Science Olympiad, February 24, 2001

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, instrument strings, audio oscillators

◯ Energy supplied solely by student, no electricity

◯ Wind instrument family

◯ Built by student within the last year

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

1	Less than a fifth
2	An octave or less
3	Less than 2 octaves
4	Two octaves
5	More than 2 octaves

[/ 5] Sound quality compared to standard instruments:

0	No sound at all
1	Pathetic
2	Poor
3	Adequate
4	Pretty good
5	Sounds like the standard instrument (or better), and in standard tune (check with pitch pipe)

_____ 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, instrument strings, audio oscillators
- ◯ Energy supplied solely by student, no electricity
- ◯ Wind instrument family
- ◯ Built by student within the last year

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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. How do they sound different?

/ 5 Show two waveforms with different frequency. How do they sound different?

/ 5 If A_4 is 440 Hz, what is the frequency of A_3?

/ 3 If C_4 is 256 Hz, what note is three times that frequency?

Team performance (3 minutes total)

Points are assigned on overall musical quality and how well the members play together.

/ 10 Duet performance: harmony, blend, tempo matching. Subjective evaluation of musical quality.

/ 6 Difficulty.

1	Tune? What tune?
2	*Mary had a little lamb*
3	Simple tune
4	Adequate tune
5	Challenging
6	*Flight of the Bumblebee* or harder

/ 4 Quality of written notation

0	Useless
1	Illegible
2	Poor
3	Adequate
4	Attractive

Team scoring

Evaluate the instrument designs, performances, and the team's understanding of theory as a whole:

_____ / 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

5	Same instrument, about the same range
7	Same instrument, different ranges
8	Different instrument families (e.g., flute vs. reed), similar ranges
10	Different ranges and 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