

SOUNDS OF MUSIC EVENT SUPERVISOR GUIDELINES for 2020 Rev. 1

Venue

It is very important that this event be run using two rooms, one for the exam and at least one for instrument testing (for large tournaments, several instrument testing rooms may be required). One instrument testing room will be needed for each 7-8 teams in a time slot. Fewer teams should be scheduled in each time slot if the people doing the pitch testing are not experienced. The instrument testing rooms should be away from outside noise that might interfere with measuring the pitch and volume of the instrument. A music practice room might work very well for instrument testing, but they are very small and may not accommodate three persons (one student, and the ES and an adult volunteer, and it may need to fit both students if both are needed to play the instrument). Remember that Science Olympiad has a "Never Alone" policy, so two adults need to be present in each room of the event.

The instrument testing room must be quiet. Please find a place in which no air handling equipment or HVAC is running to keep it quiet since it will affect measurements. Electric power should be available for the ES to plug in his/her phone and computer since they are used throughout the event.

Instrument Review

Please make sure no commercial parts are used in the instrument construction, except strings are permitted. Students may use 3D printed parts that look like commercial parts, e.g., mouthpiece, valves, and other printed parts. ESs are encouraged to ask questions about the instrument construction to ensure the student actually made the device.

It is recommended that the instrument size be checked in the exam room before leaving for an instrument testing room. The instrument size may be larger after assembled, which is another reason for building a box to check the size since all parts must fit into the box. All instrument sizes should be checked by the same person for consistency. The ES may want to build a box that has the interior dimensions equal to the maximum size to quickly check the dimensions of the instrument before assembly.

Using the National Scoresheet

The ES must use the checklist to make sure there is a written record of all data in case of errors in the scoresheet.

Choose the correct level of tournament (regional, state, or national) to get the appropriate level of scoring for the pitches. Invitationals can use any of these three levels, but regional is recommended unless it is an elite invitational tournament. Choose the data mode (cents is recommended with the pitch testing program available on the national website). Enter all team names. Enter the log scores (zero must be filled in or the scoresheet will not calculate a score). Enter the test score. (Log and test scores may be entered at any time, but they must be entered to get a final score.) Additional specific directions are provided in the text below when appropriate.

Instrument Pitch Testing

Each instrument testing room will need identical equipment to ensure consistency between rooms. This equipment includes a laptop, microphone, and stopwatch. The computer should be preloaded with the pitch testing program available free at www.pascioly.org/sounds. This is the best pitch tester available and is specifically made for this year's event. While many microphones are available, the one used at nationals will be the Neewer USB condenser microphone for Windows and Mac available from Amazon. It clamps to a table and comes with a scissors arm that makes it easy to adjust to different instruments. Please check your mike to make sure it picks up the whole range of possible notes (some mikes may not). The computer for the pitch scores must be positioned so that the students cannot see the screen and be able to make pitch adjustments while playing.

The pitch testing program gives the cents deviation from the true pitch once you enter the starting scale. The cents should be recorded on the checklist available for Sounds of Music event on the national website. It is recommended that you record the cents in a way that the student does not know the value and take advantage of this information for future pitches. You may also use frequency, but since the pitch testing program gives cents, it is recommended instead of frequency. The student must know the pitch (ex. F2 or F3) of starting note. The student should progress up to the next note in the major scale. Continue for 8 notes total. The student must be ready to play the next note quickly to keep the event moving on time. The student may adjust the instrument for each pitch, but those adjustments should be rapid like a musician playing a song.

The national scoresheet will calculate the pitch score. The ES will enter the starting note (choose the appropriate letter). If the student does not know the octave number it is a competition violation and the ES will assume an octave number based on measurements so that the pitch score is reasonable before the penalty is applied (in other words, do not assume an octave number to penalize the student). The ES will then enter the measured cents for each of the eight notes. The scoresheet can be downloaded from www.soinc.org.

The penalty for the student failing to put his/her tuner being away is called a construction violation instead of a competition violation because it results in a greater penalty. This is the intent of the Physics Committee. This gets recorded as a construction violation that is corrected (yes). When the ES notices this, he/she should warn the student. If the tuner is not put away for the first note, the ES gives the construction violation and then requires the student to put the tuner away or all other notes will be scored as skipped.

Any student who in the opinion of the ES attempts to play more than one pitch should be warned and given another attempt to play a single pitch. Sliding through a bunch of notes is a violation of the spirit of this event. This can be determined by the pitch measurement app displaying more than one note value. If the student repeats this same thing a second time, the score for that note should be zero (like if it is skipped). Students may not use vibrato or any pitch altering process and must attempt to play a single note for each of the eight notes in pitch testing.

Song Score

Ask the students to play the required measures of Twinkle Twinkle Little Star. They may not make adjustments to the instrument after pitch testing for this part of the event other than those normally

associated with playing the song. Begin timing the student when he/she begins to play the song. They must complete the song in 15 seconds. The student must maintain a consistent rhythm and the pitches must be the correct relative pitches for the song. The song score is a total of 9 points, three for playing in 15 seconds or less (time), three for rhythm, and three for pitch accuracy. The time score is all or nothing, either they finish within the 15 seconds or they do not. Exceeding 15 seconds as measured on the stopwatch results in a zero for this score.

The rhythm and pitch scoring are based on ES judgment. Measurements are not required. Attempting to use a tuner to check the pitch is not likely to be successful since the notes may not be played long enough to register. While it may be successful for teams that play the song slow, it would not work for teams that play it fast. Therefore, a tuner should not be used since there is no way to be consistent for all teams.

Rhythm should be judged based on the tempo the student begins using when the song is played. The rhythm score can be broken down as follows: 3 for good rhythm (all quarter notes and half notes identical in length and tempo maintained throughout), 2 for slightly non-uniform on rhythm (quarter notes and/or half notes not completely uniform, tempo not consistent throughout), 1 for more non-uniform rhythm (notes values not consistent, but still somewhat discernible, tempo very erratic), 0 for very non-uniform rhythm (note values not at all consistent with the song, tempo extremely erratic).

The pitch should be based on the initial note played by the student. The pitch score is also broken down: 3 for high quality pitch (it sounds like the song), 2 for medium quality pitch (some note slightly off pitch), 1 low quality pitch (many notes off pitch), 0 poor quality pitch (song not recognizable or monotone).

Enter the song scores for rhythm, pitch, and time into the scoresheet.

Bonus

The students may elect to play a bonus pitch. No adjustments may be made to the instrument after pitch testing or song testing for this part of the event. Ask the students what their bonus pitch is and use the pitch tester like used in pitch testing. The bonus with worth 5 points and uses the same tournament level scale as is used for the pitch for determining what is acceptable. The bonus all or nothing. It must be within the tournament level value in cents to get the five points. If the student does not know the bonus pitch octave and letter, the bonus will not be allowed since the ES must input this into the pitch tester program.

Enter the bonus note pitch into the scoresheet. Then enter the bonus note cents (or frequency if using that mode) into the scoresheet.

Written Exam

The written exam must include at least four questions from each of the five content areas listed in the rules. These questions do not have to have equal value but may if the ES wants. However, the values may not skew the scores in such a way to significantly de-value any one of the content areas.

I recommend that students be given the whole time period for the exam and that the ES pull students out of the exam for instrument testing. One student may continue to work on the exam while the other student tests the instrument. If this process is used, the written exam should have more than the

minimum required number of questions, but each content area should be covered approximately equally.

Scoring

You should note that the pitch scores vary depending on the level of the tournament. This is built into the scoresheet. All you have to do is enter the correct tournament level.

Any skipped notes are given a score of zero. If there is no instrument, then all notes are skipped. The scoresheet does this for you automatically when you choose Yes for No Device. Students are not allowed to hum or sing into the instrument. If they do, score each such note as a skipped note. You have to enter skipped for each note, but do not check Yes for No Device. This gives a better score since they attempted to make a device but could not play according to the rules.

The box for Construction Violations Corrected must have a Y or a blank (N) in order to get the PS score to calculate.

The box for Competition violations should have a Y in it to indicate there was such violation. If not, leave it blank or enter an N.

There is a possibility of a DQ for unsafe operation, but I really don't know what would constitute such a violation, so this is usually left blank.

Log Scoring

1. Complete list of all materials used in the instrument. Review and ask questions to ensure the list is complete and accurate. Assign two points for a complete list. Assign one point if any item is missing from the list. Assign zero points if there is no list of materials.
2. Pitch accuracy tuning and adjustment. Review to see the history of how the instrument tuning was achieved for only one note. The ES may choose which note if more than one is recorded. The log must include data to show pitch accuracy using a chromatic tuner and the measured pitch for various trials and designs. Assign two points for adequate records. Assign one point for inadequate records of the tuning mechanism and design changes. Assign zero points for no record of any pitch accuracy tuning or design changes.
3. Data for five trials. This refers to the adjustments made to tune a single pitch. It should not be a calculation (like the calculation for pipe length for a certain frequency). It is something done to modify the instrument to achieve a correct pitch after originally designed or calculated. Assign two points for five trials. Assign 1 point for 1-4 trials. Assign zero points for zero trials. Note that it is not five trials if only one trial is done for five different notes.
4. Proper labeling. All pages of the log must include appropriate titles, team name, team number, and correct units. Each section of the log must clearly identify one of required log components (however, pitch accuracy testing and the five data points may be included in one section. That means the log must include three sections: (1) list of materials, (2) discussion of pitch accuracy tuning and design changes, and (3) figures(s) showing figuring and/or how the instrument is used to play different pitched notes. Assign two points if all the above is included. Assign one point if anything is missing. Assign zero points if none of the above is included in the log.

5. Diagrams. The log must include at least one diagram/picture that is labelled to indicate how different pitched notes are played. A figuring chart is adequate in most cases. Assign two points for a complete diagram/picture that shows how all 8 notes are played. Assign one point if any note is missing or it is not clear how each note is played. Assign zero points if no diagram/picture is included in the log.

Competition Violations

Competition violations include the following:

- adjusting the instrument between pitch testing and song testing
- adjusting the instrument between pitching testing and bonus
- adjusting the instrument between song testing and bonus
- failure to inform the ES of a skipped note causing wrong data to be recorded in the checklist
- taking too much time between notes in pitch testing
- not knowing the octave number for the starting note in the pitch testing

Note Frequency Chart

	Octave 0	Octave 1	Octave 2	Octave 3	Octave 4	Octave 5	Octave 6	Octave 7	Octave 8
C	16.35	32.70	65.41	130.81	261.63	523.25	1046.50	2093.00	4186.01
C#	17.32	34.65	69.30	138.59	277.18	554.37	1108.73	2217.46	4434.92
D	18.35	36.71	73.42	146.83	293.66	587.33	1174.66	2349.32	4698.64
D#	19.45	38.89	77.78	155.56	311.13	622.25	1244.51	2489.02	4978.03
E	20.60	41.20	82.41	164.81	329.63	659.26	1318.51	2637.02	5274.04
F	21.83	43.65	87.31	174.61	349.23	698.46	1396.91	2793.83	5587.65
F#	23.12	46.25	92.50	185.00	369.99	739.99	1479.98	2959.96	5919.91
G	24.50	49.00	98.00	196.00	392.00	783.99	1567.98	3135.96	6271.93
G#	25.96	51.91	103.83	207.65	415.30	830.61	1661.22	3322.44	6644.88
A	27.50	55.00	110.00	220.00	440.00	880.00	1760.00	3520.00	7040.00
A#	29.14	58.27	116.54	233.08	466.16	932.33	1864.66	3729.31	7458.62
B	30.87	61.74	123.47	246.94	493.88	987.77	1975.53	3951.07	7902.13

Sample Major Scales (just change the number for the starting note to agree with the student's choice, and then change all of the other numbers by the same amount).

C Major Scale

C4 D4 E4 F4 G4 A4 B4 C5

D \flat Major Scale

D \flat 4 E \flat 4 F4 G \flat 4 A \flat 4 B \flat 4 C5 D \flat 5

D Major Scale

D4 E4 F \sharp 4 G4 A4 B4 C \sharp 5 D5

E \flat Major Scale

E \flat 4 F4 G4 A \flat 4 B \flat 4 C5 D5 E \flat 5

E Major Scale

E4 F \sharp 4 G \sharp 4 A4 B4 C \sharp 5 D \sharp 5 E5

F Major Scale

F4 G4 A4 B \flat 4 C5 D5 E5 F5

F# Major Scale

F#4 G#4 A#4 B4 C#5 D#5 E#5 F#5

G Major Scale

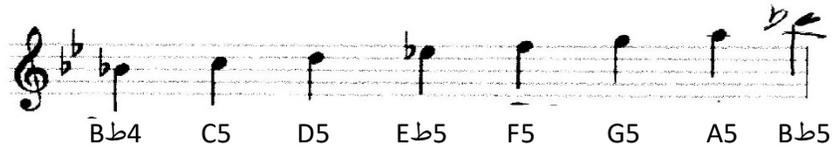
G4 A4 B4 C5 D5 E5 F#5 G5

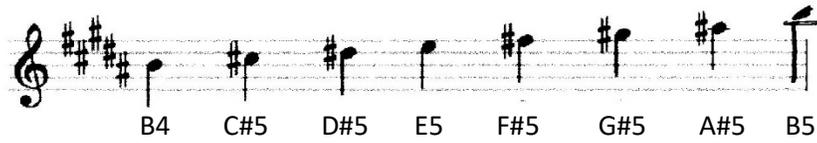
A \flat Major Scale

A \flat 4 B \flat 4 C5 D \flat 5 E \flat 5 F5 G5 A \flat 5

A Major Scale

A4 B4 C#5 D5 E5 F#5 G#5 A5

Bb Major Scale

B Major Scale

If you have questions, contact Dave Moyer at 610-751-1500.