Mini-Project Worksheet – Musical Intervals Name: _____

Part 1

Frequencies after subtracting 200 Hz: _____ _____ _____ _____ _____

Set the offset to -200Hz, and listen to the transposed melody. How does the transposed version compare to the original? Does it sound like the same melody?

_____

_____

Frequencies after adding 200 Hz: _____ _____ _____ _____ _____

Set the offset to +200Hz, and listen to the transposed melody. How does the transposed version compare to the original? Does it sound like the same melody?

_____

_____

Draw a conclusion**:** Is a constant frequency offset a good way to transpose a melody?

_____

_____

Part 2

If you play middle C (or C4 on the diagram, with the numerical value indicating the octave number), how many half steps up do you need to go in order to play a perfect fifth interval?

_____

If you begin on A4, what note is a perfect fifth above?

_____

Part 3

Use C4 as the fundamental. What is its frequency? _____ Hz

What is the frequency of a major 3rd above the fundamental? _____ Hz

What is the frequency ratio of the interval? Express your result in the form "*a* : 1": _____

Repeat using C5 as the fundamental, and A#2 as the fundamental:

Frequency of C5: _____ Hz A#2: _____ Hz

Frequency of major 3rd above: _____ Hz A#2: _____ Hz

Frequency ratio: _____ A#2: _____

Draw a conclusion**:** Based on what you have experienced about musical intervals so far, can you develop at least part of an explanation for why the frequencies have been selected as they have?

_____

_____

_____

_____

Part 4

Complete the table below to show each interval as a ratio of the form "*a* : 1".

Major 2nd – 9:8 = 1.125 : 1

Major 3rd – 5:4 = _____ : 1

Perfect 4th – 4:3 = _____ : 1

Perfect 5th – 3:2 = _____ : 1

Major 6th – 5:3 = _____ : 1

Major 7th – 15:8 = _____ : 1

Octave – 2:1 = _____ : 1

Listen to the following scale using your new VI, and using A4 (440 Hz) as the fundamental:

1 9/8 5/4 4/3 3/2 5/3 15/8 2

Comment on how well this sounds to you:

_____

_____

Transpose to G4 as the fundamental, and then F4 as the fundamental.

Comment on how well this scale transposes (the differences may be rather subtle):

_____

_____

Part 5

Derive a mathematical function to calculate the frequencies used by the equal-tempered scale, e.g., given a fundamental and semitone offset, calculate the frequency. You must show your derivation process, and not simply the end result!