Learning Intentions

- To learn how a musical instrument produces overtones that are multiples of the fundamental frequency

Procedures

1. Download the free, open source software (FOSS) program Audacity from www.audacityteam.org and install

    it. Have Mr. Renwick authorize the installation.

    a. If unable to install, use the online version at https://wavacity.com/

2. Either record a note played on an instrument, or a note sung vocally, or download a recording from the

    Internet.

3. Using Audacity, open the music file. You may need to use an online file converter to a file the Audacity can

    import (.wav, .aiff, .mp2, .mp3, .mp4, ogg vorbis, FLAC).

4. Play the audio file several times.

5. Select a portion of the audio file that has a clear, even tone. The selected audio should be at least 0.25

    seconds long.

6. Under the "Analyze" menu, choose "Plot Spectrum". This will generate a plot that show which frequencies

    are being combined to form the sound.

    a. For algorithm, make sure "Spectrum" is selected.

    b. For size, select "1024".

    c. For function, select "Hann window".

    d. For axis, select "Log frequency".

7. As you move your cursor across the spectrum, Audacity will automatically find the peaks in the graph. Use the

    information to fill out the data table below. You only need to record the first 10 peaks.

Data

Frequency	Loudness (dB)

Questions

1. What is the fundamental frequency of your note? This will be the highest peak, which is heard the most.

2. Did you find any overtones? If so, which overtones did you find? What were their frequencies?

3. Did you find any frequencies that were not overtones of the fundamental? If so, what do you think could have caused these frequencies?

Assessment

Curricular Competency	Insufficient Evidence	Emerging	Developing	Proficient	Extending
Planning and Conducting					
Evaluating					