Trial/Pilot Event

Contact the organizers of your tournament to find out what trial/pilot events will be held.

SOUNDS OF MUSIC

1 **DESCRIPTION**: Prior to the competition each team will build two types of musical instruments **[aerophone, chordophone, ideophone, or membranophone (see soinc.org for descriptions)]** based on a 12 tone tempered scale, prepare to describe the principles behind their operation and be able to perform a major scale, a required melody and a chosen melody.
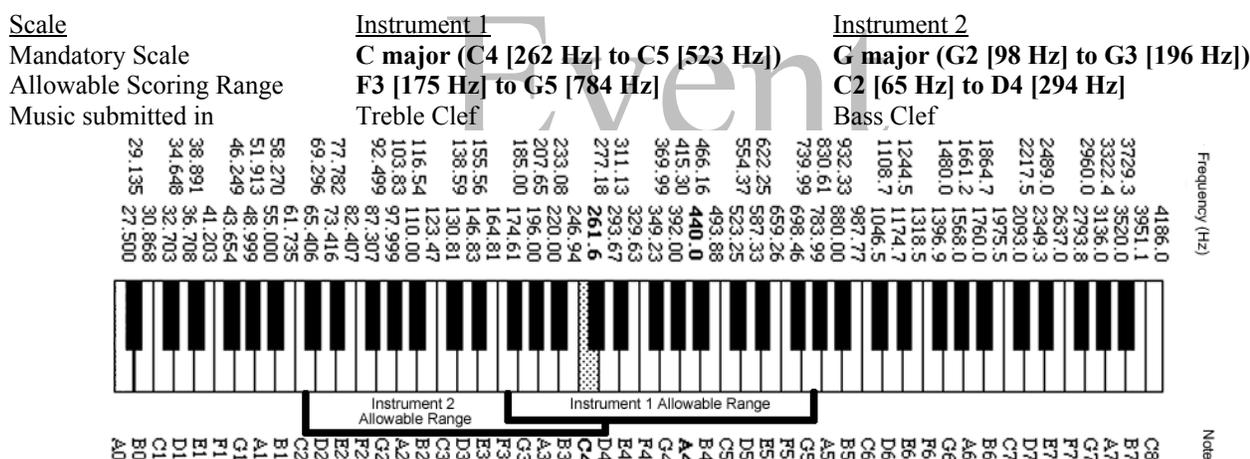
A TEAM OF: 2   **APPROXIMATE TIME**: **20** min/Set-up 5 min

2 **EVENT PARAMETERS:** Teams must provide a score of all music to be performed and submit it in notated form at the beginning of their presentation. All music submitted must be written in the appropriate clef **for each of** their musical instruments **as stated in the chart below**. Each member will play at least one instrument. No notes, calculators, books, etc. will be allowed.

3 **THE COMPETITION**:

     a. Each team member must play the required scale as given in the following chart and will be evaluated on range, pitch, and sound quality. However, to help teams select music and to improve their overall score they may wish to include notes within the maximum allowable scoring range. **Corresponding frequencies for each note below have been rounded to the nearest whole number.**

Scale	Instrument 1	Instrument 2
Mandatory Scale	**C major (C4 [262 Hz] to C5 [523 Hz])**	**G major (G2 [98 Hz] to G3 [196 Hz])**
Allowable Scoring Range	**F3 [175 Hz] to G5 [784 Hz]**	**C2 [65 Hz] to D4 [294 Hz]**
Music submitted in	Treble Clef	Bass Clef

     b. Members will also be asked to play any note from the required scale and the judge will determine its accuracy. No electric or electronic devices, toy or professional instruments or parts of such instruments will be permitted including items such as bells, whistles, mouthpieces, reeds **or reed blocks,** audio-oscillators, rosin, tuning pegs, etc. The only exception is that strings (instrument or others) of any type are permitted. No electricity **is allowed.** All energy **put into the instruments must originate directly from the students.**

     c. Instruments will also be evaluated on creativity and originality, variety and workmanship.

     d. The students will be asked to describe the **scientific principles used in the design and construction of the device**. (e.g., How does it make a sound? What determines the pitch of a note? How is volume changed?). This **will** be done **as** an oral interview and/or **with** a written set of questions. Students must be able to define or explain basic terminology regarding sound, sound production, and related science terms. These include but are not limited to fundamental elements of wave theory, Bernoulli Effect, acoustics, musical sound perception, and harmonics.

     e. The team will then perform, in any key within the musical ranges specified, the lines of music included below. The piece will be played as a duet including melody and harmony**. Students must supply their own harmony.** Each instrument must be capable of playing the required lines as written or as transposed into a key adapted to their instrument but staying within the allowable range. They will also play **a** duet of their choosing which best **demonstrates** the capabilities of their instrument**s**. Students will be given a maximum of four (4) minutes to play both the required duet and the chosen duet.

4 **SCORING:** **All** scoring **will be** done by the same set of judges (preferably 2-3). If more than one person is judging, the average of all judges' scores will be the final score for the team. Judges **will** have knowledge of both music and the physics of sound.

     a. Range of notes: quality of sound (22 points)

         i. Demonstrated range _____ octaves (for instrument #1) _____ notes   _____ Points (6)
         ii. Sound quality (compared to standard instruments #1)   _____ Points (5)
         iii. Demonstrated range _____ octaves (for instrument #2) _____ notes   _____ Points (6)

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    iv. Sound quality (compared to standard instruments #2)   _____ Points (5)

b. Creativity, variety, and workmanship of instruments (**25** points)

    i. Originality/creativity   (traditional/unusual)   _____ Points (10)
    ii. Variety (percussion, wind, brass, string, other)   _____ Points (**5**)
    iii. Workmanship (appearance, easy to play, durability, etc.)   _____ Points (10)

c. Knowledge of theoretical basis of instruments (30 points)   _____ Points (30)

Includes participation of both team members and an explanation of simple mathematical and physical principles of sound. **This will be conducted as an** interview/**written test** with approximately **3** to 6 pre-selected questions adaptable to various instruments.

d. Sound of the ensemble (25 points) Group Performance points for both required/chosen songs will be based on harmony, blend, technique, timbre, suitability of tune for instruments, rhythm, interpretation of music, etc.

    i. Group Performance for the required song (10 points)   _____ Points (10)
    ii. Group Performance for the chosen song (15 points)   _____ Points (15)

e. <u>Bonus Points</u>: Each of the following will receive the specified bonus points.

    i. Teams that follow all of the rules   _____ Points (**16**)
    ii. Teams that furnish music for the judges with team name and number   _____ Points (8)
    iii. Teams that write their music in the correct clefs and correctly notated   _____ Points (8)
    iv. Teams that play all music in the correct range   _____ Points (8)
    v. Teams that use only allowed materials in building and playing   _____ Points (8)

God Bless America

Required Song

Suggested references: Musical Instrument Design by Bart Hopkin, See Sharp Press, 2000, $18.95. Making Simple Musical Instruments by Bart Hopkin, Altamont Press, 1995, $24.95. National Science Education Standards: / CONTENT STANDARD E: All students should develop abilities of technological design and understandings about science and technology.

See: **http://www.soinc.org/events/sounds/index.htm**