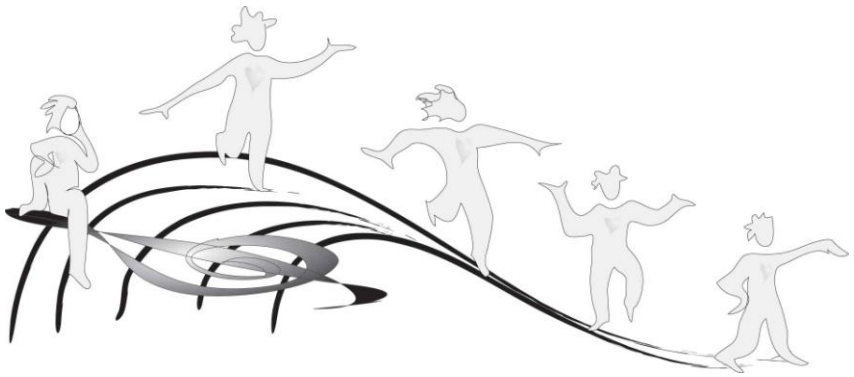
Music for Activating Memory

Activate Student Recall with Music



ArtsTime
March 20, 2009

with Chris Boyd Brewer

Chris Boyd Brewer, 2008, www.MusicAndLearning.com 336-207-7505 chris@musicandlearning.com

MUSIC AS A CLASSROOM MODIFIER

by Chris Brewer, MA FAMI

Increase learning effectiveness by using music for

Attention, Attitude, and Atmosphere

Readiness to learn begins with a positive attitude about the classroom. Music is a simple way to set a comfortable atmosphere and help students get in the mood for learning. The use of music throughout the learning cycle offers regular opportunities to reinforce positive moods and keeps students motivated for learning.

Here's how:

- Use energizing musical rhythms and tempos to heighten attention when energy levels are low.
- Play fun songs, unusual sounds, interesting sound cues, and use high-energy music and movement activities to refocus, rejuvenate, and redirect classroom activities.
- Use music activities to increase interaction and develop cooperation. It is one of the most powerful tools for understanding other cultures and bonding with one another. Play a variety of cultural styles to increase cultural awareness.

Learning and Memory States

Content presentations with a musical soundtrack make learning interesting and memorable.

Here's how:

- Use music to accompany active presentations that creatively introduce new information and help students get involved. Just getting students to pay attention increases the amount of information they hear and remember.
- Use a reflective soundtrack with a review of content to help students access a focused and stress-free learning state. These relaxed reviews provide an opportunity for students to process information and reinforce it in memory.

Personal Experience and Expression

Facts becomes knowledge when we can practice using the information in ways that make it personally relevant and give us opportunities to experience how to apply the material. The personal experience and expression of content *activates* information for our students. Student expressions of understanding demonstrate learning success and are the true test of knowledge.

Here's how:

- Play background music to encourage participation in activities that foster personal experience through writing, drawing, role-play and games. Music stimulate personal expression that brings meaning to learning.
- Songs, chants, poems and raps make it easier to remember facts and details and make repetitive practice more enjoyable and memorable.

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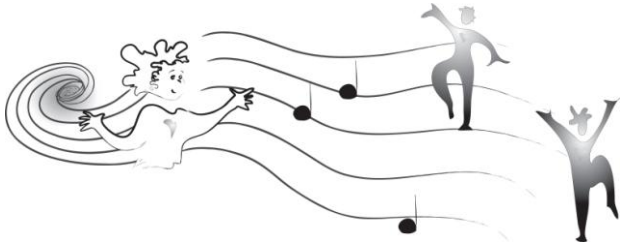
Music Memory Presentations



Music Memory Presentations are Content + Music

Music Memory presentations are teacher-directed presentations of essential content information provided with music. The goal is to

1) *facilitate a positive learning state and*
2) *to make the lesson more memorable*

There are two basic modes of learning concerts, the Active Music Memory and the Reflective Review Presentations.

THE ACTIVE MUSIC MEMORY PRESENTATION

- provides an overview of essential topic information
- uses energizing music
- activates mental, physical and emotional attention
- is designed to have students be actively focused on the teacher's presentation

REFLECTIVE REVIEW PRESENTATION

- provides an opportunity to review and process content information
- stabilizes the students' mental, physical, and emotional state
- uses slow, harmonious music
- is designed to have students listen in a reflective state, possibly with eyes closed

PRESENTATION FORMATS

Content may be organized into various formats for the concerts.

Key words*
Vocabulary and definitions*
Text summary
Biography
Story
Metaphorical Story
Learning Journey*
Play
Visual Review*
MindMap introduction or review*

*optimal Reflective Review format

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The Terminologist

Summarized from "Soundtracks for Learning: Using Music in the Classroom

Learning Outcome: Learn vocabulary words and definitions
When to Use: When you begin a unit with new vocabulary.
Text Materials: List of vocabulary words and definitions

The Terminologist turns the mundane effort of memorizing vocabulary into an enjoyable task that ensures students learn essential terms. It is based on the concept that we remember better when given information in a multisensory manner. Students are presented with vocabulary in three steps, each using different senses and attention states.

Lists of 15 to 20 words are appropriate for students 10 years and older. Shorter lists of six to 15 words are recommended for younger students. You can use a variation for non-readers who need to learn names of objects in which you speak the word and show a visual image of the object (or the real object if possible). Keep definitions short—two to five words if possible.

How to present the Terminologist

Active Presentation

1. Provide a vocabulary list to students with terms on the left, short definitions on the right. Tell students you will be reading the vocabulary words and definitions to them.
2. 2. Suggest that, as you read the words, they imagine an image that connects each word to its definition. The image can be anything that will help them connect the two but should link them—funny/unusual is good for memory. If they can't think of an image, tell them not to worry. Have students share what linking images they came up with when the reading is done.
3. Begin reading and ask students to follow along as you say the terms and definitions slowly and clearly. Pause two to three seconds between each word and definition. It is important that students look at the handout as you speak so that the information is received in the visual areas of the brain. For non-readers, show visual images as you say the term and definition!

Reflective Review

1. Ask students to sit comfortably, with eyes closed to eliminate visual stimuli if they like. Dim the lights if possible and eliminate distractions.
2. Play the slow, reflective music quietly and let it play two minutes before reading the list again. This time read it slowly, quietly and with a 6-8 second pause between each term/definition. When done, let the music play another minute and fade the music down slowly.

Practice Activation

In the final step, students actively use terms. For example: in pairs, put the words correctly into sentences; write a paragraph or story incorporating terms; draw a picture and label the terms; create a visual organizer.

Celebrate Success--Have students take the challenge (test) and celebrate success!

Sound Suggestions:

Relax with the Classics, Vol 1 or 2 (Contact Chris Brewer, chris@musicandlearning.com)
Baroque Music for Empowering Learning and Relaxation: Barzak Institute: www.optimalearning.com
MemoryBeat: LifeSounds Educational Services www.MusicAndLearning.com
Any *slow* Baroque-era (1650 to 1720) music—instrumental only—use slow movements!

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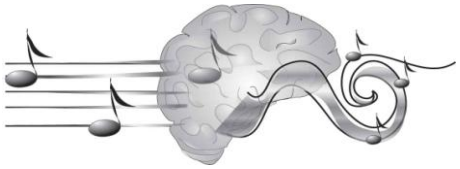
Music and Learning Research



compiled by

Chris Brewer, MA FAMI

Attention and Learning

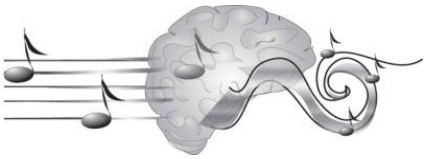
Learning begins *or ends* depending on whether or not we have student attention during lessons. Gaining student focus is a critical first-step to successful teaching. One way to stimulate attention is through novelty (Berns, Cohen, and Miintum,1997). Anything perceived by the brain as different from the norm causes release of neurotransmitters and hormones such as norepinephrine and dopamine. These natural body chemicals can support attention and learning. Norephinephrine stimulates attention in the brain and also affects the amygdala, our emotional-memory director (Sprenger, 1999). Dopamine has great impact on motivation, curiosity, learning, and memory. It also activates the emotional responses of the amygdala, encouraging rewards for learning (Fried , 2001). These effects can encourage more attention to learning.

Holding attention is another matter. Intense directed attention for long periods of time stresses the brain's attentional system in the frontal lobes (Jensen, 1998). Staying focused can be difficult and teachers need ways to balance student attention levels. Music offers a way of quickly refocusing and sustaining attention in the classroom.

Music and Attention

Music is an especially effective tool for gaining attention as it offers opportunities to be used in novel ways that can trigger the attention-stimulating neurotransmitters. In addition, there is research indicating that properties of music can create another kind of energizing effect.

Dr. Alfred A. Tomatis dedicated over fifty years of experimentation and clinical practice to understanding neurological effects of auditory processing on the mind and body. His work redefined the function of the ear and hearing mechanisms (Maudale, 1994; Thompson and Andrews, 2000). One of Tomatis' most profound realizations relates to the energizing effects of sound vibration. Sound is translated from airwaves to electrical current in the ear. This current is transmitted throughout the body and brain as electrical charge. The vagus nerve, the 10th cranial nerve, originates from the base of the cranium and connects to many areas of the body including the larynx, lung, heart, intestines and stomach. The auditory nerve (the 8th cranial) connects to the muscles of the body. Tomatis proposed that these nerves carry electrical charge produced by the high overtones of sound (harmonics) to organs and muscles throughout the body. This charge can literally energize the body by directly stimulating the autonomic nervous system (Keeping, Prada, and Sollier, 2004). This can explain why music can also physically energize us!



Stress and Learning

Fear of flunking an important test, relationship problems, peer-group pressure, and other school-related issues create stress for students. Trying to hold attention for long periods of time can shift attention to at-tension and cause stress, too. What happens to student learning then?

Under stress or in threatening circumstances, our body releases cortisol, adrenaline, and norepinephrine to stimulate actions assuring survival (Pert, 1997). While this natural response can be helpful in some situations, it can be damaging to memory and learning. Long-term presence of cortisol clouds the ability to think clearly and remember (Newcomer, 1999). When stress chemicals enter the system, blood flow to the cortex is decreased, especially in the frontal lobes, which can inhibit high-level thinking (Reichal, 2000). It can take hours for the liver to detoxify cortisol and allow calm and clear thinking to return (Hannaford, 2005). If stress becomes chronic and cortisol remains active in our system for too long it reduces immune function and can be responsible for the development of depression (Phillips, 2003) and serious illness (Clover, 2001).

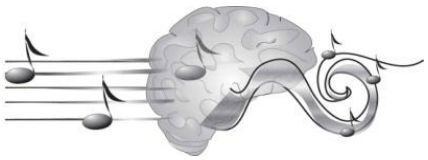
Researchers have also found that long-term stress or clinical depression can reduce the size of the hippocampus, our brain structure responsible for “filing” factual information in the brain as memory. The hippocampus has been found to shrink by as much as 20% from chronically high cortisol levels, causing memory deficiencies (Phillips, 2003). Long-term high cortisol levels can even destroy hippocampus cells (Sapolsky,1992) or reduce production of new neurons in the hippocampus (Santarelli, 2003).

Music for Classroom Stress Management

It is important for our students (and us, too!) to learn to handle stressful situations without getting overly anxious or staying stressed for long periods of time. Music offers a simple and beneficial way to balance stress in the classroom and at home. Music therapy research and practice conducted during the last 50 years has shown that music can significantly reduce anxiety and stress (Standley, 1995; Krout, 2007). It can even affect the levels of related stress hormones (Taylor, 1997; Weinberger, 2006).

Education research is finding that music is specifically helpful in reducing the effects of negative, classroom-related stress and anxiety (Field, Nawrocki, Pickens, Fox, and Schanberg, 1998; Hirokawa and Ohira, 2003). In a 1990 study, music kept students from experiencing increased anxiety during testing. Michael Hardie measured anxiety levels of 196 students before and after taking an intermediate Algebra test. During the test, Hardie quietly played Baroque, Classical and Romantic era music with tempos between 72 and 88 beats per minute. Results showed that anxiety in students without music rose significantly while the group listening to music showed no increase.

Surveys show music is a popular method for stress reduction. Mood management expert Robert Thayer surveyed college students to determine how they reduced anxiety. Music ranked third of 21 stress-reducers and more than 10% of the students said that music listening was the best way to improve mood. A 2006 RAND Corporation study reports that teens listen to an average of 10 to 21 hours of music a week. Incorporating music into the classroom is a simply and natural technique for reducing learning anxiety.



Moods and Learning

Most teachers know the impact that student moods have on learning and achievement. Researchers have established the benefits of positive attitudes for learning success, especially memory and recall (Ashby, Isen, and Turken, 1999; Smith. 2001). Biologist Carla Hannaford explains that when students think about learning in a positive way, neurotransmitters are released that increase the formation and solidifying of neural memory patterns (Hannaford, 2005).

What effect do negative, sad, or depressed moods have on learning? Teachers often see "attitude disabilities" affect learning of students who are in bad moods or have a negative attitude. There is also much research evidence that negative moods interfere with cognition and behavior (Aluja and Blanch, 2004; Crundwell and Killu, 2007). Students with depression or negative attitudes engage less in classroom activities, are less efficient at learning, and generally recall less information (Ellis et al, 1997). The number of students in our classrooms considered clinically depressed is as high as 10% (Weissman,1999; Birmaher, 1996). People who are depressed experience nearly continuous irrelevant thoughts that interfere with memory processes, take considerably more time to retrieve information, and have difficulty completing tasks. Unfortunately, a depressed or bad mood is hard to get rid of because negativity just keeps generating more negative thoughts (Wright and Salomon, 1990).

Positive Moods and Music

Music can create a positive mood state that will enhance learning (Felix ,1993). We have all experienced how music lifts our spirits, allowing us to feel more centered and productive. Music stimulates the release of mind/body chemicals that create a "feel-good" experience such as serotonin, dopamine, and endorphins (Peretz and Zatorre, 2003; Boso, Politi, Barale, and Enzo, 2006). These neurotransmitters also aid the immune system and provide for quick and easy transmission of neural messages (Glenn, 1990).

Research from music therapy suggests that music can "reset" negative attitudes to positive moods, even for people in depression (Thayer et al, 1994). Music therapists Michael Thaut and Shannon de l'Etoile researched the use of music to induce a positive mood. They played the first movement of Mozart's Clarinet Concerto in A, Opus 107 to 50 students and found the music produced a positive state in 85% of the students (Thaut, 1993).

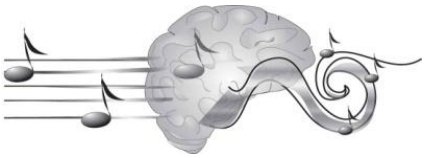
In a follow-up study, Shannon de l'Etoile asked 45 students to self-induce a positive mood by consciously matching their current mood to that of emotionally-positive music. Students focused on mood-matching for five minutes. Four groups were used to determine the most effective classroom method for increased recall. Some students listened only before instruction, others only prior to testing, one group listened both times and a control group had no music. Students were able to recall information best when mood-matching occurred both before instruction and prior to testing. Eighty-five percent of the students were able to positively shift moods with the help of music (de l'Etoile, 2002).

There are many ways to use music in a learning cycle, and playing music frequently can have the added benefit of keeping student attitudes and moods positive.

CITED REFERENCES

1. Aluja, A., & Blanch, A. (2004). Depressive mood and social maladjustment: Differential effects on academic achievement. *European Journal of Psychology of Education*, 19(2), 121-131.
2. Ashby, F., Isen, A., & Turken, U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review,* 106(3), 529-550.
3. Berns, G.S., Cohen, J.D., and Mintum, M.A. (1997). Brain regions responsive to novelty in the absence of awareness. *Science*, May 76, 5316: 1272-75.
4. Birmaher, B. (1996). Childhood and adolescent depression: A review of the past 10 years. Part 1. *Journal of the American Academy of Child and Adolescent Psychiatry* 35, 11: 1427-39.
5. Boso, M., Politi, P., Barale, F., & Enzo, E. (2006, Oct-Dec). Neurphysiology and neurobiology of the musical experience. *Functional Neurology*, 21(4), 187-191.
6. Clover, R.D. (2001). The biological processes in psychological stress. *Families, Systems and Health* 9, 22: 201.
7. Crundwell, M. & Killu, K. (2007, Sept/Oct).Understanding and accommodating students with depression in the classroom. *Teaching Exceptional Children,* 40(1), 48-54.
8. De l'Etoile, S. K. (2002). The effect of a musical mood induction procedure on mood state-dependent word retrieval. *Journal of Music Therapy* 39, 2: 145-160.
9. Ellis, H.C., Moore, B.A., Varner, L.J., Ottway, S.A. and Becker, A.S. (1997). Depressed mood, task organization, cognitive interference and memory: Irrelevant thoughts predict recall performance. *Journal of Social Behavior and Personality* 12: 453-470.
10. Feinstein, S. (2004). *Secrets of the Teenage Brain: Research-Based Strategies for Reaching and Teaching Today's Adolescents.* San Diego, CA: The Brain Store ®.
11. Felix, U. (1993). The contribution of background music to the enhancement of learning in suggestopedia: A critical review of the literature. *Journal of the Society for Accelerative Learning and Teaching,* 18, 3, 4, 277-282.
12. Field, T, Martinez, A., Nawrocki, T, Pickens, J., Fox, N., and Schanberg, S. (March 22 1998) Music shifts frontal EEG in depressed adolescents. *Adolescence.*
13. Fried, Itzhak, et. al. (February, 2001) Increased dopamine release in the human amygdala during performance of cognitive tasks. *Nature Neuroscience* 4, 2: 201-207.
14. Glenn, H.S. (1990). *The Greatest human need.* (Video Recording). Gold River, CA: Capabilities, Inc
15. Hannaford, C. (2005). *Awakening the Child Heart: Handbook for Global Parenting.* Captain Cook, HI: Jamilla Nur Publishing.
16. Hardie, M.H. (1990). The effect of music on mathematics anxiety and achievement. Unpublished dissertation, University of Nevada, Reno.
17. Hirokawa, E. and H. Ohira. (Fall 2003). The Effects of music listening after a stressful task on immune functions, neuroendocrine responses and emotional states in college students. *The Journal of Music Therapy* 40, 3, 189-211.
18. Holland, P. (1995). "The Role of Music Therapy in the Effective Use of Stress." In: *The Art and Science of Music Therapy: A Handbook.* The Netherlands: Harwood Academic Publishers.
19. Jensen, Eric. (1998). *Teaching with the Brain in Mind.* Alexandria, VA: Association for Supervision and Curriculum Development.
20. Keeping, F., Prada, R., & Sollier, P. (2004). *The Ear and the Voice.* Lanham, MD: The Scarecrow Press.
21. Kelley, C.M. (1986). Depressive mood effects on memory and attention. In L.W. Poon (Ed.), *Handbook for Clinical Memory Assessment of Older Adults,* (238-243). Hyatsville, MD: American Psychological Association.
22. Krout, R. E. (2007, April). Music listening to facilitate relaxation and promote wellness: Integrated aspects of our neurophysiological responses to music. *Arts in Psychotherapy*, 34(2), 134-141.
23. Maudale, P. (1994). *When Listening Comes Alive: A Guide to Effective Learning and Communication.* Norval, Ontario: Moulin Press.
24. Newcomer, J.W., Selke, G., Melson, A.K., Hershey, T. et al. (June 1999). Decreased memory performance in healthy humans induced by stress-level cortisol treatment. *American Medical Association*.
25. Peretz, I., & Zatorre, R. (2003). *The Cognitive Neuroscience of Music.* New York: Oxford University Press.
26. Pert, Candace. (1997). *Molecules of Emotion. Why We Feel the Way We Feel*. N.Y.: Simon and Schuster.
27. Phillips, M. L. (November 21 2003). Hippocampal neurogenesis relieves depressive symptoms. *Neuroscience for Kids.*
28. RAND Corporation. (2006). RAND study finds adolescents who listen to a great deal of music with degrading sexual lyrics have sex sooner. Retrieved from www.rand.org/news/press.06/08.07.html
29. Reichal, Marcel. (2000). *PET Scans of the Brain*. Washington DC: George Washington University.
30. Santarelli, L., Saxe, M., Gross, C., Surget, A., Battaglia, F., Dulawa, S., Weisstaub, N., Lee, J., Duman, R., Arancio, O., Belzung, C., and Hen, R. (August 2003). Requirement of hippocampal neurogenesis for the behavioral effects of antidepressants, *Science* 8: 805-809.

31. Smith, S. M. (1985). Background music and context-dependent memory. *American Journal of Psychology,* 98, 4: 591-603.
32. Sprenger, M. (1999). *Learning and Memory: The Brain in Action.* Arlington, VA: ASCD.
33. Standley, J. (1995). Music as a therapeutic intervention in medical and dental treatment: Research and clinical applications. In T. Wigram, B. Saperston, & R. West (Eds.), *The Art and Science of Music Therapy: A Handbook* (pp. 3-22). New York: Harwood Academic Publishers.
34. Taylor, D. B. (1997). *Biomedical Foundations of Music as Therapy.* St. Louis, MO: MMB Music.
35. Thaut, M.H., and de l'Etoile, S.K. (1993). The Effects of music on mood state-dependent recall. *Journal of Music Therapy* 30, 2: 70-80.
36. Thayer, R.E. (1989). *The Biopsychology of Mood and Arousal.* N. Y.: Oxford University Press.
37. Thayer, R.E., Newman, J.R. and McClain, T.M. (1994). Self-regulation of mood. Strategies for changing a bad mood, raising energy, and reducing tensions. *Journal of Personality and Social Psychology* 67: 910-925.
38. Thompson, B., and Andrews, S. A. (2000, July-Sept). Historical commentary on the physiological effects of music: Tomatis, Mozart and neuropsychology. *Integrative Physiological and Behavioral Science,* 35(3) 174-189.
39. Weinberger, N.M. (2006, Sept). Music and the Brain. *Scientific American Special Edition,* 16(3), 36-43.
40. Weissman, M.M, Wolk S., Goldstein, R.B. (1999). Depressed adolescents grow up. *Journal of the American Medical Association* 281: 1701-13.
41. Wright, J.H. and Salmon, P.G. (1990). Learning and memory in depression, In C.D. McCann and N.S. Endler (Eds.), *Depression: New Directions in Theory, Research and Practice* (211-236). Toronto: Wall and Emerson, Inc.



Music Resources

Suggested Reading

The materials in this presentation can be found in:

Soundtracks for Learning: Using Music in the Classroom, Chris Boyd Brewer, 2008. LifeSounds Education Press, www.MusicAndLearning.com

Other recommended reading/resources:

The Green Book of Songs by Subject: The Thematic Guide to Popular Music, 5th Edition, Jeff Green, 2002: Professional Desk References (online subscription)

Keeping Mozart in Mind by Gordon Shaw, 2004, Second Edition: Elvesier Academic Press

Learn with the Classics, Ole Anderson, Nancy Marsh, 2000: LIND Institute

The Mozart Effect, Don Campbell, 1997: Avon Press

The Mozart Effect for Children, Don Campbell 2000: Avon Press

Music with the Brain in Mind, Eric Jensen, 2000: The Brain Store

Top Tunes for Teaching, Eric Jensen, 2005: The Brain Store

Nurturing Your Child with Music by John Ortiz, 1999: Beyond Words Publishing

Rhythms of Learning, Chris Brewer and Don Campbell, 1991: Zephyr Press

Training with a Beat: The Teaching Power of Music, Millbower, 2000: Stylus Publishing

Music and Learning Websites

Music and Learning
Chris Brewer's site on using music in the classroom to teach and motivate. CD's, Sound Suggestions for use, articles, research and books, too.
www.musicandlearning.com

Optimalearning
Musical resources compiled by Ivan Barzakov.
www.optimalearning.com

The M.I.N.D. Institute
Researchers of music for math and spatial awareness. Provides music + math computer programs.
www.mindinstitute.net

ACE Educational Supplies
Carries a variety of pre-k and primary music recordings
www.edumart.com

ESL Lounge
www.esl-lounge.com
Lyrics for popular songs that you can download and use in ESL classes OR any class where the lyrics are important to your content. Listed alphabetically—a handy site.

Songs for Teaching
Terrific website with lots of suggestions, etc.
www.songsforteaching.homestead.com

Learning Lyrics
www.learninglyricsonline.com
CDs for most topics at primary levels. Lesson Plans and other resources.

The Learning Station
www.learningstationmusic.com

Lyrics World
Good site for getting song lyrics
www.summer.com/br/~pfilho

Rock Hall of Fame
Great resource with lesson plans and much more!
www.rockhall.com

RocknLearn
Learning resources using music
www.rocknlearn.com

School House Rock
Still one of the best for great content songs!
www.geocities.com