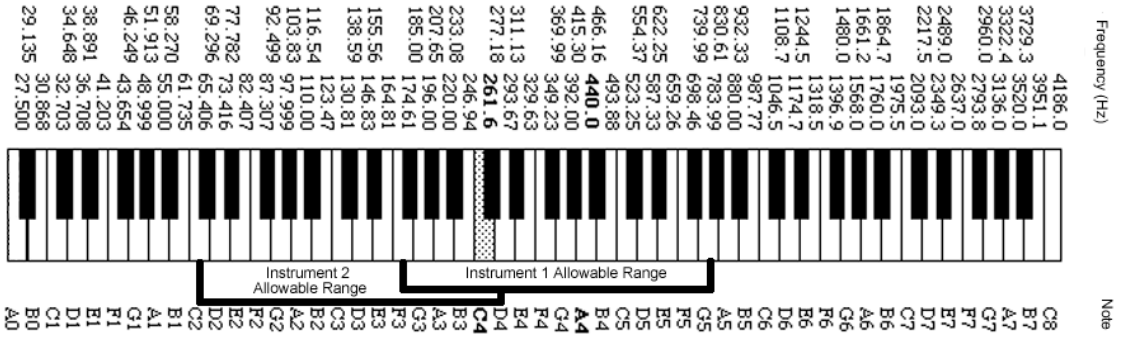
SOUNDS OF MUSIC

1. **DESCRIPTION**: Prior to the competition each team will build one wind instrument and one percussion instrument 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 with each.
   A TEAM OF: 2 **EYE PROTECTION**: None Required **APPROXIMATE TIME**: **20** min/Set-up 5 min
2. **EVENT PARAMETERS:**
   a. Teams must provide a score of **all** music (both chosen and required) to be performed and **submit it in notated** form at the beginning of their presentation. **Copies of this rules page will not be accepted.**
   b. All music must be written in the appropriate clef for each of the instruments as stated in the chart below.
   c. Each member will play at least one instrument.
   d. Notes, calculators, books, etc. will not be allowed for any portion of the judging.
3. **THE COMPETITION**:
   a. **Part 1:**
      i. 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.
      ii. 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.**
      iii. 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.
      iv. They must also **play a duet** of their choosing which best demonstrates their instruments' capabilities.
      v. Students will be given a maximum of 4 minutes to play both the required duet and the chosen duet.

Scale	Wind Instrument – Instrument 1	Percussion Instrument- 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



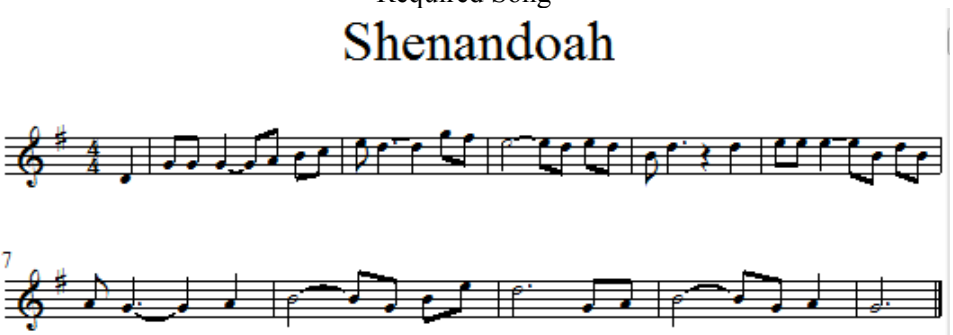
   b. **Part 2:**
      i. Instruments will be evaluated on creativity and originality, variety, and workmanship through an interview process.
      ii. Members will be asked to play any note from the required scale which will be judged for accuracy.
      iii. No electric or electronic devices, toy or 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.
      iv. No electricity is allowed. All energy put into the instruments must originate from the students.
      v. All instruments must be able to go through a standard classroom door (80 cm wide).

c. **Part 3**:
   i. The students will be asked to describe the scientific principles used in the design and construction of their instruments (e.g., How does it make a sound? What determines the pitch? How is volume changed?).
   ii. This will be done as an oral interview and/or with a written set of questions, with approximately 3 to 6 pre-selected questions adaptable to various instruments.
   iii. Students must be able to define or explain basic terminology regarding sound, sound production, and related science terms. These include the fundamental elements of wave theory, Bernoulli Effect, acoustics, musical sound perception, and harmonics.

4. **SCORING:**

a. **All** scoring **must be** done by the same set of judges (preferably 2-3). If more than one person is judging, each judge will score a separate part of the competition.
b. All sections will be added for the total score.
c. Judges must have knowledge of both music and the physics of sound.
d. Range of notes: quality of sound (22 points) (Judge 1 accuracy and quality and Judge 3 octave)
   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)
   iv. Sound quality (compared to standard instruments #2) _____ Points (5)
e. Creativity, variety, and workmanship of instruments (25 points) (Judge 1)
   i. Originality/creativity (traditional/unusual) _____ Points (5)
   ii. Appropriate types of instruments used _____ Points (5)
   iii. Workmanship (appearance, easy to play, durability, etc.) _____ Points (15)
f. Knowledge of theoretical basis of instruments (30 points) (Judge 2) _____ Points (30)
   Includes participation of both team members.
g. Sound of the ensemble (25 points) (Judge 3) 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)
h. Bonus Points: 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 (4)
   iii. Teams that write their music in the correct clefs and correctly notated _____ Points (4)
   iv. Teams that play all music in the correct range _____ Points (4)
   v. Teams that use only allowed materials in building and playing _____ Points (4)

Required Song



Note that the first note of the song is below the required octave. Students may substitute a G for the D that is written with no penalty. Also note that for ease of reading the music is written in slightly higher key than either of the given ranges and it is expected that students will choose a key to match the ability of their instruments.

Recommended Resources: All reference and training resources including the **Sounds of Music DVD** are available on the Official Science Olympiad Store or Website at http://www.soinc.org

To be placed on the website

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~~