

## A Brief History of Significant Electronic Hardware & Its Evolution to the Present Day ~ The Long and Winding Road (That Leads to the DAW)

### **About This Lesson Plan:**

- This lesson plan was developed by Richard A. McCready and Joseph M. Pisano for distribution and launch to celebrate, in part, the National Association for Music Educators' (NAfME) Music In Our Schools Month (MIOSM) that occurs every March. More information about MIOSM may be found on NAfME's Website: <http://www.menc.org/events/view/music-in-our-schools-month>
- The lesson plan was developed using the authors' extensive knowledge as field experts and only open-source or freely available materials. While Wikipedia may not be the most scholarly resource for every use, it was appropriate for use in this project given the project guidelines and serves as a reference point and "first resource". All of the contained facts were validated by the authors before they were utilized within the presentation (for more information on the validity and reliability of Wikipedia please see the referenced comparative studies performed section on Wikipedia: [http://en.wikipedia.org/wiki/Reliability\\_of\\_Wikipedia#Comparative\\_studies](http://en.wikipedia.org/wiki/Reliability_of_Wikipedia#Comparative_studies) or simply "Google" the keywords "Wikipedia" and/or "Reliability" and/or "Validity" for more information). In addition, only author owned, open-source, or public domain images were included in the presentation. Finally, appropriate YouTube videos were used for inclusion with the presentation.
- Built-in functionality:
  - QR Codes may be scanned by the students as the presentation is presented to direct them to the exact Wikipedia article being referenced. More information about QR Codes may be found here: [http://en.wikipedia.org/wiki/QR\\_code](http://en.wikipedia.org/wiki/QR_code).
  - Active links are highlighted in yellow and underlined – the authors suggest using the CTRL+Click or OPTION-Click method to open the links in separate windows. The Wikipedia logo or the QR Code may be touched/clicked to open up exact Wikipedia article referenced.
  - The YouTube logo may be touched/clicked to directly open the associated YouTube video (only the first one listed is linked if there are multiple clips embedded in a particular slide).  
**Note:** Wikipedia, YouTube, and QR Code "anchor links" do not "click" in the *SlideShare* version.
- This lesson plan is copyrighted using the Creative Commons "Attribution –Non Commercial – Non Derivatives Unported License and may be shared and utilized accordingly (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).
- Each slide was carefully placed into this presentation so that the development of the technology unfolds in a chronological and logical way for the students. Likewise, the curated YouTube videos will further enhance the understanding of each topic for the students. Teachers should be thoroughly versed with PowerPoint and associated video content prior to attempting the lesson so that they can more easily understand the music evolution being presented themselves.



**About the Lesson Plan Authors:**

**Joseph M. Pisano, Ph.D.** is currently the Associate Chairman of Music and Fine Arts at Grove City College where he is an Associate Professor of Music and Music Technology and serves as the Associate Director of Bands. Grove City College is a private, four-year college located in Grove City Pennsylvania.

Prof. Pisano is an active instrumental ensemble conductor, guest conductor, ensemble adjudicator, jazz trumpeter, technology expert, and Arts Advocate. His academic degrees include: a Bachelor of Music Degree and Public School Teaching Certification from Grove City College, a Master of Music Degree in Instrumental Conducting from the State University of New York at Binghamton (S.U.N.Y), and a Ph.D. from Kent State University in Music Education with a Doctoral Minor in Instructional Technology. His professional memberships and honoraries include: ABA, NAFME, NBA, ISME, PMEA, TI:ME, Pi Kappa Lambda, and Phi Beta Mu.

Dr. Pisano has written numerous articles, books, curriculums, and iPad/iPhone applications; he is highly sought after as lecturer and clinician. He currently serves as the Music Education Guide writer for In-Tune Monthly Magazine and DCI magazine, is the TI:ME 2011 Teacher of the Year, recipient of the 2011 Citation of Excellence from PMEA, and is the founder of many popular music, education, and technology websites.

**Richard A McCready, M.M.** is a composer, musician, and the Director of Music Technology at River Hill High School in Columbia, Howard County, Maryland. He also serves Howard County as the Resource Teacher for Music Technology.

Mr. McCready was born in Northern Ireland and studied tuba performance, piano, and composition at the Royal Northern College of Music, Manchester, England. He began his teaching career at Frodsham High School in Cheshire, England.

Since emigrating to the United States in 1992, Mr. McCready has held teaching positions at The Park School of Baltimore, Towson University, and Mayfield Woods Middle School, Elkridge, MD; he has also played professionally with the Monumental Brass Quintet, the Lexington Brass Quintet, and the Denhard/McCready Duo.

Mr. McCready has earned two Masters degrees from Towson University, one in tuba performance and one in vocal performance. He plays many musical instruments, but the focus of his teaching is Music Technology in which he is widely regarded as one of the outstanding innovators in the US. His book, *Making Music with GarageBand and Mixcraft*, was published in 2010.



## Quick Lesson Plan Outline:

### Length of Lesson:

This lesson is flexible in design. Depending upon how detailed a classroom teacher will be with elaborating upon each slide and whether or not they will show all, some, or parts of the referenced videos, different time allotments for the lesson will be required. If a brief overview of the subject material is all that is needed for a particular class, it may be completed in one 45-50 minute session. The authors estimate that the typical time needed to complete the lesson plan, including showing all the videos and going into some detail for each slide, will be approximately 80-100 minutes; however, the lesson plan may be easily extended and developed into even more units.

### Objectives:

Students will learn about the preceding developments in music technology that have led up to the development of today's modern music electronics and Digital Audio Workstations (DAW). They will explore each of the significant developments along this timeline and be able to make connections between how each one relates to one another and often leads directly to the development of the next.

### Music National Standards Met:

6. Listening to, analyzing, and describing music.
8. Understanding relationships between music, the other arts, and disciplines outside of the arts.
9. Understanding music in relation to history and culture.

### Materials Needed:

1. The associated Presentation (Powerpoint)
  - a. Via AuthorStream  
<http://www.authorstream.com/Presentation/pisanojm-1352091-pisano-mccready-daw-miosm-project-2012/>
  - b. Via SlideShare  
<http://www.slideshare.net/pisanojm/pisano-mc-creadydawmiosmproject2012>
  - c. Via MusTech.Net  
<http://mustech.net/miosm-daw>  
<http://mustech.net/go/youtubedaw>
2. Internet connection with access to YouTube  
You may find these videos linked in the presentation and also via MusTech.Net (above link)
3. LCD Projector and Integrated Sound System (or equivalent)
4. PDF Student Handout available via MusTech.Net
5. PDF Teacher Lesson Plan available via MusTech.Net



**Start** the lesson by introducing the concept of the Digital Audio Workstation. Begin a dialog about the pre-cursors to modern day music technology with the students by asking them to discuss early music technologies that they may already be familiar with and making some connections to them.

**Explore** the objectives of the lesson by beginning the associated PowerPoint presentation. As the presentation unfolds, be sure to cover key points, keywords, and to connect each slide with both the previous slide and next slide. Give the students time to ask questions about the contents of each slide. Because the associated YouTube videos contain a plethora of related content information and can immerse the students into the topic, some time must be taken to allow the students to think about what was viewed and to discuss it as a class.

**Develop** the lesson by adding appropriate references, analogies, and additional materials as there is opportunity. Engage the students in concrete ways during the course of the lesson. Allow them to brainstorm and discuss their own thoughts about what is being presented to them with this lesson.

**Close** the lesson by thoroughly making the connection to DAWs and music that is important to them. Be sure to give the students time to make connections between music that is important to them and the various technologies that have evolved to make their music and their own creations possible.

**Assess:**

1. Are the students able to show an understanding of what a DAW is?
2. Are the students able to explain and describe correctly the various devices/people shown and discussed in the presentation?
  - a. Pipe Organ, Pianola, Phonograph, Telharmonium, Theremin, Ondes Martenot, etc.
  - b. Les Paul, Robert Moog, Tom Dowd, etc.
3. Are the students able to correctly order/connect the various technologies and people discussed in the lesson to each other and in a proper chronology?
4. Are the students able to connect some of the software and hardware that they might already be using to items and people discussed in the lesson?

**Lesson Additions:**

1. Consider showing and playing examples of music and performing groups that have used the instruments discussed in the lesson. For instance the Beatles used the Mellotron in both *Tomorrow Never Knows* and *Strawberry Fields Forever*.
2. Connect the lesson to examples of items made with a classroom or home DAW (student or teacher examples).
3. Consider having a live demonstration of any "older" music technology that might be available.



**Optional Projects for Students:**

1. Have the students discuss their favorite bands, groups, or music in class. Assign them the task of finding out what types of instruments and music gear that the groups are utilizing. Then, discuss the results in class and consider having them write a paper (or create a presentation) about their findings.
2. There are many free and open source audio/editing software programs available. Utilizing them or others that the school may already own, have the students explore and create music with these programs. Consider having them replicate some of the sounds or music heard and discussed as part of this presentation. A brief list of sampling and free/open-source Software:
  - a. [Audacity](#) (Mac, Windows, Linux) : Great cross-platform audio editor
  - b. [AudioTool](#) (Online): A Web-based music creation program
  - c. [Aviary](#) (Online): Myna Audio Editor
  - d. [trakAxPC](#) (Windows): Fantastic free audio loop music/video mixing software
  - e. [Anvil Studio](#) (Windows): Multi-Track MIDI sequencing at no cost
  - f. [MusE](#) (Linux): Audio/Midi Sequencer for Linux
  - g. [Wavosaur](#) (Windows): Very good sound editor with VST support



**Selected References & Resources for this Lesson:**

Related Project Websites:

- <http://mustech.net/miosm-daw> - Project Home
- <http://mustech.net/go/youtubedaw> - Project YouTube Videos

Joseph Pisano's Websites:

- <http://jpisano.com>
- <http://mustech.net>
- *Twitter:* [@pisanojm](https://twitter.com/pisanojm)

Richard McCready's Websites:

- <http://mustechalley.com>
- *Twitter:* [@richardmccready](https://twitter.com/richardmccready)

Related Informational Websites:

- <http://www.emusician.com/gear/0769/the-electronic-century-part-i-beginnings/143739>
- <http://www.britannica.com/EBchecked/topic/183823/electronic-music#toc27520>
- <http://www.phinnweb.org/history/>
- <http://www.tadream.net/articles/historyofem/history.pdf>
- <http://www.vintagesynth.com/>

Related DVDs/Videos:

- [Imogen Heap: Everything In-Between – DVD](#)
- [Les Paul: Chasing Sound - DVD](#)
- [Mellodrama: The Mellotron Movie - DVD](#)
- [Moog – DVD](#)
- [Ohm: The Early Pioneers of Electronic Music - 3CD and DVD set](#)
- [Theremin: An Electronic Odyssey – DVD](#)
- [Tom Dowd and the Language of Music - DVD](#)

