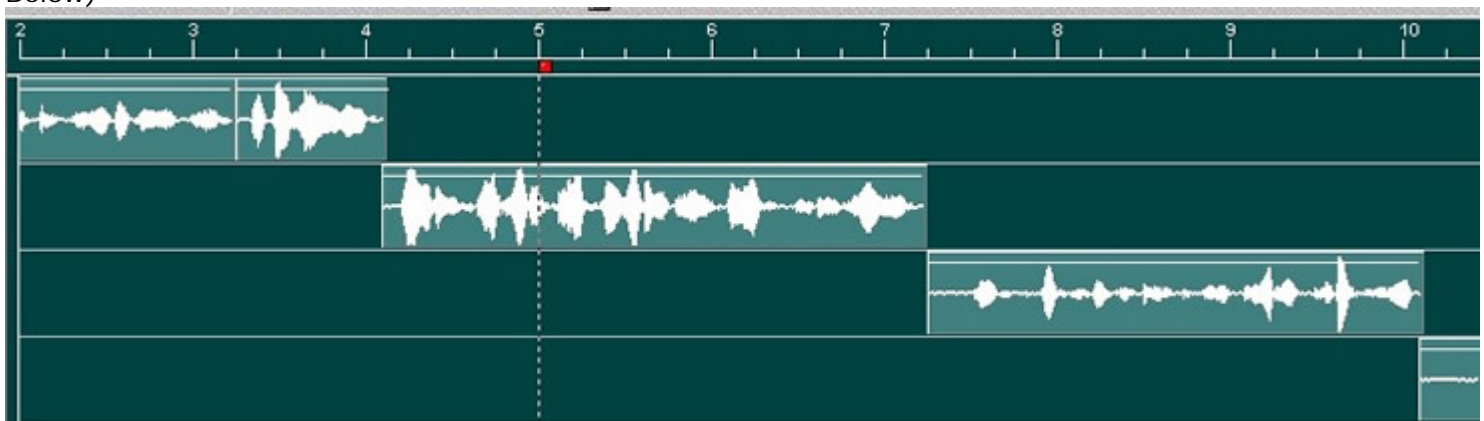
The student should save their work in My Documents. Teach the students how to save the file as a wav (wav) file, then as an MP3 (.mp3) file. If there is a problem with the volume being too loud as it is recorded into the computer, an inexpensive audio mixer can be used. The MP3 format will have to be used on the Internet because it takes up much less space than a wave file. Students need to write down the settings that they used on the microKORG so they will remember their favorite sounds the next time they use the synthesizer.


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.

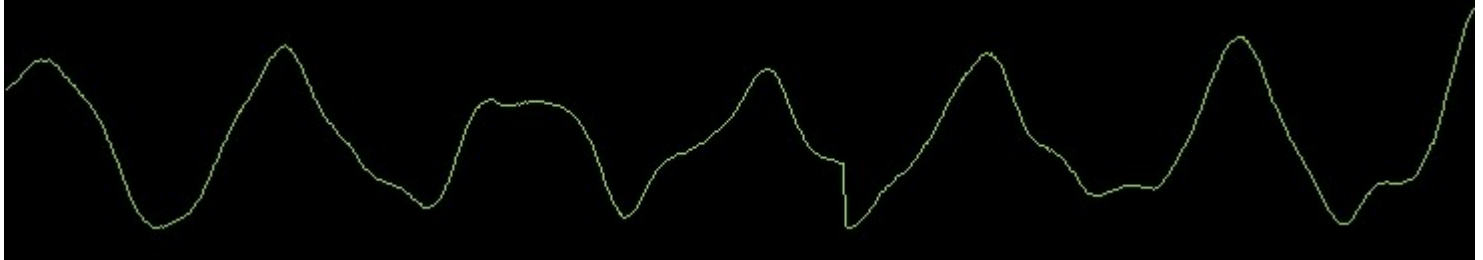
Sound Wave - the shape of a sound, which can be described by showing it on a graph. When something vibrates, variations in air pressure create vibrations and are transmitted as a sound wave. Different sounds have different shaped waves. If you have a recent version of the Windows Media Player, you can set it on 'Bars and Waves - Scope' to see the sound waves as you would using an oscillator (see graphic below).
 Sound FX Examples Using the Vocoder (MP3 Format):

 [Central Park Creed 305 KB MP3 \(Data Becker Music Center Live and the microKORG used to record this MP3\)](#)

 [Central Park Music Technology Class 165 KB MP3 \(Data Becker Music Center Live Wave File Graphic Below\)](#)



 Central Park Music Technology Class 33 KB MP3 (Windows Media Player Wave File Graphic - Bars and Waves - Scope)



Questions to discuss with students:

- What is a synthesizer?
- What is a vocoder?
- What does the vocoder do to your voice?
- What device do you need to get your voice into the vocoder?
- Do any of the sounds made with the vocoder sound like something you have heard on the radio recently? Examples?
- What kinds of things happen to a sound when you adjust the knobs for reverb, attack, release, resonance, modulation, and others?
- Does the synthesizer record your song? If not, how do you record the sounds from the synthesizer?
- Compare two or more sound waves that you record into the computer. Notice the visual shapes of the sound waves. What kinds of shapes are made depending on the sound, volume, etc?
- Can you connect other devices with sounds to the synthesizer?
- Can you record multiple sounds from the synthesizer into the computer to make a song? At once or separately?
- What kinds of careers today involve use of synthesizers? (i.e. D.J.'s, recording studio engineers and effects artists, etc.)
- What are your favorite types of sounds and effects on the synthesizer?
- Why can you find so many MP3's on the Internet now and less wave files? (i.e. SIZE of the files)



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.

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

Extra Activities:

Look for additional information on: 1) sound waves and shapes on the Internet; 2) synthesizer patches or sounds to be used on the computer; 3) early model synthesizers; 4) the creators of synthesizers; 5) how synthesizers are made / work.



Extra Activities:

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: _____

Book Resource - What's A Synthesizer? 2nd Edition by Jon Eiche

Evaluation:

- *Students will be able to successfully perform all of the assigned exercises in the Piano Level 1A Lesson Book.
- *Students will successfully complete one or more Lessons 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 vocoder 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' on the synthesizer to change the waveform.
- *Students will describe some of the features of a synthesizer and what happens to the sounds when elements are changed.
- *Students will demonstrate how to connect the microphone to the synthesizer and how to connect the audio into the computer.

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