

rests against the left side of the stomach. The right back edge of the bass should rest on the player's left groin. The inside of the left knee should touch the back of the bass (see Figure 2.9). (See Clip 16.)

Step 4

Check the balance of the bass by asking the students to drop their hands to their sides. The floor and the groin should balance the instrument. The bass should rest against the abdomen at an angle, with no further left-hand support needed. Check to see if the pitch A on the G string is over the left shoulder at eye level. See Figure 2.9 for the position of the bass.

CREATING LESSON PLANS FOR BEGINNING STRING CLASS INSTRUCTION

There are many ways to incorporate the rote strategies in a lesson plan for beginning classes. We suggest you use a combination of strategies you have already introduced and new strategies. Research shows that typical elementary school beginning string class students can understand only one or two new ideas per class and that the most effective beginning classes incorporate much review.

Begin by selecting the pedagogical goals of the lesson. Select bowing, instrument position or left-hand goals, and aural skills. Then choose rote strategies to teach those goals. Following is a sample lesson plan you may use to help guide you. See Chapter 6 for more in-depth discussion of lesson planning.

Date _____

Class _____

Technique (Time _____)

Goals

Bowing skill:

Left-Hand Skill:

Echo Sequences:

Teaching Strategies

- 1.
 - 2.
 - 3.
-
- 1.
 - 2.
 - 3.
-
- 1.
 - 2.
 - 3.

Music to Rehearse (Time _____)Passage or Line Goal

- 1.
- 2.
- 3.
- 4.
- 5.

Rehearsal Methods

- 1.
- 2.
- 3.
- 4.
- 5.

Play-Through of Passage or Music (Time _____)Assignment:

ADDITIONAL INSTRUMENT POSITION TEACHING STRATEGIES

Rote teaching activities (activities done without reading music) designed to develop students' playing skills are used frequently in string class instruction. The rote teaching strategies described in this chapter and Chapters 3 and 4 are commonly used in string classes throughout the country. They are based on the work of many experienced teachers and pedagogues, including Paul Rolland, Phyllis Young, Robert Culver, Irene Sharp, Margaret Rowell, Michael Allen, William Conable, Paul Robinson, and the authors of this text.

The following teaching strategies may be used to help students develop an acceptable body and instrument position.

All Instruments

Grow an Inch. Have students stand with feet shoulder width apart. Ask them to pull up an imaginary string attached to the top of their heads, so that their body is lengthened and free. This position allows the arms and hands to move freely for playing the instrument. Also try the same strategy with students sitting. (See Clip 17.)

Puppet Shoulders. Have students quickly raise and lower both shoulders. This frees the shoulders and arms to move efficiently. This is a particularly good strategy for cello and bass students because of the temptation to twist one of the shoulders forward when setting the instrument in playing position.

Front Half of the Chair. Ask students to sit on the front half of their chairs with their backs away from the back of the chair. If students sit on the edge of the chair, this can stiffen the back and neck muscles. (See Clip 18.)

Violin and Viola

Two-Handed Lift. Ask students to place their right index fingers on the buttons of the instruments and their left hands on the upper bouts. Request that students lift the instruments above their left shoulders and bring down to the shoulders in playing position. Be careful that students do not hunch their shoulders as the

instruments are coming down. Robert Culver, professor at the University of Michigan, uses this strategy frequently with great success.

Feel the Platform. Have each student use his right hand to feel the platform or shelf that the instrument will rest on. They may place their hands on the tops of the left shoulders, touch the sides of their necks, and touch their collarbones where the instruments will sit.

Nose/Bridge/Scroll. Have students place their instruments in playing position and then touch their nose, bridge, and scroll. There should be generally a straight line between all three.

Cello

Palms an' Knees. Have students place the palms of their hands on the tops of their legs while sitting with their feet placed flat on the floor. This sensitizes both the students and teachers to focus on the proper height of the chair for a student cellist. If the height of the chair is acceptable, the palms will generally be parallel to the floor.

Up and Light. Ask students to hang their hands at their sides with their instruments in playing position. Gently pull the cello neck away. The cello should move easily, because the knees should not be gripping the instrument. With the instrument away, check to see if the player's head, shoulders, and torso are aligned.

Jack-in-the-Box. Announce "Jack-in-the-Box." Instruct students to respond by standing quickly and easily. If their feet are placed flat on the floor and positioned correctly, they should be able to do so.

Three-Finger Check. Have each student place three fingers of his left hand, vertically positioned, between the top of his left shoulder and the back of the neck of the cello. The left index finger should rest on the top of the shoulder with the third finger touching the back of the cello neck. This helps the student begin to position the instrument neck over the shoulder.

Shuffle. Ask students to shuffle their feet on the floor. This helps the players remember to place their feet flat on the floor while relaxed.

Wite-Out Endpins. Have the students pull their endpins out to the proper length. Place a drop of Liquid Paper on the endpin to show students how far to pull the endpin. This helps each student understand how long the endpin should be when it is in playing position. Some teachers also like to use an ink marker and mark the endpin for the same purpose.

LEFT-HAND SHAPE: GENERAL GUIDELINES

Violin and Viola

Examine carefully the position of the thumb in Figure 2.10. Notice that the tips of the fingers are on the string, and the thumb is generally across from the index finger, resting on its side with the tip pointing up. When students gently tap the side of the fingerboard with their thumbs, the tapping motion allows their thumbs to rest on their sides at a location that is comfortable for their hand.

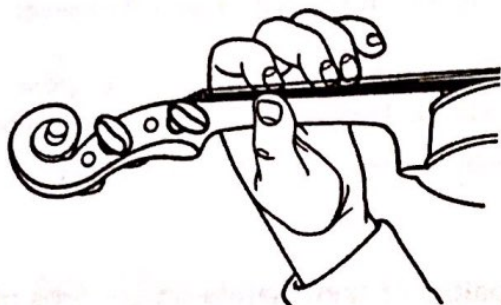


Figure 2.10 Left-hand position for violin and viola.

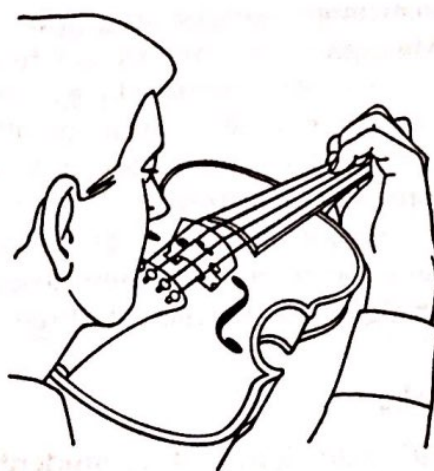


Figure 2.11 Left wrist and elbow position for violin and viola.

Also notice that the base hand knuckle of the index finger is generally across from the top of the fingerboard.

Finally, notice that the left wrist is positioned comfortably away from the instrument, generally forming a straight line from the base hand knuckle to the elbow. In this position, the elbow will be movable and underneath the back of the instrument (see Figure 2.11). (See Clip 19.)

Cello

Examine carefully the position of the fingers and thumb in Figure 2.12. Notice that all of the fingers are naturally curved, and the index finger is resting slightly on its side corner. The thumb is generally resting on its upper pad behind the second finger. The fingers should be equally spaced so that there is a half step between each finger.

Notice that the wrist and arm are in alignment. One way for students to find the best placement of the elbow is to have them alternate tapping the instrument nut and top of the bridge. When doing so, the elbow will naturally position itself at a place appropriate for the arm and hand in first position (see Figure 2.13). (See Clip 20.)

Bass

Examine carefully the position of thumb and fingers in Figure 2.14. Notice that the thumb is generally behind the second finger, resting slightly on its upper pad, and that the first finger is relatively straight. Notice the space between the index and long finger. The space between those two fingers should equal the space between the long finger and the pinky. Each interval should be one half step.

The arm and hand will be aligned, with a relaxed but generally straight wrist (see Figure 2.15). (See Clip 21.)

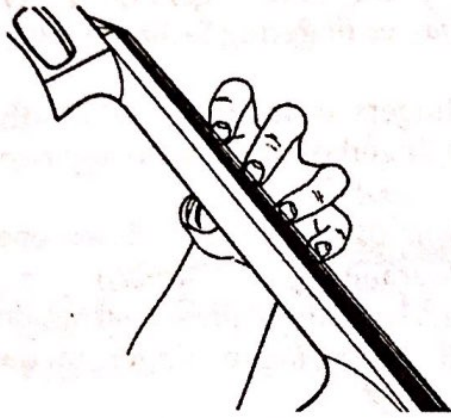


Figure 2.12 Left-hand position for cello.

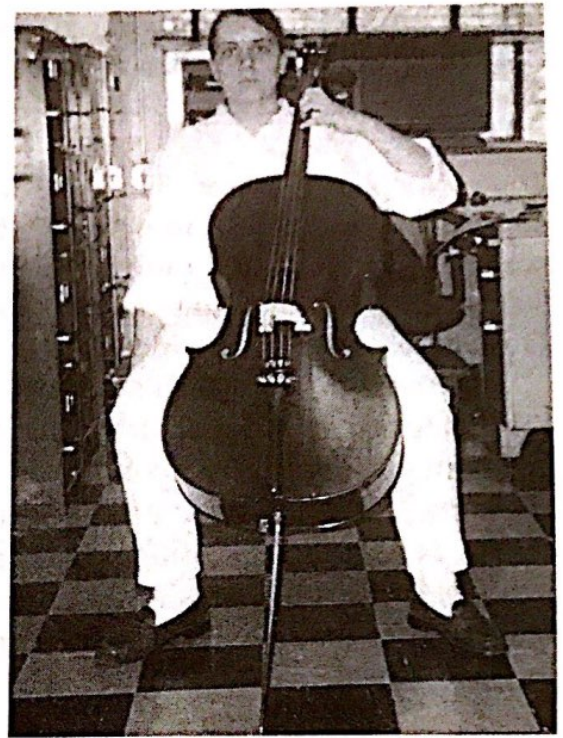


Figure 2.13 Elbow position for cello.

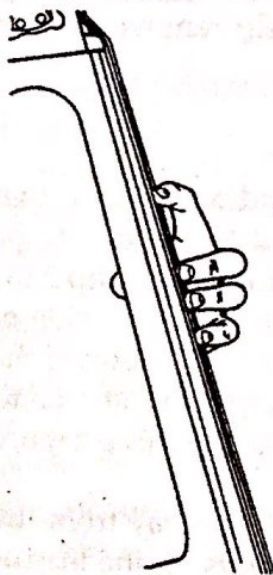


Figure 2.14 Left-hand position for bass.



Figure 2.15 Left arm and hand position for bass.

PEDAGOGY FOR TEACHING THE LEFT-HAND SHAPE

With string instruments, the index finger is referred to as the first finger, the middle finger as the second, the ring finger as the third, and the pinky, or little finger, as the fourth. To help students develop their left-hand shape, first introduce notes that use three or four fingers. It is also easier in this way for students to keep their proper hand shape when lifting fingers off to play different

pitches, compared with adding fingers. The following rote teaching strategies may be used to help students develop an acceptable left-hand shape.

All Instruments

Top of the Hand Down. Have students learn to play descending tetrachords, scales, and musical fragments first before ascending lines (e.g., G-major descending tetrachords: violin and violas starting with three fingers on the D string for G, cellos four fingers on the D string, basses fingering F-sharp on the D string while playing open G).

Tunneling. Have each student slide all four fingers, or the third and fourth fingers together, up and down the length of the fingerboard between any two adjacent strings. (See Clip 64.)

Ridin' the Rails. Have each student slide their fingers up and down one string. Hopefully their fingers will not become "derailed"! (See Clip 23.)

Doublin'. When students can bow two strings, have them finger pitches on one string while playing the next higher adjacent open string (no fingers on the string). This promotes curvature of the fingers.

Taps. Have students lightly tap their fingers on one string and then combinations of strings. This will help the students curve their fingers and begin to coordinate fingering motions. (See Clip 24.)

Thumb Taps. Ask students to lightly tap their thumbs on the instrument necks while their fingers are on the strings. This should help remove tension and prevent squeezing the neck with the hand.

Violin and Viola

Square First Finger. Encourage each student to shape the index finger so that it forms a square with the fingerboard. This helps allow all the fingers to be curved and gently poised over the fingerboard (see Figure 2.16). (See Clip 22.)

Thumb Slides. Have each student gently slide his thumb along the side of the neck with his hands in playing position. When the thumb slides toward the second finger, the wrists will gently straighten, which will help promote a hand position that is at ease and generally in alignment with the arm (see Figure 2.17). (See Clip 23.)

Pull Aways. Have each student pull the sides of his hands away from the neck of the instrument while keeping their thumbs and fingers on the instrument. This promotes a relaxed left-hand position and encourages the student not to squeeze the neck of the instrument when playing. (See Clip 58.)

Strums. Have students strum across the strings with their fourth fingers while swinging their elbows. This helps the arm move freely from the shoulder joint.

Geminiani Chord. Geminiani was a Baroque string composer who frequently composed chords performed by placing one finger on each of the strings. Have students place their first fingertips on the lowest strings, second fingertips on the next strings, third fingertips on the next strings, and their fourth fingertips on the highest-pitch strings. This will help them properly curve their fingers. (See Clip 28.)

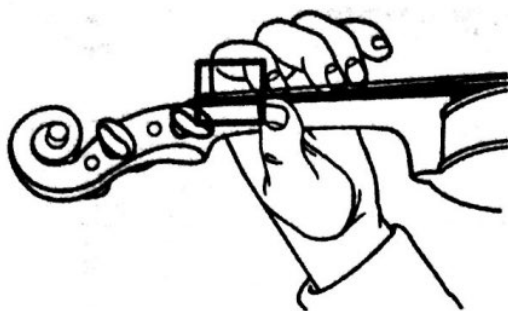


Figure 2.16 Left index finger shape for violin and viola.

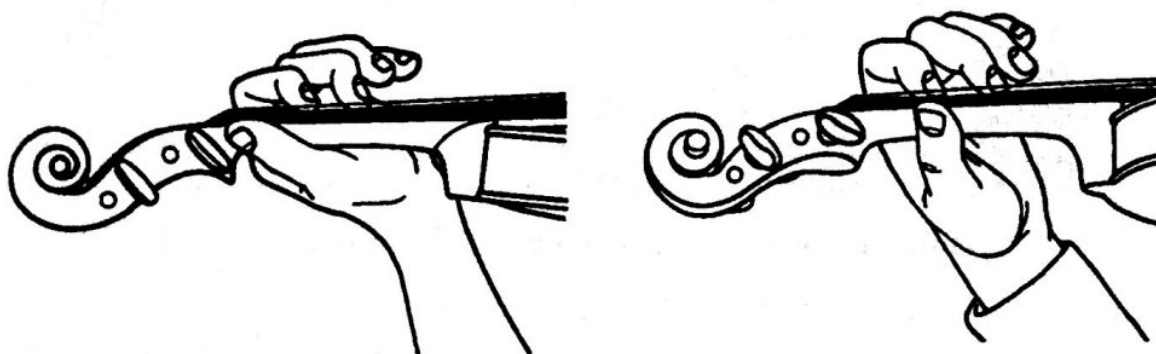


Figure 2.17 Thumb slides and position for violin and viola.

Fingertip Fingering. Remind students that they should be playing on the tips of their fingers.

Base Hand Knuckle Checks. Check to see if each student's base hand knuckles are generally at the height of the top of the fingerboard. The base hand knuckle of a student with longer fingers may be slightly lower.

Cello

Knuckle Knocks. Have students close their left hands and lightly tap the strings by raising and lowering their hands from the wrist joint. Instruct students to tap up and down the length of the fingerboard. This tapping motion from the wrist joint encourages the left hand to be relaxed from the wrist joint when playing.

Sodas and Fruits! Suggest to students that the general hand shape should be formed as though the hand is cupped around a soda can or a piece of fruit the size of an orange. Fingers should be rounded, and the thumb and index finger should form a C shape. (See Clip 25.)

Finding Our Elbows. Ask each student to alternate lightly tapping the bridge and the nut of the instrument. This will help the elbow position itself naturally so that the left hand may be properly placed on the string.

Bass

K Shape. Have the student form the shape of a K on the string as in Figure 2.14. Notice that the string is the trunk of the K, and the index and pinky fingers form the other lines of the K.



Figure 2.18 Left-hand index finger and thumb shape for bass.

C Clamp. Instruct students to shape their index finger and thumb like the shape of a C clamp. Bring a C clamp to class if students do not know what it is. C clamps may be purchased at most hardware stores and serve as a visual aid to help understand the proper shape of the left hand (see Figure 2.18).

PEDAGOGY FOR TEACHING PIZZICATO

As we stated previously, we recommend that bowing and fingering skills first be taught separately before they are combined. However, students can pizzicato simple scales and melodies while they are developing their bow hand shape and open string bowing skills. Pizzicato activities can start from the first day of instruction. Violin and viola students can pizzicato first in guitar position and later in playing position.

Violin and Viola

Instruct each student to place the tip of their right thumb at the corner of the fingerboard near their highest string and use the index finger to pluck the strings. Students should pull the string toward an adjacent upper string with the pad of their finger, not its tip, to get the best sound.

Cello and Bass

Have each student position the tip of the thumb on the low string side of the fingerboard, about two to four inches from the end. The student should pull the string toward the adjacent lower string with the side of the finger, not the tip, to get the best sound.

PEDAGOGY FOR TEACHING BEGINNING FINGER PLACEMENT

The first keys that students learn in beginning string classes are D major and G major. As the class progresses, additional keys such as C major, F major, and d natural minor may be introduced. Students should play one-octave scales and arpeggios in these keys during beginning instruction.

The following are rote teaching strategies to help students learn basic fingering.

Block Fingering. Have students place the sounding finger and all lower number fingers on the string when first learning to finger pitches (e.g., playing G on the D string on violin and viola in first position with three fingers down rather than third finger only). This helps develop students' left-hand shapes. After the hand shape is well established, students may begin to use independent fingering.

Descending Scales. First introduce scales descending to help students develop left-hand shape, fingering motion, and finger placement between the first and fourth fingers and to promote desirable left wrist and arm placement.

Descending Melodies. Emphasize melodies that begin with higher pitches and descend to lower pitches for shaping the left hand and establishing intonation within a hand frame. "Mary Had a Little Lamb" and "Joy to the World" are examples.

Simple Double Stopping. Have students finger a string while sounding the adjacent higher-pitched open string.

Finger Markers. Some teachers like to initially mark beginning students' fingerboards, indicating where students should place their fingers to help promote accurate intonation. Auto pinstriping, adhesive dots, or dots of Liquid Paper may be used. If a marking system is used, we recommend that as soon as possible, markers be removed gradually so that students will rely more on their ear than on the markers.

Violin and Viola: The 2-3 and 1-2 Finger Patterns

Teaching finger patterns helps violin and viola students easily understand finger placement. The finger patterns describe the whole step and half step spacing between fingers. The name of the pattern refers to the half step that occurs between fingers; for example, in the 1-2 pattern there is a half step between the first and second fingers. The 2-3 (1 2 3 4) finger pattern is the first one introduced to students, followed typically by the 1-2 finger pattern (1 2 3 4).

The 2-3 finger pattern involves a half step between the second and third fingers and a whole step between the first and second fingers and third and fourth fingers (see Figure 2.19). Notice that the fingertips are close to each other when forming a half step. The fingertips may or may not be touching, depending on the width of the student's fingers.

The 2-3 finger pattern allows students to play the two major tetrachords in the D-major scale: whole step between the open D (no fingers on the D string) and first finger E, whole step between first finger E and second finger F-sharp, half step between second F-sharp and third finger G, and a whole step between

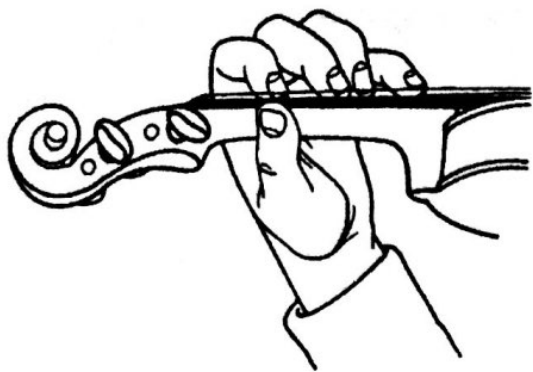


Figure 2.19 The 2-3 finger pattern for violin and viola.

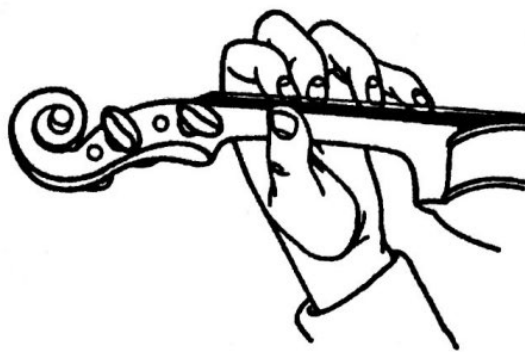


Figure 2.20 The 1-2 finger pattern for violin and viola.

third finger G and either fourth A or the open A string. The same 2-3 finger pattern may be used to play the second ascending tetrachord of the D-major scale on the A string. The 2-3 pattern is also used to play the G-major scale starting on the open G string for both violin and viola and a C-major scale on the viola starting on open C. (See Clip 29.)

The 1-2 finger pattern involves a half step between the first and second fingers (see Figure 2.20). It is used in the tetrachord on the A string (open A, first finger B, second finger C natural) and the tetrachord on the D string (first finger E and second finger F natural) when playing the C-major scale starting on the G string. The 1-2 finger pattern is also used in the d natural minor scale, starting on the open D string.

Cello

Remember on the cello all fingers are spaced a half step apart, creating an interval of a minor third between the first and fourth fingers. (See Clip 20.) The one-octave D, G, and C-major scales typically first introduced in beginning string classes are all fingered the same when starting on the open string for the tonic pitch (e.g., G major: G string—open G, first finger A, third finger B, fourth finger C [0 1 3 4]; D string—open D, first finger E, third finger F-sharp, fourth finger G [0 1 3 4]). As other major scales or tetrachords are introduced, the second finger is used. For example, to play a d minor tetrachord starting on open D, the second finger is used to play F natural (0 1 2 4). In an F-major scale, starting with a fourth finger F on the C string, the second finger is used to play B-flat on the G string (4 0 1 2).

Depending on how often the string classes are scheduled per week, cellists may begin to learn how to play the F-major scale beginning on second finger F on the D string during the first two years of instruction. This octave of the F major requires a backward extension for B-flat on the A string (2 4 1x2). Cello extensions and strategies for teaching them are presented in Chapter 3.

Bass

The distance between the first and fourth fingers is only a major second. This means that the bass player must learn how to shift to a higher position to play

the D, G, and C-major scales that the other string students are learning if octave transpositions are to be avoided. We recommend that bass players learn their initial scales without switching octaves for each tetrachord to avoid inherent string crossing, tempo, and intonation problems.

One of the decisions you will have to make in teaching basses is what left-hand position system to use with your students. There are two systems that are used frequently. One system uses Roman numerals to indicate the position. Examples of this system appear in Figure 4.3.

Another system labels the position by the pitch that is played by the first finger on the G string. For example, when the first finger is playing the note A on the G string the left hand is in "A Position." If the left hand fingers B the hand is in "B Position." We suggest you use the system that is used in your beginning string class materials and/or the system that is used by the local bass teachers.

BOWING INSTRUCTION: GENERAL GUIDELINES

The beginning of this chapter recommends that students develop body posture, instrument position, left-hand shape, and finger placement skills independent of bowing skills. Though instrument and bowing instruction should occur at the same time, beginning from the very first classes, the independent development of these skills allows students the opportunity to develop a level of mastery through review before trying to combine them. Remember that students may pizzicato the various scales and melodies they are learning as they are developing their bowing skills independently. See Chapter 6 for further discussion.

We recommend that bowing skills be taught sequentially because of their complexity. In beginning string classes, this involves first teaching bow hand shape, followed by instruction about simple détaché bowing, string crossings, and staccato and hooked bowing. Be sure to use much review to help students master each skill level before proceeding to the next skill.

BOW HAND SHAPE: GENERAL GUIDELINES

We recommend that students first learn to hold the bow at the balance point so that the fingers and thumb may be relaxed while holding the bow. This also helps students understand that the instrument will help support the bow when they are playing.

Violin and Viola

Examine carefully Figures 2.21 and 2.22 and notice the following:

- The index finger rests on top of the bow stick near the second knuckle joint.
- The second finger is curved across from the thumb, is draped over the side of the bow, and touches the stick near the second knuckle joint.
- The third finger drapes over the side of the bow, and the fingerprint touches the concave side of the frog.

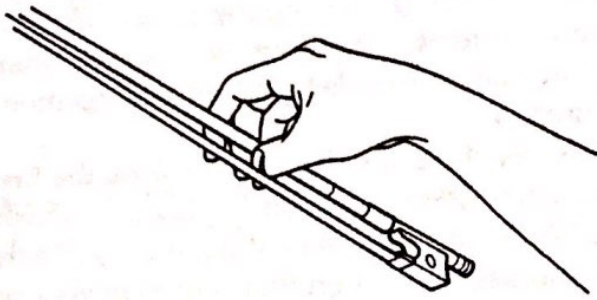


Figure 2.21 Bow hand shape at the balance point for violin and viola.



Figure 2.22 Bow hand shape for violin and viola.

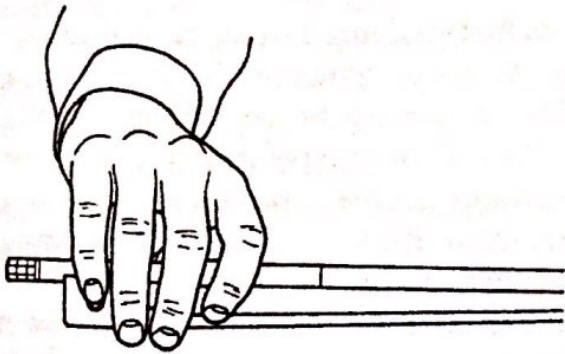


Figure 2.23 Bow hand shape for cello (view of the fingers).

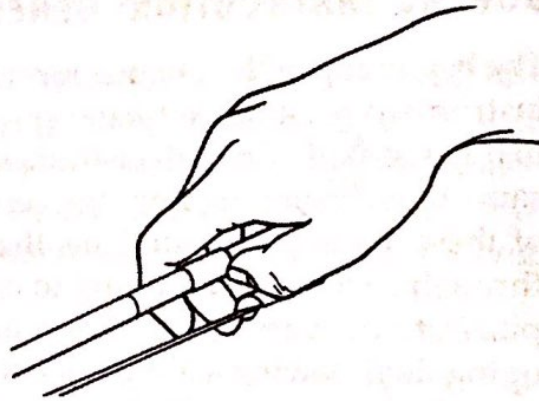


Figure 2.24 Bow hand shape for cello (view of the thumb).

- The little finger is curved and its tip rests near the inner side of the bow stick.
- The thumb is across from the second finger forming an oval shape.
- The hand leans slightly on the index finger.

Cello

Examine carefully Figures 2.23 and 2.24 and notice the following:

- All fingers are relaxed, slightly curved, and draped over the side of the frog and bow stick.
- The index finger is draped over the bow stick near the first or second knuckle joints.
- The second finger rests near the ferrule of the bow.
- The third fingerprint is near the U cutout of the frog.
- The fourth finger is near the eyelet of the bow.

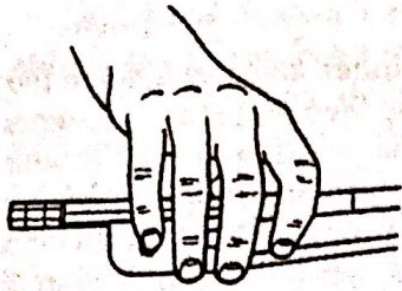


Figure 2.25 French bow hand shape for bass (view of the fingers).

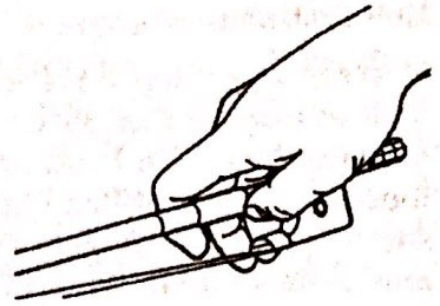


Figure 2.26 French bow hand shape for bass (view of the thumb).

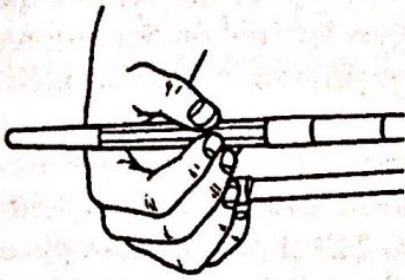


Figure 2.27 German bow hand shape for bass (front view).

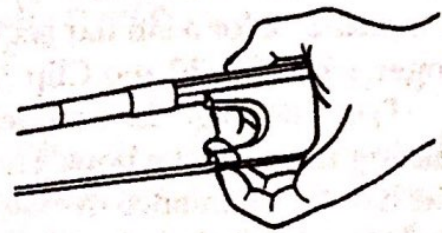


Figure 2.28 German bow hand shape for bass (back view).

- The thumb is curved, and the side of its tip rests across from the second finger.
- The hand is more perpendicular to the bow stick than upper strings.

Bass: French Bow

Examine carefully Figures 2.25 and 2.26 and notice the following:

- The shape of the hand is similar to the cello bow hand, but the fingers are positioned slightly more over the side of the frog.

Bass: German Bow

Examine carefully Figures 2.27 and 2.28 and notice the following:

- All fingers are naturally curved.
- The index finger and thumb form a circle.
- The second and third fingers are curved and positioned near the index finger.
- The fourth finger is located under the frog for support.

PEDAGOGY FOR TEACHING BOW HAND SHAPE

The following rote teaching strategies may be used to help students develop their bow hand shape.

All Instruments

Finger Bowing. Step 1: Have students hold their left index finger parallel to the floor in front of their face at the height of their chin. Step 2: Instruct students to place their right-hand fingers on the left index finger without their thumb touching. The right-hand fingers should hang on the left index finger. Students should point their fingertips over the side of the index finger. Step 3: Ask violin and viola students to tap their pinky on top of the left index finger. Step 4: Tell students to place their thumb tip across from their second finger, thumb knuckle curved outward. The thumb and the index finger should form an oval shape. Step 5: Have students move their bow hand formed on their left index finger to the place where it will be when bowing their instrument. Learning to shape their bow hand on an index finger allows students to incorporate the sense of touch when learning how to shape their fingers for bowing. See Figures 2.31 and 2.32 for a similar sequence using a pencil or pen rather than the index finger. (See Clip 30 and Clip 32.)

Pencil Bowing. Have students form their bow hand shapes on a pencil before placing them on the bow. This allows students to form their hand shape without having to balance the weight of the bow. Figure 2.29 shows an example of violin and viola bow hand shape formed on a pencil.

Straw Bowing. Have students form their bow hand on a straw. This encourages students not to squeeze or tense their hand because the straw is light and easily bends if pressure is applied.

Spyglasses and Telescopes. After students' bow hand shapes are formed, have them look through the spyglass or telescope shape formed by their long finger and thumb. (See Clip 31.)

Eyes Closed! Have each student form the bow hand with their eyes closed to help him focus on the *feel* of the bow hand when it is correctly formed.

Balance Point Bows. Instruct students to form their bow hand at the balance point of the bow. This helps the bow hand to be relaxed while holding the bow.

Tap, Tap, Tap. Instruct students to tap their fingers lightly while forming their bow hand shape on a pencil, straw, or at the balance point of their bow. This helps relax the fingers and hand.



Figure 2.29 Bow hand shape on a pencil for violin and viola.



Figure 2.30 Bow hand thumb shape on a pencil for violin and viola.

Bow Paths. Draw a line or an X on the students' fingers where the bow stick should touch. This helps students correctly position the bows in their hands.

Thumbs Up. Have students hold their bows with their bow hands. Ask them to turn the bows upside down in a counterclockwise motion so that the hair is facing the ceiling. Instruct them to check to see if their thumb is touching the bow correctly and if its middle knuckle is curved outward, forming an oval shape with their longest finger. See Figure 2.30 for an example of this hand position for the violin and viola when holding a pencil.

Thumb Bends. Step 1: Shape students' bow hands on a pencil, straw, or bow. Step 2: Ask them to turn their bow hands upside down by turning their hands in a clockwise motion. The bow hair should be facing the ceiling as a result. Step 3: Instruct students to bend their thumbs slightly, along with all their fingers. The contact point of the thumb should stay the same while the thumb bends. This promotes flexibility throughout the fingers and thumb.

Violin and Viola

Flop Hand. Have students do the following steps. Step 1: Hold a pencil in the left hand at eye level. Step 2: Hang right-hand fingers over the top of the pencil, as shown in Figure 2.31. Step 3: Place the fourth finger on top of the pencil, as shown in Figure 2.32. Step 4: Touch the tip of the right thumb on the pencil just opposite the second finger, forming an oval shape, as shown in Figure 2.33. Step 5: Lean the right hand toward the index finger, as shown in Figure 2.34. After completing Step 5, remove the left hand from the pencil.

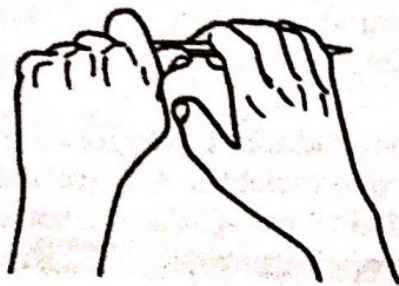


Figure 2.31 Step 1 for forming bow hand shape.

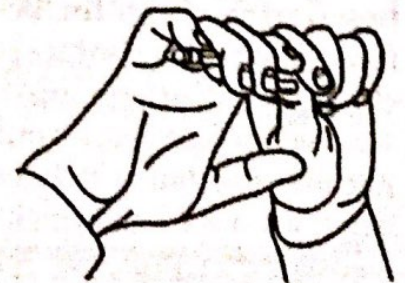


Figure 2.32 Step 2 for forming bow hand shape.

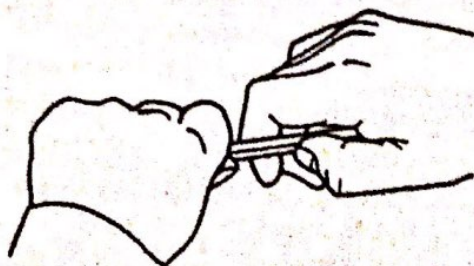


Figure 2.33 Step 3 for forming bow hand shape.

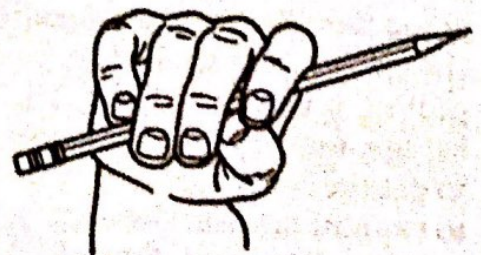


Figure 2.34 Step 4 for forming bow hand shape.

Cello and Bass

Shelving! Step 1: Ask students to loosely hang their right hand at their side with their bow stick resting at the balance point on their fingers without the thumb touching. The fingers form a shelf on which the bow can rest. Step 2: Instruct students to slide their thumb tips across from their second fingers, bending the knuckles outward. Step 3: Have students bring their hands up to their eyes and evaluate their bow hand shapes. (See Clip 33.)

SOUND PRODUCTION PRINCIPLES

As students prepare to begin bowing on the string it is a good idea to introduce them to fundamental sound production principles on string instruments. Explain that there are three sound production variables: the speed of the bow, weight (pressure), and the contact point (sounding point) of the bow on the string.

There are several general sound production principles that students should understand. First, generally the bow should travel faster on strings that are thinner in diameter, for example, the E string on the violin, and correspondingly, slower on wider strings, for example, the bass E string. Second, slower bow speeds should be used when bowing closer to the bridge. Third, louder sounds are produced either by increasing the speed of bow or weight of the bow on the string. Fourth, the higher the pitch the closer the bow should travel near the bridge. Fifth, the most clear sound production is produced when the bow travels at a right angle to the string. Sixth, softer sounds are produced through less weight on the string and/or moving the bow farther from the bridge. Seventh, the three sound production variables (speed, weight, contact point) function in relationship with each other; as one changes, the others must adjust as well.

As one can see, an entire palette of sounds can be produced through changing the correlation between the three sound production variables. An excellent description of this principle is found in an article titled "String-O-Phobia: Some Causes and Cures," by Kjelland (1987). We suggest you demonstrate each of the variables and their relationships as students begin to bow on the string.

DÉTACHÉ BOWING: GENERAL GUIDELINES

Once students have developed their bow hand shapes they are ready to develop their first bow strokes. The first bow stroke that students learn is the détaché stroke. This stroke is produced by simply placing the bow on the string and pulling it back and forth. The bow hair should generally travel parallel to the bridge, touching the string about halfway between the bridge and fingerboard to get the best beginning sound. As bowing skills develop, students may begin to explore bowing closer or farther away from the bridge and fingerboard.

Examine carefully Figures 2.35, 2.36, 2.37, and 2.38. Notice the angle of the bow hair on the string. Notice also for each instrument the height of the elbow, its placement in relation to the body and instrument, and the curvature of the



Figure 2.35 Position of bow on the string for violin and viola.

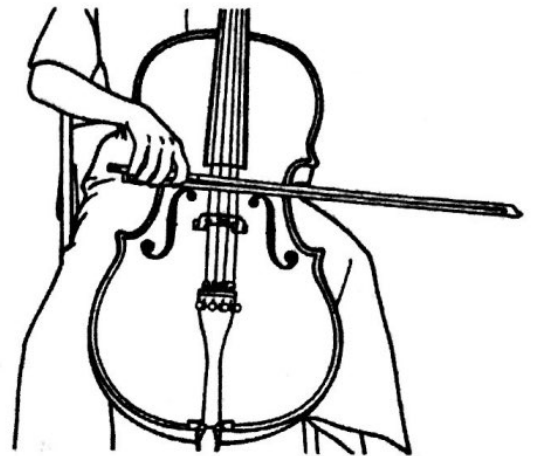


Figure 2.36 Position of bow on the string for cello.

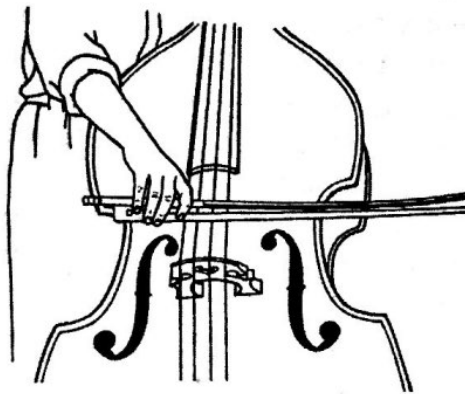


Figure 2.37 French bow position on the string for bass.

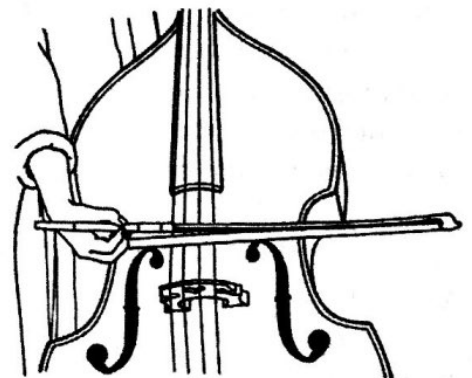


Figure 2.38 German bow position on the string for bass.

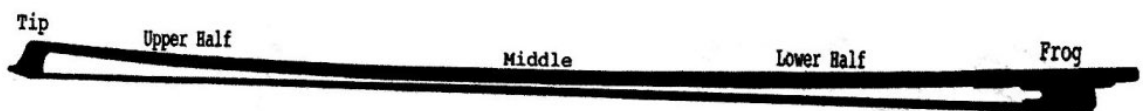


Figure 2.39 Different sections of the bow.

wrist and fingers. It is critical that students learn these correct positions when establishing their bowing skills.

The bow is divided into different sections, as illustrated in Figure 2.39. We recommend that students first learn to bow in the easiest part for their instrument: violins and violas in the middle and cello and bass middle to lower half. As students master these areas of the bow, others may be emphasized.

PEDAGOGY FOR TEACHING DÉTACHÉ BOWING

The following rote teaching strategies may be used to help students develop their détaché bowing skills.

All Instruments

Shoulders, Arms, and Tubes! To help students develop their bowing skills away from their instruments, have violin and viola students hold paper or plastic tubes slightly above their left shoulders, place their bows in the tubes, and begin bowing. Cello and bass students may hold a tube with their left hand at waist level, insert the bow in the tube, and begin bowing.

Instrument Tubing. Have each student attach a paper or plastic tube to the top of the strings for the student to bow through. The tube may be attached by tying two standard-size rubber bands together, or one long rubber band may be used. Place the rubber bands under the strings, and position the tube on top of the strings. Loop the ends of the rubber bands around the ends of the tube to fasten the tube to the strings. The tubes provide a path for the students' bows when they are first learning proper bowing motions. Straws can also be placed in the F holes to help guide the bow. See Figure 2.40 for both approaches.

Rosin Bowing. Have each student hold the rosin in the left hand and bow across it. Violin and viola students may hold the rosin over the left shoulder where the bow would touch the strings when the instrument is in playing position. Cello and bass students may hold their rosin in front of them with their instruments in playing position. When rosining, each should gently pull the bow across the rosin only three or four times. Bases should pull only down bow motions across the rosin. See Figure 2.41 for a rosin bow example.

Lift, Set, Settle. Instruct each student to lift their bow in the air above the strings, bring the bow down so that it rests on the string, and settle the bow by relaxing their right shoulder, elbow, wrist, and fingers. (See Clip 38.)

Short Bows to Long Bows. Have students first learn to master shorter bow strokes and then gradually lengthen the stroke as their mastery develops.

Buddy Bowing. Pair students up with one student bowing and the other checking and guiding the bow so that it travels parallel to the bridge correctly.



Figure 2.40 Bowing through a tube (violin and viola).

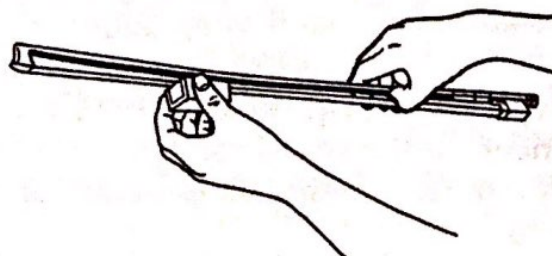


Figure 2.41 Rosining the bow (violin and viola).

Violin and Viola

Swingin' Out. Have students place their left index finger in the right elbow joint and gently swing their arm back and forth. This helps students develop the arm motion produced by the opening and closing of the elbow joint when bowing in the middle of the bow. See Figure 2.42. (See Clip 34.)

Straws in the F Hole. Have students place a plastic straw in either or both instrument F holes and then bow near the straws as illustrated in Figure 2.43. This helps the bow to travel parallel to the bridge. (See Clip 39.)

Bow Hand Shapes on the Go. Have students first learn their détaché bowing skills while holding the bow at the balance point. As students' bowing skills develop, gradually have them move their bow hand to the frog.

Cello

Ridin' the Rails. Have students hold their bows at the tips with their left hands and place the bows on the strings near the tips. Then instruct students to slide their bow hand shape back and forth along the stick. This helps students learn the proper motion of the hand, wrist, and arm when they bow. (See Clip 37.)

Traveling Down the Road. Have each student hold the end of a yardstick, dowel, or PVC tube in front of him at the height where their strings would be when the instrument is in playing position. Then have them place their bow hand shape around the object and slide their hand back and forth along the stick. As they are moving their hand, check to see if the motion is in two steps. In Step 1, the motion with the hand moving away from the body is first initiated by the upper arm, followed by an opening of the forearm. In Step 2, when the hand is moving toward the body, the elbow should close first, followed by the upper arm. See Figure 2.44. (See Clip 36.)



Figure 2.42 Swingin' Out strategy (violin and viola).



Figure 2.43 Straws in the F Hole strategy (violin and viola).

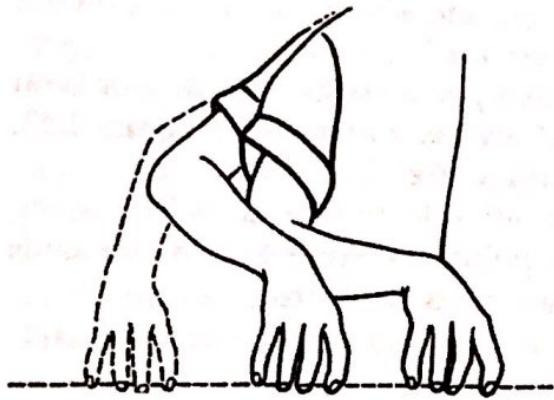


Figure 2.44 Traveling Down the Road strategy (cello).



Figure 2.45 Swingin' to the Floor strategy (bass).

Bass

Swingin' to the Floor. Have each student swing the right arm back and forth from the shoulder joint, allowing the elbow to bend only slightly so that the hand travels parallel to the floor. See Figure 2.45. (See Clip 35.)

Frog to the Floor. Have students bow back and forth on their strings, keeping the frog parallel to the floor. This helps prevent the bow from traveling toward the fingerboard, particularly on the down bow stroke.

BEGINNING STRING CROSSINGS: GENERAL GUIDELINES

It is important for students to move their arms to the new string level when they are changing strings. See Figures 2.46, 2.47, and 2.48 for illustrations. Notice that the string crossing motion is the opposite between high and low string instruments. Violinists and violists lower their arm when crossing to a higher-pitched string and raise their arm when crossing to a lower-pitched string. The motion is just the opposite for lower strings. Cellists and bassists raise their arms when moving to a higher-pitched string and lower their arms when going to a lower-pitched string.

PEDAGOGY FOR TEACHING STRING CROSSINGS

The following rote teaching strategies may be used to help students develop their string crossing skills.

All Instruments

Bridge Rocking. Have violin, viola, and cello students place the bow hair on top of the bridge at the balance point. Instruct them to rock the bows across the bridge. Basses may do so as well but will need to place their bows on the string

at their normal contact point or at the end of the fingerboard, depending on the length of their arms. This shows students the distance between string levels for their instrument and helps them follow the natural curvature of the bridge when crossing strings. After students have mastered crossing at the balance point, have them try crossing at other parts of the bow. (See Clip 40.)

Pencil Crossings. Have students insert a pencil between the bow hair and stick at the balance point. Violin and viola students may hold the bows over the left shoulder where the bow would be positioned if they were playing; cello and bass students may hold the bow in front of them in their instrument playing position. Instruct students to rock the bows up and down as in a string crossing motion, first using large arm motions, then hand, and then fingers flexing only. Instruct students to rock the bows up and down with their right hands in a string crossing motion as in Figures 2.46, 2.47, and 2.48. Experiment with



Figure 2.46 String crossings for violin and viola.

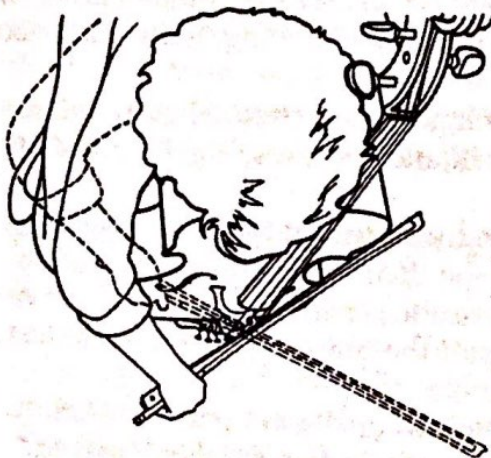


Figure 2.47 String crossings for cello.

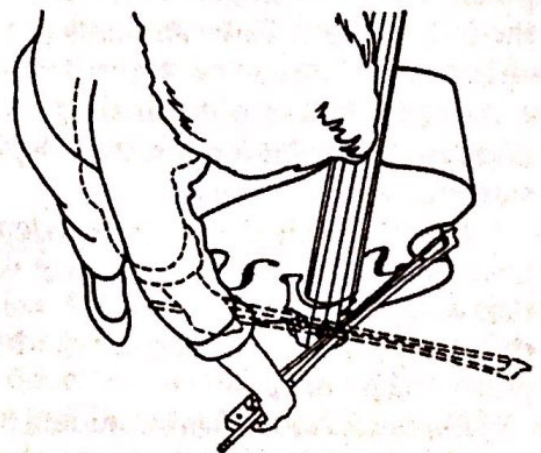


Figure 2.48 String crossings for bass.

different sizes of motions. String crossing motions can be done by moving the entire arm (large motions), just by the hand, or primarily by bending the fingers and thumb (very small motions).

Rest Crossings. Place rests between pitches that involve a string level change. This allows time for the student to execute a string crossing properly. Use longer rests first and then gradually shorten the amount of time for the string crossing motion as students develop their mastery of string crossings. (See Clip 41.)

STACCATO AND HOOKED BOWINGS: GENERAL GUIDELINES

Staccato strokes begin with a pinch or slight depression of the bow stick, which is produced by leaning primarily the index finger into the bow stick. When the bow is pulled, the extra weight at the beginning of the stroke produces an accent. Immediately after the accent, the extra weight on the bow through the index finger should be released slightly. At the end of the stroke, the arm stops and another slight pinch of the index finger is added.

Once students have mastered the basic staccato stroke, they may hook or link two or more staccato notes in the same bow direction. This is commonly referred to as *hooked bowing*.

PEDAGOGY FOR TEACHING STACCATO AND HOOKED BOWINGS

The following rote teaching strategies may be used to help students develop their staccato and hooked bowing skills.

All Instruments

Pinched Bows. Have each student practice pinching the bow by placing the bow on the string at the balance point and slightly leaning the index finger into the bow stick. It should be easy to see the bow stick go up and down while the bow hair stays on the string. Instruct students to try the pinching motion with their second fingers, then their third fingers, and finally their fourth fingers. They will feel in their hand that the index finger is the easiest finger to produce the pinch. The other fingers together help the index finger, but the motion is led by the index finger. Have students practice their staccato bowing first using open strings and then review scales.

Doorknob. Using the analogy of the turning motion used when rotating a doorknob to open a door, lean the hand back and forth into the bow stick to start the staccato stroke.

Bow Pivots. Instruct each student to lean the bow hand into the bow stick toward the index finger and pivot it by moving their bow hand closer and farther away from their body while keeping the same contact point of the bow on the string. After pivoting, the student can pull the bow to a different contact point and pivot again.

Hook and Pull. Ask each student to place the bow on the string to lean slightly into the stick with the bow hand. Once the bow stick is depressed or "hooked,"

instruct each student to pull it across the string. They may need to release some of the pressure on the bow between strokes if the sound is too scratchy.

Connect the Hooks. After students have leaned into the bow sticks with their bow hands to hook the string, they may pull the bows to connect two or more staccato pitches in the same bow direction.

Loud Rests. Emphasize the silence necessary between the staccato notes by instructing students to play a loud rest between pitches.

PEDAGOGY FOR TEACHING SLURS

Slurs are produced on string instruments by smoothly pulling the bow in the same direction and connecting two or more different pitches. The following rote teaching strategies may be used to help students develop their slurring skills.

All Instruments

Trill Slurs. Have students pull their bows in one direction while trilling. This helps students coordinate pulling their bows in one direction while playing different notes with the left hand.

Hooking for Slurs. Have students first hook different staccato pitches in the same bow direction and then play the same notes legato while slurring.

AURAL SKILL DEVELOPMENT IN BEGINNING CLASSES: GENERAL GUIDELINES

The development of aural or listening skills in the string class is critical. Refining aural skills helps students play in tune by developing their pitch discrimination skills as well as by helping them coordinate their right and left hands and memorize music. Well-developed aural skills lay the foundation for successful string playing by young students and may lead to interest in aural skills such as improvising; composing; and playing jazz, blues, and fiddling music.

Aural training is key to the effective teaching of beginning string classes. The teacher must set a high standard of intonation and pitch discrimination. Students typically will play in tune to the standard that is set by the teacher. If the teacher sets a low standard, students will be satisfied playing out of tune. Keep the standard high; reinforce aural skills through constant review and by using many different aural skill teaching strategies. Students will play in tune and will have well-developed pitch discrimination if the teacher demands it.

PEDAGOGY FOR TEACHING BEGINNING AURAL SKILLS

In beginning string classes, students can learn how to raise and lower a pitch by ear and to match pitches. Echoing by ear what the teacher plays is one of the most effective ways to help beginning students' aural skills. The following are some examples of teaching strategies that can be used. Be sure that students cannot see the person playing what they are supposed to echo. In that way,

students must use their ears to respond, not by watching the fingers of the performer. It is easiest if the leader stands behind or to the side of the class where students cannot see the player.

Sliding Pitches. Have students echo the pitch direction of the leader sliding her hand up or down the fingerboard.

Rolling Pitches. Have students echo the pitch direction of the leader by slightly rolling his finger on a pitch.

Four-Note Echoes. Have students echo four pitches played by the leader. Initially, it is best if one of the pitches is an open string and the other pitches incorporate only the interval of a major and/or minor second. For example, the teacher may play on their D string DDEE, with the D being their open string. An sequence of four-note echoes could include the following:

Teacher plays: DEEE	Students echo: DEEE
Teacher plays: DEDE	Students echo: DEDE
Teacher plays: DEF#F#	Students echo: DEF#F#
Teacher plays: DEF#G	Students echo: DEF#G

As the students' ability to echo correctly increases, the teacher may begin to incorporate additional intervals such as major and minor thirds. You may also introduce different styles (legato, staccato), slurring, and rhythms in the echoes as students become more proficient. (See Clip 42.)

We Get to Play Out of Tune! Once students can echo simple four-note patterns, the leader may begin deliberately bending or playing some of the pitches slightly out of tune. Students are required to echo the correct and incorrect pitches precisely as the leader played.

STRATEGIES FOR TEACHING INSTRUMENT TUNING IN BEGINNING STRING CLASSES

As students are learning the fundamentals of holding the instrument and bow, the teacher can be responsible for tuning the open strings that are being used in class. Be sure all violin, viola, and cello instruments have fine tuners that turn easily so that tuning can be done quickly and efficiently. Basses, of course, should have machine head pegs. Until students start learning how to tune their own instruments, we recommend that the teacher tune only the strings that students will use in class.

Once students can reliably hold their instruments, correctly produce desirable sounds on their instruments, and can discriminate differences in pitches learned by the aural skill instruction process described earlier, formal tuning instruction may begin. Many different strategies may be used. The following are some that the teacher may use:

- Play an open A string while turning its peg or tuner. Students must indicate if the string is getting higher or lower in pitch.
- Play an open A and have the students play their A string either with the bow or by plucking the string and compare it with the teacher's A. Have

the students pluck their string while turning the tuner until it matches the teacher's.

- Play an A on an electronic tuner and have each student compare and turn the tuner accordingly.
- Repeat the previous strategies with other strings.

As students' ability to match the model develops in the beginning classes, the teacher may allow the students to quietly bow their strings and use their tuners (bass machine head pegs) to match the model. Teaching students to tune their instruments is done over a long period of time. The teacher must be patient and consistent and maintain a high standard of tuning. Students will only tune as accurately as they are taught and required.

PROBLEM SOLVING: BEGINNING STUDENTS' COMMON PLAYING PROBLEMS AND SOLUTIONS

The table on page 68 includes examples of some of the most common playing problems beginning string students will experience. Solutions are suggested for each problem and are described in detail earlier in the chapter.

General Guidelines

As all beginning instrumentalists, string players frequently have problems with their body posture, instrument position, fingering, and bowing skills. Most often students have more than one problem at a time when playing. When that occurs, the string teacher must decide which problems to address and in what order. Two guidelines will help.

One. Address first problems from the center of the body out. For example, even though there may be a problem with the shape of a student's bow hand, check first to see if the student has relaxed and free neck and shoulder muscles. Then determine if the student's right arm is positioned properly and the elbow and wrist joints are bending, as they should be. Finally, check the thumb and finger shape and flexibility of the bow hand.

Two. Evaluate playing problems from the head to the feet and the feet to the head. Sometimes misplaced feet positions with unbalanced body weight on the them will encourage tension in the knees, back, and shoulders. The tension may transfer itself to left-hand or bowing motions, causing stiffness in hand and wrist joints. A head that is pointing down or toward the ceiling will cause tenseness in the shoulders and uppers, eventually, and may result in still shifting, vibrato, or uncontrollable bowing motions.

As we try to solve students' playing problems following the preceding guidelines, it is encouraging to notice that occasionally, by the time we have evaluated and remedied problems close to the center of the body or the body in general from the floor up or head down, problems that appeared in students' arms, hands, coordination, or intonation may have already fixed themselves so that we do not need to address them.

5



The School Orchestra Program

A BRIEF HISTORY OF ORCHESTRA PROGRAMS IN THE SCHOOLS

The history of vocal music in America's schools is long and rich, beginning as far back as the first half of the 1800s. However, band and orchestral instruction existed rarely as a part of school music instruction in the nineteenth century (Humphrey 1989). Society preferred vocal sacred music, and not many performances were given of high-quality instrumental music in local communities. Also, few qualified instrumental teachers were available, and there was little class instrumental instruction in Europe to serve as a model (Mark and Gary 1999).

Interest in orchestras began to appear by the mid-1800s (Humphrey 1989). European orchestras began to tour America frequently. Orchestral musicians began to immigrate to America, and larger cities such as New York, Cincinnati, and Philadelphia established orchestras. Orchestras began to appear in the schools toward the end of the nineteenth century and the beginning of the twentieth century (Humphrey 1989). These ensembles were first established in high schools and were made up of students studying privately outside of school. They were similar to theater or salon orchestras. The role of the teacher was to gather the students and try to create a performing ensemble from the instrumentation of the students. Among the first were high school orchestras in Chelsea, Massachusetts; Hartford, Connecticut; New Albany, Indiana; Sullivan, Indiana; Richmond, Indiana; and Oakland, California.

By the turn of the century, the violin was very popular in America. In 1908 Charles Farnsworth, a professor from Columbia University, observed class violin instruction in a school in Maidstone, England. Farnsworth was inspired with the concept of young students learning to play the violin in groups (Mark and Gary 2007). In 1910, Albert Mitchell, a teacher in the Boston schools, went to England to study the violin classes in Maidstone. Upon his return, he organized classes in the schools in Boston modeled after those he had observed (Mark and Gary 2007). Word of his success traveled quickly, and Mitchell

began giving summer workshops to teachers so that others could establish similar classes. In 1924 his *Violin Class Method* was published (Mitchell 1924).

By the end of the 1920s, more orchestra programs appeared in the schools. The results of a 1919–1920 study reported that of 359 cities surveyed, 278 had orchestras in the schools (Humphrey 1989). In addition, teachers began to experiment with teaching beginning heterogeneous instrumental classes. One of the most widely used heterogeneous methods series of the time was *The Universal Teacher* by Joseph E. Maddy and Thaddeus P. Giddings (Giddings and Maddy 1923).

The rapid growth of school orchestras and bands was fueled in part by the prevailing philosophy of progressive education and the contest movement (Humphrey 1989). In the late 1910s and early 1920s, school systems began to provide orchestra programs with instruments, rehearsal time, and academic credit. In 1928 the first statewide orchestra contests were held and occurred in fifteen states; the first national orchestra contest was held in 1929 in Mason City, Iowa (Humphrey 1989). The first national high school orchestra performed at the 1926 Music Supervisors National Conference (MSNC)—the predecessor of the Music Educators National Conference (MENC)—and at the 1927 conference of the National Association for School Superintendents (Mark and Gary 2007).

Following World War I, orchestras were firmly established in the school music curriculums of the larger cities in America (Mark and Gary 2007). The number and quality of orchestra programs continued to increase. Three musical movements occurred in the 1920s that strongly influenced the development and expansion of school orchestras: the music contest movement, the all-state and national orchestra movement, and the movement to found a national high school orchestra and band camp. In the 1930s, the number of school orchestra programs stabilized as the number of school bands began to increase and dominate (Turner 2001). Instrument manufacturers began offering band contests to attract interest in wind instruments and increase sales. A large number of potential band teachers became available for the first time. Performers who had played in the World War I military bands returned to America and became school band teachers. With the advent of talking films, the decline of theater orchestras put more musicians in the teaching market. Because of the Great Depression of 1929, many performing musicians who played wind and percussion instruments were thrown out of work and turned to teaching.

School orchestras continued to flourish during the early 1930s, and they held a place of prominence in most schools. However, by the end of the 1930s, the number of bands in the schools outnumbered the orchestras (Turner 2001). Band directors continually placed their ensembles in the forefront of the public, marching and performing for both civic and sports events. This frequent exposure drew more public support and interest in bands rather than school orchestras. In addition, methods of teaching school orchestras developed more slowly than band instruction. Band directors often were more successful recruiting students to enroll in their ensembles than orchestra directors as some string teachers developed an elitist attitude by allowing only the brightest and most gifted students to enroll in

their classes. Frequently a school had just one instrumental teacher. Commonly that teacher was a musician who felt more prepared to teach band and therefore favored the school band over the orchestra. Also, very little string teacher training was offered to college students who were studying to become music teachers (Turner 2001). All of these factors contributed to a gradual decline in the number of orchestras in the schools in the 1940s and 1950s.

In the late 1940s and 1950s, professional associations such as the American String Teachers Association (ASTA) and the National School Orchestra Association (NSOA) were formed to respond to the decline in the number of string teachers. However, the very existence of orchestra programs in the schools was threatened by the 1960s. There was a severe shortage of qualified string teachers for those programs that did exist (Turner 2001). In 1963 and 1964, symposia were held in Tanglewood to address the lack of preparation of string teachers and performers in America. The symposia and the premier performance of Suzuki students in 1964 in Philadelphia brought recognition and renewed interest in strings.

By the 1970s, orchestra programs started to build again in the schools. Surveys of instrumental programs beginning in the 1980s through today show that the number of school orchestras and students studying string instruments continues to increase (Hamann, Gillespie, and Bergonzi 2002). Today approximately 16,000 teachers give string instruction in the schools, 7,000 teaching in elementary schools and over 9,000 at middle, junior, and senior high schools (MTD Marketing 2007). The most recent curricular change in school orchestra programs is the dramatic rise of mariachi music instruction. In addition, fiddling, rock, and jazz styles have been introduced to the school orchestra curriculum. Developments in technology also have allowed inexpensive electric instruments and compositional software to expand the experiences of students in today's school string programs.

VALUES OF ORCHESTRA PROGRAMS IN THE SCHOOL MUSIC CURRICULUM

Why is it important for students to have the opportunity to play string instruments in the schools? What do children gain from playing stringed instruments? Answers to these questions are found in the ways school orchestra programs benefit children, enhance school music programs, and increase the value of the school district.

Why have string programs at all? In a study by Russell and Hamann (forthcoming in the *ASTA Journal of String Research*), titled "The Perceived Impact of String Programs on K-12 Music Programs," it was found that 98 percent of all music teachers felt string programs were beneficial: they offered expanded opportunities for student musical, social, and intrapersonal growth as well as enhanced interaction and programmatic development among all music/arts programs—which, in turn, strengthens community, parental, and administrative support for music and arts programs.

Read on for values for the place of string programs in the schools.

The Music Curriculum Is Not Complete without the Orchestra

Hands-on learning is one of the most effective ways children master new skills and knowledge. Educators have known this for years. School music classes offer hands-on learning every day. A wide array of music classes is necessary to meet the varied interests of students. Not all students are attracted to the sounds of band instruments, marching, or singing. The large number of students who play piano or guitar points to this. Also, some children simply prefer the sound of string instruments. Therefore, an arts or music curriculum designed to reach the largest number of students is not complete without offering string instrument instruction. It is like a school district offering math without including algebra or science without including chemistry.

In a music curriculum, the orchestra offers students a hands-on opportunity to recreate some of the masterworks by those composers considered the greatest in music, such as Bach, Beethoven, and Mozart. More of the world's greatest composers have written original compositions for orchestra than for any other type of instrumental ensemble. School orchestras can play many of these compositions. Through performing this literature, students have the opportunity to experience firsthand what the great composers intended, unlike transcriptions or arrangements that have been created for other school ensembles.

Further, orchestras should be a part of the school music curriculum to help meet the national standards. The *National Standards for Arts Education* describe the knowledge and skills that every child should have in the arts, as specified by the Music Educators National Conference (MENC 1994). To meet those standards, the Music Educators National Conference states that schools should offer a varied music curriculum, including band, chorus, and orchestra.

In addition, the national professional association for string teaching in America, the American String Teachers Association (ASTA), has established a national string teaching curriculum for string education in the schools: *ASTA Curriculum: Standards, Goals, and Learning Sequences for Essential Skills and Knowledge in K-12 String Programs* (Benham, Wagner, et al. 2011). This curriculum may be used to model a school string curriculum to validate and defend current curricula as meeting national standards established by both MENC and ASTA.

The school orchestra also enhances school choral programs. By combining strings, choral programs may perform some of the great choral literature composed for chorus and orchestra, such as Handel's *Messiah* and Vivaldi's *Gloria*. Without an orchestra, such masterpieces cannot be experienced as the composer originally intended. A pit orchestra to accompany school drama productions may be formed from a school orchestra. This allows Broadway musical productions, such as *Fiddler on the Roof* and *South Pacific*, to be performed without the expense of hiring an orchestra of professionals or just using a keyboard for accompaniment.

A school orchestra also may raise the performance standard of the band program. Wind players who play in the symphonic orchestra develop additional solo and expressive skills because there are fewer players per part than required in band literature. More playing opportunities for the woodwinds, such as oboe and bassoon, are available as they are used throughout orchestral

literature. These experiences increase the wind students' musicianship and can be taken back to the band to raise its performance standard.

The School Orchestra Increases the Value of a School District

Not all school systems have orchestra programs. One that does shows the serious commitment to excellence in education. Schools with orchestra programs have a unique opportunity to touch their communities through performance. School orchestra performances in the community offer one way for the community to be reminded of the results of their support of their school system. The orchestra program brings recognition to the school system before the public. In addition, families often are attracted to particular communities because string instruction is available in the schools.

Large orchestra programs can increase the cost-effectiveness of school districts, according to the theory of reverse economics. Large music classes taught by a small number of music teachers enable a school system to hire fewer classroom teachers (Benham 1992).

School Orchestra Programs Benefit Students

School orchestra programs offer many personal benefits to students. More children may experience the arts and discover their unique talents—talents that may not be discovered if string instruction is not available, as not all children are attracted to playing other instruments or singing.

Wind players from the band who also participate in the orchestra develop additional solo and expressive performing skills. These same wind students learn to play in keys such as A major that do not frequently appear in band literature and have the opportunity to play firsthand some of the original masterpieces by symphonic composers such as Beethoven and Brahms. Choral students may experience performing the great choral masterworks with orchestra as composers intended. The experience of a choral student performing the *Messiah* with orchestra as Handel intended rather than with a keyboard is a much different artistic experience.

Learning to play a string instrument helps develop a student's personal character and creative expression. String instruments are uniquely complex to play. A sophisticated level of physical and aural skill is required. This degree of effort and concentration required to play a string instrument successfully fosters a child's commitment to a task, as well as responsibility, perseverance, and self-discipline. Playing in an orchestra fosters the development of teamwork and social skills as the student learns to collaborate with fellow students with different opinions, cultures, personalities, and styles. Performing also allows children to experience the rewards and successes of their efforts, which contributes to the development of students' self-concept and self-esteem.

Playing a string instrument enhances a child's quality of life. In an increasingly technological society with the worth of the individual defined by job and income, playing a string instrument helps relieve stress and offers relaxation and comfort. Some of our country's greatest leaders, such as Thomas Jefferson,

Benjamin Franklin, and Albert Einstein, not only made outstanding contributions but also played string instruments for personal fulfillment throughout their lives.

The study of string instruments also may assist students in attending college. Many string scholarships are available as colleges and universities attempt to staff their student orchestras. College scholarships to play in the university orchestra are sometimes available to qualified students who are not majoring in music.

Career opportunities are also available to those string students who pursue degrees in music. String teaching positions both in the schools and privately are frequently available in communities throughout the country. According to the American Symphony Orchestra League, lifelong leisure is offered to string musicians by playing in one of approximately eighteen hundred adult orchestras in the country.

STRATEGIES FOR DEFENDING THE SCHOOL ORCHESTRA PROGRAM

Though there are many important reasons for establishing orchestra programs in the schools, string teachers frequently must defend the continued existence of their programs. Those questioning school orchestras cite factors such as poor administrative support for strings, declining funding for schools, small size of the student body or community, conflicts in scheduling, overly popular band or choral programs, lack of student or community interest, or an increase in graduation requirements. Many resources are available both through the National Association for Music Education (formerly MENC) and the American String Teachers Association (ASTA). Go to the websites of both organizations for materials and strategies to help build your advocacy campaign. The advocacy link at the ASTA website (astaweb.com) includes resources specifically designed for defending the place of string instruction in the schools.

The best strategies to defend school orchestras as important to the music curriculum are built on a strong offense based on five pillars.

Pillar One: Inform and Educate Those in Power about the Values of Orchestra Programs

Those in power to eliminate school orchestra programs include school boards and administrators. If they do not understand the intrinsic value of orchestral instruction to the music curriculum, they will use the wrong criteria when evaluating its importance during times of budget cutting. Those who make decisions regarding programs often are professionals who have not participated in orchestra programs. The job of the string teacher and those who support the orchestra program is to inform and educate regarding the values of school orchestras. Effective strategies to do so include the following:

1. Provide administrators and the school board with a well-developed orchestral curriculum that includes the values of orchestra programs, goals and

- objectives of playing skills taught by grade level with related methods of evaluation, suggested teaching strategies and materials, and a listing of all orchestra activities, including concerts, trips, student handbooks, and community outreach activities.
2. Perform at school board and administrator meetings.
 3. Invite and inform school board members and administrators to all orchestra activities.
 4. Invite school board members and administrators to visit the string classes and rehearsals to see the orchestra teaching and learning activity in process.
 5. Dedicate concerts to the board members and administrators. Ask them to participate in some way, such as by speaking or performing.
 6. Inform teachers and administrators of the results of classroom pullout research. Studies suggest that first- and second-year string students score significantly higher on standardized math and reading tests despite being pulled out of their regular classroom for string instruction (Gillespie 1992).
 7. Develop support for the orchestra program by performing frequently throughout the community. Perform in churches, at local civic service groups (e.g., Lions Club and Kiwanis meetings), for the Chamber of Commerce, at PTA meetings, and in shopping malls.
 8. Design a public relations campaign. Involve elected officials in concerts; apply for civic proclamations that focus on the orchestra; use local cable television, radio, and newspapers to advertise upcoming orchestra events; and distribute free concert tickets and advertising posters to local businesses.
 9. Study printed resources that suggest strategies for developing support for music, such as those published by MENC, music manufacturers, and ASTA.
 10. Appoint parents as local media coordinators to assist in getting the word out about the school orchestra. Listen to suggestions from administrators, teaching colleagues, and parents for effective ways to get the orchestra program before the community.

Pillar Two: Be a Good String Teacher

Being a good teacher develops support for the orchestra program among administrators, students, and parents. Administrators highly value positive feedback about instruction. Understand the pedagogy for teaching string instruments. Be able to demonstrate the playing fundamentals of string performance. Relate well to students. Plan your teaching activities. Be an effective recruiter. Keep up-to-date with the string teaching profession by attending teaching workshops and seminars. Participate in professional music teaching associations and read professional publications. Teach effectively so that the students play well and the concerts sound good.

Pillar Three: Identify and Emulate Model Orchestra Programs

Ask professional colleagues to identify the best orchestra programs in your state. Ask the teachers of those programs how they developed their programs to be successful. Ask them for suggestions for how best to develop your program. Many better programs have common characteristics that may serve as benchmarks: competent teachers, well-organized curriculum, adequate teaching time, effective recruiting process, adequate funding, and a high standard of musical performance. Compare your program with the models. Determine strategies for developing yours into a model program.

In addition, compare your curriculum to that established by ASTA as a benchmark curriculum for string teaching in the schools (*ASTA Curriculum*, Benham, Wagner, et al. 2011). Use the ASTA curriculum to evaluate your current curriculum and as a guide for further curriculum development. Show it to those in power over expanding your program so that they may be informed and make decisions of support based upon a curriculum that is recommended by the national string teaching association.

Pillar Four: Gather Data and Use It Effectively

Two guiding principles can help develop a strong offense to defend the orchestra program: (1) facts and figures often go further than emotional arguments and (2) numbers speak louder than words. Those in power over orchestra programs value data when making decisions. Emotional arguments may be effective in the short run, but the impact of data lasts.

Be aware of research that supports the benefits of music study. The results of studies are reported frequently by professional associations such as the Music Educators National Conference, websites such as supportmusic.com and www.astaweb.com/advocacy, and in research journals such as the *Journal of Research in Music Education* and the *Journal of String Research*. Also gather data about your program that is important to administrators. Figures to determine include the number of students in the orchestra program; the number of students taught per hour by the orchestra teachers; the rate of string student retention and dropout; the number of people in attendance at orchestra events; the equity of teaching loads across the entire instrumental curriculum; and the overall cost of the program, considering salaries, inventory, and materials, to determine the cost per student hour of instruction. Knowing such figures helps in planning strategies to defend the program when budget-cutting time comes. Determine how best to use the data when promoting the values of the orchestra program.

Pillar Five: Organize Support

Organize those in support of the orchestra program to lead the defense. Booster organizations, individual parents, and supporters who are leaders in the community are great resources. Administrators listen to parents. Mobilize them to write and defend the program. With their leadership you will be free to focus more on teaching students rather than defending the life of the program. Your

best defense is a large orchestra program with organized support. Back up the defense with quality teaching, and your orchestra program will be able to touch the lives of students for years to come. See the Advocacy Resource Center at www.astaweb.com/advocacy for additional ideas to organize resources and use media effectively to defend the school orchestra program.

One very valuable resource to help communicate the values of an orchestra program to parents, administrators, and the community at large is the *Essential Elements for Strings Orchestra Director's Communication Kit* (Hayes and Lautzenheiser, 2004). This text contains sample letters, in print and on disk, that present the values of string playing to students, potential supporters, and those in power over the school orchestra program. It is a valuable and user-friendly communication resource with which to advocate and defend your string program.

DEVELOPING COMMUNITY SUPPORT FOR THE ORCHESTRA PROGRAM

School orchestra programs must be a vital, active part of the local community. Voters and administrators who are not exposed to the school orchestra are more likely not to fund it. Orchestra concerts and activities must be before the public frequently, just as the marching band and show choir. If not, those in power—voters, school boards, the public—will not understand the value of orchestra programs.

Draw up a marketing plan so that every segment of the community will be exposed regularly to the orchestra program. Based on the plan, make the program visible throughout the school system and community. Intentionally design events that include senior citizens—the segment of the population that frequently votes down school funding.

The following is a sample list of places in the community for performances:

- Local service organizations (e.g., Rotary Club, Lions Club, Elks Club)
- Churches
- Chamber of commerce meetings
- City council meetings
- School board meetings
- PTA meetings
- Shopping malls, with handouts about the orchestra program
- Special theme concerts performed in the community (e.g., Halloween, patriotic, pops)
- Community parks and neighborhoods
- Lunchtime concerts at local businesses and government buildings
- Nursing homes, senior citizen centers, rest homes
- Hospitals

Organize a public relations campaign so that the community leaders and the general public are regularly informed of the activities of the school orchestra. Some ideas are the following:

- Invite the political leaders of the community to orchestra concerts. Dedicate performances to them. Ask them to emcee.
- Request civic proclamations to publicize the orchestra program (e.g., School Orchestra Day).
- Broadcast performances and special orchestra events on local cable television, the Internet, and local radio.
- Distribute free tickets for concerts to community businesses and community leaders. Ask them to display posters advertising upcoming orchestra events.
- Send special invitations to senior citizens for orchestra events. Organize transportation for seniors to orchestra concerts.
- Ask local real estate, bank, or fast-food restaurants to advertise orchestra events.
- Provide a constant stream of information about the orchestra program to local newspapers, including descriptions of upcoming events with pictures.
- Appoint a parent to become the public relations coordinator to organize publicity for the orchestra program.

School boards and administrators make the final decision regarding funding for programs. Keep them regularly informed of orchestra events. Organize parents to communicate to them the values of the school system offering an orchestra program. Be an excellent teacher who brings recognition to the school system and its supporters.

Organize parent booster support for the orchestra program. Lead and coordinate the parents' efforts. Request that they suggest ideas for developing community awareness and support for the orchestra program. Ask principals, colleagues, and local salespeople for suggestions. Allow parents to organize and carry out orchestra activities to build support for the orchestra program.



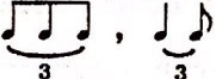
Orchestra directors need to show the community and administrators how an orchestra program benefits students, the school system, and the community. The orchestra program should be a vital part of the community and a source of pride. Then orchestras in the schools will flourish to everyone's advantage.

THE SCHOOL ORCHESTRA CURRICULUM

The school orchestra curriculum specifies the sequential learning outcomes of students in the orchestra program. These outcomes include the fundamental skills and concepts necessary for playing string instruments with musical understanding. Two principal printed resources are most used for creating and evaluating local school district string curriculum, one established by MENC

in 1991 and a more recent one published by the American String Teachers Association (ASTA) in 2011.

The MENC string curriculum publication, *Teaching Stringed Instruments: A Course of Study*, available through MENC (Witt, Angeles, et al. 1991), provides a broad overview of the goals and objectives of tone quality, rhythm and bowing skills, and finger patterns and scales described in six different sequential levels of achievement. See the following table from the publication:

Tone Quality	Rhythm and Bowing	Finger Patterns and Scales
<p>I Demonstrates: correct bow hair tension bow adequately rosined ability to draw straight bow proper contact point between bridge and fingerboard even bow speed</p>	<p>Demonstrates: détaché (legato) two-note slur and tie bow lifts (') right-hand pizzicato rhythms using these note values:  and corresponding rests Imitates bowing exercises</p>	<p>Plays scales: violin—G, D, A viola/cello—C, G, D bass—G, D Plays finger patterns: violin/viola—0 1 2 3 4 0 1 2 3 4 cello—0 1 3 4 0 1 2 4 bass—0 1 4 0 1 2 second and third positions</p>
<p>II Plays forte and piano dynamic levels with good tone Experiments with preliminary vibrato motions Demonstrates proper tone production on all four strings</p>	<p>Demonstrates: staccato three- and four-note slurs left-hand pizzicato (+) hooked bow rhythms using these patterns:  and corresponding rests double open strings</p>	<p>Plays G, D, C scales Plays finger patterns: violin/viola—0 1 2 3 4 cello—0 1 2 3 4 (forward extension) 0 1 2 3 4 (backward extension) bass—1/2 position Plays octave harmonics on each string</p>
<p>III Demonstrates basic vibrato motion Performs crescendo, diminuendo, and other dynamic markings Broadens dynamic range to include <i>pp</i> to <i>ff</i></p>	<p>Demonstrates: detached slurs spiccato (near frog) accent/martelé rhythms using  and corresponding rests $\frac{6}{8}$ meter and rhythms</p>	<p>Plays scales: violin/viola/cello— two two-octave scales bass—one two-octave scale Plays finger patterns: violin/viola— 0 1 2 3 4 0 1 2 3 4 cello—reinforce extensions bass—reinforce third position</p>

Tone Quality	Rhythm and Bowing	Finger Patterns and Scales
<p>IV Demonstrates increased use of vibrato</p> <p>Refines tone production with greater control of bow speed and distribution</p> <p>Demonstrates the relationships between bow weight, bow speed, and bow placement and their individual effects on tone</p>	<p>Demonstrates:</p> <ul style="list-style-type: none"> rapid string crossings with separate bows tremolo trills double stops spiccato (at middle) <p>Understands applications of basic bow strokes to various musical styles</p>	<p>Plays one one-octave minor scale</p> <p>Plays familiar basic melodies in higher positions</p> <hr/> <p>Plays scales:</p> <ul style="list-style-type: none"> one-octave chromatic violin/viola—three-octave major three two-octave major cello/bass—two two-octave major <p>Plays in positions:</p> <ul style="list-style-type: none"> violin/viola—third, fifth cello—second, third, fourth bass—fourth, fifth
<p>V Varies vibrato speed and width</p> <p>Maintains given dynamic levels with varied bow speeds</p> <p>Changes tone quality and dynamic levels by varying bow speed, weight, and placement</p>	<p>Demonstrates:</p> <ul style="list-style-type: none"> rapid string crossings with slurs sul tasto ponticello triple stops (chords) <p>Selects appropriate bowings</p>	<p>Plays scales:</p> <ul style="list-style-type: none"> three two-octave minor violin/viola—three three-octave major cello—four two-octave major bass—three two-octave major <p>Plays in positions:</p> <ul style="list-style-type: none"> violin/viola—second, fourth cello/bass—thumb
<p>VI Demonstrates refined bow control and vibrato, resulting in a high degree of musicality</p>	<p>Demonstrates:</p> <ul style="list-style-type: none"> sautillé ricochet <p>Plays appropriate bowing styles for different periods</p>	<p>Plays scales—all major and minor, four sharps to four flats</p> <p>Plays in positions:</p> <ul style="list-style-type: none"> violin/viola—sixth, seventh, and higher cello/bass—fifth and higher <p>Selects appropriate fingerings</p>

From *Teaching Stringed Instruments: A Course of Study*. Copyright © 1991 by Music Educators National Conference. Used with permission.

The *ASTA Curriculum: Standards, Goals, and Learning Sequences for Essential Skills and Knowledge in K-12 String Programs* (Benham, Wagner, et al. 2011) is a very detailed, comprehensive string teaching curriculum guide. In 266 pages it describes the: (1) skills and knowledge, (2) content areas, (3) end-of-program standards, (4) specific learning tasks, and (5) learning sequences and related assessments for school orchestra programs. Content areas include topics such as body postures, right-hand skills, left-hand skills, aural and ear training, rhythmic skills, creative skills, music literacy, ensemble skills, expressive fundamentals, historical and cultural information, and evaluation. Four levels of learning tasks are used to guide the instruction and assessment of skills: baseline, developing, proficient, and advanced. In addition, a resource list of the major print and media materials for string teaching in the schools is included.

We recommend that both pre-service and certified string teachers in the schools study the *ASTA Curriculum* to (1) educate themselves about what the professional, national string teaching association (ASTA) considers the benchmark for school string curriculum, (2) evaluate current string programs in the schools, (3) give to those in power over local string programs so that they may be informed regarding content and assessment of model programs and to compare their local program, and (4) guide the further development of local string programs. The *ASTA Curriculum* is available for purchase from ASTA via postal mail and astaweb.com.

ENHANCING THE ORCHESTRA CURRICULUM

Many valuable activities can enhance the basic orchestra curriculum. These opportunities broaden and deepen students' musical experiences and understanding, expand the orchestra curriculum, and enrich the community. The national content standards created in 1994 by the Music Educators National Conference also shape the activities of the school orchestra curriculum. The standards specify that school music programs, including strings, provide students the opportunities to sing, perform, improvise, compose, arrange, read and notate music, listen, describe, and evaluate music performances as well as relate music to history and the other arts. String teachers must strive to include these experiences for students in their classes. In Appendix B there are recommended rehearsal strategies for teaching the standards in the school orchestra curriculum. Included among these expanded curricular offerings are chamber music; special interest performing groups such as strolling strings, fiddle groups, and mariachi bands; and involving guitar or harp in the string class.

Chamber Music

Incorporating chamber music in the school orchestra program is extremely valuable. Playing in a chamber group helps develop students' listening skills; musical expression and independence; rehearsal skills; sight-reading skills; sensitivity to balance, blend, and intonation; ability to make musical expressive decisions; and musical leadership. Studying chamber music exposes students to music composed by master composers. A wealth of string chamber music

literature has been composed by Beethoven, Mozart, Haydn, and other prominent composers.

Chamber music in the school orchestra program may be practically incorporated in many ways. One approach is to have chamber music study be the focus of one part of the school year's schedule. Another approach is to devote one day per week of orchestra class throughout the year to chamber music rehearsals so that everyone in the orchestra has an opportunity to play in a chamber group. Rehearsals before or after school may also be held. Featuring student chamber groups on a chamber music concert or including chamber performances on orchestra concerts helps reward students for their chamber music study.

Student chamber music performances can also bring recognition to the school orchestra program when they are given throughout the community. Venues for performances can include local shopping malls, senior citizen centers, day care centers, libraries, and churches. Performances can be given for school boards, school administrators, and state legislatures and at conventions, music educator association-sponsored solo and ensemble festivals, weddings, and civic association meetings.

Scheduling coaches to guide each chamber group in rehearsals is necessary. In addition to the orchestra director, older, more experienced players may coach younger chamber groups. Local private teachers or performers may serve as coaches. Also, other school music teachers such as band directors, general music teachers, or choir directors can coach.

Resources for organizing, coaching, and selecting literature for chamber music groups is available through organizations such as Chamber Music America and ASTA. Texts such as *Establishing School Programs in Chamber Music* (Doan 1994), published by Chamber Music America, and *String Syllabus*, vol. 1 (Littrell 2009), published by ASTA, are valuable resources. Articles about chamber music appear frequently in the *American String Teacher* journal published by ASTA.

Strolling Strings

Strolling strings involves groups of students performing light classical and popular music while walking among an audience. The experience gives students the opportunity to study music that complements their standard orchestral repertoire. Playing in a strolling group helps motivate students to practice because of the increased number of performances and helps develop their sight-reading, memorization, and aural discrimination skills. Strolling also helps develop students' poise and self-confidence.

Strolling groups may serve as public relations tools for both the orchestra program and a school system. Strolling groups typically perform for local civic associations, school administrator meetings, parties, and businesses in the community. Performances by young students entertaining with popular music while strolling have wide audience appeal.

One of the best resources for information about strolling strings is *Getting Started with Strolling Strings* (Gillespie, Gilbert, and Jones 1995), published by the Music Educators National Conference. It gives practical information on how to form a group and prepare a concert in addition to performance tips and repertoire.

Mariachi Bands

Mariachi folk ensembles continue to develop in schools across the country. One of the most recent developments in string education is the addition of mariachi folk music to the school orchestra program. Because mariachi groups include violins, they are yet another way to expand the traditional school orchestra curriculum. Mariachi ensembles typically consist of guitars, trumpets, violins, percussion instruments, vihuela (a type of guitar), and the six-stringed guitarrón. Performances of mariachi music involve both singing and playing. Melodies are either sung or played by the violins or trumpets while the other instruments accompany. Mariachi literature consists of Mexican folk songs such as "Las Mananitas Tapatias," "La Valentia," "La Negra," "Guadalahara," "Las Altenitas," and "La Cumparsita."

The music industry and professional music education associations are involved in creating mariachi resources for teachers. MENC: The National Association for Music Education now produces monthly an *MENC Mariachi* on-line newsletter to support mariachi educators in the schools. Publishers are beginning to offer mariachi music especially composed to give string students and their teachers the opportunity to perform, such as *Mariachi Philharmonic* from Alfred Publishing Co.

Two articles published in the *American String Teacher* are excellent resources about starting mariachi groups in the schools: "The Estudiantian of East Los Angeles" (Ensley 1991a) and "Engaging Interest in Strings through Mariachi" (Fogelquist 2001).

Hispanic culture is rapidly spreading across America. Establishing mariachi ensembles in the schools is one way to honor Latin American and Hispanic students, expose others to the music of different cultures, and enhance the orchestra curriculum.

Fiddle Groups

Fiddle tunes such as "Cripple Creek" and "Bile 'em Cabbage Down" are part of our rich American folk tune culture. Organizing students to form a group that exclusively performs fiddle tunes gives orchestra students an additional experience within the school orchestra curriculum.

The size of a fiddle group can vary greatly. Membership can range from two to the entire orchestra string section. In addition to violins, violas, cellos, and double basses, instrumentation may include guitars, mandolins, banjos, autoharps, and keyboard. Fiddle groups need instruments to play the tune, a bass line, and harmony.

Many resources include fiddle tunes. Printed tune books and orchestral arrangements are available from most of the major string publishers. Videos that feature prominent bluegrass, Celtic, and old-time and folk music are accessible. Websites and fiddle journals can be used to find fiddle literature and to learn about the art of fiddling.

Fiddle groups may perform on a traditional school orchestra concert and as a separate organization performing throughout the community, much like

a marching band or show choir. Diverse audiences are attracted to fiddle music. Fiddle group performances attract interest in the school orchestra program, enrich students' experiences of playing string instruments, and help develop administrative and community support for the program.

Additional Alternative Music Styles

A current buzzword term in the string profession is "alternative style." It was first coined in the mid-1990s by the American String Teachers Association (ASTA) to refer to any non-classical Western art music involving string instruments. ASTA became the forerunner in promoting string playing in styles of music other than classical solo and orchestral. These styles today commonly include rock, pop, dance, and jazz. They can all be used to enhance the traditional school orchestra program.

Developments in technology have allowed all kinds of electrified string instruments and accessories. This has fostered the addition of string instruments to rock-and-roll bands, jazz groups, country, and dance and folk ensembles. The cost of electrified string instruments has dropped to the extent that now many orchestra programs purchase them to augment styles of music in the traditional string curriculum. Leaders in this field for enhancing the school orchestra program with alternative styles include: Darol Anger, Matt Glaser, Randy Sabien, Julie Lyonn Liebermann, Martin Norgaard, Christian Howes, Bob Phillips, and Mark Wood. Explore their websites and others to get their help. Attend the annual national ASTA conference and the alternative styles music, performances, and educational sessions. Print materials also have been created within the last few years to make this type of music available to school orchestra programs and those teachers not experienced with it. See the resource list at the end of the chapter to get rockin' in your school orchestra program.

REFERENCES

- American String Teachers Association. 1998. *Standards for the preparation of school string and orchestra teachers*. Bloomington, IN: American String Teachers Association.
- Benham, John. 1992. Forestalling budget problems. *Instrumentalist* 47:12-17.
- Doan, Gerald. 1994. *Establishing school programs in chamber music*. New York: Chamber Music America.
- Ensley, Jeanette. 1991a. The estudiantian of east Los Angeles. *American String Teacher* 46 (4):81-82.
- Benham, Stephen, Mary, Wagner, et al. 2011. *ASTA Curriculum: Standards, goals, and learning sequences for essential skills and knowledge in K-12 string programs*. Van Nuys, CA: Alfred Music Publishing.
- Fogelquist, Mark. 2001. Engaging interest in strings through mariachi. *American String Teacher* 51 (2):50-58.
- Giddings, Thaddeus, and Joseph Maddy. 1923. *The universal teacher*. Elkhart, IN: Conn Limited.
- Gillespie, Robert. 1992. The elementary pull-out crisis: Using research effectively. *American String Teacher* 42 (2):79-81.