



Discovering Strings and Orchestra

Science of Music Grades 1-3 – Bass to Face

(contributed by Rebecca Edmondson, July 2008

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This lesson plan is an extension of the Accoustics and Vibration lesson plan submitted by Dr. Anne Clark. It is recommended that the Bass to Face lesson be taught after Dr. Clark's Accoustics and Vibration lesson.

National Standards for Music Education

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

Lesson Length:

One 45 minutes class

Materials Needed

- String bass and bow
- Sound meter
- Cardboard f-hole
- String bass mute (or students may hold the bridge to act as mute)
- Student string vibration chart and pencil for documenting the results
- F-hole shapes made out of cardboard and masking tape

Resources and Sources for This Lesson

The photo at the top of this lesson plan was taken by a parent volunteer during Mrs. Edmondson's music class at the Connors Emerson School in Bar Harbor, Maine.

A sound meter may be purchased at a store such as Radio Shack.

The string vibration chart is found in Dr. Clark's Accoustics and Vibration lesson plan, which is to be taught prior to Bass to Face lesson plan.

Lesson Procedure

I. Review

Review terms previously learned using Dr. Clark's Accoustics and Vibration Science lesson plan. Ask leading questions in order for the students to recall the meanings of the following terms. The students may refer to their previous lesson's string vibration chart.

- Vibration
- Decibel
- Baseline
- Hypothesis
- Mute
- Sound meter
- Mute
- Variable

II. New discoveries

The DSAO clinician will introduce the string bass to the students. This may be the first opportunity for students to see and hear a string bass up close. Ask questions such as:

1. What are the similarities between a string bass and violin?
2. What are the differences between a string bass and violin?
3. Do you think the string bass will play higher or lower than the violin?
4. Do you think the baseline reading for the string bass will be higher or lower than the baseline that we measured in the last class using the violin? The students will write their hypothesis on the back of their string vibration chart.

III. Decibel measuring

Divide the students into two groups or teams. The groups will take turns altering the sound of the string bass in the manners listed below while a parent volunteer works the sound meter. The students will document the decibel readings on the string vibration chart after each sound alteration.

1. students will place their hands on the string bass body top
2. students will plug the f-holes by taping the cardboard f-holes over the string bass f-holes
3. while the f-holes are still plugged, students will place their hands on the string bass body top
4. add a bass mute while the f-holes are plugged (if mute is not available, the students will hold the bridge to act as a mute, being careful not to touch the strings)
5. plug f-holes, mute the bridge, and place hands on the body top
6. allow for student creativity, such as placing a face on the bass

IV. Conclusion and hypothesis results

Using a string bass for a science lesson, allows students to hear, see, and feel the vibrations.

Have the groups or teams share the results of the decibel readings and compare their discoveries to that of the previous lesson – Acoustics and Vibration.

Discuss how variables may alter the sound meter reading. Some variable may be

- the number of student hands on the string bass top
- pressure applied by the hands
- different people drawing the bow each time the meter is read may apply different pressure to the string or bow at differing speeds

Informal Assessment

When the groups or teams are discussing their conclusions, require the students to use all of the vocabulary terms:

- Vibration
- Decibel
- Baseline
- Hypothesis
- Mute
- Sound meter
- Mute
- Variable

Ask the students how music and science are related.

Extension Lessons

Repeat this same Bass to Face lesson using other string instrument such as (with bridge) hammered dulcimer and (without bridge) bowed psaltery, harp.

Allow the students to play the string bass and explain the two types of bass bows – German and French. Show a seating chart of an orchestra so the students are aware of where the bass players stand.

Play an excerpt recording of music with a prominent bass part, such as Saint-Saens' elephant theme from "The Carnival of the Animals."

Notes for the String Clinician and Youth Group Leader

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