MIDI sequencing in the elementary classroom

Jann M. Bradshaw
Rowan University

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MIDI SEQUENCING IN THE ELEMENTARY CLASSROOM

by

Jann M. Bradshaw

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Arts Degree
Of
The Graduate School
At
Rowan University
May, 2002

Approved by

Professor

Date Approved: May 2002
ABSTRACT

An abstract of the thesis of Jann M. Bradshaw
For the Masters in Education Program, Computer Emphasis
Title: MIDI Sequencing in the Elementary Classroom
Louis Molinari, Program Advisor
May, 2002

The purpose of this project is to provide students and educators
with an easy to follow manual that will help them learn and successfully
participate in MIDI sequencing in an elementary educational and personal
setting.

Research for the study involved the review of the New Jersey Core
Standards and national standards for music and music technology in
education. Music technology websites for educators were also reviewed.

A case study group of seven fifth grade students was formed for the
project. This group was known as the Music Technology Club. The
purpose of the group was to learn MIDI sequencing through the use of a
MIDI keyboard and a computer sequencing program. Various MIDI
sequencing manuals were consulted for reference and further
understanding of the subject.
During the course of the project students learned basic sequencing procedures and successfully created multi-track sequences. The manual was written and revised throughout the project based on student observation and the writer’s personal participation in the learning process.

A MIDI/music technology resource website was developed that can be utilized by educators and students who are developing their skills in MIDI sequencing and for educators who are interested in implementing MIDI sequencing activities in the elementary classroom.
The purpose of this project is to provide students and educators with a manual that will help them successfully participate in MIDI sequencing in an elementary school and personal setting.

Students learned basic sequencing and successfully created multi-track sequences. A manual was written based on student observation and the writer’s personal participation in the learning process. A MIDI/music technology resource website was developed.
Acknowledgements

The following people have been very instrumental in assisting me with this ambitious project. I would first like to thank my advisor, Dr. Louis Molinari, for his help and guidance not only with this project, but for his encouragement and support throughout my efforts to achieve a certification and ultimately the masters degree. He has been a patient and positive force that has made it very easy to feel confident and enthusiastic about my goals.

I also thank my family for their patience and encouragement during this entire ten-year process. There have been bumps and dips along the way, but we’re all still talking! My children may have even learned a thing or two about the importance of life-long learning. I’m sure my husband is the most pleased to see this goal come to its fruition!

Others whom I would like to thank for helping me with this project include:

John Rivera, Musician and Sales Manager, Sam Ash Music, Cherry Hill, New Jersey for his support and time.

Pat Lucas, Principal, Van Zant Elementary School, who willingly provided funding, in addition to her usual encouragement and support.

Carl Jacobson, director of Marketing Communications, Cakewalk, who responded to our funding concerns by allowing us to load Home Studio on additional computers at no cost. He also expressed Cakewalk’s interest in the outcome of the project.

Patricia Bradshaw, Recording Engineer, a graduate of Full Sail Real World Education, for her guidance and support. She also participated in the evaluation of the manual and volunteered her time to assist with the Music Technology Club in its weekly meetings.

Cindy Wasdick, Music Teacher, Van Zant Elementary School for her support and time in the evaluation process of the manual.

John Bradshaw, Computer Analyst, for his continued technical support throughout the entire multi-year process. You can well imagine the need for such support, not to mention the convenience of a live-in technician!

Jann Bradshaw
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The importance to our society of training in the arts is well established. The commitment to developing desired skills is now evident in national and state standards.

MENC, The National Association for Music Education, in its description of national music standards, emphasizes the vital importance of arts education to society, stating that it can build many kinds of literacy, while "developing intuition, reasoning, imagination, and dexterity into unique forms of expression and communication." Studying the arts, MENC says, can stimulate a child's natural creativity. Even more impressive is the discovery of the carry over from the arts to the sciences and humanities. MENC states that the "intellectual methods of the arts are precisely those used to transform scientific disciplines and discoveries into everyday technology".

The National Standards for Music, grades K-4, state that "Performing, creating, and responding to music are the fundamental music processes in which humans engage." The standards go on to list the ways in which students can pursue these processes in an educational setting. Activities include performing on instruments, improvising melodies, composing and arranging. In grades 5-8, musical development (and the musical experience) becomes even more critical. A deeper understanding of music enables students to begin making connections and understanding relationships between music and other disciplines. The National Standards emphasize that "every student should have access to a balanced, comprehensive, and sequential program of study in music." (MENC National Standards)

The New Jersey Core Curriculum Content Standards for Visual and Performing Arts declares its profound support for student training in the arts by stating that "our economic well-being and ability to compete and cooperate in the global marketplace require that our students learn to develop original ideas, increase their ability to solve problems, and interact in partnerships – skills inherently learned through the arts."

In recent years music educators have had new methods available to them for the delivery of musical experiences to students and for the development of required standards. These methods involve the use of technology. Music educators have grown more and more aware of the role that music technology can play in motivating students and enabling them to achieve in ways never before possible.

Music technology is increasingly becoming a viable and desirable method of teaching and developing of music skills, especially as it relates to the achievement of educational music standards at all age levels. In particular, the development of MIDI, Musical Instrument Digital Interface, has permanently changed the way we create,
produce and enjoy music (*The MIDI Companion, 1994*). Because of MIDI technology, it is possible for computers and MIDI compatible instruments to communicate, making these new teaching methods possible. With MIDI, a musically talented individual, with little or no formal training, is no longer at the same disadvantage that she once was when it comes to musical expression. MIDI is now a standard on millions of instruments, including keyboards, guitars and even wind instruments such as the flute. MIDI books and Internet websites abound. One recent Internet search with the keyword “MIDI” brought over five million hits.

**History of MIDI**

How was MIDI developed? The precursor to the development of the MIDI standard was the electronic synthesizer of the ‘sixties and ‘seventies. These early electronic instruments were based on analog electronics and were monophonic because they could play only one note at a time. Needless to say, it took hours and hours of time to produce a “patch” of sounds for a single performance! In the mid nineteen seventies the Oberheim company developed a polyphonic keyboard that was able to play four notes at a time! Soon new developments brought synthesizers that had a computer chip for built in memory. This also allowed the synthesizer to produce more sounds. Next came the ability to connect several instruments to each other, allowing for the layering of many sounds for a performance. Around this time came the emergence of the digital synthesizer. This meant that a performance could now be recorded and played back on an electronic instrument. By the early ‘eighties, electronic instruments were in mass production, being manufactured in not only the US, but in Europe and Japan as well.

Just as the computer industry had reached a need during its development, for standard compatibility, so had the electronic music industry. In 1982, during an annual convention of the National Association of Music Merchandisers (NAMM), a proposal was discussed that would create a universal standard between all types of electronic musical instruments. This standard came to be known as Musical Instrument Digital Interface, or MIDI. Japan introduced the first MIDI keyboards in 1983.

MIDI’s developers were proactive as it was designed with room for growth and improvement. It is now a universal standard that knows no competitors and is used in many fields such as theatrical lighting, computer games and recording studio automation. (*The MIDI Companion, 1994*)

**Importance and Benefits of MIDI Technology for Education**

Recognizing the possibilities that MIDI technology had for music education, MENC incorporated into its national standards a guide for implementation through the use of technology. Entitled “Opportunity-to-Learn Standards for Music Technology”, the
The purpose of the guide is to aid educators in helping students achieve National Standards for Music Education.

Included in the guide are additional standards for grades one through six. Following is the standard that applies to the use of MIDI technology in the classroom:

"In every school the following are available for use in music instruction: microcomputers and appropriate music software, including notation and sequencing software; printers; sufficient MIDI equipment; multiple electronic keyboards; synthesizers; CD-ROM-compatible computers; and music related CD-ROMs..."

In support of MENC’s development of technology standards and due to the recognition of the profound importance of technology to music education, a new organization was formed in 1995. **TI:ME, Technology Institute for Music Educators** was formed to “codify technology into a cohesive set of standards.” TI:ME, a national organization, provides support for music technology educators, including a technology certification program, publications and a comprehensive in-service curriculum for staff development. Their website provides comprehensive online support to its members, as well as numerous resources for music technology. TI:ME has four main goals, summarized below:

- Develop standards for music technology in-service teacher training
- Develop course materials for music technology in several specific areas
- List and define skills required to obtain proficiency in the understanding and use of technology in teaching
- Provide a forum for discussion, research, and development for music educators

Through a review of literature on the topic of music technology in the classroom and a case study involving a small group of fifth grade students, many impressive advantages of the use of (MIDI) technology are apparent.

Several general benefits are listed below:

- Provides unlimited creative musical opportunity
  
  *(Internet, George Pinchock, [http://www.lentine.com/articles/It’s%20about%20TIME.htm](http://www.lentine.com/articles/It’s%20about%20TIME.htm), Feb. 23, 2002)*

- Captures the imagination of students and provides motivation for learning
  
  *(Internet, Don Muro, [http://www.lentine.com/articles/Technology,%20A%20Tool%20For%20Music%20Education.htm](http://www.lentine.com/articles/Technology,%20A%20Tool%20For%20Music%20Education.htm), Feb. 23, 2002)*
• Attracts a variety of talented students who don’t currently participate in
the traditional public school music programs (Internet, Rocky J. Reuter,
23, 2002)

• Allows individualized instruction enabling students to develop at their
own rate

• Enables students of many music abilities and skill levels to perform on
instruments, alone and with others

• Allows students to effectively improvise melodies, variations, and
accompaniments

• Provides an opportunity for students to compose and arrange music

• Promotes easy access to MIDI files for listening, analyzing, and describing
music (National Music Standards,

• Promotes easy access for modifying songs and compositions from
the Internet (NYU Music Technology Education,
http://homepages.nyu.edu/~rjc223/MusicTechandEd/mtmeFram
eSet.html, Feb. 22, 2002)

• Affords students the opportunity to evaluate music and music
performances (National Music Standards,

• Increases levels of student interest and voluntary participation

More specific benefits include:

• Provides ability to transpose songs and compositions to any key
without affecting tempo

• Allows young and/or inexperienced students to record again and
again until they have reached a level of success

• Allows for easy correction of errors
• Allows for changing the tempo of songs and compositions without affecting pitch


Description and Purpose of the Project

In an effort to obtain information on instructing young students in MIDI sequencing it was found that few instructional materials are available. There is an apparent need, especially at the elementary level for these types of guides. This project is an attempt to provide students and educators with an easy to follow manual that will help them learn and successfully participate in MIDI sequencing.

Based on the understanding of the benefits that the use of music technology has for young students, this project was developed to achieve the following goals:

• Study the response of young students to the use of technology for music expression
• Develop a manual that enables students to experience and learn about music independently
• Develop a manual that is available and useful to music educators who are incorporating a MIDI unit into their curriculum
• Encourage and support educators new to MIDI technology and provide them with basic training so that they may use technology to deliver music experiences and develop music standards
• Encourage and enable students to use technology to experience, create, perform, appreciate and express themselves musically
• Provide an Internet resource that would be useful to students and educators working with MIDI sequencing and music technology

This project involved the use of several multimedia computers, MIDI keyboards and MIDI sequencing software.

Summary

It is well understood that technology drives the music industry. This is now evident in the methods used in music studios to produce artists and live shows, both professional and amateur. It can be seen daily on Internet websites where wave, MIDI and MP3 files abound. Retail music stores carry a plethora of music technology items
from drum machines, to sequencers, MIDI time pieces, software, MIDI keyboards and guitars.

Schools have been making an attempt for several years now to catch up to the business industry and its use of computer technology. Major funding efforts and community support have enabled staff training and the integration of computer technology into the classroom and the curriculum.

Now it is time for music educators to realize that this same technology is being applied to their field of work, and is needed in their teaching programs to give students the musical experiences and the tools they need to perform and be productive in a (music) technology based global community.
Chapter Two
Review of Literature and Description of the Project

Background

The emergence of music technology and its usefulness in (music) arts education has garnered support from numerous music education organizations and advocates. This support and endorsement has encouraged MENC, the National Association for Music Education to develop standards for the implementation of music technology in schools, beginning at the preschool level and continuing through high school. The “Opportunity-to-Learn Standards for Music Technology” is an addendum to the 1994 release of the “Opportunity-to-Learn Standards for Music Instruction”. It provides specific information about what equipment schools should buy and how to allocate their resources.

In its standards for technology MENC addresses specifications for these four areas:

- Curriculum and Scheduling
- Staffing, Equipment
- Materials/Software
- Facilities

Recommendations were made for both minimal and desired programs. For the purposes of this project standards for grades five and six were used.

Curriculum and Scheduling

Schools would provide regular instruction integrated with effective and appropriate technology. Curriculum would include activities to help students achieve skills listed in the National Standards for Music education. Software and hardware would be based on achievement goals established for students. Music classes would have the same opportunity to utilize the technology lab as other disciplines. Special needs children will have access to the same technology-based instruction as other children, as well as any specially needed devices.

Staffing and Staff Development

A minimal program would require ongoing staff development at various levels according to current staff proficiencies. Teachers would have access to email for research and other communication needs. Technical support and colleague mentoring would be available. Ample time would be allowed for development of curriculum.
desirable program long-range goals for staff development would be in place. Internet based staff development would be provided. Teacher assistants would be available to work with students in a lab situation.

**Equipment**

In a minimal program setting music classrooms would be equipped with a multimedia computer and devices such as CD/DVD ROMs and basic MIDI equipment. The school computer lab would also be equipped with a MIDI keyboard and headphones. A video display would be available for class presentations. In a desirable program there would be additional multimedia computers in the music classroom, and perhaps a separate keyboard lab that includes equipment such as various MIDI controllers, scanners and digital cameras.

**Materials/Software**

In a minimal music technology program there would be software titles to develop listening, analyzing, reading and describing music. Plans to upgrade should be included. Several titles should be available for children to create, improvise, compose, and perform music. Internet access and browsing software should be provided. In the desirable music program the software library would include the following programs or information:

- Software for generating music arrangements
- Programs with MIDI accompaniment files
- Sequencing/notation software
- Digital audio editing software
- Web authoring software for music teachers

**Facilities**

At minimum there would be space to house a multimedia computer with Internet access. In addition, students would have access to the school’s computer lab. What is even more desirable is for the school to provide space in the music classroom for multimedia computers with Internet access.

**Other Literature and Resources**

Following is a list of other organizations who’s websites were reviewed for this of music technology in the classroom. All of these organizations provide Internet resources that are easily accessible to educators.
The Association for Technology in Music Instruction (ATMI)

This organization serves as a forum for the “scholarly presentation of technical information by and for specialists in the field of computer-assisted instruction (CAI) in music”. ATMI prides itself in its well known project, the yearly publication of its Music Technology Directory. This Directory contains “one of the most extensive compendiums of freeware, shareware, and commercial software for music and music instruction.”

Lentine’s Music Technology Online Magazine

The following articles were provided and reviewed for this project:

Technology: A Tool For Music Education
Don Muro

"Just Do It"...Advice On Getting Started With Music Technology
Douglas Smith

TI:ME
George Pinchock

Dream and Plan into the 21st Century: Computer Music Lab Brain Storming
John Kuzmich, Jr.

Further articles that were not reviewed for this project include:

Maximizing The One-Computer Music Classroom,
Basic MIDI Connections, by Rick Long
Setting Up a MIDI Studio, by Rick Long
MIDI Basics for Music Educators: Let's Not Make This Difficult, by Dr. Rocky J. Reuter

Included at the end of this section is the full version of each of the following standards:

- The National Standards for Music Education from MENC
- Opportunity to Learn Standards for Music Technology from MENC
New Jersey Core Curriculum Content Standards for Visual and Performing Arts (no music technology standards have been incorporated as yet)

Description of This Project

The two basic purposes of this project were to teach young students how to create MIDI sequences and to create a useful manual that would be self-teaching in nature for both students and educators.

This project is also an attempt to engage young students in the use of music technology, specifically MIDI, for the purposes of achieving state and national music standards and developing a sense of personal music appreciation through self-expression, shared learning and independent exploration.

For this project the Cakewalk, Home Studio 2002 program was chosen. It is regarded, by retail music suppliers, as a popular, easy-to-use product, with a variety of powerful features that appeal to both professional and amateur musicians. (Sam Ash, Inc., December, 2001)

The components of this project are as follows:

1. Instructional Manual

   The main focus of the project was to create a MIDI sequencing manual for young children, aged ten and up. This manual would be easy to follow and allow young children to participate in MIDI sequencing with limited help from adults. It is also recommended for teachers and adults who are just beginning to learn about or teach MIDI sequencing and music technology. It is an attempt to introduce only the basics of MIDI sequencing, leaving more advanced recording techniques for another volume!

2. Study Group/Music Technology Club

   In order to develop the manual and test out its effectiveness, as well as garner ideas for how to best develop the lessons in the manual, the next part of the project was developed. It consisted of a small group of fifth grade students who had some piano training. This group of seven students became known as the Van Zant School Music Technology Club. It turned out that some of the students had very little piano training, which presented some interesting challenges. The group consisted of the following students: (Names have been changed to insure confidentiality.)

   Cloe – a bright, quiet, talented and conscientious girl who has studied piano for about five years. For her first sequence she chose a classical piece she had learned during her piano lessons.

   Amy – a musically talented girl who had taken piano lessons for a few years, but
was no longer doing so. She plays the saxophone and is in the school band. She brought Greensleeves for her first sequencing project.

Brandon – a special needs student with multiple learning disabilities who has studied piano for about five years. He also plays the violin. Brandon writes classical pieces and has tremendous music talent, despite his learning disabilities. He brought a Bach piece to learn but quickly began to create his own pieces.

Charlie – a very intelligent boy with a tragic family history. He said his father had “home schooled” him in piano. Charlie has ability but was challenged due to his limited piano skills. He enjoyed the technical aspects of MIDI and the computer.

Jimmy – had few skills and limited ability. His mother is a pianist. He and Charlie often worked together. Jimmy liked being a “guinea pig” and working with existing MIDI files. He is in the school band and plays the trombone.

Alyssa – Alyssa is a bubbly tiny girl who has limited piano training, but seems to have rhythm ability and an ear for music. She often worked with Cloe. She didn’t show up in the beginning weeks, but gradually started to come regularly.

Nancy – a talented girl who plays the clarinet, but has innate music ability. She often worked with Amy.

3. Equipment

The computer lab was to be used for the club activities. It consisted of 25 multimedia Compaq computers. Each had a 667 Mhz processor, 64 MB memory and 10 Gig hard drive.

Five MIDI compatible keyboards were obtained. Four of them had the standard 61 full-size keys. Here is a listing of each keyboard and some of their features:

**Yamaha PSR 195**
- Large multi-function LCD display
- 100 panel voices
- 100 styles of auto accompaniment
- Metronome
- Yamaha Education Suite Minus One
- 100 Preset songs

**Yamaha PSR520**
- Large multi-function LCD display
- 141 panel voices
• Digital effects (Reverb)
• 32 note polyphonic
• 100 styles of auto accompaniment
• Song recording (sequencer)
• Multi pads
• Registration memory
• Yamaha Education Suite Minus One
• Harmony echo effect

**Yamaha PSR530**
• All the features of the PSR520
• Over 690 Digital voices/200 panel voices
• Extended “custom” auto-accompaniment features
• Built-in five-track sequencer
• Music cartridge plug-ins for additional song libraries

**Casio CTK-471**
• Large multi-function LCD display
• 100 panel voices
• 100 rhythm patterns
• 12 note polyphonic
• 100 songs

**Musicstar Mini-keyboard (no longer being manufactured)**
• 37 notes
• Packaged with four software programs
  • Private Lessons (Teaching program)
  • Jam Session (Guided recording with no mistakes)
  • Recording Studio (4-track MIDI recording sequencer)
  • Music School (history and theory)

In addition, four MIDIman interface boxes were obtained. Three copies of Cakewalk Home Studio were purchased. One was already available. MIDI cables had to be purchased for two of the keyboards. One AC power adapter had to be obtained for one of the keyboards as it was omitted in shipping. Permission was granted from Cakewalk to load the program on additional computers for the project.

4. Website

A resource website was developed for students and educators. During this project students in the study group used this site primarily to search for MIDI files, although its resources are far more comprehensive. (See Appendix C)
Procedures

The Cakewalk Home Studio software had to be installed on the computers. It was installed on extra computers to allow for problems during club time. The interface drivers had to be installed and the interface box attached to each computer. In the control panel of each computer, under Multimedia/MIDI, an external MIDI instrument had to be created. In Cakewalk Home Studio the MIDI devices for In and Out also had to be set up so the sound and communication would be going to and from the MIDI keyboard.

The Music Tech Club met weekly and worked both alone and in pairs. A brief journal was kept which recorded activities and comments for each particular meeting. A lesson plan was prepared for each meeting and a demonstration was done either as review or for a new activity.

The manual was written throughout the duration of the Music Tech Club, as the writer was learning sequencing along with the students.

Study Group Volunteers

John Rivera, from the Sam Ash Music Store, Cherry Hill, New Jersey, acted as a consultant.

Patricia Bradshaw, Recording Engineer and graduate of Full Sail, volunteered time to the Music Technology Club.

Music Standards

On the following pages is a listing of the New Jersey Core Curriculum Content Standards for Visual and Performing Arts, the national Standards for Music Education and the Opportunity-to-Learn Standards for Music Technology.
New Jersey Core Curriculum Content Standards
for Visual and Performing Arts

Introduction

An education in the arts is an essential part of the academic curriculum for the achievement of human, social, and economic growth. The education of our students in the disciplines of dance, music, theater, and visual arts is critical to the success of New Jersey and the nation as we move into the twenty-first century. Our economic well-being and ability to compete and cooperate in the global marketplace require that our students learn to develop original ideas, increase their ability to solve problems, and interact in partnerships -- skills inherently learned through the arts.

An education in the arts has the potential to:

- Strengthen our ability to be creative and inventive decision-makers
- Develop a wide range of skills significant to many aspects of life and work
- Provide varied and powerful ways of communicating ideas, thoughts and feelings, both as individuals and as members of communities
- Enable us to understand and influence the increasingly complex technological environment affecting all aspects of our lives
- Provide a strong economic base through the state's cultural attractions
- Emphasize humanities education as a key to understanding the arts as products of complex social, cultural, and intellectual trends
- Enrich understanding of the human experience across cultures and histories, including the accomplishments of men and women of different ethnic, racial, and cultural backgrounds
- Provide valuable tools to enhance learning across all disciplines
- Empower people to create, reshape and fully participate in personal and community environments, to enhance the quality of life for all.

All children require and must be provided with an opportunity for a meaningful arts education. These core curriculum standards provide the foundation for creating a framework for essential arts education in all New Jersey schools. They form the core of our expectations for New Jersey students.

Six core curriculum content standards for Visual and Performing Arts are arranged in five broad categories including: aesthetic (1.1); creating and performing (1.2, 1.3);
critical, analytic, judgmental, and evaluative (1.4); historical, social, and cultural (1.5); and design with respect to form, function, and structure (1.6).

The categories stated above include specific standards that define these artistic concepts and elements in the art forms of dance, music, theater, and the visual arts. A focus on general artistic concepts and themes rather than on the individual art forms provides a document that can be easily accessed by all arts educators, regardless of discipline.

While national, state, and individual arts discipline standards were extensively reviewed and considered during initial panel deliberation, it was determined that a more comprehensive and interdisciplinary design be constructed, where all art forms could be included in one document. These standards reflect the concern that the separate arts disciplines be viewed as one common body of skills and knowledge.

**Visual And Performing Arts List Of Standards**

1.1 All students will acquire knowledge and skills that increase aesthetic awareness in dance, music, theater, and visual arts.

1.2 All students will refine perceptual, intellectual, physical, and technical skills through creating dance, music, theater, and/or visual arts.

1.3 All students will utilize arts elements and arts media to produce artistic products and performances.

1.4 All students will demonstrate knowledge of the process of critique.

1.5 All students will identify the various historical, social, and cultural influences and traditions which have generated artistic accomplishments throughout the ages and which continue to shape contemporary arts.

1.6 All students will develop design skills for planning the form and function of space, structures, objects, sound, and events.
Standard 1.1:
All Students Will Acquire Knowledge and Skills That Increase Aesthetic Awareness in Dance, Music, Theater, and Visual Arts.

Descriptive Statement: The arts strengthen our appreciation of the world as well as our ability to be creative and inventive decision-makers. The acquisition of knowledge and skills that contribute to aesthetic awareness of dance, music, theater, and the visual arts enhances these abilities.

Cumulative Progress Indicators

By the end of Grade 4, students:

1. Communicate their responses to dance, music, theater, and visual arts with supporting statements based on aesthetics.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students:

2. Understand that arts elements, such as color, line, rhythm, space, form, may be combined selectively to elicit a specific aesthetic response.

3. Communicate about the aesthetic qualities of art works through oral and written analysis using appropriate technical and evaluative terms.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students:

4. Demonstrate an understanding of different aesthetic philosophies through the evaluation and analysis of artistic styles, trends, and movements in an art form.
Standard 1.2:

Descriptive Statement: Through an education in the arts, students enhance their perceptual, physical, and technical skills and learn that pertinent techniques and technologies apply to the successful completion of tasks. The development of sensory acuity (perceptual skills) enables students to perceive and acknowledge various viewpoints. Appropriate physical movements, dexterity, and rhythm pertain to such activities as brush strokes in painting, dance movement, fingering of musical instruments, etc.

Cumulative Progress Indicators

By the end of Grade 4, students:

1. Demonstrate performance and participation skills by working and creating individually and with others.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students:

2. Demonstrate technical skills in dance, music, theater, or visual arts, appropriate to students' developmental level.

3. Create, produce, or perform works of dance, music, theater, or visual arts, individually and with others.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students:

4. Demonstrate originality, technical skills, and artistic expression in the creation, production, and performance of dance, music, theater, or visual arts.
Standard 1.3:
All Students Will Utilize Arts Elements And Arts Media To Produce Artistic Products And Performances

Descriptive Statement: In order to understand the arts, students must discover the common elements and properties of dance, music, theater, and visual arts. These arts elements, such as color, line, form, rhythm, space, timing, movement, mood, etc., are the ingredients from which works of art are made.

Cumulative Progress Indicators

By the end of Grade 4, students:

1. Apply elements and media common to the arts to produce a work of art.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students:

2. Demonstrate appropriate use of technology, tools, terminology, techniques, and media in the creation of dance, music, theater, or visual arts.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students:

3. Demonstrate an understanding of technology, methods, materials, and creative processes commonly used in dance, music, theater, or visual arts.
**Standard 1.4:**

**All Students Will Demonstrate Knowledge of the Process of Critique.**

**Descriptive Statement:** Art criticism assists in the development of critical thinking skills of observation, description, analysis, interpretation, and evaluation. Students engage in and evaluate multisensory learning experiences as both participants and observers. The process of critique helps students to develop a sense of aesthetics and leads to artistic and personal growth.

**Cumulative Progress Indicators**

At all grade levels, students:

1. Explain the criteria by which they evaluate the quality of their work and the work of others.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students:

2. Offer constructive critique in the evaluation of their own and others' work in dance, music, theater, or visual arts.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students:

3. Evaluate and interpret works of art orally and in writing, using appropriate terminology.
Standard 1.5:
All Students Will Identify The Various Historical, Social, And Cultural Influences And Traditions Which Have Generated Artistic Accomplishments Throughout The Ages And Which Continue To Shape Contemporary Arts.

Descriptive Statement: The history of the world is told through the arts. By being able to identify historical, social, and cultural influences related to the arts, students will have a better and more complete understanding of humankind past, present, and future and of the arts as forms of human expression.

Cumulative Progress Indicators

By the end of Grade 4, students:

1. Communicate their responses to dance, music, theater, and visual arts with supporting statements based on aesthetics.

2. Investigate, experience and participate in dance, music, theater, and visual arts activities representing various historical periods and world cultures.

3. Apply knowledge of historical, social, and cultural influences to understanding a work of art.

4. Use their senses, imagination, and memory to express ideas and feelings in dance, music, theater and visual arts.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students:

5. Identify significant artists and artistic works in dance, music, theater, and visual arts representing various historical periods, world cultures, and social and political influences.

6. Understand and demonstrate a knowledge of how various artists and cultural resources preserve our cultural heritage and influence contemporary arts.

7. Interpret the meaning(s) expressed in works of dance, music, theater, and visual arts.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students:
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<td>8.</td>
<td>Demonstrate knowledge of how artists and artistic works connect with political, social, cultural, and historical events.</td>
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<td>9.</td>
<td>Analyze and evaluate how various artists and cultural resources influence student work.</td>
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<td>10.</td>
<td>Create works of art that communicate personal opinions, thoughts, and ideas</td>
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Standard 1.6:
All Students Will Develop Design Skills For Planning The Form And Function Of Space, Structures, Objects, Sound, And Events

Descriptive Statement: The development of knowledge and skills in design produces the power to create or to enhance the economy and the quality of life. All inventions, everything made by human hands, require design skills: fabric and clothing, landscapes and interiors, residential and corporate architecture, product and package design, video and print graphics. Neighborhood and city planning can be aesthetically improved with skills in the design of space and form. Staging is essential to the planning of successful events, whether personal, business or community. Elements of design affect nearly all aspects of daily living.

Cumulative Progress Indicators

By the end of Grade 4, students:

1. Identify and state needs and opportunities for design in the contexts of home, school, recreation, and play.
2. Plan and execute solutions to design problems.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students:

3. Identify and solve design problems in space, structures, objects, sound, and/or events for home and workplace.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students:

4. Identify, plan, and provide solutions to design problems of space, structures, objects, sound, and/or events in a public or private environment.
National Standards for Music Education
From MENC, The National Association for Music Education

1. Singing, alone and with others, a varied repertoire of music.
2. Performing on instruments, alone and with others, a varied repertoire of music.
3. Improvising melodies, variations, and accompaniments.
4. Composing and arranging music within specified guidelines.
5. Reading and notating music.
6. Listening to, analyzing, and describing music.
7. Evaluating music and music performances.
8. Understanding relationships between music, the other arts, and disciplines outside the arts.
9. Understanding music in relation to history and culture.

Related Links:

Summary Statement -- What All Students Should Know and Be Able to Do in the Arts - introductory statement to the National Standards
National Standards for Arts Education: A Brief History
Standards Reprint Permission Policy
The School Music Program: A New Vision (The K-12 National Standards, PreK Standards, and What They Mean to Music Educators)
The School Music Program (Spanish Translation)
Publications on the the National Standards and Their Implementation
State Music Education Standards
Performing, creating, and responding to music are the fundamental music processes in which humans engage. Students, particularly in grades K-4, learn by doing. Singing, playing instruments, moving to music, and creating music enable them to acquire musical skills and knowledge that can be developed in no other way. Learning to read and notate music gives them a skill with which to explore music independently and with others. Listening to, analyzing, and evaluating music are important building blocks of musical learning. Further, to participate fully in a diverse, global society, students must understand their own historical and cultural heritage and those of others within their communities and beyond. Because music is a basic expression of human culture, every student should have access to a balanced, comprehensive, and sequential program of study in music.

Terms identified by an asterisk (*) are explained in the glossary. The standards in this section describe the cumulative skills and knowledge expected of all students upon exiting grade 4. Students in the earlier grades should engage in developmentally appropriate learning experiences designed to prepare them to achieve these standards at grade 4. Determining the curriculum and the specific instructional activities necessary to achieve the standards is the responsibility of states, local school districts, and individual teachers.

1. **Content Standard:** Singing, alone and with others, a varied repertoire of music

   **Achievement Standard:**

   Students
   a. sing independently, on pitch and in rhythm, with appropriate timbre, diction, and posture, and maintain a steady tempo
   b. sing *expressively, with appropriate dynamics, phrasing, and interpretation
c. sing from memory a varied repertoire of songs representing *genres and *styles from diverse cultures
d. sing ostinatos, partner songs, and rounds
e. sing in groups, blending vocal timbres, matching dynamic levels, and responding to the cues of a conductor

2. Content Standard: Performing on instruments, alone and with others, a varied repertoire of music

Achievement Standard:
Students
a. perform on pitch, in rhythm, with appropriate dynamics and timbre, and maintain a steady tempo
b. perform easy rhythmic, melodic, and chordal patterns accurately and independently on rhythmic, melodic, and harmonic *classroom instruments
c. perform expressively a varied repertoire of music representing diverse genres and styles
d. echo short rhythms and melodic patterns
e. perform in groups, blending instrumental timbres, matching dynamic levels, and responding to the cues of a conductor
f. perform independent instrumental parts I while other students sing or play contrasting parts

3. Content Standard: Improvising melodies, variations, and accompaniments

Achievement Standard:
Students
a. improvise "answers" in the same style to given rhythmic and melodic phrases
b. improvise simple rhythmic and melodic ostinato accompaniments
c. improvise simple rhythmic variations and simple melodic embellishments on familiar melodies
d. improvise short songs and instrumental pieces, using a variety of sound sources, including traditional sounds, nontraditional sounds available in the classroom, body sounds, and sounds produced by electronic means 2

4. Content Standard: Composing and arranging music within specified guidelines

Achievement Standard:
Students
a. create and arrange music to accompany readings or dramatizations
b. create and arrange short songs and instrumental pieces within specified guidelines 3
c. use a variety of sound sources when composing
5. Content Standard: Reading and notating music

Achievement Standard:
Students
a. read whole, half, dotted half, quarter, and eighth notes and rests in 2/4, 3/4, and 4/4 meter signatures
b. use a system (that is, syllables, numbers, or letters) to read simple pitch notation in the treble clef in major keys
c. identify symbols and traditional terms referring to dynamics, tempo, and articulation and interpret them correctly when performing
d. use standard symbols to notate meter, rhythm, pitch, and dynamics in simple patterns presented by the teacher

6. Content Standard: Listening to, analyzing, and describing music

Achievement Standard:
Students
a. identify simple music *forms when presented aurally
b. demonstrate perceptual skills by moving, by answering questions about, and by describing aural examples of music of various styles representing diverse cultures
c. use appropriate terminology in explaining music, music notation, music instruments and voices, and music performances
d. identify the sounds of a variety of instruments, including many orchestra and band instruments, and instruments from various cultures, as well as children's voices and male and female adult voices
e. respond through purposeful movement 4 to selected prominent music characteristics 5 or to specific music events 6 while listening to music

7. Content Standard: Evaluating music and music performances

Achievement Standard:
Students
a. devise criteria for evaluating performances and compositions
b. explain, using appropriate music terminology, their personal preferences for specific musical works and styles

8. Content Standard: Understanding relationships between music, the other arts, and disciplines outside the arts

Achievement Standard:
Students
a. identify similarities and differences in the meanings of common terms 7 used in the various arts
b. identify ways in which the principles and subject matter of other disciplines taught in
the school are interrelated with those of music.

9. Content Standard: Understanding music in relation to history and culture

Achievement Standard:
Students
a. identify by genre or style aural examples of music from various historical periods and
cultures
b. describe in simple terms how elements of music are used in music examples from
various cultures of the world

c. identify various uses of music in their daily experiences and describe
characteristics that make certain music suitable for each use
d. identify and describe roles of musicians in various music settings and cultures
e. demonstrate audience behavior appropriate for the context and style of music
performed

Notes:
1. E.g., simple rhythmic or melodic ostinatos, contrasting rhythmic lines, harmonic
progressions and chords.
2. E.g., traditional sounds: voices, instruments; nontraditional sounds: paper tearing,
pencil tapping; body sounds: hands clapping, fingers snapping; sounds produced by
electronic means: personal computers and basic MIDI devices, including keyboards,
sequencers, synthesizers, and drum machines.
3. E.g., a particular style, form, instrumentation, compositional technique
4. E.g., swaying, skipping, dramatic play
5. E.g., meter, dynamics, tempo
6. E.g., meter changes, dynamic changes, same/different sections
7. E.g., form, line, contrast
8. E.g., foreign languages: singing songs in various languages; language arts: using the
expressive elements of music in interpretive readings; mathematics: mathematical basis
of values of notes, rests, and meter signatures; science: vibration of strings, drum heads,
or air columns generating sounds used in music; geography: songs associated with
various countries or regions
9. E.g., Navajo, Arabic, Latin American
10. E.g., celebration of special occasions, background music for television, worship
11. E.g., orchestra conductor, folksinger, church organist

GRADES 5-8

The period represented by grades 5-8 is especially critical in students' musical
development. The music they perform or study often becomes an integral part of their
personal musical repertoire. Composing and improvising provide students with unique insight into the form and structure of music and at the same time help them to develop their creativity. Broad experience with a variety of music is necessary if students are to make informed musical judgments. Similarly, this breadth of background enables them to begin to understand the connections and relationships between music and other disciplines. By understanding the cultural and historical forces that shape social attitudes and behaviors, students are better prepared to live and work in communities that are increasingly multicultural. The role that music will play in students' lives depends in large measure on the level of skills they achieve in creating, performing, and listening to music.

Terms identified by an asterisk (*) are explained in the glossary. Except as noted, the standards in this section describe the cumulative skills and knowledge expected of all students upon exiting grade 8. Students in grades 5-7 should engage in developmentally appropriate learning experiences to prepare them to achieve these standards at grade 8. These standards presume that the students have achieved the standards specified for grades K-4; they assume that the students will demonstrate higher levels of the expected skills and knowledge, will deal with increasingly complex music, and will provide more sophisticated responses to works of music. Every course in music, including performance courses, should provide instruction in creating, performing, listening to, and analyzing music, in addition to focusing on its specific subject matter. Determining the curriculum and the specific instructional activities necessary to achieve the standards is the responsibility of states, local school districts, and individual teachers.

1. Content Standard: Singing, alone and with others, a varied repertoire of music

Achievement Standard:
Students
a. sing accurately and with good breath control throughout their singing ranges, alone and in small and large ensembles
b. sing with *expression and *technical accuracy a repertoire of vocal literature with a *level of difficulty of 2, on a scale of 1 to 6, including some songs performed from memory
c. sing music representing diverse *genres and cultures, with expression appropriate for the work being performed
d. sing music written in two and three parts Students who participate in a choral ensemble
e. sing with expression and technical accuracy a varied repertoire of vocal literature with a level of difficulty of 3, on a scale of 1 to 6, including some songs performed from memory

2. Content Standard: Performing on instruments, alone and with others, a varied repertoire of music
Achievement Standard:
Students
a. perform on at least one instrument accurately and independently, alone and in small and large ensembles, with good posture, good playing position, and good breath, bow, or stick control
b. perform with expression and technical accuracy on at least one string, wind, percussion, or classroom instrument a repertoire of instrumental literature with a level of difficulty of 2, on a scale of 1 to 6
c. perform music representing diverse genres and cultures, with expression appropriate for the work being performed
d. play by ear simple melodies on a melodic instrument and simple accompaniments on a harmonic instrument

Students who participate in an instrumental ensemble or class
e. perform with expression and technical accuracy a varied repertoire of instrumental literature with a level of difficulty of 3, on a scale of 1 to 6, including some solos performed from memory

3. Content Standard: Improvising melodies, variations, and accompaniments

Achievement Standard:
Students
a. improvise simple harmonic accompaniments
b. improvise melodic embellishments and simple rhythmic and melodic variations on given pentatonic melodies and melodies in major keys
c. improvise short melodies, unaccompanied and over given rhythmic accompaniments, each in a consistent *style, meter, and tonality

4. Content Standard: Composing and arranging music within specified guidelines

Achievement Standard:
Students
a. compose short pieces within specified guidelines, demonstrating how the elements of music are used to achieve unity and variety, tension and release, and balance
b. arrange simple pieces for voices or instruments other than those for which the pieces were written
c. use a variety of traditional and nontraditional sound sources and electronic media when composing and arranging

5. Content Standard: Reading and notating music

Achievement Standard:
Students
a. read whole, half, quarter, eighth, sixteenth, and dotted notes and rests in 2/4, 3/4, 4/4
6/8, 3/8, and alla breve meter signatures
b. read at sight simple melodies in both the treble and bass clefs
c. identify and define standard notation symbols for pitch, rhythm, dynamics, tempo, articulation, and expression
d. use standard notation to record their musical ideas and the musical ideas of others

Students who participate in a choral or instrumental ensemble or class
e. sightread, accurately and expressively, music with a level of difficulty of 2, on a scale of 1 to 6

6. Content Standard: Listening to, analyzing, and describing music

Achievement Standard:
Students
a. describe specific music events in a given aural example, using appropriate terminology
b. analyze the uses of elements of music in aural examples representing diverse genres and cultures
c. demonstrate knowledge of the basic principles of meter, rhythm, tonality, intervals, chords, and harmonic progressions in their analyses of music

7. Content Standard: Evaluating music and music performances

Achievement Standard:
Students
a. develop criteria for evaluating the quality and effectiveness of music performances and compositions and apply the criteria in their personal listening and performing
b. evaluate the quality and effectiveness of their own and others' performances, compositions, arrangements, and improvisations by applying specific criteria appropriate for the style of the music and offer constructive suggestions for improvement

8. Content Standard: Understanding relationships between music, the other arts, and disciplines outside the arts

Achievement Standard:
Students
a. compare in two or more arts how the characteristic materials of each art can be used to transform similar events, scenes, emotions, or ideas into works of art
b. describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with those of music

9. Content Standard: Understanding music in relation to history and culture
Achievement Standard:

Students

a. describe distinguishing characteristics of representative music genres and styles from a variety of cultures 6

b. classify by genre and style (and, if applicable, by historical period, composer, and title) a varied body of exemplary (that is, high-quality and characteristic) musical works and explain the characteristics that cause each work to be considered exemplary

c. compare, in several cultures of the world, functions music serves, roles of musicians, and conditions under which music is typically performed

Notes:

1. E.g., band or orchestra instrument, keyboard instrument, fretted instrument, electronic instrument

2. E.g., a particular style, form, instrumentation, compositional technique

3. E.g., entry of oboe, change of meter, return of refrain

4. I.e., sound in music, visual stimuli in visual arts, movement in dance, human interrelationships in theatre

5. E.g., language arts: issues to be considered in setting texts to music; mathematics: frequency ratios of intervals, sciences: the human hearing process and hazards to hearing; social studies: historical and social events and movements chronicled in or influenced by musical works

6. E.g., jazz, mariachi, gamelan

7. E.g., lead guitarist in a rock band, composer of jingles for commercials, singer in Peking opera
Immediately following the release of the National Standards for Music Education in 1994, MENC--The National Association for Music Education released *Opportunity-to-Learn Standards for Music Instruction* as a guide to what schools should provide to help students achieve both the National Standards for Music Education in grades K-12 and the MENC prekindergarten music education standards. MENC recommends that states either adopt these opportunity-to-learn standards or use them as a basis for developing their own. The standards challenge all who are committed to high-quality music instruction to work together to improve the teaching and learning of music in the nation's schools.

The writers of the opportunity-to-learn standards were well aware that new technologies have an impact on the ways schools deliver music instruction. Throughout the text of those standards, there are references to computers, software, MIDI equipment, CD-ROMs, and other resources that are important to the world of the music teacher, as well as essential to the world of music outside the classroom. In the years since the publication of the opportunity-to-learn standards, technologies useful for music education (as for all education) have grown more capable, more varied, simpler to use, and certainly more ubiquitous.

This addendum to the opportunity-to-learn standards is meant to provide more specific guidance to all those music teachers, administrators, and other decision makers who must determine how best to take advantage of new technologies in the ongoing effort to give every American student a full, balanced curriculum oriented toward the skills and knowledge set forth in the National Standards. This document does not actually call for resources beyond that seen as necessary in the Opportunity-to-Learn standards published in 1994; rather, it tells more specifically what equipment to buy and how to allocate those resources. For each level, specifications are listed for:

- **Curriculum and Scheduling**
- **Staffing, Equipment**
- **Materials/Software**
- **Facilities**

It is important to note that each one of these categories is important. It is, unfortunately, an all-too-common occurrence to find a school that has invested in computer hardware
without the appropriate software to run on it, without appropriate facilities in which to store or use it, and without the all-important teacher training and technical staff support that enables the school's faculty to bring the equipment's potential value to bear on the students' potential for learning.

It is essential that all schools provide a basic level of music technology equipment and software with the appropriate facilities for implementation. It is also essential that all schools provide a minimal level of training for their staff and teachers, and make an effort to effectively incorporate the technology into the music curriculum. Of course, some schools will have at their disposal sources of funding or other resources that make it possible for them to go beyond this basic level—if not with their initial implementation of music technology, then as part of an ongoing plan for development. This addendum provides standards for both minimal and desirable technology programs. The minimal standards are intended to provide guidance for schools that are just beginning to incorporate technology into their music curriculum and have limited. It is the recommendation of MENC that all music programs use the desirable standards as a long-range goal.

This addendum also contains a strong, if implicit, message to decision makers connected with any of the schools or school districts around the nation that are struggling to find ways to use technology to serve the overall curriculum. That message is simple—remember the music program. Those who give music teachers the same level of access to technological resources as teachers in other disciplines will find two things. First, they will find that the music program is greatly enhanced by innovative applications of technology. In addition, they will find that music offers an exciting way for students and teachers alike to make technology come alive as an innovative instrument for creative expression.

With imaginative and creative uses of technology to support a strong music program, everyone wins, especially America's students.

**TECHNOLOGY STANDARDS FOR PREKINDERGARTEN AND KINDERGARTEN (ages 2-5)**

<table>
<thead>
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<th>Technology Standards in Context</th>
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<tr>
<td><em>Opportunity-to-Learn Standards for Music Instruction</em>, published by MENC in 1994, contains a number of references to technology-based requirements for music</td>
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**Curriculum and Scheduling**

1. Technology is used when it appropriately enhances music learning at this level.

2. Student learning experiences in the curriculum include the use of technology for singing and playing instruments, creating music, responding to music, and understanding music.
3. Software and hardware selections are made based on the learning goals established for the students.

4. Students have the same degree of access to school computer equipment for instruction in music as for instruction in other disciplines, and appropriate music software is available.

5. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

Staffing

6. Technology training for teachers who provide music instruction at the prekindergarten and kindergarten levels is conducted by people who know the needs of music learners at these levels.

7. Teachers are provided with the necessary development time for creating new curriculum materials and instructional strategies that make effective use of music technology.

8. Teachers have easy access to email and other web services for professional and curricular development, research, and other communication needs.

Equipment

*Minimal:*

One multimedia-ready computer is provided that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, and a CD- or DVD-ROM player.
Desirable:

9. A MIDI keyboard synthesizer or controller is connected to the computer.

10. The addition of a touch pad, large trackball, or other alternative pointing device more suitable than a mouse for children of this age.

11. A computer video projector to enhance class presentations in large classrooms.

Materials/Software

Minimal:
The software library includes at least three titles of instructional software that reinforces listening, understanding, and responding to music. The library also includes multimedia software that enables children to create and perform music, and permits musical exploration and game playing. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

Desirable:
There is a basic sequencing/notation package, appropriate to the age level, for recording and printing music.

Facilities
Suitable space is available for one computer with appropriate power and an Internet connection in every classroom in which music is taught.

TECHNOLOGY STANDARDS FOR ELEMENTARY SCHOOL
(Grades 1-5 or 1-6)

Curriculum and Scheduling

1. Use of technology is a regular and integral part of instruction.

2. Teachers employ instructional strategies that appropriately utilize the unique capabilities of technology.
3. Learning experiences in the curriculum include the use of computer-assisted instruction, MIDI sequencing, music notation software, Internet music resources, and electronic musical instruments to help students acquire the knowledge and skills listed in the National Standards for Music Education.

4. Software and hardware selections are made based on the learning goals established for the students.

5. Music classes have the same degree of access to school technology resources, including technology labs, as other classes in the school.

6. Learning profiles (e.g., attendance records and progress reports) for individual students are maintained using databases and other record-keeping technologies.

7. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

Staffing

Minimal:

8. A planned program of ongoing staff development to provide teachers with training in applying technology in the curriculum is in place. Training is available on a variety of levels to match the varying backgrounds and proficiencies of teachers.
9. To remain up-to-date in the field, all music educators receive at least one staff development day per year for technology training. Training is conducted by those with an awareness of the needs of music educators.

10. Teachers have easy access to email and web services for professional and curriculum development, research, and other communication needs.

11. Teachers are provided with ample time to consult with other colleagues about the use of technology.

12. Technical support and mentoring by those who are knowledgeable about the hardware and software used by music educators is available to music teachers.

13. Teachers are provided with the necessary development time for creating new curriculum materials that make effective use of music technology.

Desirable:

14. A well-planned, long-term program of professional staff-development support is available to all music teachers.

15. Music teachers have ready access to Internet-based professional development opportunities.

16. In lab settings, an appropriate student/teacher ratio is maintained through the use of teacher assistants or aides.

Equipment

Minimal:
17. Every music classroom should contain one multimedia-ready computer that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, CD- or DVD-ROM player, and a MIDI keyboard connected to the computer. When a teacher must move between classrooms and schools, a similarly equipped laptop computer is preferred for that teacher.

18. The school computer lab is equipped with dual headphones and MIDI keyboard controllers for use by the students.

19. Students have access to eight digital keyboards (possibly portable units) with standard-size, touch-responsive piano keys.

20. A large-screen video display for class presentation.

Desirable:

21. In addition to the minimal specifications, the classroom teaching station has two to three additional multimedia-ready computers with keyboard controllers (dual headphone capable). Alternatively, there is a digital keyboard lab or dedicated computer music lab with fifteen or more computers configured in a similar way to the workstations recommended in Number 1 above. All equipment includes powered speakers, a computer display projector, and large-capacity removable disk storage.
22. For instrumental instruction, alternative MIDI controllers, such as wind, guitar, string, and drum controllers, are available.

23. Music teachers have the same access to scanners, digital cameras, and other multimedia equipment as teachers in other disciplines.

24. A computer video projector to enhance class presentations in large classrooms.

Materials/Software

Minimal:

25. The software library contains at least six titles of instructional software that reinforces listening, analyzing, reading, and describing music. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

26. At least six titles of multimedia software that enables children to create, improvise, compose, and perform music are also available. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

27. There is Internet software for supervised access to Web resources.

Desirable:

28. Additional multimedia and software titles are available, and a plan to purchase six new titles in each category each year is in place.
for generating music arrangements and accompaniments and libraries of MIDI accompaniment files.

30. There is a basic sequencing/notation package, appropriate to the age level, for recording and printing music.

31. Students have access to basic digital audio editing software for capturing, modifying, and reproducing music.

32. Music teachers have the same access to graphic, multimedia, and Web authoring software as teachers in other disciplines.

Facilities

Minimal:

33. Suitable space is available in the dedicated music classroom for one computer with appropriate power and Internet connections.

34. Students have access to a school computer lab.

Desirable:

35. The school provides music classroom space with appropriate furniture, power, and Internet connections for multiple computer stations.
Chapter Three
Instructional Manual

Chapter three is the culmination of both the observations of the Van Zant Music Technology Club meetings, and the learning process of the writer. It is a comprehensive learning tool that includes more than just the basics on MIDI sequencing. It contains Internet learning resources, a chapter for educators, a unit on copyright and some information about careers in the field of MIDI. The manual is intended for students from at least the fifth grade level. It’s goal is to provide instructions that are simple and easily understood by young children, thereby enabling them to participate independently in their own learning process and at their own pace.

Most of the illustrations in the manual are screen shots of Cakewalk Home Studio. The manual also includes some original illustrations, created by the writer. Those that are not originals are either royalty free graphics obtained from the Internet or those found on commercial graphics CDs.

It should also be mentioned that a CD of several of the students’ sequences was created. It is called the Student Work CD and is included in Appendix A of this document.
Piece of Cake

Cakewalk Sequencing Manual for Kids
Preface

This manual is the result of the study and use of software that allows for creating MIDI sequences. Cakewalk Home Studio was chosen because of its ease of use and the recommendation it received from retail music equipment dealers. It is designed for use with a PC compatible, multimedia computer. According to retailers it is sold in large quantities to all levels of musicians because of its easy set up, company technical support and powerful features. Although this manual addresses the basics of MIDI sequencing, Cakewalk Home Studio is more than a MIDI sequencing program. A list of the following features were obtained from the Cakewalk Home Studio packaging box:

- Record and play back unlimited tracks of audio and MIDI
- Real-time mixing console
- Loop-based song construction tools
- Import WAV, acid wav and mp3 FILES
- Complete library of ACID-format audio loops
- Support for third-party DXi soft synth plug-ins
- Includes Virtual sound Canvas DXi and Dreamstation Dxi soft synths
- Real-time DirectX audio effects; Reverb, Chorus, Delay, Flange, EQ
- Edit and print notation, with chord symbols, guitar, chord grids, lyrics, dynamic markings
- Unlimited Edit Undo
- Fruityloops Express loop generator
- 16 and 24-bit audio support
- Multitrack Piano Roll view
- Import and synchronize AVI video to music project
- Non-destructive slip-editing of audio and MIDI clips
• Playback meters per track
• Burn CDs and create MP3s with Pyro (trial version)

This manual is intended for students from about the fifth grade level. It is also recommended for teachers and adults who are just beginning to learn about or teach MIDI sequencing and music technology. It is an attempt to introduce only the basics of MIDI sequencing, leaving more advanced recording techniques for another volume!

It is assumed in this manual that the user has a certain level of PC computer proficiency. Users must have an understanding of the following procedures:

• Basic mouse proficiency
• Opening programs
• Saving files
• Being able to follow basic computer manual procedures for installing programs and other functions
• Word processing/editing skills
• Understanding copying and pasting functions
• Accessing and browsing the Internet

It is difficult to say what skills are necessary for the user to create MIDI sequences. A student who has had a few years of piano training is certainly at an advantage. However, a student who has a good ear for music and rhythm, a feel for harmony and the ability to search out and combine clips and tracks from other sources, along with a bit of creativity, can certainly be successful in creating MIDI sequences. Also, a little bit of one-on-one assistance is very helpful in the beginning so that students of any level can get the gist of what MIDI
sequencing is and learn to successfully perform many of its basics.

Provided with this manual is a CD that includes demos and free downloads of several different programs. They are intended to give the user an idea of the different types of music technology programs that are available. They will also provide the user with an opportunity to explore and gain more experience in the MIDI/music technology area.

The programs provided are:

- Virtual Drummer
- Microsing Karaoke Recorder
- E-Drummer
- JazzWare
- Fruity Loops
- Band in a Box
- Protools

A introduction sheet listing the programs and some of their features is also provided.
For Educators and Parents

Music technology is increasingly becoming a viable and desirable method for the teaching and developing of music skills, especially as it relates to the achievement of educational music standards at all age levels. In particular, the development of MIDI, Musical Instrument Digital Interface, has permanently changed the way we create, produce and enjoy music. Because of MIDI technology, it is possible for computers and MIDI compatible instruments to communicate, making it all possible. With MIDI, a musically talented individual, with little or no formal training, is no longer at the same disadvantage that she once was when it comes to musical expression. MIDI is now a standard on millions of instruments.

It is well understood that technology drives the music industry. This is now evident in the methods used in music studios to produce artists and live shows, both professional and amateur. It can be seen daily on Internet websites where wave, MIDI and MP3 files abound. Retail music stores carry a plethora of music technology items from drum machines, to sequencers, MIDI time pieces, software, MIDI keyboards and guitars. Schools have been making an attempt for several years now to catch up to the business industry and its use of computer technology. Major funding efforts and community support have enabled staff training and the integration of computer technology into the classroom and the curriculum.

It is time for music educators to realize that this same technology, now being applied to their field of work, is needed in their programs to give students the musical experiences and the tools to produce and perform in a technology based global community.
Acknowledgements

The following people have been very instrumental in assisting me with this ambitious project. I would first like to thank my advisor, Dr. Louis Molinari, for his help and guidance not only with this project, but for his encouragement and support throughout my efforts to achieve a certification and ultimately the masters degree. He has been a patient and positive force that has made it very easy to feel confident and enthusiastic about my goals.

I also thank my family for their patience and encouragement during this entire ten-year process. There have been bumps and dips along the way, but we’re all still talking! My children may have even learned a thing or two about the importance of life-long learning. I’m sure my husband is the most pleased to see this goal come to its fruition!

Others whom I would like to thank for helping me with this project include:

John Rivera, Musician and Sales Manager, Sam Ash Music, Cherry Hill, New Jersey for his support and time.

Pat Lucas, Principal, Van Zant Elementary School, who willingly provided funding, in addition to her usual encouragement and support.

Carl Jacobson, director of Marketing Communications, Cakewalk, who responded to our funding concerns by allowing us to load Home Studio on additional computers at no cost. He also expressed Cakewalk’s interest in the outcome of the project.

Patricia Bradshaw, Recording Engineer, a graduate of Full Sail Real World Education, for her guidance and support. She also participated in the evaluation of the manual and volunteered her time to assist with the Music Technology Club in its weekly meetings.

Cindy Wasdick, Music Teacher, Van Zant Elementary School for her support and time in the evaluation process of the manual.

John Bradshaw, Computer Analyst, for his continued technical support throughout the entire multi-year process. You can well imagine the need for such support, not to mention the convenience of a live-in technician!

Jann Bradshaw
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Welcome to Piece of Cake!
What's This All About?!

Okay guys, this is what it's all about. In this manual you will learn how to record music using your keyboard and the computer. You will be able to create songs, as if a whole band was playing - the keyboard part, the guitar part, drums and other effects. You can even add your voice if you want to! Then of course, you will also be able to play it back.

You will be using a program called Cakewalk Home Studio, referred to most often in this manual as "Home Studio". Below is a picture of the main screen. Look confusing? No problem. This manual will teach you, step by step, how to use the program to make your songs.
Not only will you be able to create songs, but you will also be able to make changes, fix mistakes and record as many times as you want until it's just the way you want it!

The process of creating music this way is called sequencing. Home Studio is a sequencer because it lets you “sequence” or create songs one part at a time. Before we get started, though, there are a few things you need to know and do to get ready for sequencing.
CHAPTER ONE

Stuff You Need to Get Started
Stuff You Need to Get Started

In order to record music sequences there are several things that you need to have.

- MIDI compatible keyboard
- MIDI cables
- Power supply for your keyboard
- MIDI interface
- MIDI sequencing program (Cakewalk Home Studio)
- Multimedia computer
- Music stand
- Headphones (optional)
- Sheet music

Here is an idea of what your MIDI “system” will look like when it is all set up.
MIDI compatible keyboard

You will be creating your own sequences using a MIDI piano keyboard. If you do not yet have a keyboard there are many types and prices to choose from. Some of the keyboard manufacturers are Yamaha, Casio and Roland. Your local music equipment store can help you decide what keyboard is best for you. Your parents might help by stating what price is right for you, too! You will probably want to get a keyboard with 61 keys. This is standard. Keyboards have lots of sounds, rhythms, demos and other controls on them. Some of these things will be used for computer sequencing and some will not. Many keyboards are designed to be played with or without the computer. Some have their own sequencers in them, also. They can be rather expensive and not necessary when you are going to use the computer for sequencing.

Make sure you have a power adapter for the keyboard. This is the cable (attached to a box) that attaches to your keyboard and plugs into the electrical outlet that will provide the energy to run the keyboard.
Chapter One – Stuff You Need to Get Started

MIDI Cables

In the back of your keyboard you will notice that there are two round ports or holes. One says “In” and the other says “Out”. This is why you need two MIDI cables. One end of each cable will connect to your keyboard and the other end will connect to an interface box. (More on that later!)

You know that your regular computer keyboard and mouse each have a cable that connects into the back of the computer so they can carry your messages to the computer as you are working. Your music keyboard needs the MIDI cables to connect it to the computer for the same reason. The music, called MIDI, messages that you send by playing your keyboard need to get from the keyboard into the computer. But, your computer is also going to be sending messages back to your keyboard! Because messages will be going out of your keyboard and into the computer, and out of the computer into the keyboard you need two cables.
The Interface box

There is another special device or box that you need in order for your computer and your music keyboard to understand each other. It is kind of like a translator. Your keyboard is speaking one language and your computer speaks another. The translator box, called an interface, is like a person who translates words between two people who speak different languages. You plug your MIDI cables into the interface (translator) box. Then, the interface has a cable that gets plugged into the computer. This way the interface can get all the messages coming from your keyboard and change them into a language that your computer understands. It then sends it into your computer. When the computer sends information back out to your keyboard, the interface changes it back into the language that your keyboard can understand! This language that your keyboard speaks, as we discussed earlier, is called MIDI.
The Sequencer

The easiest way to use MIDI instruments is with the computer and a special program that can communicate to the MIDI instrument and can help you create music. It's sort of like when you use a scanner to put pictures into your computer. You need a program that helps the scanner and the computer talk to each other so the picture can get from the scanner into the computer. You open up the scanner program and with the computer you tell the scanner what to do. With the sequencer you help your keyboard tell the computer what to do! That's the recording part. Then, your computer remembers, and when you press “Play”, it's the computer's turn to tell the keyboard what to do!

Cakewalk Home Studio is a sequencing program. Below is a picture of the Home Studio screen for a new MIDI project.
A MIDI sequencer records messages, not sound. The messages are in the MIDI language we talked about. These messages can be saved on a floppy disk and played through any other MIDI compatible device. You don’t even have to have a keyboard hooked up to hear your sequence play, because most computer sound cards have what is called a General MIDI module that can play the MIDI messages that your sequencer sends. In many computers it is what’s known as a wavetable synth.

A sequencer also provides you with a metronome, a device that ticks and helps you keep the beat while you’re recording. When the sequencer plays back your song, it plays with the right beat, also! Below is a picture of a sequence being played in Home Studio.
Multimedia Computer
Important!

Before you purchase the sequencing software it is very important for you to be sure your computer has certain specifications that the sequencer needs to run properly. The outside of the box that the program is packaged in should tell you what is required. That way you don’t have to buy it and find out you can’t use it after you get home. Some of the information you will find is this: what operating system you need, how much memory your computer must have, the amount of space needed on your hard drive and what speed the processor of your computer must be. For instance, for Cakewalk Home Studio 2002, you must have Windows 98 or better, a 300 MHz processor, 32 MB of RAM, (but 64 is better) and 100 MB of free hard disk space.
Chapter One – Stuff You Need to Get Started

Miscellaneous Stuff

Music stand
Headphones (optional)
Sheet music or piano book
Chapter Two

Setting Everything Up
First, A Note About MIDI - What is MIDI??

What does this word “MIDI” mean? MIDI is a computer language that lets certain musical instruments communicate with each other. It uses numbers, just zeros and ones, to send all the messages that are needed to create and playback your songs! We never see these messages, we only hear the sound they represent. MIDI is also the name for the kinds of instruments and equipment that use this MIDI language to communicate. A MIDI keyboard is a very popular instrument. You will be using a MIDI keyboard for your sequencing projects.
Chapter Two – Setting Everything Up

Setting Everything Up

Well, now that you have all the “stuff” what do you do with it? Basically you need to do the following:

Install the sequencing software

Follow the instructions that come with your software. Home Studio has a manual that takes you through all of the steps for installation. It is also very important that you “register” your software. This will provide you with technical support from the Cakewalk company. That means if you have any questions you can call them or email them on their website and they will help you to find the solution to your problem!

The Cakewalk website is at:

Their technical support site is at:

Support for Home Studio is at:

Piece of Cake
Hooking Everything up

After you have installed Home Studio and the interface box you will be ready to put it all together!

Starting with your keyboard. Make sure that it is turned off. Take the two MIDI cables and attach one to the MIDI port that says “Out” and one to the MIDI port that says “IN”.

Make sure the interface is hooked up to your computer. Now, take the other end of one of the cables that is plugged into the keyboard. If it is plugged into the “Out” port in your keyboard, you will plug it into the “In” on the interface. It must be set up like this in order for the messages to be transmitted to and from the computer properly. (One end of the cable goes into “In” and the other end of the cable goes into “Out”.) Do the same with the other cable. Plug it into the opposite port of what it is plugged into on the keyboard. Now, make sure your keyboard is plugged into an electrical source.

Your system is ready to go! But before your keyboard and Home Studio meet each other let’s learn a little about Home Studio!
CHAPTER THREE

A Look at Cakewalk Home Studio
A look at Home Studio

Before you actually use Home Studio to create sequences, it is important that you explore it. You will play, listen to, and observe sample sequences and even try making some changes to them. This will familiarize you with some of the basics of Home Studio, making it easier to get started with your own sequencing.

Cakewalk Home Studio can do more than help you make MIDI sequences. This manual will teach you about MIDI sequencing because it is the easiest to start with. You might want to explore more of Home Studio’s features later, after you have had an introduction to MIDI.

Now, let’s find out what a sequence looks and sounds like on the computer.

When you open Home Studio for the first time there will be some set up operations that you will have to perform. You have to set up the Input and Output devices and possibly do some other “tweaking” before your system is ready. You may need an adult’s help and the help of the Home Studio user’s manual.
Opening Home Studio

When you first open Home Studio, you will encounter a couple of screens. The first one is the “Tip of the Day” screen.

We are going to close this screen so that it doesn’t appear each time you open Home Studio. You can always get it back by clicking up on “Help” and choosing “Tip of the Day”. Click in the box that says “Show Tips on Startup”. The check will disappear and the box will not appear the next time you open the program.
After you close the tips page another screen pops up. It is the Home Studio Quick Start Screen.

This time you will choose “Open a Project” (not “Open a Recent Project”). Under “Cakewalk Projects” choose “Cakewalk Home Studio Sample Content. Open up the “Boogie Woogie” file. The “Auto-Send Sysx” box will pop up. Just click OK.
The next box is the File Info box.

This box tells you who created the sequence and some things about how it was made. Just click the "X" to close it. Next, Home Studio will show you the Boogie Woogie Sequence. There are several things to see on the screen, but what you will work with most when you are creating sequences is the track view, as seen below.
The Track View

The track view window is the main screen of Home Studio. This is the screen that you will view most when you are recording the parts (or tracks) for your sequence.

You will see two parts of the Track View when you open Home Studio or a Home Studio project.

The small rectangular boxes make up one part. These boxes contain what are called clips. They show you the different parts of the sequence (called tracks) which were recorded by the person who made it. "Boogie Woogie" is a very simple sequence. The person who made it recorded a piano track (the top clips bar) and a drum track (bottom clips bar).
On the left next to the clips is another section that looks like this:

This is called the tracks pane. This gives you information about what is being recorded. Just like in a word processor, you can make changes before or after you complete your work.
Now, Let’s Boogie!

You are now going to play the Boogie Woogie sequence. While the sequence is playing observe the many things happening on the screen. Besides the tracks pane, you will see something called the “Staff view” where the musical notes are displayed as on sheet music. The notes will light up in red as they are played. If you cannot see the whole staff view screen, you can drag the bottom edge of that screen down to enlarge it.

Since you do not have the computer configured to play the MIDI sequences through your keyboard yet (Chapter Four), your computer will use its internal MIDI module (part of your computer’s sound card) to play the sequence. In other words, you’ll hear the music through your computer speakers!

At the top right of the screen you will see some controls that look like those on a CD player. It’s really called a “Transport bar”. (Gotta get the lingo!) Make sure your sound is turned on. Ready? Click up on the play button. Voila! When you are done listening, click the Stop button. To listen again, press Rewind, then Play.
Messin’ Around!

Let’s make some changes to this Boogie Woogie sequence now! First, you will close the Staff view box. Click toward the top of the Staff view box to bring it forward. Then click on the “X” in the upper right corner to close it.

Notice the minimize and maximize boxes in the tracks next to the “R”. Click the box next to the “R” to maximize the track that contains the piano clips. (It says “Boogie Piano”).

It will look like this: (You may have to drag the bottom edge down to see everything.) Notice the area where it says “Acoustic Grand Piano”. Well, just as in a word processor where you can change the font (Boogie, Boogie, Boogie), you can change the instrument sound, called a Patch (Labeled “Pch” in the track view), in a sequence! Let’s change the Acoustic Grand Piano to Timpani. To do this just click on the arrow in the box where it says Acoustic Grand Piano. A list of about 128 instruments or “patches” will pop up! Choose “Timpani”. Next, click the rewind button in the transport bar and then click Play! Weird? Try “Glockenspiel”, another interesting sound. Now, have fun trying a few more patches.

Piece of Cake
Staff View Changes

Let’s try something else. First, you will need to open the Staff view again. Click on the Staff view icon above the Track view area.

At the top of the Staff view box is a group of tools. Do you see the pencil and the eraser? (If you don’t, click on the staff view window to bring it in front of the track pane.)
The pencil and eraser are for when you are recording and you make a small mistake. It’s just like fixing a spelling mistake in your typing. You simply go to where the mistake is, erase it and type in the correct letter. In this case you just use the eraser to erase the wrong note, then use the pencil to make the correction.

You are going to add some new notes to this sequence! You might want to erase others! Also, it might help to maximize the staff view screen while you experiment. Click on the pencil, then use it to click in new notes anywhere you like. You will hear the notes being played as you add them. They will be played in the current instrument sound that you have chosen. Use the eraser to erase some notes if you like. Minimize the staff view screen when you are ready to play back your new sequence. Click on Rewind, then Play. Well, how did it sound?

Let’s try one more thing.
Changing the Tempo

Look up above the track view screen. You will see a green number 80 in a black box.

This number tells the speed at which the song is to be played. This speed is called the “tempo”. If you make the number higher, the sequence will go faster. If you make the number lower it will play slower. Let’s try both. When you click in the box where the 80 is, a plus and minus sign will appear. Let’s speed the tempo of this song up a little. Change the number to 130. (Sometimes it’s actually faster to type the new number in the box instead of holding down the plus or minus.) Now play it! Ok, let’s slow it way down. Remember it used to be 80. That’s its regular speed. So let’s try it on 30. Rewind and click Play. Weird again, eh?

You might want to experiment further. Just remember not to save changes when you close Boogie Woogie or it will be changed permanently.
Flyin’ Machine

Let’s observe one more sequence. This one is much more complex than Boogie Woogie. It has many tracks, as you will see when you open it. Go to File, Open. Select "Cakewalk Projects" and choose "Cakewalk Home Studio Sample Content". Open up the "Flyin’ Machine." file. (You may have to browse further to find it.) The "Auto-Send Sysx" box will pop up. Just click OK. Also, close up the "File info" box.

If you use the scrollbar on the right side of the track view box you will see that this sequence has 13 tracks! Click on Play and listen. Pretty cool, huh?
We are going to listen to some of the tracks individually. Notice that up by the minimize/maximize boxes are the letters “M”, “S” and “R”.

<table>
<thead>
<tr>
<th>Track</th>
<th>Label</th>
<th>Channel</th>
<th>M</th>
<th>S</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>perc. organ</td>
<td></td>
<td></td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>synth bass</td>
<td></td>
<td></td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>10</td>
<td>chiffer lead</td>
<td></td>
<td></td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>11</td>
<td>choir ahhs</td>
<td></td>
<td></td>
<td>M</td>
<td>S</td>
</tr>
<tr>
<td>12</td>
<td>bass</td>
<td></td>
<td></td>
<td>M</td>
<td>S</td>
</tr>
</tbody>
</table>

Notice that on track 10 it says “chiffer lead”. Click on the “S” and it will turn green. The “S” is for “Solo”. Now when you play the sequence it will only play that track. It’s like the chiffer lead track is doing a solo. Be sure the sequence is rewound and click to play. Now, click the “S” again to turn off solo in that track. Go to the track above it, track 9, which is the “synth bass”. Click “S” to solo that track, then play it. Go back and click the “S” on track 10 again so that both track 9 and 10 have solo selected. This time when you click Play, just those two tracks will play. You can continue to experiment. The “M” is for Mute, whenever you do not want a track to play. You can mute more than one track at a time, also. The “R” is for when you are ready to record on that track.

Try some of the other exploration goodies we did with Boogie Woogie. Remember, when you are done, exit without saving.

Are you ready to try some recording? Let’s go!!

Piece of Cake
Chapter Four

Getting Ready to Record
Getting Ready to Record

Setting Up Your Computer

Now it’s time to check to be sure all of your cables are plugged in properly and that the keyboard is turned on.

Before recording with your keyboard there is some set up you must do within the Control Panel of your computer. It may vary from computer to computer but here are some basic procedures that may be helpful.

Go to the Control Panel from My Computer and double-click the Multimedia icon. The Multimedia Properties box will pop up.

Click on MIDI
Chapter Four - Getting Ready to Record

Click on Add New Instrument.

Click on "Next".
Chapter Four – Getting Ready to Record

Choose **General MIDI Instrument**.

Click on **"Finish"**.

Now **Home Studio** knows to look for an external MIDI device (your keyboard) through the interface.

Piece of Cake
Getting Ready to Record

Now you’re ready to open Home Studio and begin recording!

Don’t forget your music (unless you plan on freestyling it!)

During this process you will do the following:

- Create a new project in Home Studio
- Set MIDI Inputs and Outputs
- Set up the metronome

Create a new project

Open Home Studio (or click on File, New if Home Studio is already open). Choose “Create a New Project” and select “MIDI Only”.

![Create a new project in Home Studio](image.png)
This next step is **VERY** important as it will enable you to record and play your sequences properly. Choose **Options-MIDI Devices** to open the MIDI Devices dialog box. In the Inputs column select the MIDI In for your external MIDI interface. (Pretty much just click on whatever’s there!) In the MIDI outputs area click on everything, except your MIDI interface, to “deselect” them. With only the MIDI interface selected click on “Move Selected Devices to Top”. Then make sure all other choices are selected again before clicking “OK”.

![MIDI Devices dialog box](image)
Setting the metronome

A metronome, as mentioned earlier, is a device that ticks and helps you keep the beat while you’re recording. You will set up Home Studio’s metronome so that it starts ticking before you record. This is so that you can be ready to play when Home Studio starts recording. Below is a picture of the metronome toolbar. It is above the Track view on your screen.

![Metronome Toolbar Image]

There is only one thing you are going to change in the metronome toolbar before you record. The number in the black box (0) tells how many beats Home Studio is going to give you to get ready. These beats are called “count-in” beats. The zero means that there are no count-in beats and Home Studio will start recording as soon as you click the record button. We are going to change the number to two. That means the metronome will count (and click) for two measures (1, 2, 3, 4, 1, 2, 3, 4) before Home Studio starts recording. This will give you time to get ready.

Click on the zero. You can either erase zero and type 2, or click on the plus button to get a 2. Now the metronome is ready. Let’s go record!
CHAPTER FIVE

Rock On!
Record and Play
Rock On, Record and Play

When you create a new sequence in Home Studio you see several tracks, just as you observed in the samples you worked with earlier. Each part of your sequence will be recorded on a different track. (Read this section first before recording so you know what to expect!)

In order to record MIDI you don’t need to change any of the settings in the Track pane area. This can be done after recording and before playback.

Notice Track One is “maximized”. To begin recording you must do two things. Click on the “R” in track one. (It will then be in a red box.) This is called “arming the track” or getting it ready for recording. Next, click on the record button in the transport toolbar.

Listen for the metronome and begin Piece of Cake
recording after the two count-in measures.

You will not see anything happening in the clips pane while you are recording. You really will not know if Home Studio successfully recorded your sequence until you have finished recording. You might want to just play a few notes to double-check. Click the Stop button when you have finished recording. Then you should see a “Clip” of your recording.

Now go and try what you just read – have fun!!

Let’s try playing it back!
Simple Sequence - Help for the Beginner

Here is a simple sequence you can try if you’re not sure where to begin.

Row, Row, Row Your Boat

Have Fun!

Piece of Cake
Playing it back!

After you stop recording you need to click on the rewind button to return to the start of the project.

Next, click the Play button and listen! How did it sound? If you didn’t like it you can delete it and start over. Just click up on Edit, and select “Undo Recording”.

Record it again.....and again.....and again.....until you like it!

Piece of Cake
When you are satisfied with your recording let’s change the patch. Remember, the patch is the sound or instrument that you choose to use for that track. You learned how to change the patch earlier while experimenting. To change the patch, click on the arrow in the patch box (Pch).

This will bring up the list of patches to choose from. Click on a patch to select it. Rewind, then click Play to check it out. Keep trying until you find the one you like.

Are you ready to record another track?? 😊
## Basic List of Patches

<table>
<thead>
<tr>
<th>Patch Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guitar Harmonics</td>
<td>Pad 6 (metallic)</td>
</tr>
<tr>
<td>Acoustic Bass</td>
<td>Pad 7 (halo)</td>
</tr>
<tr>
<td>Acoustic Grand Piano</td>
<td>Pad 8 (sweep)</td>
</tr>
<tr>
<td>Bright Acoustic Piano</td>
<td>FX 1 (rain)</td>
</tr>
<tr>
<td>Electric Bass (finger)</td>
<td>FX 2 (soundtrack)</td>
</tr>
<tr>
<td>Electric Grand Piano</td>
<td>FX 3 (crystal)</td>
</tr>
<tr>
<td>Electric Bass (pick)</td>
<td>FX 4 (atmosphere)</td>
</tr>
<tr>
<td>Honky-tonk Piano</td>
<td>FX 5 (bright)</td>
</tr>
<tr>
<td>Rhodes Piano</td>
<td>FX 6 (goblins)</td>
</tr>
<tr>
<td>Chorused Piano</td>
<td>FX 7 (echoes)</td>
</tr>
<tr>
<td>Harpsichord</td>
<td>FX 8 (sci-fi)</td>
</tr>
<tr>
<td>Clarinet</td>
<td>Sitar</td>
</tr>
<tr>
<td>Celesta</td>
<td>Banjo</td>
</tr>
<tr>
<td>Glockenspiel</td>
<td>Shamisen</td>
</tr>
<tr>
<td>Music Box</td>
<td>Koto</td>
</tr>
<tr>
<td>Vibraphone</td>
<td>Kalimba</td>
</tr>
<tr>
<td>Marimba</td>
<td>Bagpipe</td>
</tr>
<tr>
<td>Xylophone</td>
<td>Fiddle</td>
</tr>
<tr>
<td>Tubular Bells</td>
<td>Shanai</td>
</tr>
<tr>
<td>Dulcimer</td>
<td>Tinkle Bell</td>
</tr>
<tr>
<td>Hammond Organ</td>
<td>Agogo</td>
</tr>
<tr>
<td>Percussive Organ</td>
<td>Steel Drums</td>
</tr>
<tr>
<td>Rock Organ</td>
<td>Woodblock</td>
</tr>
<tr>
<td>Church Organ</td>
<td>Taiko Drum</td>
</tr>
<tr>
<td>Reed Organ</td>
<td>Melodic Tom</td>
</tr>
<tr>
<td>Accordion</td>
<td>Synth Drum</td>
</tr>
<tr>
<td>Harmonica</td>
<td>Reverse Cynt</td>
</tr>
<tr>
<td>Tango Accordion</td>
<td>Guitar Fret No</td>
</tr>
<tr>
<td>Acoustic Guitar (nylon)</td>
<td>Breath Noise</td>
</tr>
<tr>
<td>Acoustic Guitar (steel)</td>
<td>Seashore</td>
</tr>
<tr>
<td>Electric Guitar (jazz)</td>
<td>Bird Tweet</td>
</tr>
<tr>
<td>Electric Guitar (clean)</td>
<td></td>
</tr>
<tr>
<td>Electric Guitar (muted)</td>
<td></td>
</tr>
<tr>
<td>Overdriven Guitar</td>
<td></td>
</tr>
<tr>
<td>Distortion Guitar</td>
<td></td>
</tr>
<tr>
<td>Piece of Cake</td>
<td></td>
</tr>
</tbody>
</table>
Chapter Six

Record a Second Track
Record A Second Track

Changing the Channel

If you plan on recording more tracks (which is usually the case) you need to choose a “Channel” for your current track before moving on. You can do this before or after you listen to the recording of your first track.

To change the channel, click on the arrow in the section where it says “Ch”. Select Channel 1.

It is best to choose the same channel number as the track number. For instance, choose Channel 1 for Track 1, Channel 2 for Track 2, and so on.

What is a channel? Well, you know you have lots of channels on your TV that you can watch. But did you know that all the channels are coming in to your TV at the same time? When you select the channel you want to watch, your TV blocks out all of the other channels and only lets the one you choose come through. With MIDI, which has exactly sixteen channels, you can play all the channels at once! In fact, you need to play all the channels you have recorded on in order to hear all the different sounds you have chosen. If you play different
tracks on the same channel, they will all be played with the same sound.

Recording a second track simply involves clicking on Track Two, maximizing it and doing the same thing you did to record Track One. Here is a review of the procedures:

- Select Track Two
- Click the “R” to arm the track for recording
- Click on the Record button in the Transport bar
- Listen for the metronome count in and begin recording
- Click the Stop button
- Click Rewind, then Play
- Change the channel to Channel Two
- Change the patch in the track

Congratulations, you now have a two track sequence!
Saving Your Work

It is really important to save your work in the beginning and as you go along. After you save your work for the first time, you will be making more changes. Those changes need to be saved also. When you save your project for the first time go to File, Save. The “Save As” box will pop up.

In the File name area type a name for your project. Click on the Save box. Your work will automatically be saved in the folder named “Cakewalk projects”. Remember, save often by choosing File, Save (or the shortcut “Ctrl S”). Any new changes will automatically be added.
Sidetrack

When you are working at the computer, you are working in a place called RAM. This is a temporary work place and anything in it is wiped out when you close the program or shut down your computer. If the electricity goes off, whatever is in RAM is lost also. When you save your work you are actually sending your work from RAM to the hard drive of your computer. The hard drive is where it is stored and safe, whether the computer is on or off.
Naming a Track

It’s a good idea while you are creating a song to name each of the tracks. Use a name that will identify what is on the track, such as “piano melody” or “bass drum”. You can also use the name of the patch, such as “synth bass”. Look at some samples to see how the tracks are named.

To name a track, double-click in the track name area.

The space will turn blank.
Simply type in the name. If you use any more than ten letters, the whole name may not show up. “Piano melody” could also be “Piano mel”.

Below is an example of track names:

Piece of Cake
Simple Sequence – More Help for the Beginner

Here is how you can turn this simple sequence from Chapter Five into a multi-track sequence.

Row, Row, Row Your Boat

Record the song as you would sing it in a round. In other words, play and record it on Track one. Then, on Track two, wait until measure two to start playing/recording. Record Track three and wait until measure three to play/record the song. Then go back and change the patches for each of the tracks. Remember to put each Track on a different channel.

Add a couple of percussion tracks on channel 10 and you’ve got your first sequence! (See chapter Seven)

Have Fun!
Chapter Seven

Recording Rhythm and Drum Tracks
Recording Rhythm and Drum Tracks
(and other Great Kicks!)

Well, now that you have a couple of music tracks recorded let’s trying putting some percussion or drums in this song!

Click on the track that you will be using for your drum sounds. How can you add drum sounds when all the notes you play on your keyboard play musical notes? Well, here’s how.

Changing the Channel

Whenever you are going to create a drum track you need to change the channel to Channel 10. This is a standard that MIDI uses. This will allow the drum sounds to play from your keyboard through Home Studio.
Changing to a Drum Patch

Next, you will change the patch to a drum patch. Click as usual to change the patch. Look in the list for the “Pad” patches. These are groups of drum sounds. Select one.

<table>
<thead>
<tr>
<th>Patch</th>
<th>Patch</th>
<th>Pad 1 (Ambient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tango Accordion</td>
<td>Orchestra Hit</td>
<td>Lead 7 (live)</td>
</tr>
<tr>
<td>Acoustic Guitar (nylon)</td>
<td>Trumpet</td>
<td>Lead 8 (bass + lead)</td>
</tr>
<tr>
<td>Acoustic Guitar (steel)</td>
<td>Trombone</td>
<td>Pad 1 (new age)</td>
</tr>
<tr>
<td>Electric Guitar (jazz)</td>
<td>Tuba</td>
<td>Pad 2 (warm)</td>
</tr>
<tr>
<td>Electric Guitar (clean)</td>
<td>Muted Trumpet</td>
<td>Pad 3 (polysynth)</td>
</tr>
<tr>
<td>Electric Guitar (muted)</td>
<td>French Horn</td>
<td>Pad 4 (choir)</td>
</tr>
<tr>
<td>Overdriven Guitar</td>
<td>Brass Section</td>
<td>Pad 5 (bowed)</td>
</tr>
<tr>
<td>Distortion Guitar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Setting the Keyboard

Finally, you will set your keyboard to play drum sounds. To do this, look at the “Voice” section on your keyboard and find the number that corresponds to the Drum Kit. Select the number that will change the keyboard voice to the Drum Kit setting. Now your keyboard and Home Studio are set.

Start playing some notes on your keyboard. You should hear drum sounds. Experiment with the drum sounds. Play along with your sequence so that you can decide what sounds and rhythms you would like to record.

Piece of Cake
Confused? You don’t have to play all the drum sounds on one track. Start with a very simple rhythm for your first drum track. Arm the track for recording. (Click on the “R”). Click on the record button and tap out that beat!! Play it back. When you are ready click on the next empty track and select Channel 10.

This shows a very simple drum beat. You can create several simple drum tracks all with different sounds and rhythms. When they are all played together they will add a rich rhythm section to your song! **Just remember to change the channel to Channel 10 each time you create a drum track.**

This is a picture of several drum tracks.
NOTE: When you are finished creating your drum tracks you will need to change the voice setting on your keyboard back to an instrument voice.

Great Kicks!
Chapter Eight

Fixing Mistakes
Fixing Mistakes

Punch-In Recording

You learned previously how to change mistakes in the staff view by adding or deleting notes. Punch-in recording is another way of fixing mistakes. It allows you to re-record a whole section within a track, leaving the rest of the track untouched.

The easiest way to fix mistakes this way is to follow these steps:

- Click up on the menu bar where it says \textit{Transport}.
- Select \textit{Record Options}.
- Choose \textit{Auto Punch} and click “OK.”
You will see a little pink tab at the beginning of the first measure.

- Click and drag the tab and you will see a second tab appear.
- Drag the “Punch” tabs to the beginning and end of the section you would like to replace.

- Next, you will get ready to record. Only the section you have indicated will be recorded, so you may start playing along with the original recording at any time, in order to get the rhythm and be prepared.
- Click on the “R” to arm the track you are fixing. Then click on the “Record” button. Start
- playing any time and continue playing until you are passed the section you want replaced.
- You will notice a gap is formed in the section you are replacing. After you record the gap will be filled with your new recording.

- Play it back. If you don’t like it, you can undo the recording and do it again!
Quantizing

When you recorded you may not have done it with a perfect rhythm. It is common to make some mistakes in timing while recording. Home Studio has a plan to help you to fix these simple rhythm inconsistencies! The process is called “Quantizing”.

To quantize a particular track do the following:

Highlight the track to be quantized. Choose Edit, “Quantize”. The Quantize box will appear.

Choose the “Resolution” that represents the smallest note value found in your track - probably an eighth or sixteenth note.

Leave the “Change” and “Options” areas as they are.

Now, try playing back your sequence. Hopefully, it will sound much better. If it doesn’t, you may just have to record the track again.
Chapter Nine – Download MIDI Files from the Internet

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Downloading MIDI files from the ‘Net

Finding MIDI Files on the ‘Net

You can search for and download MIDI files from the Internet. Later, in Home Studio, you can experiment with them, change them, and remix them into new versions of the original! You will find download sites listed in the “Internet Sites” section of this manual or you can go to the Van Zant School Music Technology website at http://www.evesham.k12.nj.us/vzweb/WelcomePg/VZHomepage.htm and find several links to MIDI files there.

Zipped Files

When you go to a MIDI files website you might find that the files are in a special format called a “zip” file. Downloading a zip file is the same as downloading any other file, but after you download it you must “unzip” it. Those instructions are included here, also.

What is a zipped file? A zipped file can contain one or several files. It is a way of “squishing” up a file or files so they don’t take up so much computer space. This way they can be sent over the Internet faster or copied to a floppy disk easily. Think of it as the difference between ice and water. Say you take three ice cubes (like three files). Put them in a glass. See how much space they take up. Let the ice
cubes melt and then see how much space they take up in the glass. Less space right? It’s kind of like that with zipped files. After you download a zipped file to your computer you have to “unzip” it so that it is back to its original state. Then you can open it, install it, or do whatever you planned with it.

**Here is how to download MIDI files from the Internet:**

While you are searching for MIDI files you can listen to them. This will make the job of selecting the ones you want much easier. (Remember to watch out for those ads!! On some sites they will just pop up all over the place!)

To download a file you will either right-click on the file or click on a download link. Look for download instructions. You should see the following box.
Click "OK" to "Save this file to disk".

Click on the arrow in the "Save in" area. Then browse to the folder you want to save your MIDI files in.

Click "Save". The file will be saved in that folder. When the file is finished downloading you will get the following message:

Piece of Cake
Click on “Close”.

To unzip your new MIDI files

You will need a special program like Winace or WinZip installed on your computer to unzip your zipped files. If you need an unzip program you can download one for free from the Internet.

To unzip your files, go to the folder where they are saved.

Next, go to Edit, “Select All” to select the files you downloaded.

Right click on one of the files and choose “Extract selected files”

You will have to click “OK” several times, one time to extract each file. (The box will disappear when you are finished.)

After they are extracted you can delete the zipped files.
When MIDI Files Are Not Zipped

Some MIDI files are not zipped. In that case, you just right click on the file link to get the following menu.

Choose “Save Target As...” The Save As box will appear. Browse to the folder you want to save your MIDI files in. Click on Save. When you get the “Download Complete” box (as above), click on “Close”. These files are ready to go without any other procedures.

Editing and “Remixing”

You can experiment with your newly downloaded files. Change the patches, tempo, notes, anything you can think of to create a new “mix”. To open a file do the following. Open Home Studio. Click on “Open a Project”.

Piece of Cake
The Cakewalk Projects folder will open.

Click up on the arrow to open the “Look in” area.

IMPORTANT: Before you start changing and messing around with the file go to File, “Save As”. Type a new name for the file. Now you have two versions of the same file, the original MIDI file that will not be changed and a new one you can mess around with. Do with this with any downloaded files you want to change. This way you always have the unchanged original. You can make many versions or “remixes” of the original if you remember to change the name before you start. You can do this with your originals also. That way you can have several versions of each.

Have fun!!!
CHAPTER TEN

Adding Chords
Adding Chords

You might want to put chords in your song. Then you can print out your music and have someone play along on the guitar. The staff view of Home Studio lets you add chord symbols to your sequence. You can even draw the guitar chord grids! (You will need to have a guitar chord chart handy.)

To add a chord symbol follow these steps:

- Open the file you wish to add the chords to.
- Click on the track number to highlight the track to which you will add chords.
- Open the staff view of the track.

- Click on the Draw tool.
- Next, select the chord tool.

Piece of Cake
- Position the drawing pencil tool above the staff.
  (If you don’t see the pencil tool move the mouse around until you do.)
- Click to place the chord symbols.

Home Studio will insert a copy of the most recently added chord. You can change the symbol to the chord you want. To do this right click on the chord symbol. This will bring up the chord properties box.
Type the name for the new chord. Use # for a sharp and b for a flat.

If you would like, you can create a guitar chord.

- First, follow steps to open the chord properties box.
- Click on “New Grid.”
- Using your guitar chord chart, click on the grid at the appropriate locations to form the
- chord. You will hear the notes played as you place them on the grid.

- When you are finished, you can play the chord back to check its accuracy.

- Click “OK.”

You will see your new guitar chord(s) now displayed in the staff view!
If you would like to see a sample of chords added to a sequence, check out the Cakewalk Sample “Blues in C Major.” Also, figuring out what chord is needed, and where to put it can be a little tricky. You might want to ask an adult for help.
Chapter Eleven

A Thing Called Copyright
A Thing Called Copyright!

Did you know that if you write a song, your song is "protected" by special laws? Just like that, the moment you write it, it's protected by these laws called Copyright laws. It's the job of the United States Copyright Office to provide people with the means of copyrighting and protecting their original work.

Ok, great, what does "protected" mean?

Protected means that as the writer of a song (or other works), you have the right to do certain things with your song. No one else has that right, since the song was created by you. You can give permission to others to do those things too, if you wish. Here is a list of the things you might wish to do with your song:

- Make copies of your song.
- Distribute or give away copies of your song.
- Perform your song publicly (like in a play, movie or concert).
- Display your song publicly (such as posting it on the Internet or playing it on television).
- Make "derivative works" (like making different versions or remixes, or translating the song to another media).
How can I prove the song was created by me?

Suppose you wrote a song and someone else thought it was so good they decided to take it, make a CD single, and sell it without your permission. They might even say they wrote it. How would you prove that it was you who wrote the song? Well, that could be really hard to do. Even though our copyright laws say that your work is protected from the minute you write it, there is nothing in writing to prove it...unless...you register your song with the United States Copyright Office.

What does it mean to register my song?

When you register your song you fill out special paperwork and send it with your song to the US Copyright Office. Then it is officially on file that you are the creator (or writer) of your song. If anyone ever tries to take your song, you have proof that it belongs to you. The U.S. Copyright Office is the only office through which you can register your song. There is also a registration fee. The current fee will be stated on the form.
Where do I get this paperwork and what do I actually have to do to get my song registered?

There is a copyright website just for kids called "Copyright Kids". It is sponsored by The Copyright Society of the U.S.A. It has all kinds of information for kids about copyright. The address is www.copyrightkids.org. Right on the home page there is a link called "Register Your Own Works". This will take you to the area that tells you everything you need to know and do to get your song copyrighted.

Which form should I use???

It can be rather confusing trying to figure out what form to use to register your song. You will use either form PA or form SR. PA is for registering a work in the Performing Arts. Form SR is for registering a Sound Recording that is ready to be released and sold to the public. It is even a little more complicated than that, but Form PA will probably be the best form for you.
NOTE: There is a copy of the copyright form PA at the end of this section. (The directions are included.) You can make a copy of it or download a copy through the Copyright Kids site. Be sure, however, that your copy looks exactly like the original, front and back.

How do I know if the U.S. Copyright Office got my paperwork and filed my song?

You will receive a “Certificate of Registration”. It will take quite a while, about 4 to 5 months after you send in the paperwork. There is a sample of a Certificate of Registration at the end of this section.

What does Public Domain mean?

Eventually the copyright on a particular work expires. When this happens the work is no longer protected and enters a new status called “Public Domain”. Works that are in the public domain belong to everyone and can be freely used without getting permission from or making payment to the author. There are websites where you can find public domain songs. A few are listed below. With new copyright laws, however, most songs will be copyrighted for many years to come. Any music and lyrics written by an American author and published in 1922 or earlier are now in the Public Domain in the United States.
For more information on copyright check out these sites:

The Copyright Office Website, Public Information Section
http://www.loc.gov/copyright/faq.html

For Public Domain Information and Lists try these:

Public Domain Music
http://www.pdinfo.com/

Public Domain Music List
http://www.pdinfo.com/list.htm
On the next two pages is a sample of the PA copyright form. It can be downloaded from the Library of Congress Site at http://www.loc.gov/copyright/forms/
DO NOT WRITE ABOVE THIS LINE. IF YOU NEED MORE SPACE, USE A SEPARATE CONTINUATION SHEET.

PREVIOUS REGISTRATION. Has registration for this work, or for an earlier version of this work, already been made in the Copyright Office?

☐ Yes ☐ No If your answer is "Yes," why is another registration being sought? (Check appropriate box)

☐ This is the first published edition of a work previously registered in unpublished form.

☐ This is the first application submitted by this author as copyright claimant.

☐ This is a changed version of the work, as shown by space 6 on this application.

If your answer is "Yes," give:

Previous Registration Number

Year of Registration

DERIVATIVE WORK OR COMPILATION Complete both space 6a and 6b for a derivative work, complete only 6b for a compilation.

Preexisting Material Identify any preexisting work or works that this work is based on or incorporates.

Material Added to This Work Give a brief, general statement of the material that has been added to this work and in which copyright is claimed.

DEPOSIT ACCOUNT If the registration fee is to be charged to a Deposit Account established in the Copyright Office, give name and number of Account:

Name

Account Number

RESPONDENCE Give name and address to which correspondence about this application should be sent.

Name/Address/Apt/City/State/ZIP

Area code and daytime telephone number ☐ ( ) Fax number ☐ ( ) Email

CERTIFICATION I, the undersigned, hereby certify that I am the

☐ author

☐ other copyright claimant

☐ owner of exclusive rights

☐ authorized agent of

Name of author or other copyright claimant, or owner of exclusive rights.

☐ of the work identified in this application and that the statements made by me in this application are correct to the best of my knowledge.

Typed or printed name and date ☐ If this application gives a date of publication in space 3, do not sign and submit it before that date.

Handwritten signature ☐

CERTIFICATE will be mailed in window envelope this address:

Name

NorthernVirginia ☐

City/State/ZIP ☐

For fee information, before completing this space, see instructions before completing this space.

If this application gives a date of publication in space 3, do not sign and submit it before that date.

Handwritten signature ☐

WEB REV: June 1999

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EXAMINED BY FORM PA
CHECKED BY
CORRESPONDENCE FOR COPYRIGHT OFFICE USE ONLY

Yes__________
Following is an example of a Certificate of Registration. You will receive this certificate a few months after you register your song. It is a great feeling when you get it in the mail! You feel like a real pro!

CERTIFICATE OF REGISTRATION

This Certificate issued under the seal of the Copyright Office in accordance with title 17, United States Code, attests that registration has been made for the work identified below. The information on this certificate has been made a part of the Copyright Office records.

Marybeth Peters
REGISTER OF COPYRIGHTS
United States of America

DO NOT WRITE ABOVE THIS LINE, IF YOU NEED MORE SPACE, USE A SEPARATE CONTINUATION SHEET.

1

TITLE OF THIS WORK
"Cynical" and "Why" Compilation

2

NAME OF AUTHOR
Katherine Simpson Bradshaw (Kate)

NAME OF AUTHOR
Katherine Simpson Bradshaw (Kate)

Was this contribution to the work a work made for hire?

Yes
No

AUTHOR’S NATIONALITY OR DOMICILE
Name of Country
WA

a.

Was this author’s contribution to the work a work made for hire?

Yes
No

AUTHOR’S NATIONALITY OR DOMICILE
Name of Country
WA

b.

Was this author’s contribution to the work a work made for hire?

Yes
No

AUTHOR’S NATIONALITY OR DOMICILE
Name of Country
WA

c.

Was this author’s contribution to the work a work made for hire?

Yes
No

AUTHOR’S NATIONALITY OR DOMICILE
Name of Country
WA

3

YEAR IN WHICH CREATION OF THIS WORK WAS COMPLETED
2001

DATE AND NATION OF FIRST PUBLICATION OF THIS PARTICULAR WORK

4

COPYRIGHT CLAIMANT
Name and address must be given even if the claimant is the same as the author given in space 2.

Katherine S. Bradshaw
53 Branch St.
Medford, MA

TRANSFER
If the claimant named here in space 4 (not different from the author) named in space 2, give a brief statement of how the claimant obtained ownership of the copyright.

DO NOT WRITE BELOW HERE
**Chapter Eleven - Copyright**

---

### DERIVATIVE WORK OR COMPILATION

<table>
<thead>
<tr>
<th>Work Added to This Work</th>
<th>Material Added to This Work</th>
<th>Give a brief, general statement of the material that has been added to this work and in which copyright is claimed.</th>
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### DEPOSIT ACCOUNT

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<tr>
<th>Name</th>
<th>Account Number</th>
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</table>

### RESPONSE CORRESPONDENCE

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Phone number</th>
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</tbody>
</table>

### CERTIFICATION

The undersigned hereby certify that I am the

- Author
- Owner of exclusive rights
- Authorized Agent of Katherine S. Bradshaw

of the work identified in this application and that the statements made by me in this application are correct to the best of my knowledge.

**Katherine S. Bradshaw**

**Date:** 10/1/01

---

**Note:**

Any person who knowingly makes a false representation of a material fact in the application for copyright registration provided for by section 408, or in any written statement filed in connection with the application, shall be fined not more than $250.

---

**Form PA Instructions**

- A 100% deposit, or a deposit not less than 25% of the copyright fee, is required before registration can proceed.
- If you choose to reserve the right of the exclusive right(s) listed in box 6, the copyright fee is due to the Copyright Office.
- The copyright fee is due at the time of deposit.
- The deposit is not refundable.
- The copyright fee is subject to change.
Chapter Twelve

Internet Sites
Music Learning Sites on the Internet

The Piano Player at FUNBRAIN
http://www.funbrain.com/notes/index.html

The Online, Free Ear Training on the Net
http://www.good-ear.com/
Good Ear helps you to develop good music ears. It works within your browser. This version contains many different exercises.

Van Zant Elementary School Music Technology Site
http://www.evesham.k12.nj.us/vzweb/WelcomePg/VZHomePage.htm
Variety of sites including Karaoke, Music shareware, Virtual Drum Kit, Music Games, etc.

Playmusic
http://www.playmusic.org/
Take a seat in the orchestra, or try writing your own music!

Virtual Music Classroom from Music Kit
http://www.musickit.com/virtualclassrm.html
This site contains music resources and activities that encourage the ability to read, write, and make music.
Musical Instrument Encyclopedia
http://www.lehigh.edu/zoellner/encyclopedia.html
Here how different instruments sound!

Children’s Music Web
http://www.childrensmusic.org/

Playhouse Radio
http://www.playhouseradio.com/radio/index2.html
A fun place for young children!

Shari Lewis Charlie Horse Music Pizza Learning Site
http://www.menc.org/guides/charguid/charopen.html

The Piano Education Page
http://www.piano.avijon.com/pnokids.html#music
Music Game Sites on the Internet

KidsDomain Music Games
http://www.kidsdomain.com/games/music.html
Great music games!

Van Zant Elementary School Music Technology Site
http://www.evesham.k12.nj.us/vzweb/WelcomePg/VZHomepage.htm
Variety of sites including Karaoke, Music shareware, Virtual Drum Kit, Music Games, etc.

Funbrain – Music Games
http://www.funbrain.com/cgi-bin/getskill.cgi

Ted’s Guitar Game
http://members.aol.com/mathewsrfp/guitar.html
Strum the online guitar!

CBC For Kids Music Games (Scroll down and find on the left)
http://www.cbc4kids.ca/regular/music/default.html

The Piano Player at FUNBRAIN
http://www.funbrain.com/notes/index.html

Alfred’s Fun Zone
http://www.alfredpub.com/fun/
Happy Note – Download for free
http://www.happynote.com/music/download.html

Playhouse Radio
http://www.playhouseradio.com/radio/index2.html
A fun place for young children!

Music Game downloads from Kids Domain
http://www.kidsdomain.com/down/pc/_music-index.html

Moodalyzer – Practice you keyboarding skills with the musical keyboard!
http://www.bigtop.com/sideshow/mood.html

Musical Memory Match
http://www.bigideafun.com/veggietales/arcade/musical_mem/default.htm
MIDI files on the Internet

There are lots and lots of MIDI files on the Internet. You can download them and save them on your computer. Then you can listen to them, remix them and let your music imagination lead the way! Here are some places to get them:

Find MIDIs – Free Pop MIDI Files
http://midi-network.com

Partners in Rhyme
Pop Rock and Other MIDI Files
http://partnersinrhyme.com/midi/

MIDI Music – Classical, TV, Game and Movie Music
http://www.jmusic.com/MIDI_Music.html

Gary’s MIDI Jukebox
http://users.erols.com/crysimgs/midimain.htm
Classic Rock MIDI files

Ultimate MIDI File Collection
http://www.geocities.com/Hollywood/6248/
Older site – not updated recently, but has MIDI files and information about MIDI (includes what MIDI is)

Musician’s Tech Central
http://www.musicianstechcentral.com/midi.html
Piece of Cake
Harmony Central
Provides a list of many MIDI files resources

MIDI Composer's Exchange
http://s-allen.home.mindspring.com/picks.html
The oldest and largest site for original MIDI music

Patriotic MIDI Music
http://www.geocities.com/Pentagon/9787/music.html

Disney Music Page
http://www.dismusic.com/
A fun site with a collection of MIDI files of Disney music.

Christian MIDI
http://members.aol.com/jmpaa/midi.html

FREE MIDI drum beats
These tracks are also royalty-free
http://www.vtg.org/cimonline/ComposingEx.html

MIDI Explorer
http://www.musicrobot.com/
A MIDI search engine just for finding MIDI files on the Net

Piece of Cake
Mikes world of Drums and Drumming – Free Drum Files
http://www.nowopen.com/drums/dmidi.htm
Free Drum files page

More MIDI Drum Patterns
http://muzikdostlari.virtualave.net/schedule.htm

E-Drummer – A free multimedia drum tutor
http://www.e-drummer.net/GROOVE.ZIP
This program is a kind of multimedia drum book. It contains almost a half million different patterns. You can also enter your own patterns.
Free MIDI Music Archives – Provides a List of MIDI Links
www.onlinebusiness.com/shops/_midi/BEST_MIDI_Archives.shtml

CLASSICAL MUSIC

Classical MIDI files/Classical Archives
http://www.classicalarchives.com/

The Classical MIDI Connection
http://clavier.com/
Classics archived by period and by composer

Dave’s J.S. Bach Page
http://www.jsbach.net/index.html
Site dedicated to J.S. Bach and his music. MIDI downloads for non-commercial use.

Chopin
http://www.geocities.com/Vienna/4279/MIDI.html

Handel
http://www.classicalarchives.com/handel.html

Music for Pianos
http://frontpage.uk.digiserve.com/musicforpianos/
Piano music is mainly from the romantic and late-romantic periods
Ragtime Piano MIDI Files
http://www.trachtman.org/ragtime/

HOLIDAY MUSIC

The Haunted Jukebox
Listen to Midi files of famous scary tunes
http://www.fortunecity.com/roswell/blavatsky/557/midi.html

Online Christmas Songbook
lyrics, sheet music, and midi files of popular Christmas tunes.
http://rememberjosie.org/carols/

PUBLIC DOMAIN AND SHAREWARE

Public Domain Music (Legally free!) Music that has no copyright
www.pdinfo.com/

Music Shareware
http://www.hitsquad.com/smm/
MIDI Karaoke Sites

NOTE:
WinZip (www.winzip.com) - You may need this to uncompress the song files.

WinKaraoke Player for Win95 (www.winkaraoke.com)
The easy-to-use MIDI Karaoke Player for Windows 95 with the Bouncing Ball!

MIDI Karaoke
http://www.midikaraoke.com/home/
“The sole purpose of this music site is to provide visiting music students resources for vocal technique and MIDI sequencing interpretation and to encourage learning from the various musical interpretations that have been recorded in music files linked to this site.” You will need to download a couple of plug-ins, which are available at the site.

FREEKaraoke
http://www.freekaraoke.com/
Provides directory of Karaoke sites on the Internet and discussion area for Karaoke fans.

Canadian Kids Page Karaoke Player
http://www.canadiankids.net/singalong.jsp
Over 50 fun songs on this site.
National Institute of Environmental Health Science
Karaoke Site
www.niehs.nih.gov/kids/musicchild.htm
Good for the very young and campers!

MoJo’s Musical Mouseum
lyrics and songs
www.kididdles.com/mouseum/index.html

Karoake Music Download Site from Liberty Music
www.brockton.tv/karindex.html

Microsing
Download this software and record your own voice and add voice effects
www.microsing.com/

StreamKaraoke.com
Uses Streaming Karaoke. High quality Karaoke streamed to your computer. (Free demo download)
MIDI Learning Sites on the ‘Net

Want to learn more about MIDI? Here are good sites on the web to checkout.

Bob’s MIDI Information page
http://r2d2.cochise.cc.az.us/pedigo/index2.htm

Betty’s MIDI Mania Site
(Learn more about Cakewalk, too!)
http://www.ping.at/users/akainz/midimani.htm

Classical MIDI sequencing
MIDI World – Learn how to create great classical MIDI files
http://www.midiworld.com/cmc/midi/midi.htm

FREE piano sheet music on the web (Includes many MIDI files, also)
http://www.genhit.com/top.php/sites/scores

A MIDI Tutorial
by Robert S. Finley
Boston, MA USA
http://www.piano.avijon.com/pnotmidi.html
Chapter Thirteen

MIDI Careers
MIDI Careers

Do you enjoy creating music with MIDI? Do you have a love and a talent for music? You might have what it takes to make it a career when you grow up!

This section will give you some idea of the kinds of jobs you can get in the field of MIDI. One of the best sources for that kind of information is the National Association for Music Education. It is called MENC for short. They have a great website with all kinds of information relating to music. The address is http://www.menc.org/. On the following pages is a list of some information about MIDI careers obtained from their website.
<table>
<thead>
<tr>
<th>Science Information Technology &amp; Music</th>
<th>Knowledge of Digital Ensembles</th>
<th>Musical Talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Music and Degrees in Video Editor</td>
<td>Participation in Jazz, Pop</td>
<td>Interest in Classical Music</td>
</tr>
<tr>
<td>Sound and Video Publisher and Multimedia</td>
<td>Familiarity with Computers and MIDI</td>
<td>Creativity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Training Education and College Recommended</th>
<th>Familiarity Qualifications Personal Opportunities for Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training College Recommended Knowledge Skills</td>
<td>Education and College Recommended</td>
</tr>
</tbody>
</table>

MIDI careers obtained from MENC website.
| Teaching music: computer study | Music Skills or Arranging
<p>| Music Technology-based Music Instruction Designer Degree |</p>
<table>
<thead>
<tr>
<th>Music Career</th>
<th>Duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composer</td>
<td>Composition, arrangement, and music theory</td>
</tr>
<tr>
<td>Music Copyist</td>
<td>Knowledge of music notation, computer music notation, and computer programming</td>
</tr>
<tr>
<td>Studio Engineer</td>
<td>Knowledge of studio equipment, audio production, and sound design</td>
</tr>
<tr>
<td>Recording Engineer</td>
<td>Knowledge of recording equipment and techniques</td>
</tr>
<tr>
<td>Music Producer</td>
<td>Knowledge of music production, audio mixing, and master recording</td>
</tr>
<tr>
<td>Music Business Manager</td>
<td>Business management, marketing, and finance in the music industry</td>
</tr>
<tr>
<td>Artist Manager</td>
<td>Knowledge of artist management, negotiation, and contract law</td>
</tr>
<tr>
<td>Music Publisher</td>
<td>Knowledge of music publishing, copyright law, and royalty distribution</td>
</tr>
</tbody>
</table>

Chapter Thirteen - MIDI Careers

Piece of Cake
Some careers in MIDI require that you play an instrument like the piano or keyboard extremely well. But some careers, such as Recording Engineering, only require that you have music talent and a little music training. One thing you do have to do though, is go to a school or college that teaches how to do the job you would like.

**How would you like to design musical accompaniment for an electronic greeting card company?**

![Birthday Card](image)

Above provided as a free service by All-Yours Internet Solutions

http://www.all-yours.net/
The following MIDI career information was taken from a website called Women in Music at:

**Recording Engineer**

The recording engineer operates the sound board and other electrical equipment during the recording of music. Recording engineers run the recording session. They may also be responsible for setting up equipment in the studio prior to the session, and discussing with the producer or musical act what they want the end product to sound like. It is the Engineer's subsequent responsibility to craft a recording that meets the act's desires. The engineer may also be responsible for mixing down the recorded tracks into the finished product.

**Assistant Engineer**

The assistant engineer works in the recording studio and is responsible for assisting the recording engineer with setup, recording tracks, and mixing. He works as directed by the recording engineer.

**Other Jobs Include:**

- Acoustic Consultant
- Audio Engineer for Videos
- Computer Music Researcher
- Acoustician
- Composer/Arranger
- Consultant
Digital Audio Editor
Educator
Film/Video Sound Designer
Interactive Multimedia Specialist
Jingle Writer
MIDI Pre-Producer
Performer
Product Representative
Studio Musician
Synthesist/Producer
Digital Remastering Engineer
Live Sound Engineer
Manufacturer’s Rep/Customer Service
Mastering Engineer
Multimedia Developer
Music/Re recording Mixer (film and video)
Post-production Engineer
Record Company staff
Recording Studio Set Up worker
Sound Technician
Studio Designer
Studio Technician/maintenance

Still more jobs that include the use of MIDI:

Sound design for feature films
Programming/Sequencing of Music
Creating MIDI sequences for computer games
Creating MIDI background music for recording artists
Chapter Fourteen

For Educators
Music Software is being used by more and more schools across the U.S. and internationally. In an academic environment, the software can be used to create and understand musical compositions as well as recording technology.

**What is the difference between MIDI and Digital Audio?**

MIDI data is recognized by a computer and the software when a MIDI keyboard, which can send and receive MIDI data, is hooked directly up to a computer through a MIDI interface. The software records Digital Audio when a microphone or an instrument is plugged into a 16 bit or better sound card, either directly, or through an audio mixer. With MIDI, you are recording information such as what note was played, how hard the note was hit, etc. With digital audio, you are recording the actual sound of the instrument or voice.

Once musical ideas are recorded into Cakewalk, they can be edited in many ways. MIDI parts can be transposed and tempos can be changed. Wrong notes can be turned into correct notes. Parts can be harmonized. Real voices and instruments can be recorded with a microphone, cut and pasted. Audio effects like Reverb and Chorus can be added. Cakewalk Professional and Cakewalk Pro Audio are excellent for Multimedia projects, with the ability to sync up to video through SMPTE.

**Here are some powerful and imaginative ways that Cakewalk Music Software is used in schools.**

1. Many teachers actually use the programs for teaching better instrument performance skills. The just released Cakewalk In Concert provides real-time interactive accompaniment for students of all playing levels. The band or orchestra will follow the student’s tempo and dynamics. With a tempo display and the ability to record each practice, both the teacher and student can critique the performance on playback.

2. There are some teachers working with their students, who will take a musical score; jazz, classical or popular, and play the different parts into Cakewalk. Since Cakewalk can record actual instruments, and not just MIDI, some teachers will take the sax part of Piece of Cake
a jazz piece, for instance, mute the MIDI sax, and replace it with an actual live performance by one of their students. If the school has four tenor sax players, perhaps all four can try to play or improvise their parts on different audio tracks over the original.

3. Some teachers also create rhythm parts or exercises with the percussion line notation. A teacher can print out the percussion line notation and have a student tap out the rhythm. Teachers can use the notation features to create assignments such as providing students with the root of a chord, and having the students fill in the rest of the notes needed to complete the requested chord. Cakewalk can be used to easily create assignments to learn about chord progressions, and the rules of four part harmony.

4. With the price of CD recorders dropping everyday, schools that own CD Recorders can actually compose songs in Cakewalk and then create their own CDs.

5. Students can use Cakewalk to learn about the Internet because you can now place your music on the world wide web using Cakewalk.

6. Cakewalk Music Software’s flagship program is Cakewalk Pro Audio. This powerful program allows you to add effects like Reverb, Digital Delay, Chorus, and more to your audio tracks. The Deluxe version includes the Musician’s Toolbox II; two CD ROM’s of MIDI and Audio files, and on-screen tutorials to help both teachers and students get the most out of the program. The Musician’s Toolbox II also includes excellent MIDI performances of classical piano pieces by J.S.Bach, and Frederick Chopin, as well as ragtime pieces by Scott Joplin. A teacher can slow the music down for students to analyze. Finally, there are some tutorials included by G-Vox for students learning popular music on the guitar.

On the surface, Cakewalk Music Software encourages creativity in a musical realm. For students, this creativity should translate well into other areas of scholastic endeavors.

Cakewalk Music Software provides powerful editing tools for recording and learning about music. We have only scratched the surface of the many exciting possibilities that Cakewalk brings to our schools. Most importantly, Cakewalk Music Software puts music and technology directly into the hands of students and teachers in a user friendly way that inspires them to be their best in and out of the classroom.
Activity and Lesson Plan Ideas for MIDI

1. Introduce concept of MIDI sequencing and demonstrate MIDI sequences

2. Allow students to explore MIDI sequences with no keyboard attached
   - Play MIDI sequences
   - Experiment with changing patches and tempo
   - Make random changes in staff view

3. Have students create a simple two track sequence using music they are familiar with
   - Using a classical piece, play the right hand on track one and the left hand on Track two
   - If it’s too difficult for student to play separately copy and paste a track that has been played with both hands. Using the staff view erase the treble cleff in the second track and change the patch. Erase the bass cleff in the first track and change the patch. Now you have two tracks. One with treble cleff and one with bass cleff.
   - Assign a channel and a patch to each track

4. Have students hook up their own equipment before recording
   - Hook interface to computer
   - Hook MIDI cables to interface and keyboard
   - Plug in power supply for keyboard
   - Check that interface is receiving input/output

5. Create an original sequence in this order:
   (Start as simple eight measure project with just one track or sound)
   - Create a simple bass part that repeats every four beats
   - Add a couple of percussion tracks

Piece of Cake
Chapter Fourteen – For Educators

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• Create a melody to go with the bass and percussion
• Add chords if student desires and is capable
• Assign channels and patches to all tracks
• Play around with tempo

6. Take a one track sequence (perhaps played with two hands) and copy it to a new track. Set the channels and change the patch sound for each of the tracks. The sound is duplicated in two different sounds with a fuller effect

7. Provide students with pre-made beats for a song starter lesson
   • Have students choose a drum sample first
   • Next have students choose a base sample
   • Students can add more pre-made drum patterns
   • Students can create and add a melody line

8. Use Row, Row, Row Your Boat to easily create a three track sequence that plays a round using different instruments. Add some drums sounds.

9. Search for and download MIDI files on the Internet

10. Choose from Home Studio tutorials or Internet MIDI file collection to remix and re-create sequences. (Use your favorite pop tune MIDI file!)

11. Print out staff view notation so you can follow more easily and decide what changes or additions you want. Like adding some emphasis notes in another track, or putting in chords

12. Teach students how to add chords to a selected sequence
   • How to determine what chord to add
   • How to add and create the chord on the grid (Have a copy of a guitar chord chart handy)

13. Create a random song by just using the staff view and clicking in notes. Add a drum track, bass
14. track, speed up the tempo, and make other changes.
15. Explore your MIDI keyboard without using the sequencer
16. Pretend you are a free-lance MIDI artist and create a 30 second tune for a commercial
17. Collaborate with a partner to create or remix a sequence
18. Download the PA copyright form and show students how to complete it to copyright their creations
19. Copy and paste drum tracks from other songs and use as a song starter.
20. Have students listen to some selections from “Switched on Bach” and discuss the history of electronic music and the MOOG synthesizer.
21. Explore and experiment with Fruity Loops (packaged with Home Studio)
22. Download demos and explore demos such as Electronic Drummer
   Band in a Box
   Fruity Loops
23. Invite musicians to bring and demonstrate other equipment such as MIDI guitars and drum machines.
24. Import pieces of demos into Cakewalk Home Studio
25. (In fruity Loops, under “Vintage” or
26. Play a simple/familiar melody then copy/paste it to a different track. In that track change the channel to channel 10 and see how the melody sounds as a drum pattern!
27. Download video game MIDI files and edit them. Some seem more conducive to editing than regular song files.
MIDI UNIT PLAN

- Easily create real music on any standard computer.
- Instructions relate to using software and hardware found on most computers or downloaded free and legally from the internet.

- Multi-Level
- Self Guided
- Cross Curricular
- Low Level of Written Communication

*Developed by Jason Callaghan, Education Advisor, Ipswich District Office*

Piece of Cake
MIDI UNIT PLAN

This is a discreet unit of work introducing students to MIDI devices on a regular computer. The nature of the plan lends itself to individualised learning, supporting contexts other than traditional classroom environments.

MIDI is a set of standards for computers to make digitalised sound. Every computer has this capability and students can work through this unit without the need to purchase a lot of hardware or software. However, if you do have a budget, optional extras may include:

- Professional sequencing software (around $80-$100 such as Cakewalk Home Studio)
- A MIDI keyboard and cable from electronic shops (around $100)
- A professional quality soundcard (around $200 for Montego II)

These simple extras can greatly increase the ease of MIDI composition and the quality of sound students experience.

For an explanation of MIDI devices, find the resource "MIDI and the Classroom" (email Jason.callaghan@qed.qld.gov.au) and ask for a copy.

Resources: This unit plan is based on FREE and LEGAL MIDI sequencing software called Massiva. You can download it from www.download.com (search for Massiva). To get this piece of software working, you need to press F12 and make sure the FILE-OPTIONS-MIDI-MIDI OUT port is set up for your computer – you may have to do a bit of fiddling and set the default once you can hear sound. A more professional piece of software is however recommended such as Cakewalk Home Studio (approx $100) or Cakewalk Express (approx $60). A selection of MIDI files can be easily downloaded off the internet (search for MIDI). Students should have a chance to find these themselves and work with their favourite pieces of music.

This unit plan is divided into five levels, each progressively more difficult in content. It is suggested that students start at the lower levels and progress at their own pace. The content is suitable for grades 5-12, as the tasks are open ended and accept a wide variety of ability levels.

1. Listen to MIDI – isolate notes
2. Change existing MIDI: extended mix
3. Change existing MIDI: genres
4. Generate new compositions based on given chords
5. Compose original MIDI track

Jason Callaghan – EALT IPDO ©2000
LEVEL 1

OUTCOME: Though analysing existing MIDI tracks, student’s understanding of music comprehension and auditory discrimination will be enhanced.

RESOURCES:
- A collection of favourite MIDI files
- MIDI sequencer software

ACTIVITIES

1. Open a popular MIDI file in a sequencer, viewing all tracks.
2. Listen to the song.
3. This time, mute all but one track while listening to the song.
4. Keep on turning on individual tracks, until you have heard all of the individual tracks in a song.
5. While playing the file again, turn on groups of tracks that accompany each other. You may find that some tracks are active during the chorus, while some are active during the verses.
6. Isolate the tracks that sound out of key or would sound better with an instrument change. Change the instrument or the key for that song.
7. Once you have better instruments playing, it is time to remix the song to make it just the way you like it. Adjust the volume, panning, velocity and key of each track, each time listening to how the overall music is changed. You may also like to adjust the tempo of the song.
8. Save your finished creation. Listen to your original track. Then listen to your changes. Have you improved the song or make it worse? Think about the changes you made to each track. What changes worked, what didn’t?
9. Find another song you like and start from scratch. Change one track at a time, starting with the drums and then moving onto the main melody (what might be the vocal track). Sometimes too many changes can be bad or a song, as a song might only require small changes such as the volume of one track or the overall velocity.
10. Make sure you know about the definitions of these words. Use the help file, your dictionary or the internet to help you:
   - Velocity
   - Pan
   - Key
   - Volume
   - Pitch
   - Reverb
   - Chorus
   - Mute
   - Solo
LEVEL 2

Some people make a living out of remixing other people’s songs. Ever heard of the Chemical Brothers? When you buy a CD, you might find a few remixes from different people that give a new feel to the song. We’re going to use the same process in this activity.

OUTCOMES: Though modifying the structure of an existing file, student’s understanding of time relationships and auditory discrimination will be enhanced.

RESOURCES:
- One favourite MIDI file
- Sequencing Software

Activities:

1. This activity asks you to extend part of a song. Firstly, listen to your song and choose the part of the song you would like to extend. Often, programmers extend the second last chorus or the area before the last verse. You will need to identify where the chorus and verses are.

2. Use the track and piano roll view to find how the song is built up. MIDI is very mathematical. You might find that a new track comes in every 4 or 8 bars. You can also count the length of each chorus or verse in bars – these usually stay the same throughout the song. Also, have a look at the patterns of notes. You will find that a whole pattern usually fits in 4 bars (refer to the numbers on top). This tight fitting sequence will allow you to cut and paste notes easily.

3. Use the software to identify where you would like to insert a section of music. Remember to work in the bars and spacing that already exists in the song. In Massiva, use the left mouse button to select the start of the new area and the right mouse button to select the end of the new area. Other software will have its own way of letting you select files. Then go to SEQUENCE – INSERT AREA. Now you should have a blank area to work with. You should be able to see the blank area in the track view and also in the piano view.

4. Now you need to fill the gaps with notes! For the track view, Massiva lets you select a part of a track and then APPEND it (make a copy at the end of it). In piano roll view, you can cut and paste notes or groups of notes. Fill each track with a mixture of notes and listen to it each time.

5. You might also want to remove a certain area, for example if the introduction is too long. Experiment with cutting and pasting. You might also like to try cutting and pasting between two songs – take a drum track from one song and add it to another one!

6. You’ll be amazed at how easy the whole process is! You might also like to go into the piano roll view and start drawing a few more notes on the inserted part – press the keyboard first to hear the notes, then draw them on the right line. Add an extra symbol or drum kick to the drum track to change the whole feel of the song!
LEVEL 3

OUTCOME: Through analysing and modifying MIDI tracks, students understanding of the structure of a range of musical genres will be enhanced.

RESOURCES:

- A range of MIDI files across many genres
- MIDI sequencing software

ACTIVITIES:

1. This activity requires students to change a MIDI file from one musical genre to another. You will need to choose two genres to work with from this list:
   a. Pop/Easy Listening
   b. Dance/techno
   c. Heavy Metal
   d. Classical
   e. Jazz
   f. County and Western

NOTE: It is very common for some great dance/techno tracks to be born out of classical music or pop music. You will also find that there is a great similarity between classical and heavy metal.

2. Choose the genre you’d like to finish with and find a few examples of MIDI tracks in this style. For example, you might want to make a dance track, so you need to find a few existing dance tracks and see how they are made. Listen to the song and have a look at how it is made up, getting to know the:
   a. Types of instruments used (percussion, string etc)
   b. The tempo
   c. The velocity of tracks
   d. How the beat is kept
   e. How tracks relate to one another (do many tracks play at once, do they take turns)
   f. The patterns made in each track. You might like to look at the Piano Roll of each track, analysing if the notes are played in tight, mathematical patterns, or loose, improvised patterns. You might especially need to analyse the drum track.

3. You might want to write down these elements, so you can refer to them later.

4. Select a simple MIDI track to start your process of change. For example, a classical piece of music. Try not to get anything longer than five tracks and be prepared to have to change the music if you just can’t get anywhere.

5. Start by changing the tempo of your track, then change the instruments and settings of each track to get to your new genre. To change the instrument, double click or right click on the instrument name in the track view. Choose BANK/PROHRAM and under GM, choose another instrument. You can do this while the song is playing so you can hear the effects of different instruments. It might also be helpful to SOLO each track as you change it.
You may also want to VIEW – GM INSTRUMENT to find the name of each sound much faster. (These are Massiva instructions.) This will take a while, requiring you to listen to each change before going onto the next. When you are changing instruments, notice that their names appear in families (all of the pianos are together, as are the string instruments).

6. If you need to, you might have to COPY and PASTE or DRAG one track into another to get a few more sounds.

7. Save your creation. Does it actually sound like another genre? You might like to try again, choosing two more genres.

- Later on, we learn how to add new tracks. You might like to revisit this song later and make it sound better.
- For another advanced idea, you might have to change the attack/decay/expression/modulation/sustain of the instruments, to make them sound more realistic. You will have to find these features and experiment for yourself if you are interested.
LEVEL 4

OUTCOME: Through experimenting with repetition, pattern and accompaniment, students create a new song using a given segment of melody.

This activity is best done as part of a group. Each person in the group is given the same MIDI file to work with – usually a whole song reduced to only one track holding the melodic elements. Students then build the rest of the song around this by composing original music or importing tracks from other songs.

RESOURCES:

- A modified MIDI file – your friend or teacher should find and modify a file for you, so you don’t hear the whole song and get your ideas influenced.
- MIDI sequencing software
- A MIDI keyboard could also be used here

ACTIVITIES:

1. Open your MIDI file and listen to the track provided. This should be a melody to a song.
2. Start by adding a drum track – just a simple beat to go throughout the song. To do this, go to the second track, change the channel to 10 (10 is always the drum track) and then insert a part. Although this part is blank, you can go into piano roll and draw in a drum track. Start with one beat per bar. You should only have to draw 4 notes, then copy and paste this beat for the whole song. When you have a few drum parts pasted, you can group these together so it’s easier to copy and paste.
3. Adjust the tempo of the song, listening to the drum beats.
4. Add other instruments in other tracks the same way. You can only use 16 channels in Massiva, and you can’t have different instruments using the same channel.
LEVEL 5

OUTCOME: Through synthesising knowledge of MIDI sequencing, students create an original composition.

RESOURCES:
- MIDI sequencing software
- A MIDI keyboard is useful
- Optional recording equipment (audio cassette for example)

ACTIVITIES:

1. This is your turn to make a song from scratch. Usually, MIDI files are composed this way:
   
a. Map out a simple drum beat  
b. Adjust the tempo  
c. Using markers in the software, or writing down the bar numbers, plan the patterns of your song. For example:
   i. Intro – bars 1-8  
   ii. First verse bars 9-12  
   iii. Chorus – bars 13-16 etc..  
d. Remember to work in multiples of 4 or 8  
e. Write your song, or have some idea of what the melody should sound like  
f. Use a piano to mark in the chorus melody  
g. Copy this melody to all choruses  
h. Use a piano to mark in each verse – these can also be copied if they are similar  
i. Decide on your genre and use the appropriate instruments to build up the rest of the song.  
j. It’s always easier to constantly look at other songs to get ideas about how to build up your song. Remember you can cut and paste their notes into your own song.

2. Once you have your song finished, you need to think about how others are going to listen to it. Here’s a few ideas:
   - Save it as a MIDI file and keep it on floppy disk until you need it again  
   - Put it on the background of a web page  
   - Put it on the background of a Word document  
   - Put it on the background of a PowerPoint file  
   - Record it as a wave file using Sound Recorder (you can then make a CD)  
   - Take it to someone with a good sound card and hear what your creation sounds like on a better computer.  
   - Make a compilation of songs and put out an “album”.  
   - Enter MIDI competitions on the internet.  
   - Use the file as a backing for school concerts.  
   - Use it to teach others how to make MIDI.  
   - Play your own music files while you work at the computer every day.
**MASSIVA SCREEN SHOTS**

The track view – here you can see individual tracks, their listings and when MIDI events are sequenced to come on (the purple bars).

The PIANO ROLL view – here you can see individual notes being programmed to turn on and off. The piano on the left lets you hear the notes before you 'draw' them. You can also change the length of notes and their positions in this view. This is also the place to copy and paste selected sections of a track.

On the lower bar, you can see vertical lines. These are the properties of each note – here you can see their velocity or volume. You can also see sustain, decay, reverb or chorus in this bar.
Here you can see a close-up of the track properties. You can set the volume, panning, channel and reverb for each track here. You can also see the SOLO button.

This is the view of one song after a space has been inserted, the start of making an extended mix.

Instead of seeing the track names in the track view, choose X-RAY and see the MIDI events (the white dots on each bar).
Music Technology Sites for Educators

ATMI – Association for Technology in Music Instruction
http://www.music.org/atmi/
Especially noted for ATMI Technology Directory, a 400+ page guide to thousands of software and hardware products used in music instruction.

Technology Institute for Music Educators (TI:ME).
http://www.ti-me.org/
A non-profit corporation registered in the State of Pennsylvania whose mission is to assist music educators in applying technology to improve teaching and learning in music. **Music Technology Certification program offered.**

Music Technology and Education
http://homepages.nyu.edu/~rjc223/MusicTechandEd/mtmeFrameSet.html
From NYU - Technology Resources and Information for Music Educators

Children’s Music Web
http://www.childrensmusic.org/
** Composers In Electronic Residence (CIER)
http://www.edu.yorku.ca/ciermain.html/Page2.html

CIER's interactive conference site is designed to explore original student music in the classroom. Students upload their music, either finished or in progress (it could be a two-bar theme), into the conference where it is stored in a discussion group. The music, before being uploaded, is stored as a Standard MIDI File. Participating composers download the piece of music, listen to it and then respond to it. As well as a note of comment and encouragement, the note will contain some advice for revision or further development as well.

Music Jokes
http://www.talentz.com/MusicEducation/Services/Jokes.mv

World Rhythm Training
Guides to polyrhythms with MIDI soundfiles

K-12 Resources for Music Educators
(Tons of links)
http://www.isd77.k12.mn.us/resources/staffpages/shirk/k12.music.html

MIDI in the Classroom
*MIDI Unit Plan
A series of developmental activities

Piece of Cake
ISTE
http://cnets.iste.org/

Music Technology Online Magazine
Articles – Numerous authors write about music technology in the classroom
http://www.lentine.com/articles/article_front_page.htm

Music Education Software Recommendations
http://www.lentine.com/articles/Music%20Education%20Software%20Recommendations.htm
By Dr. Thomas Rudolph

Music Technology Curriculum & Lesson Plans
http://home.earthlink.net/~celder23/mtcurric.html

Betty’s MIDI Mania Site
(Learn more about Cakewalk, too!)
http://www.ping.at/users/akainz/midimani.htm

Playhouse Radio
http://www.playhouseradio.com/radio/index2.html
A fun place for young children!

MIDI and Music Technology Resources for Teachers
Great resource with lots of links
www.isd77.k12.mn.us/resources/staffpages/shirk/midi.html
The Piano Education Page
http://www.piano.avijon.com/
"a one-stop resource for teachers, students, parents of students, and fans of the piano with over 600 pages of free information, upgraded biweekly".
TI:ME - An Organization for Music Technology Educators

In the summer of 1995 TI:ME was formed to address the following areas: First, there was a need to codify technology into a cohesive set of standards. Next, a certification process was explored to recognize the achievement of in-service music teachers in music technology. Finally, it became clear that there was a need for a new organization, national in scope and focused on the subject of teacher training in music technology. A National Advisory board was established and met in October of 1996 setting in motion the tasks that led to the creation of a world wide web site, the publication of a book of Strategies and a Newsletter The TI:MES, the criterion for membership, and the development of a comprehensive curriculum for in-service teacher training in music technology.

TI:ME Goals

The Goals of the Institute include:

1. The Institute will develop standards for music technology in-service teacher training courses in public or private educational settings. This will be accomplished by organizing an advisory board comprised of experts in the field of music education, music technology, manufactures and distributors. A printed document will be created describing the specific technology standards for music education. This booklet will be made available to educational institutions and music educators.

2. The Institute will develop course materials for music technology in several specific areas to include sequencing, notation, telecommunications, computer-assisted instruction and other courses.

3. The Institute will list and define skills required to obtain proficiency in the understanding and use of technology as
it is applied to the teaching of music. In addition the Institute will certify skill levels through appropriate tests and measurements. Teachers who have gained proficiency in music technology will be awarded certification and the Institute will maintain records of certification as evidence of professional growth.

4. The Institute will provide a forum for discussion, research, and development for music educators to improve their understanding and use of technology. This will be accomplished by developing a Web site, publishing a newsletter, and offering to music educators a yearly membership in the Technology Institute. Also, a biannual national music education technology convention will be organized to bring together the music education community and the manufacturers, publishers, and developers of software and hardware.

Articles (in alphabetical order by author)

- **Applying Theory to Technology in the Music Classroom** by Bill Bauer

- **Multimedia Basics** - courtesy of StevenEstrella.com
  - Understanding Moving Images
  - Understanding Sound
  - Understanding Still Images
  - Understanding Text
• **Biography** of this quarter's featured composer - courtesy of StevenEstrella.com
  (This link opens in a new window.)

• **An Archive of Music Technology Articles** - courtesy of IAEKM

• **Crisis in the Computer Lab** by Fred Kersten

• **What's New in Music Technology** by Mike Klinger

• **Marchin' to Your Own Virtual Drummer** by Stefani Langol

• **An Archive of Music Technology Articles** - courtesy of Lentine's
  
  o Music Education Technology and Instructional Courseware

  o MIDI Software and MIDI Instrument Reviews

• **Nine Suggestions for Improving Sequences** by Don Muro

• **Computers and Music at Harvard-Westlake School** by Daniel Newsom

• **Music Technology and the National Standards** by Thomas E. Rudolph

• **Notation Software: The Ultimate Tool for the Music Teacher** by Thomas E. Rudolph

• **Educator's Corner** - courtesy of SoundTree

• **Home Practice Online!** by Scott Watson
TI:ME Membership Form

Fill out the form below, and mail it to the address below with a check or money order made payable to "TI:ME".

TI:ME
305 Maple Avenue
Wyncote, PA 19095

Select Your Membership Type:
- Individual $35.00
- Institutional/Commercial $200.00
- Student $15.00
- Library $25.00

Name

Mailing Address

City, State, Country, and Zip or Postal Code

Phone (Daytime) (Evening)

Fax

e-mail (PLEASE PRINT CLEARLY.)

School or Professional Affiliation

This form can also be printed from the TI:ME website at http://www.ti-me.org/
National Standards for Music Education

From MENC, The National Association for Music Education

1. Singing, alone and with others, a varied repertoire of music.
2. Performing on instruments, alone and with others, a varied repertoire of music.
3. Improvising melodies, variations, and accompaniments.
4. Composing and arranging music within specified guidelines.
5. Reading and notating music.
6. Listening to, analyzing, and describing music.
7. Evaluating music and music performances.
8. Understanding relationships between music, the other arts, and disciplines outside the arts.
9. Understanding music in relation to history and culture.

Related Links:

Summary Statement -- What All Students Should Know and Be Able to Do in the Arts - introductory statement to the National Standards

National Standards for Arts Education: A Brief History
Standards Reprint Permission Policy
The School Music Program: A New Vision (The K-12 National Standards, PreK Standards, and What They Mean to Music Educators)
The School Music Program (Spanish Translation)
Publications on the the National Standards and Their Implementation
State Music Education Standards
The K-12 National Standards, PreK Standards, and What They Mean to Music Educators

(The National Standards begin at PREKINDERGARTEN, AGE 2-4). For the purposes of this study we will list standards beginning at grades K-4, up to and including grades 5-8.

GRADES K-4

Performing, creating, and responding to music are the fundamental music processes in which humans engage. Students, particularly in grades K-4, learn by doing. Singing, playing instruments, moving to music, and creating music enable them to acquire musical skills and knowledge that can be developed in no other way. Learning to read and notate music gives them a skill with which to explore music independently and with others. Listening to, analyzing, and evaluating music are important building blocks of musical learning. Further, to participate fully in a diverse, global society, students must understand their own historical and cultural heritage and those of others within their communities and beyond. Because music is a basic expression of human culture, every student should have access to a balanced, comprehensive, and sequential program of study in music.

Terms identified by an asterisk (*) are explained in the glossary. The standards in this section describe the cumulative skills and knowledge expected of all students upon exiting grade 4. Students in the earlier grades should engage in developmentally appropriate learning experiences designed to prepare them to achieve these standards at grade 4. Determining the curriculum and the specific instructional activities necessary to achieve the standards is the responsibility of states, local school districts, and individual teachers.

1. Content Standard: Singing, alone and with others, a varied repertoire of music

Achievement Standard:
Students
a. sing independently, on pitch and in rhythm, with appropriate timbre, diction, and posture, and maintain a steady tempo
b. sing *expressively, with appropriate dynamics, phrasing, and interpretation
c. sing from memory a varied repertoire of songs representing *genres and *styles from
Chapter Fourteen - For Educators

diverse cultures
d. sing ostinatos, partner songs, and rounds
e. sing in groups, blending vocal timbres, matching dynamic levels, and responding to
the cues of a conductor

2. Content Standard: Performing on instruments, alone and with others, a varied
repertoire of music

Achievement Standard:
Students
a. perform on pitch, in rhythm, with appropriate dynamics and timbre, and maintain a
steady tempo
b. perform easy rhythmic, melodic, and chordal patterns accurately and independently
on rhythmic, melodic, and harmonic *classroom instruments
c. perform expressively a varied repertoire of music representing diverse genres and
styles
d. echo short rhythms and melodic patterns
e. perform in groups, blending instrumental timbres, matching dynamic levels, and
responding to the cues of a conductor
f. perform independent instrumental parts / while other students sing or play contrasting
parts

3. Content Standard: Improvising melodies, variations, and accompaniments

Achievement Standard:
Students
a. improvise "answers" in the same style to given rhythmic and melodic phrases
b. improvise simple rhythmic and melodic ostinato accompaniments
c. improvise simple rhythmic variations and simple melodic embellishments on familiar
melodies
d. improvise short songs and instrumental pieces, using a variety of sound sources,
including traditional sounds, nontraditional sounds available in the classroom, body
sounds, and sounds produced by electronic means 2

4. Content Standard: Composing and arranging music within specified guidelines

Achievement Standard:
Students
a. create and arrange music to accompany readings or dramatizations
b. create and arrange short songs and instrumental pieces within specified guidelines 3
c. use a variety of sound sources when composing

5. Content Standard: Reading and notating music
Achievement Standard:
Students
a. read whole, half, dotted half, quarter, and eighth notes and rests in 24, 34, and 44 meter signatures
b. use a system (that is, syllables, numbers, or letters) to read simple pitch notation in the treble clef in major keys
c. identify symbols and traditional terms referring to dynamics, tempo, and articulation and interpret them correctly when performing
d. use standard symbols to notate meter, rhythm, pitch, and dynamics in simple patterns presented by the teacher

6. Content Standard: Listening to, analyzing, and describing music

Achievement Standard:
Students
a. identify simple music *forms when presented aurally
b. demonstrate perceptual skills by moving, by answering questions about, and by describing aural examples of music of various styles representing diverse cultures
c. use appropriate terminology in explaining music, music notation, music instruments and voices, and music performances
d. identify the sounds of a variety of instruments, including many orchestra and band instruments, and instruments from various cultures, as well as children's voices and male and female adult voices
e. respond through purposeful movement 4 to selected prominent music characteristics 5 or to specific music events 6 while listening to music

7. Content Standard: Evaluating music and music performances

Achievement Standard:
Students
a. devise criteria for evaluating performances and compositions
b. explain, using appropriate music terminology, their personal preferences for specific musical works and styles

8. Content Standard: Understanding relationships between music, the other arts, and disciplines outside the arts

Achievement Standard:
Students
a. identify similarities and differences in the meanings of common terms 7 used in the various arts
b. identify ways in which the principles and subject matter of other disciplines taught in the school are interrelated with those of music8
9. Content Standard: Understanding music in relation to history and culture

Achievement Standard:
Students
a. identify by genre or style aural examples of music from various historical periods and cultures
b. describe in simple terms how *elements of music are used in music examples from various cultures of the world 9
c. identify various uses of music in their daily experiences 10 and describe characteristics that make certain music suitable for each use
d. identify and describe roles of musicians 11 in various music settings and cultures
e. demonstrate audience behavior appropriate for the context and style of music performed

Notes:
1. E.g., simple rhythmic or melodic ostinatos, contrasting rhythmic lines, harmonic progressions and chords.
2. E.g., traditional sounds: voices, instruments; nontraditional sounds: paper tearing, pencil tapping; body sounds: hands clapping, fingers snapping; sounds produced by electronic means: personal computers and basic *MIDI devices, including keyboards, sequencers, synthesizers, and drum machines.
3. E.g., a particular style, form, instrumentation, compositional technique
4. E.g., swaying, skipping, dramatic play
5. E.g., meter, dynamics, tempo
6. E.g., meter changes, dynamic changes, same/different sections
7. E.g., form, line, contrast
8. E.g., foreign languages: singing songs in various languages; language arts: using the expressive elements of music in interpretive readings; mathematics: mathematical basis of values of notes, rests, and meter signatures; science: vibration of strings, drum heads, or air columns generating sounds used in music; geography: songs associated with various countries or regions
9. E.g., Navajo, Arabic, Latin American
10. E.g., celebration of special occasions, background music for television, worship
11. E.g., orchestra conductor, folksinger, church organist

GRADES 5-8

The period represented by grades 5-8 is especially critical in students' musical development. The music they perform or study often becomes an integral part of their personal musical repertoire. Composing and improvising provide students with unique insight into the form and structure of music and at the same time help them to develop
their creativity. Broad experience with a variety of music is necessary if students are to make informed musical judgments. Similarly, this breadth of background enables them to begin to understand the connections and relationships between music and other disciplines. By understanding the cultural and historical forces that shape social attitudes and behaviors, students are better prepared to live and work in communities that are increasingly multicultural. The role that music will play in students’ lives depends in large measure on the level of skills they achieve in creating, performing, and listening to music.

Terms identified by an asterisk (*) are explained in the glossary. Except as noted, the standards in this section describe the cumulative skills and knowledge expected of all students upon exiting grade 8. Students in grades 5-7 should engage in developmentally appropriate learning experiences to prepare them to achieve these standards at grade 8. These standards presume that the students have achieved the standards specified for grades K-4; they assume that the students will demonstrate higher levels of the expected skills and knowledge, will deal with increasingly complex music, and will provide more sophisticated responses to works of music. Every course in music, including performance courses, should provide instruction in creating, performing, listening to, and analyzing music, in addition to focusing on its specific subject matter. Determining the curriculum and the specific instructional activities necessary to achieve the standards is the responsibility of states, local school districts, and individual teachers.

1. Content Standard: Singing, alone and with others, a varied repertoire of music

Achievement Standard:

Students
a. sing accurately and with good breath control throughout their singing ranges, alone and in small and large ensembles
b. sing with *expression and *technical accuracy a repertoire of vocal literature with a *level of difficulty of 2, on a scale of 1 to 6, including some songs performed from memory
c. sing music representing diverse *genres and cultures, with expression appropriate for the work being performed
d. sing music written in two and three parts Students who participate in a choral ensemble
e. sing with expression and technical accuracy a varied repertoire of vocal literature with a level of difficulty of 3, on a scale of 1 to 6, including some songs performed from memory

2. Content Standard: Performing on instruments, alone and with others, a varied repertoire of music

Achievement Standard:

Students
a. perform on at least one instrument accurately and independently, alone and in small and large ensembles, with good posture, good playing position, and good breath, bow, or stick control
b. perform with expression and technical accuracy on at least one string, wind, percussion, or *classroom instrument a repertoire of instrumental literature with a level of difficulty of 2, on a scale of 1 to 6
c. perform music representing diverse genres and cultures, with expression appropriate for the work being performed
d. play by ear simple melodies on a melodic instrument and simple accompaniments on a harmonic instrument

Students who participate in an instrumental ensemble or class
e. perform with expression and technical accuracy a varied repertoire of instrumental literature with a level of difficulty of 3, on a scale of 1 to 6, including some solos performed from memory

3. Content Standard: Improvising melodies, variations, and accompaniments

Achievement Standard:
Students
a. improvise simple harmonic accompaniments
b. improvise melodic embellishments and simple rhythmic and melodic variations on given pentatonic melodies and melodies in major keys
c. improvise short melodies, unaccompanied and over given rhythmic accompaniments, each in a consistent *style, meter, and tonality

4. Content Standard: Composing and arranging music within specified guidelines

Achievement Standard:
Students
a. compose short pieces within specified guidelines, demonstrating how the elements of music are used to achieve unity and variety, tension and release, and balance
b. arrange simple pieces for voices or instruments other than those for which the pieces were written
c. use a variety of traditional and nontraditional sound sources and electronic media when composing and arranging

5. Content Standard: Reading and notating music

Achievement Standard:
Students
a. read whole, half, quarter, eighth, sixteenth, and dotted notes and rests in 2/4, 3/4, 4/4, 6/8, 3/8, and alla breve meter signatures
b. read at sight simple melodies in both the treble and bass clefs
c. identify and define standard notation symbols for pitch, rhythm, dynamics, tempo, articulation, and expression
d. use standard notation to record their musical ideas and the musical ideas of others

Students who participate in a choral or instrumental ensemble or class
e. sightread, accurately and expressively, music with a level of difficulty of 2, on a scale of 1 to 6

6. Content Standard: Listening to, analyzing, and describing music

Achievement Standard:
Students
a. describe specific music events in a given aural example, using appropriate terminology
b. analyze the uses of *elements of music in aural examples representing diverse genres and cultures
c. demonstrate knowledge of the basic principles of meter, rhythm, tonality, intervals, chords, and harmonic progressions in their analyses of music

7. Content Standard: Evaluating music and music performances

Achievement Standard:
Students
a. develop criteria for evaluating the quality and effectiveness of music performances and compositions and apply the criteria in their personal listening and performing
b. evaluate the quality and effectiveness of their own and others' performances, compositions, arrangements, and improvisations by applying specific criteria appropriate for the style of the music and offer constructive suggestions for improvement

8. Content Standard: Understanding relationships between music, the other arts, and disciplines outside the arts

Achievement Standard:
Students
a. compare in two or more arts how the characteristic materials of each art can be used to transform similar events, scenes, emotions, or ideas into works of art
b. describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with those of music

9. Content Standard: Understanding music in relation to history and culture
Achievement Standard:
Students
a. describe distinguishing characteristics of representative music genres and styles from a variety of cultures 6
b. classify by genre and style (and, if applicable, by historical period, composer, and title) a varied body of exemplary (that is, high-quality and characteristic) musical works and explain the characteristics that cause each work to be considered exemplary
c. compare, in several cultures of the world, functions music serves, roles of musicians, 7 and conditions under which music is typically performed

Notes:
1. E.g., band or orchestra instrument, keyboard instrument, fretted instrument, electronic instrument
2. E.g., a particular style, form, instrumentation, compositional technique
3. E.g., entry of oboe, change of meter, return of refrain
4. I.e., sound in music, visual stimuli in visual arts, movement in dance, human interrelationships in theatre
5. E.g., language arts: issues to be considered in setting texts to music; mathematics: frequency ratios of intervals, sciences: the human hearing process and hazards to hearing; social studies: historical and social events and movements chronicled in or influenced by musical works
6. E.g., jazz, mariachi, gamelan
7. E.g., lead guitarist in a rock band, composer of jingles for commercials, singer in Peking opera
Opportunity-to-Learn Standards for Music Technology

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Reston, VA 20191
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Immediately following the release of the National Standards for Music Education in 1994, MENC--The National Association for Music Education released *Opportunity-to-Learn Standards for Music Instruction* as a guide to what schools should provide to help students achieve both the National Standards for Music Education in grades K-12 and the MENC prekindergarten music education standards. MENC recommends that states either adopt these opportunity-to-learn standards or use them as a basis for developing their own. The standards challenge all who are committed to high-quality music instruction to work together to improve the teaching and learning of music in the nation's schools.

The writers of the opportunity-to-learn standards were well aware that new technologies have an impact on the ways schools deliver music instruction. Throughout the text of those standards, there are references to computers, software, MIDI equipment, CD-ROMs, and other resources that are important to the world of the music teacher, as well as essential to the world of music outside the classroom. In the years since the publication of the opportunity-to-learn standards, technologies useful for music education (as for all education) have grown more capable, more varied, simpler to use, and certainly more ubiquitous.

This addendum to the opportunity-to-learn standards is meant to provide more specific guidance to all those music teachers, administrators, and other decision makers who must determine how best to take advantage of new technologies in the ongoing effort to give every American student a full, balanced curriculum oriented toward the skills and knowledge set forth in the National Standards. This document does not actually call for resources beyond that seen as necessary in the Opportunity-to-Learn Standards published in 1994; rather, it tells more specifically what equipment to buy and how to allocate those resources. For each level, specifications are listed for:

- **Curriculum and Scheduling**
- **Staffing, Equipment**
- **Materials/Software**
- **Facilities**

It is important to note that each one of these categories is important. It is, unfortunately, an all-too-common occurrence to find a school that has invested in computer hardware
without the appropriate software to run on it, without appropriate facilities in which to store or use it, and without the all-important teacher training and technical staff support that enables the school's faculty to bring the equipment's potential value to bear on the students' potential for learning.

It is essential that all schools provide a basic level of music technology equipment and software with the appropriate facilities for implementation. It is also essential that all schools provide a minimal level of training for their staff and teachers, and make an effort to effectively incorporate the technology into the music curriculum. Of course, some schools will have at their disposal sources of funding or other resources that make it possible for them to go beyond this basic level—if not with their initial implementation of music technology, then as part of an ongoing plan for development. This addendum provides standards for both minimal and desirable technology programs. The minimal standards are intended to provide guidance for schools that are just beginning to incorporate technology into their music curriculum and have limited. It is the recommendation of MENC that all music programs use the desirable standards as a long-range goal.

This addendum also contains a strong, if implicit, message to decision makers connected with any of the schools or school districts around the nation that are struggling to find ways to use technology to serve the overall curriculum. That message is simple—remember the music program. Those who give music teachers the same level of access to technological resources as teachers in other disciplines will find two things. First, they will find that the music program is greatly enhanced by innovative applications of technology. In addition, they will find that music offers an exciting way for students and teachers alike to make technology come alive as an innovative instrument for creative expression.

With imaginative and creative uses of technology to support a strong music program, everyone wins, especially America's students.

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**TECHNOLOGY STANDARDS FOR PREKINDERGARTEN AND KINDERGARTEN (ages 2-5)**

**Technology Standards in Context**

*Opportunity-to-Learn Standards for Music Instruction,* published by MENC in 1994, contains a number of references to technology-based requirements for music classes at this level. The

**Curriculum and Scheduling**

1. Technology is used when it appropriately enhances music learning at this level.

2. Student learning experiences in the curriculum include the use of technology for singing and playing instruments, creating music, responding to music, and understanding music.
3. Software and hardware selections are made based on the learning goals established for the students.

4. Students have the same degree of access to school computer equipment for instruction in music as for instruction in other disciplines, and appropriate music software is available.

5. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

Staffing

6. Technology training for teachers who provide music instruction at the prekindergarten and kindergarten levels is conducted by people who know the needs of music learners at these levels.

7. Teachers are provided with the necessary development time for creating new curriculum materials and instructional strategies that make effective use of music technology.

8. Teachers have easy access to email and other web services for professional and curricular development, research, and other communication needs.

Equipment

Minimal:
One multimedia-ready computer is provided that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers,
Desirable:

9. A MIDI keyboard synthesizer or controller is connected to the computer.

10. The addition of a touch pad, large trackball, or other alternative pointing device more suitable than a mouse for children of this age.

11. A computer video projector to enhance class presentations in large classrooms.

Materials/Software

*Minimal:*

The software library includes at least three titles of instructional software that reinforces listening, understanding, and responding to music. The library also includes multimedia software that enables children to create and perform music, and permits musical exploration and game playing. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

*Desirable:*

There is a basic sequencing/notation package, appropriate to the age level, for recording and printing music.

Facilities

Suitable space is available for one computer with appropriate power and an Internet connection in every classroom in which music is taught.

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**TECHNOLOGY STANDARDS FOR ELEMENTARY SCHOOL**

(Grades 1-5 or 1-6)

**Curriculum and Scheduling**

1. Use of technology is a regular and integral part of instruction.

2. Teachers employ instructional strategies that appropriately utilize the unique capabilities of technology.
3. Learning experiences in the curriculum include the use of computer-assisted instruction, MIDI sequencing, music notation software, Internet music resources, and electronic musical instruments to help students acquire the knowledge and skills listed in the National Standards for Music Education.

4. Software and hardware selections are made based on the learning goals established for the students.

5. Music classes have the same degree of access to school technology resources, including technology labs, as other classes in the school.

6. Learning profiles (e.g., attendance records and progress reports) for individual students are maintained using databases and other record-keeping technologies.

7. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

Staffing

Minimal:

8. A planned program of ongoing staff development to provide teachers with training in applying technology in the curriculum is in place. Training is available on a variety of levels to match the varying backgrounds and proficiencies of teachers.
9. To remain up-to-date in the field, all music educators receive at least one staff development day per year for technology training. Training is conducted by those with an awareness of the needs of music educators.

10. Teachers have easy access to email and web services for professional and curriculum development, research, and other communication needs.

11. Teachers are provided with ample time to consult with other colleagues about the use of technology.

12. Technical support and mentoring by those who are knowledgeable about the hardware and software used by music educators is available to music teachers.

13. Teachers are provided with the necessary development time for creating new curriculum materials that make effective use of music technology.

Desirable:

14. A well-planned, long-term program of professional staff-development support is available to all music teachers.

15. Music teachers have ready access to Internet-based professional development opportunities.

16. In lab settings, an appropriate student/teacher ratio is maintained through the use of teacher assistants or aides.

Equipment

Minimal:
17. Every music classroom should contain one multimedia-ready computer that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, CD- or DVD-ROM player, and a MIDI keyboard connected to the computer. When a teacher must move between classrooms and schools, a similarly equipped laptop computer is preferred for that teacher.

18. The school computer lab is equipped with dual headphones and MIDI keyboard controllers for use by the students.

19. Students have access to eight digital keyboards (possibly portable units) with standard-size, touch-responsive piano keys.

20. A large-screen video display for class presentation.

Desirable:

21. In addition to the minimal specifications, the classroom teaching station has two to three additional multimedia-ready computers with keyboard controllers (dual headphone capable). Alternatively, there is a digital keyboard lab or dedicated computer music lab with fifteen or more computers configured in a similar way to the workstations recommended in Number 1 above. All equipment includes powered speakers, a computer display projector, and large-capacity removable disk storage.
22. For instrumental instruction, alternative MIDI controllers, such as wind, guitar, string, and drum controllers, are available.

23. Music teachers have the same access to scanners, digital cameras, and other multimedia equipment as teachers in other disciplines.

24. A computer video projector to enhance class presentations in large classrooms.

Materials/Software

Minimal:

25. The software library contains at least six titles of instructional software that reinforces listening, analyzing, reading, and describing music. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

26. At least six titles of multimedia software that enables children to create, improvise, compose, and perform music are also available. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

27. There is Internet software for supervised access to Web resources.

Desirable:

28. Additional multimedia and software titles are available, and a plan to purchase six new titles in each category each year is in place.
for generating music arrangements and accompaniments and libraries of MIDI accompaniment files.

30. There is a basic sequencing/notation package, appropriate to the age level, for recording and printing music.

31. Students have access to basic digital audio editing software for capturing, modifying, and reproducing music.

32. Music teachers have the same access to graphic, multimedia, and Web authoring software as teachers in other disciplines.

Facilities

Minimal:

33. Suitable space is available in the dedicated music classroom for one computer with appropriate power and Internet connections.

34. Students have access to a school computer lab.

Desirable:

35. The school provides music classroom space with appropriate furniture, power, and Internet connections for multiple computer stations.
### Glossary of Music Technology Terms

<table>
<thead>
<tr>
<th><strong>AFTERTOUCH</strong></th>
<th>Pressure applied to keys held down on a keyboard. This changes the volume.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATTACK</strong></td>
<td>The time that it takes to reach the highest volume after a key is hit on the keyboard. Pianos and guitars have fast attack rates. Horns and most organs have medium attack rates. Instruments in the violin family, as well as synthesizers, can have varying attack rates.</td>
</tr>
<tr>
<td><strong>BAUD RATE</strong></td>
<td>The number of bits (see below) that are sent per second. The baud rate for MIDI is 31,250 bits per second. This translates to roughly 3.1 kilobytes per second.</td>
</tr>
<tr>
<td><strong>BYTE</strong></td>
<td>A group of 8 bits. MIDI messages are sent as a series of bytes.</td>
</tr>
<tr>
<td><strong>CD BURNER</strong></td>
<td>A device which records data onto a CD</td>
</tr>
<tr>
<td><strong>CELESTE TUNING</strong></td>
<td>A tuning scheme where two tone generators are slightly out of tune of each other. This is often desirable in order to achieve “enhanced” sounds. A deviation greater than 1.5% is usually too “sour” for normal musical use.</td>
</tr>
<tr>
<td><strong>CHANNELS &amp; TRACKS</strong></td>
<td>There are 16 channels to choose from on each track. Only one channel per track may be chosen used to record on. It is best to match the track and the channel while recording – i.e. On Track 1 choose Channel 1 on Track 4 choose Channel 4. This makes it easier to find what you have recorded on the track.</td>
</tr>
</tbody>
</table>
Sometimes a track uses a different channel. For example, drum patches are always recorded on channel 10, no matter what track is being used.

**CHUNK** – Is either a sequence (a collection of tracks) or a song.

**CONTROLLER** – A device that tells other MIDI instruments and equipment what to do. This usually a keyboard or a computer. It could be a MIDI guitar, MIDI horn or other hardware.

**COPYRIGHT** – Gives credit to the writers and authors of music and written work. These works cannot be copied without permission from the writer or author.

**DATA** – Information

**DIGITAL** – Any technology that uses number to represent information. CD players and MIDI instruments are digital.

**DOWNLOAD** – When you copy files or programs from the Internet and save them on your computer.

**EVENT LIST** – A list you can view in your sequencing program that shows everything you have done to create your sequence. You can edit your sequence in this view, but it is a complicated process if you’re not a real pro!

**FREE MIDI** – For Macintosh computers. It provides certain features for FreeMIDI compatible software programs. (Ask for an adult to help!)

**FREEWARE** – Software that you can download and use for free.
<table>
<thead>
<tr>
<th><strong>GENERAL MIDI</strong> – Provides a standard for MIDI instruments including 128 instrument sounds and functions such as volume, reverb, stereo panning, vibrato, pitch bend, and more.</th>
</tr>
</thead>
</table>
| **KARAOKE** – Kar-a-o-ke  
A Japanese word that refers to a device that plays instrumental accompaniments (backup music) to which the user sings along. The singer’s voice can also be recorded along with the music. |
<p>| <strong>MELODY</strong> – The main tune of your song. Other parts are called “harmony” and enhance the main tune. |
| <strong>MEMORY</strong> – Special computer chips used for remembering information, sometimes called RAM. |
| <strong>METRONOME</strong> – A device or clicker that helps you keep the beat while recording. |
| <strong>MIDI</strong> – Letters that stand for the words Musical Instrument digital Interface. It is a system of communication between instruments. |
| <strong>MIDI FILE</strong> – A song recorded using a sequencer and saved on a tape or a computer. MIDI files can be copied and even sent over the Internet. There are different types – 0, 1 or 2. Types 0 and 1 are the most common. |
| <strong>MIDI INTERFACE</strong> – A special box that allows the computer and MIDI instruments and devices to communicate with each other. It has special connectors for cables going to and from the computer and the MIDI devices. |</p>
<table>
<thead>
<tr>
<th><strong>MONO MODE</strong></th>
<th>When you “solo” a track in your sequence your are using mono mode. That means you are only playing one channel.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MP3</strong></td>
<td>A system of compressing large music files into a format that contains less data and takes less computer space.</td>
</tr>
<tr>
<td><strong>MONOPHONIC</strong></td>
<td>Able to play only one note at a time. This was a characteristic of the early synthesizers of the ‘sixties and ‘seventies.</td>
</tr>
<tr>
<td><strong>MULTI-TIMBRAL</strong></td>
<td>Able to play different types of sounds at the same time. MIDI keyboards and today’s computer sound cards are multi-timbral.</td>
</tr>
<tr>
<td><strong>MUTE</strong></td>
<td>Turning off sound, not just turning it down.</td>
</tr>
<tr>
<td><strong>ORCHESTRATE</strong></td>
<td>When you arrange accompaniment or backup music using several tracks in a sequencer.</td>
</tr>
<tr>
<td><strong>ORCHESTRATION</strong></td>
<td>The arrangement that is made using several tracks in a sequencer.</td>
</tr>
<tr>
<td><strong>OVERDUB</strong></td>
<td>To add newly recorded data to existing recordings in a track. (It does not replace or erase the existing data.)</td>
</tr>
<tr>
<td><strong>PATCH</strong></td>
<td>Also called sound, voice or instrument. One of the 128 sounds you choose for each track you have recorded. You will hear the specific sound when you play back the track.</td>
</tr>
<tr>
<td><strong>PATCH BAY</strong></td>
<td>A piece of equipment that lets you change</td>
</tr>
</tbody>
</table>
**MIDI connections without actually changing cable connections.**

**PITCH** – The sound of a note is determined by its vibration. Pitch describes where the note is in the musical scale based on its vibration (whether its middle C, or an E, etc.)

**PITCH BEND** – A means of sliding from one note to another by gradually moving the pitch. It is done manually with a wheel, movable stick or pedal. Electric guitarists often use pitch bends while playing.

**POLY AFTERTOUCH** – Pressure applied to several keys at a time – like when you’re playing a chord.

**POLY MODE** – When MIDI is reading and allowing all channels to play. If, however, you choose to solo a track then MIDI will ignore all other channels and allow only the soloed channel to play.

**POLYPHONY** – This refers to the number of voices or sounds that a MIDI device has. It determines the maximum number of notes that can be played at a time.

**PUNCH-IN RECORDING** - This allows you to re-record a specified amount of measures anywhere in the middle of a song. If you want to correct some mistakes, you can just play the new notes right where they belong and they will record over the old wrong notes.

**PROGRAM CHANGE** – A patch change. For example, going from a piano sound to a flute.
### RESOLUTION
- How many parts the sequencer divides a quarter note into. The higher the resolution, the more accurate the sequencer playback will be. A resolution of 96 parts per quarter note is a good minimum standard. It’s sort of like graphics - the higher the resolution the clearer the picture.

### QUANTIZATION
- Sometimes you might not keep a perfect beat when you are recording. Quantization can fix those errors and create a smoother beat.

### RELEASE
- The time that it takes for a note to die out after you let go of the key you have pressed.

### REVERB
- A type of effect you can apply to your sequence that makes it sound like you are in a large hall or room. Sort of an echo-type sound.

### SEQUENCE
- A set of tracks that are displayed in the tracks window. Each track is assigned a MIDI channel. The data in the track is played on whatever channel it has been assigned to. The word sequence is also used to mean any song recorded using a computer.

### SEQUENCER
- A sequencer is any equipment (hardware) or computer program (software) that allows you to record and save music. It records and saves note data, not sound. It plays back the information through a synthesizer or computer sound card. The playback is heard in the form of music. Cakewalk Home Studio is a software sequencer.

### SERIAL
- MIDI is serial in nature. The means just one “bit” goes through at a time. It is a method of digital communication where a byte (8 bits) is broken up into...
individual bits and sent one at a time. MIDI and modems use this type of communication.

**SHAREWARE** – Computer program (software) that is distributed for free, but should be paid for if you intend to keep it.

**SOLO** – A mode used in a sequencer to allow you to hear only one track. This is often used to help you find mistakes or make changes to your sequence.

**SOUND BOARD** – In MIDI terms, it refers to a computer sound card.

**SOUND CARD** – A circuit board that allows a computer to produce sound.

**SOUND MODULE** – A hardware device that allows a MIDI instrument to produce additional instrument sounds that are not built in.

**SYNTHESIZER** – An instrument that produces sound electronically.

**SYSTEM EXCLUSIVE** – A type of command that is only understood by one brand of keyboard or other device. The command is “exclusively” designed for only that device to understand.

**TRANSPOSITION** – You can change the key that your song is in.

**TRANSCRIPTION** – This is the process of taking a MIDI file and creating musical notation from it. Home Studio does this in the staff view.
**REAL-TIME RECORDING** – This is what you are doing when you use your sequencer’s metronome and record in time with its ticking. For every beat that passes you’re recording a beat of data.

**VELOCITY** – How hard you tape the keyboard keys.

**VIBRATO** – A fast oscillation (moving up and down) of pitch. Good vibrato is usually 5-7 cycles per second in which the pitch fluctuates a very small amount. Opera singers have vibrato when they sing.
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US Copyright Office Song Registration Links http://www.ccli.com/CopyrightAdmin/CopyRightofficeUs.cfm


Electronic Download Sources


Chapter Four
Evaluation of the Project

On the following pages is a journal of the Van Zant School Music Technology Club Study Group meetings. This journal reflects the activities and progress of the students during the club meetings held weekly from February 1, 2002 thorough April 26, 2002.

The student information below has been taken from Chapter Two and is provided to give the reader a frame of reference and better understanding of the journal entries. It lists and describes the students in the study group. Following this information are the journal entries. Remember, the names of students have been changed to insure confidentiality.

**Cloe** — a bright, quiet, talented and conscientious girl who has studied piano for about five years. For her first sequence she chose a classical piece she had learned during her piano lessons.

**Amy** — a musically talented girl who had taken piano lessons for a few years, but is no longer doing so. She plays the saxophone and is in the school band. She brought Greensleeves for her first sequencing project.

**Brandon** — a special needs student with multiple learning disabilities who has studied piano for about five years. He also plays the violin. Brandon writes classical pieces and has tremendous music talent, despite his learning disabilities. He brought a Bach piece to learn but quickly began to create his own pieces.

**Charlie** — a very intelligent boy with a tragic family history. He said his father had "home schooled" him in piano. Charlie has ability but was challenged due to his limited piano skills. He enjoyed the technical aspects of MIDI and the computer.

**Jimmy** — had few skills and limited ability. His mother is a pianist. He and Charlie often worked together. Jimmy liked being a "guinea pig" and working with existing MIDI files. He is in the school band and plays the trombone.

**Alyssa** — Alyssa is a bubbly tiny girl who has limited piano training, but seems to have rhythm ability and an ear for music. She often worked with Cloe. She didn’t show up in the beginning weeks, but gradually started to come regularly.

**Nancy** — a talented girl who plays the clarinet, but has innate music ability. She often worked with Amy.
Journal Entries

Feb. 1

Five students were present for this first meeting. Students explored MIDI samples from Cakewalk Home Studio. (Boogie Woogie and Flyin’ Machine) They explored the Track view and experimented with Staff view by adding and erasing notes. They tried different patches also. Some students sat where a keyboard was hooked up to the computer and the sound came through the keyboard. Others sat where there was no keyboard and the sound came from the built in MIDI features of the computer sound card. They tried out the Solo and Mute options.

Feb. 8

Today the teacher reviewed how to open a new project in Home Studio. Then students were given a demo of how to do the following:
- Arm track for recording
- Stop recording
- Choose Edit, Undo recording
- How to change tempo

Students began recording classical sequences. They learned to record additional tracks. A couple of students who have not had much piano training made several random tracks as an experiment. The recordings were rather discordant but the students enjoyed themselves! They also experimented with notes in Staff view. Trying to make actual corrections is difficult for them. Finding the incorrect notes is difficult and replacing them can be tricky.
Students like to play around with the controls on the keyboards, but need to be told to avoid this as doing so may affect whether or not they can record.

Feb. 15
Today the teacher demonstrated how a simple piece such as “Row, Row, Row Your Boat” can be made into a sequence with three tracks. Students were also shown how the sequence can be enhanced by using different patches for each track. Three students continued to record their classical pieces. It was discovered that making a classical sequence should really be kept very simple – basically two tracks – a track for the left hand and a track for the right hand. Some tried to add more sounds/tracks but it doesn’t sound quite right. One student is having difficulty getting her sequence played perfectly. Trying to edit in Staff view was difficult for her. Her piece is long and may have to be shortened or copied/pasted for repeating parts.

Feb. 22
Five students were present today. Students will be encouraged to finish their classical pieces using just two tracks. They were told that they will be starting something new the following week. Students who have little training listened to and experimented with Home Studio samples. They changed tempo, patches, notes in Staff view and even volume within tracks. They soloed tracks to get ideas about how the sequences are put together and how different tracks are made. Students who were working on classical pieces were encouraged to try this as well.

Brandon – created a couple of new songs. One has one track that needs patch changes and can be copied and pasted to a new track. Both tracks were the same but had a different sound patch to create a fuller sound.

Cloe – finished her two track sequence. It just needs some editing.

Amy – completed her sequence and added chords, etc. She needs to change patches, tempo, etc.

Jimmy/Charlie – enjoyed experimenting with pop MIDI files that were downloaded by the teacher. They made various changes.

March 1
Students were shown how to build a sequence starting with a bass track. They were shown how to create a bass line for one measure and repeat it. Next, the teacher showed them how to create a drum beat on Channel 10. A noted suggestion is to have them copy and paste the melody to another track for fuller sound.
Brandon attempted to work on his existing projects. His computer would not record for some reason. The interface had to be reinstalled and after it was set-up again it was still not recording. Consequently he did not get anything accomplished. Some days later it was finally discovered that this keyboard has a setting on the back that is for PC, MAC, and MIDI. The switch was off the MIDI setting.

Amy and Nancy - worked on Amy's existing project “Greensleeves”. Amy changed the patches and worked with the volume control on her tracks. They worked on some other things as well.

Cloe and Alyssa - attempted to do the new project I had shown them for today. It was difficult, but they got a few tracks done and it has an interesting sound!

Jimmy and Charlie - continued to experiment with existing MIDI files from the Internet. Later they tried creating some new sounds.

March 8
Students were shown how to hook up a MIDI workstation. They attached the DC cable for power to the keyboard, and hooked MIDI cables to keyboard and interface.

Brandon – worked on his original one-track song. He is a perfectionist musician who can focus and spend lots of time tweaking and perfecting his work. He chose violin and cello patches, which sounds great!

Cloe and Alyssa – continued creating their song from scratch. They added a couple of drum tracks.

Amy and Nancy – continued to work on Yankee Doodle. They made several tracks but the rhythms are inconsistent and need redoing or quantizing. The suggestion is to play it through perfectly once, then copy/paste it to different tracks. Note: It seems that playing a simple melody sometimes is difficult – trying to get the timing, correct notes, etc.

Charlie – enjoys the technical aspects of MIDI and the computer. He tried to figure out why the Musicstar keyboard set up was not producing sound, when everything was working, recording, playing back etc. There continued to be no sound. Later, a district technician resolved the problem by doing the following:

- Open Control Panel
- Go to Multimedia
- Choose MIDI
- Go to “Custom Configuration”
- Click on “Configure”
- Select all of the options
- Click on “Apply”, then “OK”
Jimmy – spent some time trying to figure out how to hook the system up without instruction and did so successfully. Then tried to figure out why nothing was recording, but had no luck. (The computer had to be restarted as the interface was not responding.) Then he worked on trying to create some simple drum patterns. He had a little difficulty understanding and completing that task.

March 22

The problem with getting one of the keyboards to record from the week before was resolved. The cables were double-checked. The interface was double-checked. The settings in the computer were checked by a district technician and nothing could be found wrong. The only thing left to assume was that the problem was with the keyboard. Some setting must have been changed and was not resetting or defaulting back when the keyboard was turned off/on. Finally, a setting switch was discovered on the back of the keyboard. The switch can be set to MAC, PC or MIDI. It was off the MIDI setting. As soon as it was switched back to MIDI, everything was fine.

John Rivera from Sam Ash was scheduled to come and assist today, but was unable to make it at the last minute. The meeting will be rescheduled.

Today the kids learned how to go into the Public folder on the school computer network and choose a song starter drum pattern. I also showed them how they could copy and paste a clip from one track to a new one.

Amy/Nancy – continued to work with Yankee Doodle. I showed them how to highlight a track and quantize to the sixteenth note. They added copied tracks of the first
track and changed the patch. They discovered that the clarinet voice holds out the note, which is the effect they wanted for one of the tracks.

**Cloe/Alyssa** – they tried one of the song starters. They took turns adding various melody tracks. They saved, but it seems as though several of the new tracks mixed down to one track. They must have saved it as a MIDI 0 format.

**Brandon** – continued to work on his original classical piece. He added some other tracks and was so proud of it that he came and got me so that I could listen to it, an interesting gesture on his part.

**Charlie** – had headphones on and was using one of the song starters to create. I did not bother him during the process to check his progress.

**Jimmy** – used the Musicstar keyboard and its program (as he likes to do). He created a new song. Musicstar is a very simple program that has only 4 tracks, one of which is a drum track. Jimmy enjoys this as he can experiment. His rhythms and compositions are not always consistent, but he is enjoying the creating process.

April 12

Five students were present today. Patricia Bradshaw, Recording Engineer, helped with today’s session. Students did not work with the keyboards. Instead, they were shown how to download and unzip MIDI files from the Internet. They used the Van Zant School Music Technology Club website which was created for this project. The site
address is http://www.evesham.kl2.nj.us/vzweb/clubs/MTclub/mthome.htm. Students also learned how to create a new folder within a folder. After students downloaded several files they learned to extract them (in multiples) to a new folder. They learned to open the files in Cakewalk by browsing to the folder where they were saved. Some students began editing files. Brandon searched for Rhapsody in Blue by George Gershwin. He found Gershwin MIDI files and was not sure which one was the one he wanted. He was hunting for one he had heard before, and when he heard Rhapsody in Blue he knew that was the one. He also downloaded a Harry Potter MIDI file. The other students downloaded Pop MIDI files. (Jon Bon Jovi, Backstreet Boys, etc.) Charlie already knew how to download and unzip files.

While reviewing the students files mid-week, the teacher discovered that Jimmy had recorded a good melody recording of “O Come All Ye Faithful”.

April 19

Five students were present today. Brandon was absent from school and Alyssa wasn’t feeling well after school. Patricia Bradshaw was again present to assist us. There was a problem with getting sound from the Musicstar keyboard. Everything was recording and playing back fine, there was just no sound. This problem had occurred before, but the solution did not work this time. Finally, it was discovered that because
the Musicstar keyboard does not have its own speaker, the sound must come from the PC. Therefore, it was necessary to go into the Control Panel of My Computer. Multimedia, then MIDI was selected. Under the MIDI area the setting that denotes the MIDI wavetable had to be selected. This tells the computer to use its internal MIDI module to play the MIDI sequences.

**Today the students were focused and knew what they wanted to do.**

**Cloe** - took one of the sequences she had downloaded the week before and copied a base track to use as a song starter. She continued to add tracks to her new song. One of her sequences has fourteen tracks! She is a talented and focused girl. Cloe has an original song that she will be bringing in next week. (She has forgotten it a couple of times!)

**Nancy** - worked with the Musicstar keyboard since she had missed a few meetings and was still becoming familiar with recording. Musicstar comes with its own easy-to-use software for beginners. She created two very basic sequences.

**Jimmy** - also worked with existing sequences he had downloaded. He also copied tracks from one project to another.

**Charlie** - also worked with existing MIDI files. He created a base track from the keyboard. He was working with two tracks.

**Amy** - continued to work with Yankee Doodle. She re-recorded a track that had a very inconsistent rhythm and could not be fixed with quantizing. She continued to work on her editing of this project.

**April 26**

Today four students were present. This is the last meeting day before the thesis is to be completed, however, students will continue to meet through May. Students were asked to try to complete one sequence and begin or work on a second sequence. They were told about a district expo, to be held on May 18, which will showcase student work from all over the district. They worked on their sequences today without much direction. They were given reminders about changing Channels. They were also reminded that they can use bits and pieces of existing sequences to develop new ones. Some of the students have done this. Students listed the sequences that they consider completed. As of the end of today’s meeting these are the sequences that are finished:

**Charlie**
- Night Party
- Midnight City

**Brandon**
- Song
- Song of Angels

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Evaluation of the Manual

April 16
Patricia Bradshaw, Recording Engineer and graduate of Full Sail reviewed the manual for any editing errors and for accuracy of technical instructions. Several errors were found and corrected. She also made some suggestions for wording.

April 18
Mrs. Cindy Wasdick, Van Zant School Music Teacher, agreed to assist with evaluating the manual and its effectiveness in teaching how to do MIDI sequencing with Cakewalk Home Studio. She is relatively new to music technology and was an eager, supportive learner. The review began with Chapter Three, A Look at Cakewalk Home Studio and continued through ... Mrs. Wasdick offered several suggestions regarding wording and explanations.

April 25
Patricia Bradshaw continued to review the manual for editing purposes.

Resource Website

As a result of the observations during the study group sessions and the learning experiences of the teacher, it was decided that an Internet resource website would be extremely helpful and beneficial to both students and teachers. This would encourage even more independent learning and exploration of MIDI and music technology. Several categories were created and several resources are included for each one. A printout of the website is included as appendix A.

Student Work Demo

A CD with several samples of the students’ work was created. See Appendix A.
Chapter Five
Conclusions and Summary

The two basic purposes of this project were to teach young students how to create MIDI sequences and to create a useful manual that would be self-teaching in nature for both students and educators.

Both goals were realized, although suggestions were noted that would increase the effectiveness of both the hands on learning sessions and the manual. The following suggestions are based on observations made during study group meetings and the ongoing evaluation of the manual.

Consistency of Equipment and Specifications

For this project five different models and brands of MIDI compatible keyboards were used, each with its own unique set of features. Although this particular project did not require an extensive knowledge of each keyboard’s features, the fact that each one was different seemed to complicate issues at times, especially when teacher had to stop and trouble-shoot on these different models. Valuable time was taken from students that could have been saved if all keyboards were the same. This diversity prevented any consideration of exploring or using features such as auto accompaniment, digital effects or built-in sequencers. There was not enough time during the project for the teacher to learn to operate advanced features of each keyboard, nor did it seem practical. It is highly recommended that all keyboards be the same make and model.

The computers were all the same brand, used the same operating system and had the same specifications. It cannot be emphasized enough how important it is that computer make and model specifications be consistent.

Adult to Student Ratio

A higher adult to student ratio is highly recommended. In this study group there was one adult for seven children during many of the sessions.
An adult volunteer was recruited toward the last weeks of the project, which proved to be more rewarding for adults and students. Students often need a one-on-one session while working on certain aspects of their sequencing, especially editing. They also need help with assimilating new lessons and developing new skills through ongoing advising and assisting.

**Length of Study Group Sessions**

The study group sessions were approximately an hour long. This time went very quickly, and often students were frustrated when they learned it was time to stop working. It is suggested that the session times be increased to one and a half hours to allow a little more time for students to focus on their projects. More than one and a half hours is not recommended at this time until further study can be made. Students are young and might become unfocused, tired, bored or frustrated with longer sessions.

**Length of Study**

It is recommended that this type of beginners’ technology group be scheduled for longer than three months. This was not enough time to thoroughly complete and edit sequences. More time was needed to teach and build skills in the use of quantizing, punch-in recording and staff view editing. Several sequences were successfully completed by the end of the study, but some of these sequences needed more refined editing. There was also not enough experimentation time. Students were just becoming familiar with copying and pasting tracks within their sequence or from other sequences. Using drum tracks and base lines as song starters was touched on and used briefly by some students but not by others as they had not finished previous sequences in time to go on to this process.

**Instructional Methods**

During most of the sessions, instruction of students involved teacher demonstration and group hands-on training in the first part of the session. Then students dispersed and began practicing and using what they were shown. If there is low teacher-student ratio it is difficult to address students questions on a timely basis. This also makes it hard to challenge students who are ready for further learning. It would have been very helpful to have written instructions or a manual available to students so that they could attempt problem-solving on their own or find clarification of a process on which they were stuck. Of course, the very purpose of this project was to create such written instructions and encourage the self-learner.
Recommendations for Further Study

This study was an introduction to the MIDI sequencing aspects of music technology at the elementary school level. There are several ways to continue the learning process of music technology. Some recommendations are listed below.

Instructional Manual

Providing a manual for classroom and private use is highly recommended. The effectiveness of the instructional manual that was created as a result of the project needs to be tested so that it can serve the purpose for which it was intended. This important step must be taken before continuing to introduce other aspects of music technology to elementary aged children. The manual should be tested in a private setting, where students attempt self-learning through the use of the manual. It should also be reviewed and utilized by music teachers who are planning to teach MIDI sequencing in the elementary school. Thirdly, it should be used in a classroom setting to test its effectiveness in aiding teachers and students with the learning of MIDI sequencing. Finally, a second volume could be written that would address more advanced MIDI and music technology activities.

Song Starters

Students could use more time experimenting with preset base lines and drum tracks as song starters. They could learn to download and incorporate these tracks into a new sequence and build upon them to create their own songs.

Advanced MIDI Activities

Editing

More time needs to be spent with helping students refine their editing skills. The project time-frame did not allow for this. Editing skills can be considered a bit more advanced than the simple process of creating sequences.

Saving Files

Students should be taught the different types of formats in which the sequences can be saved and what each means. A Cakewalk Home Studio file is saved in a different format than a MIDI format 0 file, or MIDI format 1 file.
Other MIDI instruments

An introduction to other MIDI instruments, such as a drum machine, would be both motivating and relatively easy for students to understand and learn.

Other Cakewalk Home Studio Features

After mastering the basics of MIDI sequencing students could be shown some basics of audio recording. This could be done with a basic computer microphone of good quality.

Keyboard Features

A teaching unit on the basic features of the keyboard that students are using could prove to be helpful in creating better sequences. Keep in mind that it is a must that all the keyboards are same model with the same features. For example, students could learn how to record auto accompaniment provided by the keyboard and perhaps incorporate digital effects into their sequences as well.

Extended Activities and Self-Learning Resources

During the course of the project a resource website was developed that can be utilized by educators and students who are developing their skills in MIDI sequencing and music technology. It is also meant for educators who are interested in implementing MIDI sequencing activities in the classroom. The website provides resources for learning more about MIDI, downloading MIDI files for further evaluation and experimentation, music technology sites for educators and much more. This resource can be utilized by students and educators in the home or at school, encouraging self-teaching and continued learning outside the institutional setting.

Summary

The project was successful in that its goals were accomplished. Students learned to create basic MIDI sequences and an instructional manual teaching basic sequencing to young children was completed. Students were highly motivated by the recording process. It can be noted that the students who were the most successful and focused were the students who had piano training. The other students were a little less focused and it was more difficult for them to complete multi-track sequences, seemingly due to their lack of piano training. This does not mean that they could not have the same level of success as the more trained students. With more one-on-one assistance and more training in the area of utilizing existing clips and tracks to create new sounds and other music technology strategies, it is believed that these students could be almost, if not equally, successful in
creating age appropriate sequences. All students seemed to thoroughly enjoy being a part of the project. A couple of students, however, were not consistent in their attendance, thus showed less of an interest in the project than the rest. When they attended they were engaged and focused for the most part. These students were musicians but were not trained in piano.

As the manual was developed it became more than an instructional manual on basic MIDI sequencing. It grew into a multi-resource that includes the following:

- Information on downloading MIDI files
- How to copyright an original work (and other copyright information)
- A listing of numerous related Internet resources
- A section on MIDI careers
- A section for educators that includes such things as activity and lesson plan ideas and music technology sites for educators
- A glossary
- A CD of free Internet downloads
- A CD of samples of student work

Music technology is definitely motivating and educationally beneficial to young students. It has been quite apparent through this project how its use can easily help students gain the skills that are recommended by the National Association for Music Education. Technology is part of their world. They are drawn to it and respond readily and effectively to it. Music is a part of everyone’s lives, especially our young. Using technology to teach music skills and standards can only enhance the lives of our children. It is an excellent and motivating way to develop the higher order thinking skills such as analysis, synthesis, and evaluation, not to mention others such as creativity and self-confidence. The use of music technology in elementary education is growing. It is a vehicle that can be “instrumental” in producing a new generation of students who learn beyond the walls of the institution, a trend that technology is making possible.
References


Young, Rob. _1996. MIDI Files._ Prentice Hall Europe. Hertfordshire, HPw 7EZ.


US Copyright Office Song Registration Links http://www.ccli.com/CopyrightAdmin/CopyRightofficeUs.cfm


Electronic Download Sources


Appendix A

About the Student Work CD

The accompanying student work CD contains sequences created by the study group, the students of the Van Zant School Music Technology Club. The files have been saved in two formats, Cakewalk Home Studio format and MIDI 1 format. There are folders on the CD marked accordingly.
Appendix B

Free Demos and Downloads CD

**Band-in-a-Box 9.0 (3.55 MB)**

Accompaniment Software for Windows.

This is a demo version. The following information was taken from the download site at:

http://www.pgmusic.com/demo.htm

Arrange rhythm and harmony backing tracks for your favorite songs. This time limited demo is fully functional except that the Save, Notation and Soloist/Melodist generation features have been disabled. In other words this demo is a 'play only' version, which you can use to play any Band-in-a-Box file. There are also many sample files included. The demo will expire on July 1st, 2002. Some basic features include:

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Piece of Cake
• Automatically generate professional quality solos-includes 100 Soloists!
• Record Melodies using the built-in sequencer or step-time entry.
• View/edit the music and lyrics in piano roll or music notation.
• Automatically Generate complete songs from scratch, including chords, melodies, intro and even a song title!
• Harmonize the melody or play along with harmonies in real time.
• Create and edit new Songs, Styles, Harmonies, Melodists and Soloists.
• Reads and Writes Standard MIDI Files (.MID) so you can transfer your work from/to other music programs.
• Supports General MIDI (GM/GS), soundcards and non-GM modules/synthesizers.
• Add-on disks available for songs, Styles, Soloists, Melodists, Harmonies and more

**Virtual Drums – [912 KB]**

The real Virtual Drums is a fully interactive drum kit that you can play with your mouse with higher quality sounds. You can play along with music and you can even do drum rolls! Download from

http://www.virtualdrummer.com/
Protools – (4.81 Mgs.)

The following information was taken from the download site at: http://www.digidesign.com/ptfree/

Digital sound editing and audio production program. It is considered by many to be the most powerful and flexible audio editing tools in the industry.

Comes with fully functional MIDI sequencer. Other features include:

- Fully functional, track and I/O limited version of Pro Tools® 5.0.1 LE
- 8 channel audio (voices)
- 2 channels of I/O support via Wave Drivers/Sound Manager (allows compatibility with 3rd party HW)
- 48 MIDI tracks

Editing window with comprehensive track overview. Intuitive Mixer window includes all of the features you'd expect in a pro studio console.

E-Drummer (1.37 MB)

The following information was taken from the download site at: http://www.e-drummer.net/GROOVE.ZIP

Contains copyright-free drum samples. This program is a kind of multimedia drum book. It contains almost a half million different patterns (That's just the presets) that can be seen in drum music notation heard through your soundcard and parts can be turned off so you can hear Piece of Cake
and see only the parts you want to. You can also enter your own patterns. While playing the noteheads are highlighted on the screen. This program will be of use to advanced and beginners alike.

**JazzWare (1.79 MB)**

The following information was taken from the download site at: [http://www.jazzware.com/cgi-bin/Zope.cgi/jazzware/](http://www.jazzware.com/cgi-bin/Zope.cgi/jazzware/)

JAZZ++ is a full featured, audio capable midi sequencer for Linux and Windows. JAZZ++ offers a lot of functions normally only found in expensive sequencer software, and is used by professionals and hobby musicians all over the world.

![JazzWare screenshot](image)
Karaoke Microsing 2.02 (2.79 MB) Karaoke Recorder

The following information was taken from the download site at:
http://www.hitsquad.com/smm/programs/microsing/

This is a demo. You must have DirectX 8.1 on your computer which can be download from www.download.com

Record your voice while singing along with lyrics, mix and add real-time effects to your voice. You can modify MIDI-formatted tracks and save them as WAV files. They can be posted to the Web, shared with friends and even burned to a CD.

Fruity Loops (7.31 MB)

The following information was taken from the download site at:
http://www.hitsquad.com/smm/programs/FruityLoops_win95/

It is a potent program for a novice who knows Piece of Cake.
nothing about making music but also for a pro whose been at it for years.

Fruity Loops is a very useful drum programming tool. Demo is sort of limited, but gives you a good idea of what the program offers.
Music Technology Club is a small club of fifth grade students who are exploring and experimenting with various aspects of music technology. They are exploring the world of MIDI and MIDI sequencing, as well as online music learning sites. Feel free to explore some of the following online resources we have discovered!!

Back to Clubs Page   Back to Multilevel Lessons Page
Explore These MIDI and Music Sites

| Music Learning Sites                  |
| Music Games Sites                    |
| Karaoke Sites                        |
| MIDI Files on the 'Net               |
| Classical MIDI Files on the 'Net     |
| Holiday MIDI Music                   |
| Learn More About MIDI                |
| (Several MIDI Learning Links)        |
| Shareware and Public Domain          |
| Copyright Links                      |
| For Educators                        |

Other Cool Music Tech Stuff

| Virtual Drum Kit                     |
| What does "Copyright" mean?          |
| Mr. Schafle's Music Links            |

http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/Main%20List%20Enter.htm
### Music Learning Sites

**Van Zant Music Technology Club**

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<td>Learn notes on the scale and the piano</td>
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<th>The Online, Free Ear Training on the Net</th>
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<td><strong>Good Ear</strong> helps you to develop good ears. It works within your browser. This version contains 30 different exercises, more coming soon</td>
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<tr>
<th>Virtual Music Classroom from Music Kit</th>
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<td>This site contains music resources and activities that encourage the ability to read, write, and make music.</td>
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<th>Playmusic</th>
<th>Take a seat in the orchestra, or try writing your own music!</th>
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<th>Musical Instrument Site</th>
<th>Listen to different instruments</th>
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<th>Play a Piano</th>
<th>See what the sound waves look like as you play a virtual piano!</th>
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<tr>
<th>Playhouse Radio</th>
<th>A great place for young children!</th>
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http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/music_learning_sites.htm  5/1/02
\[ \text{Music Games} \]

Van Zant Music Technology Club

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<td><strong>The Sounds of Chaos</strong> - Create your own!</td>
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<td>Young Composers</td>
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<td>Ted's Guitar Game</td>
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<td><strong>CBC for Kids Music Games</strong> - Lots of cool games here</td>
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<td>Kids Domain Music Games</td>
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<td>Musical Memory Match</td>
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<td><strong>Moodalyzer</strong> - Practice your keyboarding skills with the musical keyboard!</td>
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<td>Music Game Downloads from Kids Domain</td>
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<td>Alfreds Fun Zone</td>
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<td><strong>Happy Note</strong> - Free Download!</td>
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http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/music_games.htm

5/1/02
MIDI Karaoke Sites

Van Zant Music Technology Club

WinZip - You need this to uncompress the song files.

WinKaraoke Player for Win95
The easy-to-use MIDI Karaoke Player for Windows 95 with the Bouncing Ball!

MIDI Karaoke

"The sole purpose of this music site is to provide visiting music students resources for vocal technique and MIDI-sequencing interpretation and to encourage learning from the various musical interpretations that have been recorded in music files linked to this site." You will need to download a couple of plug-ins, which are available at the site.

FREEKaraoke

Provides directory of Karaoke sites on the Internet and discussion area for Karaoke fans.

The Singing Station - Source for professional soundtracks starting at $1.50.

Canadian Kids Page Karaoke Player. Over 50 fun songs

National Institute of Environmental Health Sciences Karaoke Site - Good for the very young and campers!

http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/karaoke.htm

5/1/02
| **MoJo's Musical Mouseum - lyrics and songs** |
| **Karoake Music Download Site from Liberty Music** |
| **Microsing - Download this software and record your own voice and add voice effects** |

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- **Find MIDI Files - Free Pop MIDI Files**
- **Partners in Rhyme - Pop, Rock and Other MIDI Files**
- **Radio Mute Music Directory - All different genres of music**
- **Ultimate MIDI File Collection - All Genres Including Pop, Rock and Alternative**
- **The Top 125 MIDI Sites - All the newest files on the 'net first!**
- **Harmony Central - Comprehensive MIDI and Music Tech Site**
- **Musician's Tech Central**
- **MIDI Composer's Exchange**
- **The oldest and largest site for original MIDI music**
- **Gary's MIDI Jukebox**
- **Classic Rock MIDI files**

http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/midi_files_on_the.htm

5/1/02
<table>
<thead>
<tr>
<th><strong>Video game Music Archive</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Game Music MIDI files</strong></td>
</tr>
<tr>
<td><strong>Patriotic MIDI Music</strong></td>
</tr>
<tr>
<td><strong>Disney Music Page</strong></td>
</tr>
<tr>
<td><strong>Christian MIDI Files</strong></td>
</tr>
<tr>
<td><strong>MIDI Explorer - A MIDI Search Engine for Finding MIDI Files on the 'Net</strong></td>
</tr>
<tr>
<td><strong>Mike's World of Drums and Drumming - Free Drum Files</strong></td>
</tr>
<tr>
<td><strong>More MIDI Drum Patterns</strong></td>
</tr>
<tr>
<td><strong>E-Drummer - A free multimedia drum tutor</strong></td>
</tr>
<tr>
<td>This free program is a kind of multimedia drum book. It contains almost a half million different patterns. You can also enter your own patterns.</td>
</tr>
<tr>
<td><strong>Music for Pianos</strong></td>
</tr>
<tr>
<td>Piano music is mainly from the romantic and late-romantic periods</td>
</tr>
<tr>
<td><strong>Free MIDI Music Archives - Provides a list of MIDI Links</strong></td>
</tr>
</tbody>
</table>

http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/midi_files_on_the.htm
Classical MIDI Files on the 'Net

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<table>
<thead>
<tr>
<th>Classical MIDI Files</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Classical MIDI Connection - Also an online Store</td>
</tr>
<tr>
<td>Dave's J.S. Bach Page</td>
</tr>
<tr>
<td>Chopin</td>
</tr>
<tr>
<td>Handel</td>
</tr>
<tr>
<td>Ragtime Piano MIDI Files</td>
</tr>
</tbody>
</table>

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http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/classical_midi_files_on_the.htm 5/1/02
Holiday MIDI Music Sites

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<table>
<thead>
<tr>
<th>The Haunted Jukebox - &quot;Spooky&quot; MIDI Stuff!</th>
</tr>
</thead>
</table>
| Online Christmas Songbook

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http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/holiday midi music sites.htm
# MIDI Learning Sites

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<table>
<thead>
<tr>
<th>Bob's MIDI Information Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDI Tutorial</td>
</tr>
<tr>
<td>Free piano sheet music and MIDI files</td>
</tr>
<tr>
<td>Classical MIDI sequencing - Learn how to create great classical MIDI files</td>
</tr>
<tr>
<td>Betty's MIDI Mania Site</td>
</tr>
<tr>
<td>FREE piano sheet music on the web (Includes many MIDI files, also)</td>
</tr>
</tbody>
</table>

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Public Domain and Shareware

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Public Domain Music (legally free!)
(Music that has no copyright)

Music Shareware

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http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/public_domain_and_shareware.htm
Copyright Sites

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<table>
<thead>
<tr>
<th>Copyright Kids</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Copyright Office Website</td>
</tr>
<tr>
<td>U.S. Copyright Office Forms Site</td>
</tr>
</tbody>
</table>

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For Educators

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<table>
<thead>
<tr>
<th>Technology Institute for Music educators (TI:ME)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A non-profit corporation registered in the State of Pennsylvania whose mission is to assist music educators in applying technology to improve teaching and learning in music. Music Technology Certification program offered.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ATMI - Association for technology in Music Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Especially noted for ATMI Technology directory, a 400+ page guide to thousands of software and hardware products used in music instruction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Music Technology and Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>From NYU - Technology Resources and Information for Music Educators</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MIDI in the Classroom (MIDI Unit Plan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A series of developmental activities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Music Technology Online Magazine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles by numerous authors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MIDI and Music Technology Resources for Teachers</th>
</tr>
</thead>
</table>
## K-12 Resources for Music Educators

Provides tons of links

### Composers In Electronic Residence (CIER)
Explore original student music. Students upload their music which is saved as a Standard MIDI File. Participating composers download the piece of music, listen to it and then respond to the student with advice and encouragement.

### World Rhythm Training
Guides to polyrhythms with MIDI soundfiles

### Music Education Software Recommendations
From Dr. Thomas Rudolph

### Music Technology curriculum & Lesson Plans

### Betty's MIDI Mania Site
Learn more about Cakewalk

### ISTE - International Society for Technology in Education

### The Piano Education Page

### Music Jokes

### Children's Music Web

### Playhouse Radio

http://www.evesham.k12.nj.us/vzweb/clubs/MTclub/for_educators.htm
A fun place for young children