SOUNDS OF MUSIC EVENT SUPERVISOR GUIDELINES for 2023

In-Person Guidelines

Venue

It is very important that this event be run using at least 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 instrument testing room. If you have more than one testing room,

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 but must adhere to 3D printing requirements in the rules. ESs are strongly encouraged to ask questions about the instrument construction to ensure the device was made by students on the current 15-person team and the rules about 3D printing policy were followed. The instrument may be completely 3D printed as long as the rules were followed. The design log must contain a description of original work done by students (this is not worth any points but is the basis for determining the legality of 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.

TBD when the scoresheet is available.

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. If using more than one pitch testing room, I recommend the same people do the song scoring for all teams to have more consistency. Perhaps all testing rooms except one do pitch testing and one does all song scoring. I also recommend the pitch testing setups be compared prior to testing to insure consistency. For example, I use my trumpet to play notes for all setups to test simultaneously to make sure they are consistent with each other. If needed, change computers and/or microphones as needed.

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.

The student must know the pitch (ex. F2 or F3) of tonic for their chromatic scale (if they do not, they receive a competition violation). The Event Supervisor will determine which 7 additional notes are required to be played after the tonic. The same 7 notes should be required from all teams (relative to the tonic regardless of scale). A chromatic scale technically has 12 notes, and each note is one degree, however we will use 13 notes with the 13th being the octave above the tonic. Using the C chromatic scale, C is 1st degree, C# is 2nd degree, D is 3rd degree, and so on. See the figure below which shows this using the C chromatic scale as an example. The ES must tell the students what these notes are and should use the note numbers. An example for choosing additional required notes is 2, 4, 6, 7, 9, 10, 13 (the ES does not need to specify C#, D#, etc). After announcing the required notes, the student may indicate which, if any, cannot be played and those notes will receive a zero score.

C chromatic scale
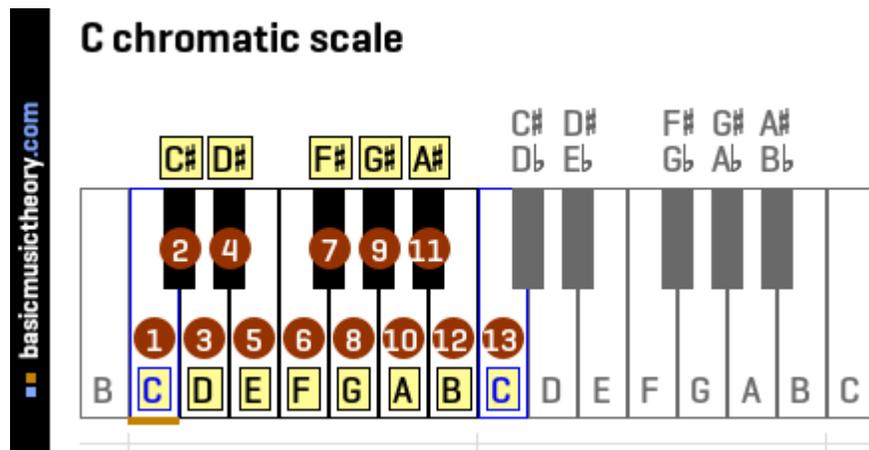
After playing the tonic (1st degree), the student should progress up to the next note required note. Continue for 8 notes total. The student must be ready to play the next note quickly to keep the event moving on time. The student may adjust the instrument for each pitch, but those adjustments should be rapid like a musician playing a song.

The 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. 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.

Satellite Pitch Testing

Testing instruments in satellite mode may take longer than in person. Allow 15 minutes per team to debug the setup and gather the data. A coach or adult must be present with students during the Zoom session. The ES will also need a 2nd person present with them.

There are two approaches using live Zoom sessions.

The 1st method has the pitch tester running on a computer with the coach/adult present with the students. The coach runs the pitch tester and shares the screen so you can read the pitches from their computer. This method seems best because the sound is not transmitted over the internet but heard directly by computer running the pitch tester. However, there is a concern that the student may be able to see the screen or be given clues by someone else if not directly viewing the screen. Despite that, I still think this method is better since it is basically the same as doing it live. The sound is picked up by the computer and the pitch tester shows the pitch. When the screen is shared, you can read the cents. This method also requires the microphone to be connected to both pitch tester and Zoom. This is the biggest problem to overcome and where the most time may be spent problem solving.

If sharing the microphone is a problem, another variation is to run the pitch tester on a cell phone facing the camera of the computer used for the Zoom session. A coach will have to operate the pitch tester on the cell phone.

The operation of the pitch tester should preferably be done by the ES. The ES can request control of the student computer (a feature of Zoom). This allows the ES to operate the pitch tester. The coach can observe to verify that is all you do. I prefer this approach, but I am some will object to the ES controlling the student computer. In that case, the coach will have to operate the pitch tester under the direction of the ES.

The 2nd method is the reverse of the first. The pitch tester is run on the computer of the ES and the pitch is transmitted over the internet. I have significant concerns about this method and have seen it not work well. However some have used it successfully.

Song Scoring

Any of the above methods can be used for the song for tournaments in Satellite format.

Files that contain audio clips of the song excerpts are available for ESs to use to learn the song and help determine how to score each song excerpt. Link to files (available by 10/1).

Ask the students to play the appropriate song excerpt for the tournament level. 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. Start the stopwatch when the student begins to play the song. They must complete the song in time limits. 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 25 points, five for playing in 25 seconds or less (time), five for rhythm, five for pitch accuracy, and five for the embellishments.

A. Time Scoring

The time limits are based on the tournament level. Subtract points for exceeding the time limit as stated in the rules.

B. Rhythm scoring

The rhythms as shown in the song excerpt must be played in the correct manner. A demo file is available for ESs to learn the correct rhythms. The ES uses judgment to determine the rhythm score. I recommend recording the song so you can listen to it again if needed (this will be a help at higher level tournaments).

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:

5 for very good rhythm (all similar notes identical in length and consistent tempo maintained throughout)

4 for slightly non-uniform rhythm (similar notes not completely uniform, tempo slightly not consistent throughout)

3 for more non-uniform rhythm (notes values not consistent, but still somewhat discernible, tempo not consistent)

2 for very non-uniform rhythm (note values very inconsistent, tempo erratic)

1 because there was something that did not deserve a 0

0 for extremely non-uniform rhythm (note values not at all consistent with the song, tempo extremely erratic).

C. Pitch scoring

The pitches of the notes in the song excerpt must be appropriate based on the judgement of the ES. 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. Therefore, a tuner should not be used since there is no way to be consistent for all teams.

The pitch should be based on the initial note played by the student. The pitch score is also broken down:

5 for very high quality pitch (all pitches right on)

4 for high quality pitch (one note slightly off pitch)

3 for medium quality pitch (some notes slightly off pitch)

2 for just below medium quality pitch (a few notes off pitch)

1 low quality pitch (many notes off pitch)

0 poor quality pitch (song not recognizable or monotone).

D. Embellishments

Each song excerpt has 5 embellishments that are worth one point each. Check to make sure each embellishment is included as the song is played. Assign one point for each one correctly performed.

Written Exam

The written exam must include at least three questions from each of the five content areas listed in the rules, however exams must be longer than 15 questions. 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 the exam be at least 40-50 questions for regional tournaments and 60-70 for state tournaments to make it easier to distinguish the top teams.

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.

Design 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 is any item is missing from the list. Assign zero points if there is no list of materials.

2. Diagrams. The Design 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 13 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.

3. Pitch accuracy tuning and adjustment. Review to see the history of how the instrument tuning was achieved for <u>only one note</u>. 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 (either frequency or cents off) for various trials and designs. Assign two points or 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 <u>single pitch</u>. It cannot be a calculation (like the calculation for pipe length for a certain frequency) because this ignores end corrections and other material factors that affect the exact pitch. 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 for the current tournament, and correct units. Each section of the Design 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) diagrams(s) showing figuring and/or how the instrument is used to play different pitched notes, (3) discussion of pitch accuracy tuning and design changes. 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. If 3D printing was used, there must be a section that includes the things stated in the rules: This is not worth any points but is critical for the ES to determine the legality of the instrument. If this section is not included in the log and 3D printing was used, the instrument should be disqualified (students may still take the exam).

6. Students must provide documentation about any constructed part that might be confused with a professional instrument component, such as reeds, mouthpieces, etc. If the part was 3D printed, the info in part 5 above is adequate and no additional documentation is required. This section is not worth any points but needed to determine the legality of the constructed parts.

Competition Violations

Competition violations include the following:

a. adjusting the instrument between pitch testing and song testing

b. adjusting the instrument between pitching testing and bonus

c. adjusting the instrument between song testing and bonus

d. failure to inform the ES of a skipped note causing wrong data to be recorded in the checklist

e. taking too much time between notes in pitch testing

f. 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 Chromatic Scales

Key of C major

Key of C# major

Key of D major

Key of Eb major

Key of E major

Key of F major

Key of F# major

Key of G major

Tonic 2   3   4   5   6   7   8   9   10 11 12   13

Key of A♭ major

Tonic 2   3   4   5   6   7   8   9   10 11 12   13

Key of A major

Tonic 2   3   4   5   6   7   8   9   10 11 12   13

Key of B♭ major

Tonic 2   3   4   5   6   7   8   9   10 11 12   13

Key of B major

Tonic 2   3   4   5   6   7   8   9   10 11   12   13

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