Science Olympiad, February 23, 2002

Sounds of Music C: Judging sheet

_____ School name

Place a checkmark or X in all circles (◯) when you have inspected that the instruments satisfy the stated conditions. Score the students by entering a number before the slash in each scoring box [/ n] where n is the maximum number of points for that category.

_____ Team member name A _____ Grade

_____ Instrument type _____ Senior?

◯ No electric or electronic parts

◯ No toys or professional instruments or their parts

◯ No purchased items: bells, whistles, mouthpieces, reeds, audio oscillators (metal instrument strings okay)

◯ Energy supplied solely by student, no electricity

◯ Built by student within the last year

[/ 5] Play the lowest and highest notes. How many octaves?

1	Less than a fifth
2	Between a fifth and an octave
3	One octave exactly
4	Up to an octave and a fifth
5	More

[/ 3] Sound quality compared to standard instruments:

0	Pathetic
1	Poor
2	Adequate
3	Pretty good

[/ 2] Pitch accuracy for F_5

0	Could not tell pitch
1	More than a quarter-tone off
2	Within a quarter-tone

_____ Team member name B _____ Grade

_____ Instrument type _____ Senior?

- ◯ No electric or electronic parts
- ◯ No toys or professional instruments or their parts
- ◯ No purchased items: bells, whistles, mouthpieces, reeds, audio oscillators (metal instrument strings okay)
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Theory

Ask questions as necessary to establish their understanding of music science. (30 points total; either student can answer)

/ 6	What is sound, and how do your instruments produce it? (Full-credit answer must mention vibration and resonance)
/ 4	How do you change the pitch?
/ 2	How do you change the volume?
/ 5	Show two waveforms with different amplitude and the same frequency. How do they sound different?

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/ 5	If A_4 is 440 Hz, what is the frequency of A_5?
/ 3	If a guitar string is tuned to C_6, what note will that same string produce at the same tension if it is $\frac{1}{3}$ as long?

Team performance of Ode to Joy (3 minutes total)

/ 1	Range as given, or transcription provided if transposed
/ 1	Steady tempo
/ 2	Tempo matching between players
/ 3	Intonation
/ 3	Expression

Team performance, student's choice (3 minutes total)

/ 1	Legible transcription
/ 1	Tempo steady
/ 1	Tempo matching between players
/ 2	Intonation
/ 2	Expression
/ 3	Difficulty

1	*Mary had a little lamb* or easier
2	Reasonable
3	Complex

Team scoring

/ 10	Originality/creativity	
	0–4	Fundamental design flaws
	5	Decent copies of an existing design in the same material
	10	Would require all of: novel or unique materials (2); novel or unique design (3)
/ 10	Variety	
	2	Same instrument type
	4	Same family, different type
	10	Different families
/ 10	Workmanship	
	0–4	Did not survive the demonstration in working order
	5	Ugly but it worked
	10	Would require all of: high quality materials (1); beautiful fabrication and finish (3); decorative touches (1)

_____ Judge's signature