Title/Description of Lesson
Guitar Science Lesson: Connecting Science to Visual Art and Music

Grade Level:
Third Grade

Lesson Links
Objectives/Outcomes
Materials and Resources
Vocabulary
Procedures
Criteria for Assessing Student Learning
California Standards in Visual & Performing Arts
California Standards for Integrated Subject
Other Resources

Objectives/Outcomes (Return to Links)
Students will learn through discussion and hand-on experiments how sound travels, tone and pitch.

Materials and Resources (Return to Links)
3rd grade science book
Investigation 1: Ziploc bags, water, beans, pencils
Investigation 2: Tuning forks of different sizes
Investigation 3: plastic cups, string

Vocabulary (Return to Links)
Sound comes from vibrations.
Vibrations are caused by objects moving back and forth.
Vibration makes sound waves.
Pitch depends on the frequency of the sound waves.
The faster the frequency, the higher the sound or pitch.
The slower the frequency, the lower the sound.

**Procedures** *(Return to Links)*

Introduce concepts of sound waves, tone and pitch.
Read and discuss pages 16-19 in Science book.
Do hands on investigations.

- **Investigation 1:** Students fill the bag with air, water, and beans. Students hold bags to their ears and listen as they tap the bag with the eraser side of the pencil.
- **Investigation 2:** Students use different size tuning forks to discover sound vibrations and conduction through bone by holding the tuning fork to mastoid process.
- **Investigation 3:** Students make a sound violin to discover that sound can be created when molecules vibrate and hit the side of the cup. Students poke hole in the center of the cup, insert the string (secured with a paper clip and tape). Students grasp the string and run their fingers down the string causing the vibrations to gather in the cup and create sound. Students try this procedure with both a dry and wet string.

**Criteria for Assessing Student Learning** *(Return to Links)*

- Through investigation and discussion, can the students describe how sound travels and how pitches are made?
- Can students use the vocabulary presented in their description of their findings during the investigations?

**California Standards in Visual & Performing Arts** *(Return to Links)*

An integrated curriculum project using Art, Music and third grade Physical Science standard for multi-modality learning experience.

**Music Content Standards for 3rd Grade**

**CONNECTIONS, RELATIONSHIPS, APPLICATIONS:**
5.0 Connecting and applying what is learned in music to learning other art forms and subject areas and to careers.
5.1 Identify the use of similar elements in music and other art forms.

**Art Content Standards for 3rd grade**

**ARTISTIC PERCEPTION:**
1.5 Identify and describe elements of art in works of art, emphasizing line, color, shape, form, texture, space and value.

**CREATIVE EXPRESSION:**
2.6 Create an original work of art, emphasizing rhythm and movement, using a selected printing process.

**California Standards for Integrated Subject**  
(Return to Links)

Physical Science: **1.d**: Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.

**Other Resources**  
(Return to Links)

Examples of student Investigations:

Investigation 2:

![Image of tuning forks]
Investigation 3:

Step-by-step