

**Tune Up! Teaching Tuning Independence to Middle School Orchestra Students**  
**Mr. David Saccardi**  
**Thompson School District R2-J**  
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1. ASTA standards regarding tuning
  - a. As a *DEVELOPING* skill, students should possess basic pitch discrimination (high and low), and be able to manipulate the fine tuners (bass mechanical pegs) for all four strings
  - b. As a *PROFICIENT* skill, students should be comfortable tuning their instrument to a given pitch, and be able to tune their instrument in fifths.
    - i. Cello and bass players should also be proficient in using tuning harmonics
2. Current research regarding tuning
  - a. Hopkins (2002)- Six Stages of Tuning Instruments in Orchestra
  - b. Alexander (2008)- Teaching Tuning to the String Orchestra
  - c. More resources in the “References” portion of the handout
3. When should you start to teach tuning?
  - a. I believe you should begin teaching the necessary aural skills for tuning from the moment you start your beginners
  - b. While a beginning student may not possess the physical skills to manipulate their instrument yet, they still can begin to differentiate high and low pitch.
4. Tuning fork or tuning drone?
  - a. Research suggests that there is no advantage to using one or the other (Alexander, 2011) however, my philosophy is that in a performance setting, musicians aren’t adjusting their intonation to an electronic drone (mostly...), so we should seek to replicate that in the tuning process.
  - b. I am an advocate for using an A 440 tuning fork because it allows students to tune to their peers and develops ensemble listening skills. It also has students tuning to complex tones (pitches with overtones) rather than electronically generated tones (simple tones).
  - c. A word on tuning apps, clip-on tuners, and other electronic aids
    - i. There is a time and a place for these devices, but it is NOT in the large ensemble class. Tuning time should be a chance for students to develop aural skills, tuning fluidity, and ensemble unity. They cannot develop these skills if they are watching a dot flash on a screen.
    - ii. These devices should be saved for individual home practice, and even then, I encourage my students to only tune their A-string, and tune the rest using either double stops or harmonics.
5. Walkthrough of the Phases of my classroom tuning procedure
  - a. Things to consider before tuning
    - i. Make sure all students have functioning instruments. Violin, Viola, Cello players should have fine tuners on all four strings. Basses should have adjustable bridges so that strings remain a consistent distance from the fingerboard year-round.

- ii. Make sure that tuning pegs stay firmly in place (use peg drops or peg goop if necessary). Conversely, make sure pegs are not too tight. Be particularly vigilant on *Violin Shaped Objects*, or VSOs, especially anything that's a bright color. These instruments are often difficult to tune and can frustrate students.
  - iii. Mark the tuning harmonics on cello and bass. I recommend either paper protectors for 3-ring notebook paper, or some Scotch tape and the little punch outs from a 3 hole punch. I mark those spots on the fingerboard at the same time as putting on finger tapes for students (another discussion on its own!)
- b. Phase 1- Early Beginners
- i. For the first semester of instruction, my focus is getting kids started with a good setup and producing a warm, resonant tone on their instruments. To this end, I go around and hand tune each instrument while the students work on a focusing activity. If I have a larger group (30-40), I'll typically only tune the D and A strings for time. This is the only instance in a student's instruction with me where their instrument leaves their person during tuning.
- c. Phase 2- Late Beginners
- i. Using a tuning fork, I tune the A-string of one of my cello players. I prefer to use the cello A to the violin A because it is one octave above the bass A, and an octave below the violin/viola A. This gives everyone in the orchestra a fair shake at hearing the reference pitch.
  - ii. When the cello A is in tune, that student (you can rotate every day which kid gets to play) plays their open A with the bow (starting gently at the tip) while I go around and each kid plays their A string (also at the tip) while I adjust them. Repeat for D, G, C, E. I start this phase once the students have some facility with the bow, typically at the beginning of the spring semester. I also stick to open strings during this time so that students get used to the sound of an "in-tune" open string.
- d. Phase 3- Second Year Instruction
- i. At the beginning of the second year of instruction, my students begin to take a little more ownership of their tuning. I will introduce cello and bass players to their tuning harmonics, and I introduce the concept of double stops to the violin, viola, and cello players.
  - ii. In this phase, I tune the cello A, and we go down the line while each individual A is tuned, but now I no longer handle the instruments. The students make their own adjustments with their fine tuners with my guidance.
  - iii. If I point up, it means the pitch is flat and needs to be adjusted up, and if I point down, it means the pitch is sharp and needs to be adjusted down. A simple thumbs up will let each student know when they got it right.
  - iv. Once all A's are in tune, then each cellist uses their tuning harmonics to tune all four strings, still under my guidance, followed by the bass section using their tuning harmonics. You must model for students how this looks. I insist on two *fast* bows per string, to ensure clarity of pitch on each harmonic. Make them go back and re-do it if they get that trademark scratch on the harmonic.

- v. Once cellos and basses are in tune, have them all softly play their A-strings while the violins and violas tune their A's to the cello and bass A's. This should still be one by one down the line. Repeat for D, G, C, E. I like to have the basses play their octave harmonic on the E-string to help the violins tune their E-strings.
- vi. Be sure and make eye contact during this part, as it is a quick and easy way to build lasting relationships with students, even in a larger group.
- vii. Students are not yet using tuning pegs. I introduce those around halfway through the second year of instruction, after some fluidity is developed with fine tuners.
  - 1. NOTE: From here on, it is not exact when I move into phases 4 and 5. Each group of students is different, and some move through these phases faster than others. The goal is to send students off to high school with a firm understanding of the mechanics and aural skills of tuning, however long that takes. There will be time to refine the skills in high school.
- e. Phase 4- Late Second Year/Early Third Year
  - i. Much of phase 4 is similar to phase three, but with the addition of students using their tuning pegs. I wait to introduce these so that students are only working on one new tuning skill at a time.
  - ii. Before, if there was a major meltdown with an instrument, I would move the tuning pegs while the student bowed the string. Now I am completely hands-off.
  - iii. Encourage students to use pegs on their own in front of their peers, and when they get it right, make a big celebration of it. It can be scary for a student to use their pegs, and it is important to show that they can be successful at that skill.
  - iv. I also begin to incorporate the use of double stops for the violins and violas rather than using open strings.
- f. Phase 5- Third Year Instruction
  - i. At this point students should have a firm grasp on pitch adjustment, mechanics of fine tuners and tuning pegs, tuning harmonics and/or double stops. Now it is time to move away from individual tuning to tuning as sections and eventually as an entire orchestra.
  - ii. As before, I will start by tuning the principal cellist's A-string with a tuning fork. I will then signal all cellists to tune their A's (quietly!) to the principal player. Once I feel the cello section A's are correct, I move on to the basses and they tune their A's.
    - 1. NOTE: For many young bass players, it can be difficult to tune their open A's in a big group, so I recommend having them use their tuning harmonic in third position on the A-string instead.
  - iii. When the cellos and basses are in tune, I will gesture for the violins and violas to tune their A's all at once. When this is complete, I will hold up two fingers (all tuning communication is nonverbal). This is the signal for the orchestra to tune A and D strings together. Violin/Viola will use double stops, and Cello/Bass use their tuning harmonics. When this is close, I will hold up one finger which means "D Alone" and we refine the D strings. Once complete, I will hold up two

fingers again, which is the signal to go on to D and G. Repeat this for the remaining strings.

1. NOTE: For C and E strings, in an effort to keep everyone playing at all times, have violins and basses play open G while tuning C-strings, and violas and cellos play open A while violins and basses tune their E-strings.
2. NOTE: I like to have the basses tune their E-strings first, then the violins rather than together in this phase. The octave displacement can still be jarring for young players.

g. Final Phase- End of Third Year Instruction

- i. At this stage it is a matter of condensing the steps in Phase 5 to more closely resemble the tuning process of a professional orchestra.
- ii. Some possible options could be to:
  1. Have all sections tune their A-strings at once upon tuning the principal cellist, then walk through the Phase 5 steps.
  2. Have all the cellos and basses check all their strings upon taking the A, then have the violins and violas do the same thing. I recommend walking around the room and checking random instruments for accuracy.
- iii. Eventually, I like to throw kids in the deep end, where we take one A from the cello, and everyone quietly checks their tuning. In the intermediate years, we will check open strings together afterwards. For my experienced high school students, we tune in about 30 seconds and we can begin rehearsal.

6. Final thoughts

- a. The earlier stages of this process take time. When I am working on this with my second year students, it can very well take the entire class period with a group of 40. Be patient. With careful instruction, the students will get faster and more proficient at tuning. You have to go slow so you can go fast.
- b. When assessing tuning, I propose a couple of options. At the end of the second year, I will take a student's instrument and de-tune all of their strings except their A-string. It is their job to get it back to "in-tune". I leave the A-string as a reference. I do the same test at the end of the third year, but I now knock out all four strings and they have to tune to a reference pitch.
  - i. NOTE: Watch out for violin and viola players tuning their strings in fourths rather than fifths. They are listening for that consonant interval, and can sometimes mistake this a fourth for a fifth. I tell them that if any of their strings are in octaves, they missed something.
- c. By having each student participate in the tuning process at the beginning of class, you work on ear training skills while maintaining good classroom management. Insist on a culture of quiet tuning, and encourage every student to practice their diagnosing skills when they are not playing, as they may be called on to help.
- d. This must be done EVERY DAY. Doing it occasionally will not help your students develop the skills they need to tune independently. Start this process long before your next concert so you still have plenty of time to work on skills and repertoire.

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<b>Category 2: Musicianship Skills and Knowledge</b>	
<b>Content Area:</b>	<b>2A—Tonal Aural Skills and Ear Training</b>
<b>Benchmark:</b>	<i>Students demonstrate the following abilities: matching and manipulating pitch, playing with a sense of tonality, tonal--melodic and tonal--harmonic function (horizontal and vertical relationships/functions of tonality), ear-to-hand skills, aural and kinesthetic awareness of pitch accuracy and intonation, including and related to improvisation.</i>
<b>Learning Task:</b>	<b>2.7—Students use fine tuners to adjust strings to match an external tonal reference</b>
Learning Sequences & Processes	Indicators of Success
<p><u>General Information, Prior Knowledge and Precursors</u></p> <ul style="list-style-type: none"> <li>• Because string players must find pitches from the open string with minimal visual clues, they must develop a good sense of pitch discrimination from the beginning. It is critical that the open strings be in tune in order for students to practice productively.</li> <li>• Tuning with the pegs is difficult for beginning students. In addition to the challenge of hearing and matching pitches, the physical finesse required to tune accurately with the pegs is beyond the reach of most beginning players. Also, the pegs on many school instruments are not well adjusted, making tuning even more difficult. Therefore, it is recommended that all instruments be fitted with fine tuners on all four strings.</li> <li>• Before beginning to tune the instruments, students should demonstrate the ability to discriminate higher and lower pitches and produce a resonant tone on their instruments.</li> </ul> <p><u>Sequence of Activities</u></p> <ul style="list-style-type: none"> <li>• Demonstrate and explain the mechanics of fine tuners: when the screw is tightened—turned to the right—it pushes against the lever under the tailpiece, increasing tension on the string which then produces a higher tone. When the screw is loosened—turned to the left—the lever releases tension, causing the string to sound lower. Caution students to avoid tightening the screw enough that the lever digs into the top of the instrument.</li> <li>• Demonstrate and lead students through the following steps in tuning the open strings:             <ul style="list-style-type: none"> <li>• LISTEN quietly to the reference tone (may be played on the teacher’s instrument, the piano, or an electronic tuner).</li> <li>• PLAY (pizzicato or arco) the corresponding open string and determine whether it is the same as or different from the reference tone. (It can be helpful to have students softly hum the reference tone as they work.) If it is the same, move to the next string.</li> <li>• IF it is different from the reference tone, determine whether it is higher or lower; then use the tuner to make the necessary adjustment.</li> <li>• REPEAT the same sequence for each string.</li> </ul> </li> <li>• Emphasize the importance of listening and remembering the reference tone. Give students repeated guided tuning experiences until they can successfully tune their instruments independently using fine tuners.</li> </ul>	<ul style="list-style-type: none"> <li>• Students accurately demonstrate the ability to use fine tuners to tune open strings to an external tonal reference.</li> </ul>
<b>Standards Links:</b>	
<b>Resources and References:</b>	

Level: **Proficient**

**Category 2: Musicianship Skills and Knowledge**

**Content Area: 2A—Tonal Aural Skills and Ear Training**

**Benchmark:** *Students demonstrate the following abilities: matching and manipulating pitch, playing with a sense of tonality, tonal--melodic and tonal--harmonic function (horizontal and vertical relationships/functions of tonality), ear-to-hand skills, aural and kinesthetic awareness of pitch accuracy and intonation, including and related to improvisation.*

**Learning Task: 3.5—Students use fine tuners and/or pegs to tune strings in 5ths to an external tonal reference.**

**Learning Sequences & Processes**

**Indicators of Success**

General Information, Prior Knowledge and Precursors

- Once students are comfortable tuning their instruments to a given pitch (e.g., tuning the A-string to another sounding A-string or to a tuner playing the note A), they may begin to tune their instruments in fifths. This process will take time and requires good aural preparation, instruments in good working order, students with the physical coordination to turn a peg or fine tuner while playing their instrument, and the ability to play with good tone production while adjusting the tuners.
- It may be best to introduce this activity gradually, for example, tuning three of four strings to the same pitch, and then on a given day, just tuning one of the strings in fifths (such as the D-string against the A-string).
- Students should be able to perform long, smooth bow strokes, with control over the whole length of the bow.
- Students should already be able to distinguish “same” and “different” sounding pitches in terms of identifying out-of-tune notes.
- Students need to be directed to start tuning at the tip of the bow, tune quietly, and to wait two or three seconds to listen carefully to the pitch before tuning their own instruments.

- Students accurately identify whether pitch is too high or too low.
- Students maintain a long, smooth bow stroke while performing.
- Students correctly adjust pitch using fine tuners or pegs.

Sequence of Activities

- A variety of strategies may be used, such as the following:
- The teacher demonstrates on an instrument what in-tune and out-of-tune fifths sound like. Students should have their eyes closed and raise their hands when they think that the pitch being adjusted is in- or out-of-tune. This will help the teacher assess which students have good aural understanding and discrimination.
- The teacher asks a section (such as the violins) to play an A, while having the other sections tune their D-string against that sounding A.
- Depending on the amount of time this takes for a given class, this activity may need to be repeated for several days. Other classes may master the activity quickly.
- In subsequent classes, repeat the process with the D- and G-strings, G- and C-strings, and A- and E-strings.
- Once students are comfortable tuning against the external reference, they should begin to tune their own instruments in double stops. Because the string bass is tuned in 4ths, the teachers should demonstrate to the basses at this point how to tune their instruments using harmonics (see Content Area 1B—Left Hand Skills & Understandings Learning Task 2.4—Harmonics)
- If students have a difficult time hearing whether the pitch is sharp or flat, the teacher directs the students to make the pitch lower (to the point where it’s clearly flat) and then bring the pitch back in tune.

*cello should use harmonics as well!!*

**Standards Links:**

**Resources and References:**



MS/HS School Orchestra Benchmarks

6 <sup>th</sup> grade		7 <sup>th</sup> grade		8 <sup>th</sup> grade		9 <sup>th</sup> grade		10 <sup>th</sup> grade		11 <sup>th</sup> grade		12 <sup>th</sup> grade	
MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES	MAJOR SCALES
D1, G1, A1, C1	D2, G2, C2, A2 F1, Bb1	D2, G2, C2, A2, F1, Bb2, Eb, Ab	All 1 and 2 octave: 24 major scales (1 octave for bass)	All 1 octave minor scales: 12	All 1 octave major scales	Prof 1 scales	Prof 2 scales	Prof 3 scales	Prof 1 scales	Prof 2 scales	Prof 3 scales	Prof 3 scales	Prof 3 scales
<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>	<b>MINOR</b>
	d1, g1, e1	Working knowledge of 1-2 melodic minor scales	Working knowledge of 1-2 melodic minor scales	Working knowledge of 1-2 melodic minor scales	Working knowledge of 1-2 melodic minor scales	State MSBOA Proficiency I	State MSBOA Proficiency II	State MSBOA Proficiency III	State MSBOA Proficiency I	State MSBOA Proficiency II	State MSBOA Proficiency III	State MSBOA Proficiency III	State MSBOA Proficiency III
		All 1 octave major scales	All 1 octave major scales	All 1 octave major scales	All 1 octave major scales								
		Working knowledge of 1-2 melodic minor scales	Working knowledge of 1-2 melodic minor scales	Working knowledge of 1-2 melodic minor scales	Working knowledge of 1-2 melodic minor scales	1 <sup>st</sup> card: all 2 oct. Maj + 1 Tune for Shifting	1 <sup>st</sup> card: 1 <sup>st</sup> 4 3 oct Maj + 1 Tune for Shifting	1 <sup>st</sup> card: 1st 4 3 oct Maj + 1 Tune for Shifting	1 <sup>st</sup> card: all 2 oct. Maj + 1 Tune for Shifting	1 <sup>st</sup> card: 1 <sup>st</sup> 4 3 oct Maj + 1 Tune for Shifting	1 <sup>st</sup> card: 1st 4 3 oct Maj + 1 Tune for Shifting	1 <sup>st</sup> card: 1st 4 3 oct Maj + 1 Tune for Shifting	1 <sup>st</sup> card: 1st 4 3 oct Maj + 1 Tune for Shifting
						2 <sup>nd</sup> card: all 2 oct maj + 1 Tune for Shifting	2 <sup>nd</sup> card 1st 4 3 oct minors + 1 Tune for Shifting	2 <sup>nd</sup> card 1st 4 3 oct minors + 1 Tune for Shifting	2 <sup>nd</sup> card all 2 oct minor + 1 Tune for Shifting	2 <sup>nd</sup> card 1st 4 3 oct minors + 1 Tune for Shifting	2 <sup>nd</sup> card 1st 4 3 oct minors + 1 Tune for Shifting	2 <sup>nd</sup> card 1st 4 3 oct minors + 1 Tune for Shifting	2 <sup>nd</sup> card 1st 4 3 oct minors + 1 Tune for Shifting
						3 <sup>rd</sup> card: 1 <sup>st</sup> 4 1 oct min + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting	3 <sup>rd</sup> card: Passagework from Materials + 1 Tune for Shifting
						4 <sup>th</sup> card: 2 <sup>nd</sup> 4 1 oct min + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials	4 <sup>th</sup> card: 1 Tune for Shifting + Audition Materials
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Students can match open strings and adjust fine tuners. Have working knowledge of pegs. Basic tuning with pizzicato and moving into using bows.	Student can match open strings using pegs and fine tuners. Students use bows for tuning.	Students are able to match all 5 <sup>th</sup> 's using the bow and fine tuners. Are able to manipulate pegs to aid tuning.	Refinement of 5ths and use of bow and pegs	Refinement of 5ths and use of bow and pegs	Refinement of 5ths and use of bow and pegs	Continued refinement-mastery	Mastery	Mastery	Continued refinement-mastery	Mastery	Mastery	Mastery	Mastery
<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>	<b>VIBRATO</b>
Modeling and goal setting/Beginning motions and Glissandos	Beginning motions: waves, chutes, etc. By 2 <sup>nd</sup> semester smoothing and use	More consistent use and fluidity	Refinement	Refinement	Refinement	Continued refinement- mastery	Mastery	Mastery	Continued refinement- mastery	Mastery	Mastery	Mastery	Mastery