



Brass Techniques and Pedagogy



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Brass Techniques and Pedagogy is intended to serve as a guide for the band music educator. The text is written with the non-brass playing music education student in mind and focuses on developing beginning levels of brass technique alongside a more expansive understanding of brass fundamentals and pedagogy. While a basic level of technical proficiency will be developed throughout this text, the ability to teach beginning to intermediate brass players effectively with sound pedagogy is the primary purpose of this text.

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PART I
GENERAL BRASS
TECHNIQUES AND
PEDAGOGIES



[Prelude: Introduction to Brass Techniques
and Pedagogy](#)

A brief explanation of how to use this book.

A Brief History of Brass Instruments

Brass instruments have a millennia old tradition and history.

Getting Started with Posture, Breathing, and Embouchure

Before picking up the instrument, it is critical to have fundamentals of the body in place.

Tone Production Fundamentals on the Mouthpiece

The mouthpiece serves as the starting point for good brass technique and tone.

Brass Acoustics

Understanding how brass instruments function helps us to understand how to play and teach them.

Tone Production Fundamentals on Brass Instruments

Brass instruments have a shared set of fundamentals that dictate effective tone production and instruction.

Pitch and Intonation

Pitch control is a constant demand for brass players.

Articulation on Brass Instruments

While each instrument has its own idiosyncrasies, the fundamentals of articulation transfer across instruments.

Instrument Care

With proper care and maintenance, brass instruments can serve the musicians for decades.

Advanced Techniques

As music educators, students will approach you with questions

about techniques that you may not be able to perform as novice brass players.

Prelude: Introduction to Brass Techniques and Pedagogy

Introduction to Brass Technique and Pedagogy

Brass instruments include a broad family dating back thousands of years in nearly every major culture of the world. The term *brass* is somewhat deceptive, as brass instruments can be made of any hard material, including animal horn in the Hebrew shofar, termite-carved eucalyptus for the Aboriginal didgeridoo, snail shell for the conch, spruce in the Swiss alphorn, and PVC in the modern-day P-Bone.

There is one element that characterizes all brass instruments. Unlike other families of instruments, the sound of the instrument initiates from the human body, specifically, the vibration of the lips as air passes between them. The mouthpiece serves as a collector of this buzzed sound, and the body of the instrument amplifies and clarifies this timbre to create what we characterize as a brass sound.

This shared trait allows brass instruments to share many characteristics in terms of their technique. All brass instruments use the same overtone series, which dictates how the instrument is manipulated in performance. All valved or rotoed brass instruments (all standard band and orchestral brass except the trombone) also utilize the same fingering systems. These commonalities allow for an ease of concept transfer between brass instruments. In essence, once you learn the concepts for playing one brass instrument, you can easily transfer those ideas to other brass instruments.

As a music educator, you can use these similarities to help you to teach your students. While each instrument has its own details and challenges, many of the concepts are transferable. Throughout this text, an emphasis will be placed on these similarities which you can

use to diagnose problems, propose solutions, and provide quality instruction. Specifically, two concepts will be returned to over and over:

MORE AIR

Air is critical for all brass playing. It should be free flowing and relaxed, starting from deep in the torso. When breathing as a brass player, it is critical that the throat is open and that the breath is deep. On the exhale, brass players focus on steady air usage supported by core muscles.

LESS TENSION

Tension is the enemy of smooth flowing air. While there is a certain amount of tension that is needed to play brass instruments, excess tension inhibits full tone production. The entire air column needs to be relaxed, from the throat through the oral cavity to the lips. Even the arms, wrists, and fingers should remain without tension to allow for greater dexterity and positive ergonomics. Too much tension can not only affect tone but also lead to muscle, tendon, skeletal, and nerve injuries. Reducing tension when playing positively impacts tone production and ensures the long term health of brass players.

This text approaches brass playing from two perspectives. First, you will be guided through a series of exercises to develop your own **technical** development as a brass player. This progression is the standard for most brass players, starting with tone production, moving to pitch control, and continuing with flexibility and dexterity studies. The goal is that after a semester of study, you have competencies that are typical after the first year of study by a middle school student. The course is set up with an expectation of at least three to four weeks on each standard brass instrument (trumpet, horn, trombone, euphonium/tuba).

Second, this text will guide you in your **pedagogical** knowledge as an instructor of brass students. While your technical skills may be limited, you need to be prepared to teach brass students with solid fundamentals. The great news is that while each instrument has its own idiosyncrasies, many of the concepts you will teach are **brass**

concepts which are transferable across instruments. While you are developing your own technical abilities, this text will also be pointing out common issues experienced by young brass musicians and problem solving steps to take in order to diagnose and correct those issues. If this text is being used as part of a class, you are encouraged to work with your peers to practice instruction. Your conceptual knowledge of brass techniques will likely exceed your technical ability if you are not a brass player already.

This book is organized to differentiate the technical exercises for your own brass development and the pedagogical concepts for your teaching practice.

Exercises

Exercise boxes will include activities you should do as a developing brass player to establish technique and promote brass fundamentals. Many of these include activities that should become part of daily practice for warming up or sustaining strength and flexibility as a brass player.

Common Errors

Common error boxes will help you diagnose and correct common issues of beginning brass players. Throughout this course, those common errors could be done by your peers or you! In some cases, these errors will simply address what you should pay attention to in order to avoid the development of bad habits. In other cases, these error boxes will point to specific activities or exercises to correct problems or develop competencies.

This book is divided into four main sections.

- [**General Brass Techniques and Pedagogies**](#) discuss common concepts that extend across all brass instruments. As mentioned earlier, brass instruments are variations on a theme, and that theme is built around commonalities in acoustics, mechanics, and tone production. This section is perhaps the most important for the music educator who is not a brass player, as these concepts will extend across all brass instruments and reflect the most common issues beginning to intermediate brass musicians have. Mastery of this content will allow you to be effective in the ensemble setting when working with brass students.
- [**Instrument Specific Techniques and Pedagogies**](#) discuss the nuances between different brass instruments. While at the 10,000 foot view, these instruments are very much the same,

they each have nuances that become particularly important as students transition from beginning to intermediate player which impact technique, intonation, and dexterity. This section can serve as a reference point for you in your own development and that of your students.

- **[Guided Practice Lessons](#)** provide daily lesson outlines that you can use between class meetings. While these are not intended to be repeated for multiple days, they provide a framework for your own development as a brass musician.
- **[Resources and Activities](#)** provide a range of materials that will be used throughout the text. All of these materials can also be used as pedagogical materials to distribute to your own students.

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With that, let's toot our own horns and blast the trumpets!

I. A Brief History of Brass Instruments

Significant portions of this chapter were adapted from Steven Maxwell's Teaching Low Brass, accessed at <http://newprairiepress.org/ebooks/22> under a Creative Commons license 4.0.

It is important to understand the history of brass instruments as an educator for a few reasons. First, students will come to you with questions and strange instruments from the back of closets, and a basic understanding of history will allow you to better respond to the gnarled family tree that makes up brass instruments. Second, the history of an instrument will help you to understand the musical role of the instrument and why it functions as it does in various ensembles today. Third, learning the history of brass assists you with understanding the technical and physical limitations and advantages of the instrument. Finally, knowing the history of an instrument helps you to understand the literature that is available for the instrument.

Early brass instruments were made from hollow items found in nature such as termite hollowed eucalyptus or conch shells. Thousands of years ago, straight and curved trumpets were constructed of a variety of materials including wood, bronze, and silver, such as the Greek salpinx and the Roman tuba, lituus, and buccina. Other early brass instruments were flared horns made of bronze or animal horn, like the Scandinavian



Carved horn shofar

lur, the Roman cornu, and the Hebrew shofar (which is still used in Jewish ceremonies today).

1400-1600



Soprano, Alto, Tenor, and Bass Sackbuts

During the Renaissance, brass instruments began to develop into the instruments we know and recognize today. The earliest known curved trumpets were developed in the early 15th century, which was followed by the folded and slide trumpets. These early instruments had wide interval spacing between notes due to their acoustic characteristics (which still influence brass instruments today).

The trombone developed out of the slide trumpet around 1450, referred to as the sackbut. While structurally different from the modern trombone, the sackbut revolutionized brass instruments by allowing for chromatic performance. It also allowed for the development of an instrument with a practical tenor range, which developed into the modern trombone today.

During this period, the trumpet and horn existed, but they were considered functional, non-musical instruments. European courts maintained corps of trumpeters used for signal heralding. These ensembles involved up to five-part music, but were limited in their harmonic variety due to the construction of the non-chromatic instruments. Players tended to specialize in high or low register, and music with artistic merit for brass was scarce. The horn existed at this time as well, typically used for hunting to allow for communication over distances outside. The horn began to be presented at this time in its curved and helical design.

By the end of the 1500s, brass instruments (particularly the sackbut) began to be used within both like instrument and mixed ensembles. In 1597 Italian composer Giovanni Gabrieli, then the organist at Saith Mark's Cathedral in Venice, composed the earliest known piece to call for specific brass instruments, *Sonate pian'forte*.

1600-1750

Brass instruments began to be used more extensively in the 17th century as ensemble instruments. Many of the instruments were used in outdoor performances or as a supportive voice in church choirs. Brass instruments had little use as solo instruments. During this time, brass instruments could play chromatic passages through use of the high overtone series (which can be quite difficult to perform) and through the use of 'stopped' notes on horn.

Sackbuts were regularly employed in a variety of ensembles, such as court and municipal bands, where it was common to combine them with double reed shawms. The sackbut was also used in ensembles where they were to blend with softer instruments or voice to improve projection. A vocal-like style of playing developed for the trombone that contrasted the period's fanfare trumpet style. By the mid-18th century, solo pieces for alto trombone were written by Christoph Wagenseil, Johann Albrechtsberger, Michael Haydn, and Leopold Mozart. With the sacred associations of the trombone from the previous century it was natural for composers to utilize trombones to help portray religious or supernatural effects in operas of the late 18th century. Two of the most easily recognizable examples of this were in Wolfgang Amadeus Mozart's *Don Giovanni* and *The Magic Flute*.



In order to change the key of a horn, allowing for a different pitched partial series, crooks of various lengths needs to be added to the instrument.

During the 18th century, the horn developed as an instrument capable of musical expression, rather than as a utilitarian or novelty instrument. A Viennese instrument maker, Michael Leichnambschneider, began to put terminal crooks on horns in order to play them in different keys around 1700. In 1705, Reinhard Keiser added the horn to his orchestra for the first time in his opera, *Octavia*, and Georg Frederic Handel added two horns to *Water Music* in 1717. The horn played

mostly in its upper overtone series to allow for diatonic movement. Around 1750, a hornist in Dresden, Germany developed techniques for hand stopping that allowed for chromatic playing of the horn in the lower register, and this soon became a standard practice for horn players. The first major horn concerto was written by Franz Joseph Haydn using this chromatic practice in 1762.

The trumpet developed as a virtuosic instrument during the first half of the 18th century, reaching its peak in the compositions of Johann Sebastian Bach, originally written for trumpet virtuoso Gottfried Reiche. This clarino technique used the extreme upper register of the trumpet, often in a soloistic capacity. By the second half of the 18th century, tastes for this technique changed, leading to a decline in the virtuosic presentation of the trumpet in ensemble music during the Classical period.

1750-today

The 19th century was the period of greatest development and modernization of brass instruments. The vast majority of literature for brass instruments performed today was written from the late

19th century through today. This is largely due to developments in brass instruments starting in the late 1700s that allowed for greater ease of chromatic manipulation and expressive performance. By the Classical period, trumpet and horn were standard fixtures of the orchestra with trombone and tuba following in the 1800s.

The keyed trumpet was developed by Viennese trumpeter, Anton Weidinger, to allow for chromatic performance on trumpet around 1770. While this instrument was short lived due to problems in tone consistency, it opened the possibility of the trumpet to be used as a chromatic solo instrument, leading to its first major concertos by Franz Joseph Haydn in 1796 and Johann Nepomuk Hummel in 1803. In 1818, the first horn rotor was patented by Heirich Stölzel and



Keyed bugles had holes cut in their tubing, similar to a modern saxophone, to allow for chromatic manipulation of pitch.

Friedrich Blümel in Germany, and around 1826, German instrument makers began producing valved trumpets. The development of rotors and valves made instruments far superior to hand stopped or keyed versions of brass instruments due to their consistency and dexterity, and were quickly adopted by composers. Hector Berlioz was the first to use these new instruments in his *Overture to Les Francs-juges* in 1826, followed by the use of valved horns in Fromental Halévy's opera, *Le Juive*. By 1835, the first tuba, pitched in F with five valves, was invented by Berlin instrument makers Wilhelm Wieprecht and Johann Gottfried Moritz, followed by the earliest euphonium in 1843 by Sommer of Weimar.

Throughout the 20th century, many variations on the standard brass instruments have been made. Numerous keys of trumpets have been created, including the Bb, C, Eb, and piccolo trumpet. Each of these alter the timbre of the instrument and provide various advantages to the performer. The horn has added a second “side,” allowing the same instrument to play in F and Bb. The double horn,

as it is termed, allows for greater flexibility and precision in performance. The trombone frequently includes an F attachment, which is similar to the Bb side of the horn to allow for greater ease in performance with less slide movement. The euphonium and tuba continued to be developed throughout the 20th century by including various configurations, notably including 4th and 5th valves or rotors that provide for greater ease in pitch manipulation and dexterity.

Various instruments have come and gone throughout this time period as well. These include novelty instruments such as the double-belled euphonium, alternatives to modern instruments such as the saxhorn, and various bass instruments including ophicleides.

With better designed instruments and the development of musicians with increased technical and musical ability, trumpet, horn, trombone, and tuba became standard parts of the orchestra with increased exposure within the large ensemble and numerous solo works. At the same time, the concert band developed with the brass section playing a significant role with the inclusions of sections of trumpets, cornets, horns, trombones, euphonium/baritones, and tubas.

2. Getting Started with Posture, Breathing, and Embouchure

While each brass instrument has its own peculiarities, many elements are common across all brass instruments related to posture, breathing, and embouchure. Within each instrument, we will discuss variations on the fundamentals that follow, but all brass instruments utilize the same elements. It is important as a teacher of brass students that we emphasize these fundamentals for all students before they have the instruments in their hands and continuing throughout their brass playing careers.

Posture

The two most important aspects of all brass playing regarding posture are that the torso stays symmetrical and well balanced and that the entire body is relaxed and comfortable. This open position allows for free breathing that is critical for all brass playing. If the arms are kept close to the body or the back is collapsed, the lungs are less able to fully inhale with ease, resulting in a stuffier sound, limited sustain, and greater fatigue. Beginning players should have proper posture emphasized from the first lesson on, so that habits are established that become automatic. Importantly, proper posture should be established before introducing the instrument, and the instrument should always be brought to the body that is already in proper posture. Beginning players will often base their posture off of the instrument's position, which can lead to twisted torsos

and collapsed bodies that inhibit good air flow and tension-free manipulation of the instrument.



Proper posture on brass instruments requires a well-balanced, open torso and relaxed arms that allow for free breathing and movement.

Torso

Symmetrical and vertical posture in the torso establishes a foundation for all brass (and woodwind) playing. Before students have instruments in their hands, teachers should establish proper posture. Start by having students stand, as they are less likely to allow the back to collapse. An emphasis should be placed on

vertically aligning shoulders, hips, and arches of the feet while keeping the spine centered and extended. The body always remains symmetrical without any twisting or favoring of one side of the body over the other. Once seated, the shoulders should stay aligned with the hips, allowing for a comfortable, tall orientation of the spine. The head should be held comfortably up so that the chin is pulled away from the throat. One exercise that can be done is to place the hand on top of the head and envision pulling an invisible string upward, as though suspended like a marionette.

Proper torso alignment can also be established by having the students stand with their feet shoulder width apart. Allow the body to collapse at the waist, with the arms hanging to the ground. The students should slowly roll their body up on a slow count. Every fourth count, a different part of the body should be in place.

Shoulders are a frequent issue for beginning brass players. The upper torso should be open by having the shoulders rolled back with relaxed arms. At the same time, the shoulders should not be hyperextended by bringing the shoulder blades together, creating tension across the front of the upper torso. One exercise to establish proper shoulder placement is to have students start with their shoulders collapsed forward. They should then roll their shoulders up and back, stopping once they are comfortable. This action will create a naturally open, tension-free shoulder posture.

In brief, the key considerations for proper posture include the following:

1. Hips lined up vertically over the arch of the foot
2. Base of the neck lined up vertically over the hips
3. Shoulders comfortably rolled back allowing for the open presentation of the upper torso.

4. Head raised comfortably with slight elevation of the chin.



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Common Issues for Torso Posture

Collapsed back-Students frequently will slouch, allowing the lower back to collapse and the shoulders to come forward. This posture diminishes lung capacity and limits full breath support. Related issues include elbows or the instrument resting on the leg. Visual cues (e.g. marionette string on the head) and posture establishing exercises (e.g. rolling the body into position) can help to reinforce proper posture.



Exaggerated posture-Beginning players seeking to please their teachers often will exaggerate their posture by pushing the upper torso forward, pulling the shoulders back too far, and bending the head back to create tension in the throat. This pushes bell front instruments above a position parallel to the floor, akin to what is often seen in marching band. These over-exaggerations lead to increased tension in the back, neck, and arms that can inhibit relaxed air support and easy manipulation of the instrument.. For these students, the roll up exercise can be very effective while the teacher watches to remind students of where to stop their unroll.



Arms and hands

For all instruments, relaxed arms and hands with limited tension are critically important for both proper technique and good ergonomics. When students introduce tension into their elbows, wrists, and fingers, they create issues that inhibit fluid performance and promote long term health issues such as muscle soreness, tendonitis, and focal dystonia.

As a general rule, sharp angles should be avoided, especially in the wrists and fingers. Attention should be given to ensure that arms and wrists do not collapse. Good posture allows for space between the arms, the body, and the instrument.

For a neutral position, the upper arm should be comfortably away from the torso of the body so that the rib cage can naturally expand when deep inhalations are made. Shoulders should be relaxed and fall naturally down, and there should be space between the elbows and the musician's sides. When taking a deep breath, the arms should not need to move.

While the exact positioning of fingers and wrists differ from one instrument to the next, there are few considerations that apply to all wind instruments.

- Wrists and fingers should be positioned in continuous lines and curves. No severe angles should be present.
- The hand forms a C shape when you play. Fingers should not be completely flat, and for brass instruments, the tips of the fingers should be used on top of the valves

Common Issues with Arms/Hands

Fly-away arms-Beginner players will often exaggerate their arm placement, positioning the arms close to parallel to the ground. This posture inhibits good air production and can lead to repetitive stress injuries. Students should

drop the arms to their sides and return to playing position, with attention to allowing the arms to naturally hang.





Collapsed arms or wrists-Students will often allow their arms to collapse against their rib cages or collapse the wrists in to their instruments. This posture limits air support and can lead to stress injuries. Students should set their instruments down and allow their arms to hang at their sides. They should take note of how the arms naturally hang away from the rib cage and should seek to imitate that posture. Regarding collapsed wrists, specific details for correction of hand position can be found in discussions of individual instruments, but in general, there should be a continuous curve through the wrists and fingers without any right or acute angles. Attention should also be given for flat fingers which slow down agility.





Breathing

When playing brass instruments, musicians should focus on deep breathing that allows for the full expansion of the rib cage. This approach to breathing is different than typical breathing in life, which tends to use just the upper portions of the lungs and require little expansion of the rib cage. It is critical that beginning brass players are taught proper breathing for sustaining full tone of their instruments, and that regular exercises for introducing proper breathing and expanding lung capacity are a part of warm up activities.

Technique

Brass breathing should focus on maintaining open, relaxed airways on both the inhale and exhale. The oral cavity and throat should be open (think “ahhhhh”) and expansion should be felt in the across the width of the rib cage and down in the lower torso. The shoulders should not move when breathing deeply.

The exhale should come immediately without pause and should require effort. Again, the oral cavity and throat should remain relaxed, though a firmness should be felt in the abdominal muscles when exhaling. Emphasis should be placed on a full exhale which leads to the need for immediate inhale.

All breathing on brass instruments should take place through the mouth.

Whenever you are practicing breathing techniques, make sure to be seated. It is very easy for students to experience light-headedness when developing proper breathing technique because they are frequently not accustomed to deep breathing, which alters oxygen intake.

Breathing Technique Exercises

Yawn breathing—When first introducing brass instrument breathing, students should be instructed to yawn. While the position of the jaw is not consistent with good brass playing, the expansion of the rib cage and dropping of the lower abdomen is consistent with good brass playing. For most students, this is one of the few times in which full lung capacity is engaged.



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Timed breathing-To allow students to develop awareness of their own breathing and to start to build capacity, timed breathing exercises should start every practice session. Students should be seated during this activity, at least at first, to promote proper posture and to ensure that students do not fall over if they become light headed. Initially, the time frame should be short and balanced with 4 counts breathing in, and 4 counts breathing out. On each inhale, students should focus on reaching their maximum lung capacity while feeling rib cage expansion and the drop of the stomach. On each exhale, students should make an effort to fully exhaust their breath. There should be no pause between inhale and exhale. As students become more comfortable with the activity, times can be extended to 8 and 16 counts of exhale, with an emphasis on continuous and steady intake and exhale of air.



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Paper airplane—This exercise emphasizes the reversal of inhale to exhale and the ability sustain both inhale and exhale smoothly. Imagine that you have a paper airplane between your thumb and first finger. Hold the paper airplane in front of your face. As you pull your hand back toward your ear to throw, take a deep breath in that allows for the expansion of the rib cage and drops the lower abdomen. Immediately “throw” the airplane, turning your air from inhale to exhale and steadily blowing the airplane forward. When you are out of air in your lungs, immediately bring the airplane back again while breathing in and repeat

the exercise. Make sure that you do not pause between inhale and exhale.



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Breathing Capacity Exercises

Three sips-This activity is a variant on timed breathing to build on inhale capacity. You will still do a controlled inhale over 4 counts, but instead of immediately turning to the exhale, pause, take 3 sips of air, and then do a controlled, timed exhale. Each time you do the 3 sips, you should feel expansion in your rib cage that should border on discomfort.



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Santa-This activity focuses on increasing air exhale capacity. It begins with a timed inhale of 4 counts, followed by 3 loud “Ho, Ho, Hoooo” with the final syllable being sustained fully for 2 counts. Emphasis should be placed fully expending all air after 4 counts, and being able to fully fill the lungs after 4 counts. Once students can reliably inhale for 4 counts, the inhale should be shorted to 2 counts, and eventually 1 count.



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Breathing Control and Resistance Exercises

Stiff breeze—This exercise allows for the visualization of steady, controlled exhale. Hold a tissue in front of the face with the thumb roughly 2 inches from the tip of the nose. Inhale with a full breath, and then exhale on a “puuu” syllable. The emphasis should be on blowing the tissue as flat as horizontal as possible without varying air speed or direction. Once this able to be done close to the face, the hand can be moved further away to increase attention on steady air speed and direction. This activity can also be done with the mouthpiece to focus on air speed and direction.



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Sizzle—This exercise allows for controlled air exhale with the resistance that naturally occurs because of the embouchure and mouthpiece. When exhaling, articulate and sustain the consonant “Tssss”. The focus should be on a continuous hiss without change in pitch or tone. Continue until air is completely expended from the lungs. As students continue to engage in this exercise, they should focus on extending the exhale to 15 seconds or more.



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Common Issues for Brass Breathing

Shallow breathing-Shallowing breathing is can be diagnosed in many different ways. The pitch of the inhale is very high with a raspy tone, indicative of a tight oral cavity. There is also limited rib cage expansion as the breath is controlled by the upper chest as opposed to the lower

abdomen. Often, students will raise their shoulders when they breathe, which further inhibits deep breathing. To fix this problem, the technique exercises listed above should be done, with a focus on expanding the rib cage. The yawn exercise in particular is a great one for teaching students how deep breathing feels.



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Weak exhale—Students will often take a strong inhale, but experience issues with having a controlled, strong exhale.

Sound quality is the clear give away for this issue, as the tone on the instrument will be very airy and pitch and tone will fluctuate. Students will often also lose good posture, with the shoulder and back collapsing on the exhale. The sizzle exercise is a great diagnostic tool, as the teacher can hear whether tone quality fluctuates. The same exercise is also good for developing the student's awareness of their own technique, which can lead to better technique. Attention to proper posture is also key.



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Embouchure

The embouchure refers to the positioning of the lips, jaw, and oral cavity. Unlike other instruments, the sound of brass instruments is created by the vibration of the musician's body, specifically their lips. The instrument serves to focus and amplify the sound of lip vibration, which is called *buzzing*. Just like posture and breathing, the key to proper embouchure is limiting tension and allowing for free flowing air. While each brass instrument has a slightly different embouchure, the fundamentals for all brass instruments remain the same.

Jaw placement

While there is not a single “correct” embouchure, most successful brass musicians position their upper and lower jaws evenly vertically or with a slight underbite. This is not to say that a student with a severe under or overbite cannot play a brass instrument, but they will need to work on maintaining balance between the upper and lower lip to allow for free flowing air and relaxed buzzing. An ideal embouchure will be flat from the base of the nose to chin. The teeth are slightly separated, with the space between the lips increasing the larger the mouthpiece becomes. Attention should be placed to ensure that the jaw muscles by the ears remain relaxed and are not clenched while playing, especially when playing in the upper register.

Jaw Placement Activities

Vowel shaping-As we cannot see into our students' mouths as they play, the use of kinesthetic reminders is useful in brass playing. Have the students sing or sustain the syllable, "Ahhhh." Then have the students sustain the syllable, "Eeee." Discuss the differences they feel in their jaw and tongue placement as well as the tension they feel throughout their oral cavity. Identify "Ahhh" as the proper placement of jaw and tongue.

Face shaping-Have students place their hands on their cheeks so that their finger tips are positioned between their upper and lower molars. They should feel slight space between the back molars with no tension in the jaw muscles near the ears. This activity can be done at the same time as vowel shaping.



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Lips

The lips create the sound of all brass instruments, so attention should be placed on maintaining a firm but relaxed presentation of the lips. A good brass embouchure will provide a fleshy pad for the mouthpiece. The center of the embouchure, inside of the mouthpiece, should be relaxed with as little tension as possible. Each brass instrument's embouchure is slightly different, but typically, there should be a roughly even balance of top and bottom lip within the mouthpiece. If the muscles in the center of the mouth

are used to control the embouchure, tone will become thin and bright.

The corners of the mouth provide for the control of the embouchure. Corners should be firm, allowing for the center of the embouchure to remain soft. The corners of the mouth control two aspects of brass playing: tone quality and pitch. The tighter the corners are, the brighter the tone and higher the pitch. Beginning brass players should be regularly reminded to control their sound from the corners of the mouth, allowing for center of the mouth to remain fleshy, allowing for full buzzing.

The presentation of the proper brass embouchure is a flat line. Care should be taken that students neither smile nor frown when playing, as these expressions introduce tension into the lower lip.

Exercises for Setting Up the Embouchure

Deep breath exhale-The embouchure should feel natural and relaxed. One way to set the embouchure is to have the students take a deep, yawning breath in and then close the lips on the exhale, allowing the air to escape through the nose. When doing this exercise, students should be reminded to stop closing once the lips touch. Their tendency will be to continue to close the jaw and clench the lips together.

Hum-Another way to establish the embouchure initially is say, “Hmmmmm.” The hum should be a loud, buzzy hum, encouraging the students to maintain an open oral cavity,

relaxed jaw, and just-touching lips. Similar to the deep breath exhale exercise, students should be reminded to stop closing the lips as soon as they touch.

Pea spitting—The final step in setting up a proper embouchure is establishing the aperture, which is the hole in the embouchure through which air moves. Keeping this part of the embouchure focused yet relaxed is the single most important part of the brass embouchure as it is the part that creates the buzz sound. Once the embouchure is established, students should envision that they are spitting peas, allowing for a fast stream of air to move through a focused space in the embouchure. They should be reminded that if they pinch the lips together, the “pea” will be smashed. Alternately, they can also articulate the diphthong “pff” to create the same effect if you prefer not to encourage thoughts of spitting. This can be combined with the Hum exercise as well, making the syllable, “Hmmmph.”



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Introducing the mouthpiece



Students should demonstrate the ability to make the proper embouchure before introducing the mouthpiece for two reasons. First, the mouthpiece blocks the teacher's view of the aperture of the embouchure, making it difficult for the teacher to see errors. While mouthpiece visualizers can be used, the need to sanitize them between students makes them impractical for group instruction. Second and more importantly, students have the tendency to adjust the embouchure to match the mouthpiece, making it feel "right." This often results in erroneous embouchures that force too much lip into the mouthpiece or introduce tension through the center of the embouchure.

The mouthpiece should be introduced separate from the instrument. When playing just the mouthpiece, the shank of the mouthpiece should be held between the thumb and first finger. Care should be made to keep the wrist relaxed so to discourage the introduction of lateral pressure on the embouchure. The mouthpiece should be placed gently on the embouchure with the

middle of the cup centered on the aperture of the embouchure. Student should be reminded to set the mouthpiece lightly on the embouchure, avoiding pushing it into the face or adjusting the embouchure once the mouthpiece is placed.



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Details for creating first sounds on both mouthpiece and the instrument will be discussed in the next chapter.

Common Issues for Embouchure Setup

Smashed aperture—Students will have a tendency to pinch the middle of the embouchure together, either pucker as though to kiss the mouthpiece or bunching the chin up under the mouthpiece. Both of these situations limit the free buzzing of the lip, inhibit full tone, and can lead to long term muscle problems due to tension. Return to the Hum or Deep breath exhale activities without the mouthpiece to establish proper embouchure.



Cheek puffing-While some brass players naturally experience some cheek puffing when they play (most famously, Dizzy Gillespie), in general, cheek puffing should be discouraged as it is sign of limited control of the embouchure from the corners of the mouth. When students puff their cheeks, they place undue stress on the center of the embouchure, leading to poor tone and control, quick fatigue, and possible muscle damage. The Pea spitting activity can help to discourage cheek puffing. Additionally, once the student is playing the instrument, playing long tones in the lower register can help build muscle control that will come into play in the upper register where cheek puffing often occurs.



Mouthpiece placement-Ideally, the mouthpiece should be centered on the embouchure both horizontally and vertically (though there are some individual instrument differences). Individual students may have specific reasons for misplaced mouthpiece placement, including dental peculiarities, skeletal abnormalities, and pronounced under or overbite, but generally, most students should be able to play with the mouthpiece centered on the embouchure. Misplaced mouthpieces can result in quick fatigue and tone and control issues as one side of the embouchure is more responsible for control than the other. It is critical that errors in placement are corrected early in a student's brass playing career, as muscles will compensate for misplacement and habits will be built that are hard to correct later. For beginning players, there will be little difference in tone quality because of misplaced mouthpieces, but the differences will become more pronounced as the student proceeds forward. With this said, there are tremendously successful brass players (e.g. Jon Faddis, Maynard Ferguson) who play with asymmetrical embouchures with great success.



3. Tone Production

Fundamentals on the Mouthpiece

The sound on brass instruments starts with the vibration of the lips, which is commonly referred to as buzzing. The mouthpiece serves to focus the buzz and transfer the vibration into the instrument itself. The body of the instrument continues to focus the buzz and amplify its volume. Anything with a mouthpiece, body of tubing, and a flared bell can fundamentally serve as a brass instrument. While the details differ from brass instrument to brass instrument the underlying fundamentals of how tone is produced remain the same:

- Firmer lips and smaller oral cavity create a higher pitch and a brighter tone.
- More relaxed lips and more open oral cavity create a lower pitch and a darker tone.

The other variable that impacts brass instrument pitch and tone is air. Air can be thought of in many different ways, including quantity and speed.

- More air or faster air passing through the aperture results in a higher pitch and a fuller tone.

- Less air or slower air passing through the aperture results in a lower pitch and a softer tone.

This returns to the principle addressed on the first page of this text:

MORE AIR, LESS TENSION

For all brass instruments, there needs to be ongoing attention to reducing tension. Most importantly, the embouchure should be as relaxed as possible, with control of the embouchure being derived primarily from the corners of the mouth. To aid in reducing tension, students should be regularly reminded to keep the jaw and oral cavity relaxed (think the consonant “Ahhhh”), the throat should remain open (focus on yawn breathing), and the arms and torso should be relaxed. Importantly, the mouthpiece should be set upon the embouchure and not pushed into the lip.

X-ray cinefluorography provides a way to see inside the mouth as brass musicians play. In this [video clip](#) from the 1968 dissertation by Joseph A. Meidt, you can see how the tongue adjusts the amount of space in the oral cavity and how the tip of the tongue is used for articulation.

Similarly, [using a mouthpiece with a camera attached](#)

[inside](#), you can see how the embouchure vibrates differently in different registers. The aperture becomes smaller in high registers and at soft dynamics, and broader in low registers and fuller dynamics.

Mouthpiece Buzzing

While different instructors feel differently about the role of mouthpiece buzzing (particularly for larger brass instruments), the position of this text is that mouthpiece work is imperative to developing and maintaining good fundamentals of brass playing.

The mouthpiece is an important tool for brass instruction for a few reasons:

1. The mouthpiece is simple. For young players, it also removes the complexity of handling and manipulating the instrument itself.
2. The mouthpiece is diagnostic. The mouthpiece presents the purest presentation of the tone that is being created by the buzzing of the lips. By removing the rest of the instrument that serves to clarify brass tone, you can diagnose tone quality and consistency issues much more readily.
3. The mouthpiece is task-independent. Mouthpiece exercises are removed from literature being studied, thereby giving more focus to fundamentals of good performance.
4. The mouthpiece is portable. By developing a range of exercises for the mouthpiece, brass players can more easily prepare themselves for performance through fundamentals of good warm up and warm down. It is quiet enough to be played in a hotel room, small enough to be pulled out in a car commute, and quick enough to allow for first thing in the morning warm up and end of day warm down.

First Sounds on the Mouthpiece

To set the embouchure for the initial sound, follow the following steps:

1. Say the syllable, “Hmmpf,” starting with the mouth open and closing the lips just to the point of having them touch.
2. With the shank held between the thumb and first finger, set the mouthpiece gently on the lips.
3. Relax the corners of the mouth to breathe in with a full breath. (For the first time, students can breathe through their nose to make sure that the embouchure does not shift, but this should not be made a habit as it fails to fully fill the lungs.)
4. While articulating “Pffff” or thinking about spitting peas, blow steady, full air through the aperture of the lips.



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Common Issues with Mouthpiece Placement and Buzzing

- **Misplaced mouthpiece position**—The mouthpiece should gently rest on the center of the embouchure. If the mouthpiece is not centered or if it is pushed heavily into the lips, a buzz may not freely occur with

air leaking around the edges of the embouchure.

- **Over-engagement of the center of the embouchure**—Most of the control for brass playing takes place from the corners of the mouth. Students will tend to pucker or pinch the center of their embouchure, making it so that air cannot move freely through the embouchure. An effective way to address this is to have students envision a balloon. When the corners of the balloon are pulled, the balloon squeals. If the same balloon was pinched in the middle, it would produce no sound. Students can place one finger on each corner of the mouth and practice pulling the embouchure from the corners of the mouth while keeping the center soft and fleshy.



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- **Weak control of the embouchure**—Students will often buff their cheeks or have no control of their embouchure, leading to air leaking around the mouthpiece. Reinforce the same balloon exercise listed above to encourage control from the corners of the mouth.
- **Lack of air support**—Students tend to underestimate how much air is required for effective tone control. If they breathe as they do normally, their sound will be very weak and inconsistent. This is particularly true for students on low brass instruments. Exercises such as “Paper Airplane” and “Santa” will help to develop the required air support.

Mouthpiece technique

The mouthpiece can be used for several different purposes as a pedagogical tool. Since the mouthpiece lacks the body of the brass instrument to refine the tone quality, it is very sensitive to small differences in embouchure, air, and technique. Because of this sensitivity, the mouthpiece allows the student to hear the impact of small changes and develop greater awareness of both audio and kinesthetic feedback. The following is a suggested sequence of activities that build embouchure strength and flexibility.

Mouthpiece Exercises

For all brass players and particularly beginner students, it is critically important that there is as much time off the face as there is playing. Mouthpiece work for brass players can be viewed in a similar way to weight training for athletes; it simultaneously builds strength and endurance. And just like weight training, too much-too fast can cause excessive fatigue, development of bad habits, or injury. This sequence can be used as a regular part of the warm up cycle for musicians at all levels.

4 on, 4 off-On a comfortable pitch, sustain a mouthpiece buzz for 4 counts and rest for 4 counts. Continue to repeat this activity through multiple cycles. When playing long tones, the student should pay attention to consistency of both pitch and tone with a full-bodied buzz at all times. Additionally, attention should be given to clean attacks and releases (especially once articulation is taught).



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Long tone—Similar to 4 on, 4 off, students will sustain a single comfortable pitch on the mouthpiece. The goal with long tones is to extend the duration of the sustain at a soft dynamic. This exercise promotes muscle and air control and endurance. After each long tone, the student should take the mouthpiece off the face to rest for the same amount of time that the mouthpiece was on this face. Similar to 4 on, 4 off, attention should be given to consistency of pitch and tone with a vivacious buzz at all times.

Mouthpiece Sirens—As air is blown more quickly, the

corners of the embouchure naturally firm up, pulling the center of the embouchure tighter. When performing sirens, the student should start at a low note and use gradually faster air to allow the pitch to glissando up. They should then slow down the air, causing the pitch to drop back to the start pitch. The focus in this activity is on pitch control and maintain a full bodied buzz at all times. The center of the embouchure should remain soft and fleshy.



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Melody playing-Since the mouthpiece is a fully chromatic brass instrument, all pitches can be played on it. Students should select simple melodies of limited range to play on the mouthpiece. Initially, the melodies should be made of up of steps and slow rhythms to facilitate easier technical execution, but gradually can become more complex. This activity also makes a great group exercise as students then need to match pitch and timbre with other students. Attention should be given to making sure that the pitches are immediately centered and that tone is consistent and full voiced.

Common Issues with Tone Production on the Mouthpiece

Inconsistent pitch and/or tone-Instability in pitch or tone is typically caused by one of two issues. First, the embouchure can lack stability. Watch for frequent movement in the lower jaw or constant fidgeting with the embouchure. This is particularly the case early in sustained playing as students try to make the mouthpiece “fit” right on their embouchure. Second, air support can be

inconsistent. Students can play with huffs of air rather than a steady air stream or squirm while they play causing the air flow from lungs to the embouchure to be inconsistent. Long tones are important exercises for these students with a focus on maintaining steady pitch and tone. Watching themselves in a mirror can help as well as they can visually see additional movement that may inhibit smooth sound.



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Weak buzz (or no buzz)-The sound when buzzing on the

mouthpiece should be a rich sound full of many overtones. When playing with under-supported air, the mouthpiece will sound, but the buzz will be fuzzy and lack richness. This is caused by only one lip vibrating or a very weak vibration from both lips. This can also occur if students heavily press the mouthpiece into one lip (typically the bottom lip), causing only one lip to fully buzz. Breathing exercises are critical for this student (especially “Sizzle” and “Santa”) to ensure that they have enough air on their exhale to support a full sound. Limiting pressure and keeping a soft fleshy cushion in the middle the of the embouchure also helps to allow the air to interact with the lips.



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Leaking air-Many students will experience air leaking around the sides of the mouthpiece. This can be indicative of either overly relaxed corners or pinching in the middle of the embouchure (or often times both). “Sirens” are a good exercise for developing corner strength while paying attention to keeping the center of the lips soft and cushioned.



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4. Brass Acoustics

Brass instruments are all built on a shared set of acoustical principles. These principles make it that concepts learned on one instrument transfer to all other brass instruments. If you can develop your familiarity with these underlying principles, your movement between instruments as a performer and a teacher will be greatly simplified.

Overtone series

All musical sounds make use of a fixed overtone series which is dictated by physics. These overtones become apparent on non-brass instruments as well in particular situations, such as the altissimo register on single reed instruments and harmonics on strings. The particular combination of overtones with varying degrees of prominence is also what gives each instrument its unique timbre. A great illustration of these overtones can be heard if you play a note on any instrument directly into an undamped grand piano. The strings of the piano will sympathetically resonate the present overtones, creating a harmonic echo of the instrument that was played.

For all musical sounds, the overtone series is fixed based on sound wave ratios. Every time the length of a sound wave is cut in half, our ear perceives the difference of an octave between any two pitches. So to use a commonly referenced pitch, A440 is the A above middle C (aka a4). A220 is one octave lower, the A below middle C (aka a3). A880 is the A above the treble clef staff (aka a5). Similar ratios exist for every harmonic interval. A quick Google search for “Harmonic Series Ratios” will give you a much more scientific and detailed explanation than will be provided here for the curious!

So what does this mean for brass instruments? As you have already noticed, there are only 3 valves on most brass instruments (or seven slide positions for the trombone). There are obviously well more than seven notes that can be played on a brass instrument, and this is done through the manipulation of the overtone series.

On any fingering combination, a sequence of partials can be played. Partial is the presentation of the various overtones as the primary overtone on a brass instrument. You may also hear brass players refer to shelves, which is a slang reference to brass partials. Each brass instrument has a fundamental pitch, which is the hypothetically lowest note in open fingering (or first position for trombone), as shown in the chart below. For some brass instruments, particularly the trumpet, this pitch is not usable due to the acoustical construction of the instrument which distorts the timbre in that register. With that said, this fundamental is regularly used in advance literature for various instruments including horn, bass trombone, and tuba.

Brass Instrument Fundamentals
Notes in parentheses are functionally unusable due to tone or intonation

	Fundamental	Partial 1	Partial 2	Partial 3	Partial 4	Partial 5	Partial 6	Partial 7
Trumpet	(C ₂)	C ₃	C ₄	C ₅	C ₆	C ₇	(C ₈)	C ₉
Horn	(C ₂)	C ₃	C ₄	C ₅	C ₆	C ₇	(C ₈)	C ₉
Trombone/ Euphonium	(C ₂)	C ₃	C ₄	C ₅	C ₆	C ₇	(C ₈)	C ₉
Tuba	(C ₂)	C ₃	C ₄	C ₅	C ₆	C ₇	(C ₈)	C ₉

Above that fundamental, open fingers follow the same pattern.

Partial	Change from previous partial	Change from fundamental
Fundamental		
1st partial	Perfect 8	1 Octave
2nd partial	Perfect 5	1 Octave + Perfect 5
3rd partial	Perfect 4	2 octaves
4th partial	Major 3	2 octaves + Major 3
5th partial	minor 3	2 octaves + Perfect 5
6th partial	flat minor 3	2 octaves + flat minor 7
7th partial	sharp Major 2	3 octaves

Hypothetically, this pattern continues infinitely with increasingly smaller intervals between notes. For musicians that perform advanced literature that continues into that upper register, individuals will frequently identify the easiest fingering combinations and partials to use for various notes. Historically, there was also literature written that utilized this extreme upper register, such as diatonic trumpet music of the Baroque period.

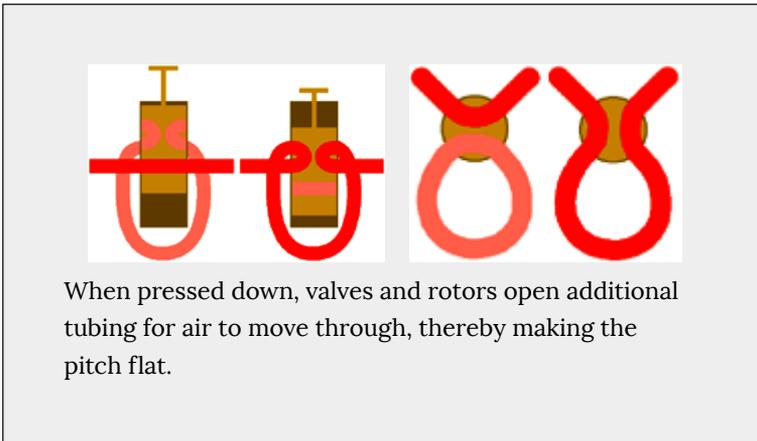
As shown in the chart below which presents the most common brass instruments, once the fundamental pitch is established, it becomes easy to identify the various partials using the series of intervals. Each partial also has characteristic tuning problems. Octaves of the fundamental are always in tune, but the other partials need to be adjusted through the embouchure to ensure that they are played in tune. Notably, the 6th partial is so flat that it is functionally unusable.

Partial	Intonation tendency
Fundamental	in tune
1st partial	in tune
2nd partial	2 cents sharp
3rd partial	in tune
4th partial	14 cents flat
5th partial	2 cents sharp
6th partial	31 cents flat (functionally unusable)
7th partial	in tune

Valve acoustics

The valves on all brass instruments are developed the same way, allowing for the transfer of fingering concepts across brass instruments. The role of each valve stays the same between brass instruments, and the same sequence of combinations is used as it relates to the partials. Once you learn valve sequences on one brass instrument, you can transfer those ideas across instruments.

Whether a valve, a rotor, or a slide, the underlying function remains the same. When the valve or rotor is depressed or the slide is moved out, additional tubing is added to the instrument by the additional channels that are opened in the valve or rotor. By adding additional tubing, the pitch on the instrument moves flat.



All brass instruments aside for trombone have three valves or rotors, and many are augmented with 4th valves (and in the case of tuba, occasionally 5th and 6th rotors). Valves, rotors, and trombone slides are mechanically different, but their function is the same: to open up additional tubing for air to move through. By adding tubing to the brass instrument, the instrument becomes longer,

which results in a lowered pitch. The role of each valve/rotor is as follows:

1st valve-lowers Major 2nd

2nd valve-lowers minor 2nd

3rd valve-lowers minor 3rd

4th valve-lowers perfect 4th (found on piccolo trumpet, higher quality euphonium, and many tubas)

5th valve-lowers flat Major 2nd (found on advanced tubas in some keys)

6th valve-lowers flat minor 2nd (found on advanced tubas in some keys)

The horn additionally has a unique system that creates two instruments in one. The so called “trigger” on double horns opens a second set of tubing that is pitched a perfect fourth higher from F to Bb which provides a different set of fingering combinations and allow for greater ease in certain registers.

When learning valve combinations, the same sequences are used to produce chromatic notes as they relate to the fundamental. Because the partials on brass instruments become closer together the higher the register is, many pitches have multiple fingerings that can be functionally used. In general, the preferred fingering is the one positioned higher up on the chart below, as the intonation issues become more pronounced lower down on the chart. The other available fingerings become alternates that can be used in rare occasions such as trills, complicated technical passages, and corrections to particularly out of tune upper partials. You will notice that the 1st and 2nd valves on their own are naturally slightly flat and the 3rd valve is unusably flat. This is to accommodate fingering combinations with them that become sharper.

Valve combination	Chromatic change down	Intonation tendency
0 (no valves)	Unaltered partial	In tune
2	minor 2nd	5 cents flat
1	Major 2nd	5 cents flat
1-2	minor 3rd	1 cent sharp
(3)	minor 3rd (unusable)	21 cents flat
2-3	Major 3rd	8 cents flat
1-3	Perfect 4th	7 cents sharp
1-2-3	Augmented 4th	28 cents sharp

Different fingerings or other techniques are used to allow for the correction of the innate intonation problems of various fingerings, which will be discussed in the chapters on individual instruments. Pertinent at the moment, the 4th valve found on many euphoniums, tubas, and specialty trumpets serves a specific purpose as a more in tune alternate to 1-3 combinations. 4 can be used in place of 1-3 to play a perfect 4th and 2-4 in place of 1-2-3. It also allows the player to close the gap created between the fundamental and first partial, functionally extending the range of low brass instruments.

Conical versus Cylindrical Construction

The acoustic design of brass instruments affects their overall timbre

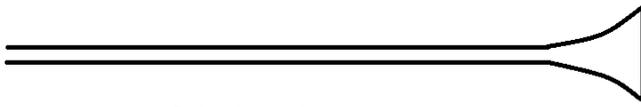
as well as aspects of individual instruments' technical performance. The primary distinction deals with the construction of bore (diameter) of the tubing which come in two variations:

Conical bore

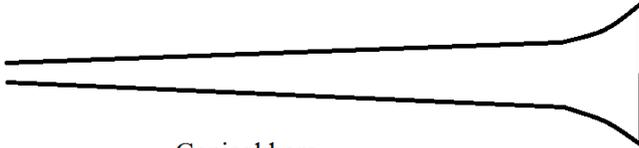
The bore gradually increased in diameter from the mouthpiece through the bell flare. The resultant timbre is typically warmer and less direct. A conical bore instrument will require more air than a similarly sized cylindrical bore instrument but will typically have a smaller mouthpiece that is more responsive to pitch adjustment.

Cylindrical bore

The bore stays the same from the mouthpiece to the flare of the bell. The timbre tends to be very direct and bright. The mouthpiece will be wider than a similar conical instrument but will be more temperamental to embouchure changes in regard to timbre.



Cylindrical bore



Conical bore

Conical instruments have a continuous taper from the mouthpiece to the bell. Cylindrical instruments maintain tubing bore diameter from the mouthpiece to the bell flare.

While there are no standard brass instruments that are purely cylindrical or conical, brass instruments are typically grouped around these tendencies. Instruments with cylindrical tendencies include trumpet, trombone, baritone, and sousaphone. Instruments with conical tendencies are horn, euphonium, tuba, cornet, and flugelhorn.

Familiarity with these characteristics can help teachers understand issues that students encounter. Beginner students on conical instruments need to focus on rich tone development and may have issues centering pitch. These instruments also require more air than similarly sized cylindrical instruments, requiring a more relaxed embouchure that allows for free buzzing. Depending on construction, valve/rotor slides may not be reversible, so students should take care to place slides back into the instrument with correctly matched tubing bores.

Beginner students on cylindrical instruments will find that fatigue sets in more quickly and need to be aware of the potentially strident

tone that they often create. Their embouchure needs to be more focused and firm than students on similarly sized conical instruments as well.

Transposition and Notation

Similar to clarinets and saxophones, brass instruments are pitched in different keys. The pitching of brass instruments refers specifically to the position of the fundamental pitch of the instrument. Instrument names refer to the concert pitch which sounds when playing the lowest fundamental partial. This system dates back to when brass instruments were without valves, rotors, slides, or keys to allow for chromatic performance. As pieces were written in different keys, crooks needed to be added to the instruments to allow them to play the most typical notes in each key. As chromatic additions were made to brass instruments, various keys became preferred for each instrument. Common keys for each instrument are listed below.

Instrument	Most common key(s)	Additional keys
Trumpet	Bb, C (orchestral)	Eb, D
Horn	F	Eb, Bb
Trombone	Bb	
Euphonium	Bb	
Tuba	BBb, CC (orchestral)	Eb, F

Brass Notation

The notation of brass instruments is not consistent in how it addresses keyed instruments. Treble and bass clef notations differ.

Treble Clef Instruments

Trumpet and horn parts are typically written to reflect instrument pitch, as opposed to concert pitch. This allows for transferability across different keyed instruments. On these instruments, the pitch C represents the instrument's fundamental, regardless of concert pitch. So, on a Bb trumpet, the written C is concert Bb. Similarly, on an F horn, the written C is a concert F.

The general rule of thumb for transposing instruments is that the written pitch is written higher than the concert pitch. so for the Bb trumpet, the transposition from concert pitch to written pitch is a Major 2nd up. For the F horn, the transposition from concert pitch to written pitch is a Perfect 5th up.

The benefit of this system of notation is that students can easily move between instruments that are pitched differently. A trumpet player will play a written F with the first valve regardless of whether they play on a Bb, C, or Eb trumpet (provided the part is written for that instrument). The disadvantage is that the player must know what their written pitch transposes to in concert pitch to communicate with other musicians.

Bass Clef Instruments

Bass clef brass parts are typically written to reflect concert pitch, regardless of the key of the instrument on which the part is being played. The Bb that is written for a trombone, euphonium, or tuba is

a concert Bb. If the musician is playing on an instrument that is not pitched in Bb (for example, a CC tuba), the fingering combinations change, forcing them to transpose the part to perform it.

The benefit of this system is that bass clef musicians speak the same key language as the rest of the ensemble. An F on the trombone is the same as the F on the piano. The disadvantage is for musicians when they become more advanced and move between instruments that are pitched in different keys. They must make sure to be aware of the key of their instrument, and properly transpose fingerings to match the transposition.

Euphonium BC/TC

The euphonium (or baritone) pose a unique challenge, in that parts for bands are often written for both bass clef (BC) and treble clef (TC). The parts are typically identical in performance, but are notated differently. Euphonium TC follows the tradition of notating C as the fundamental, making it a transposing instrument. Euphonium BC is notated in concert pitch. So while the sound created would be the same, Euphonium TC would have a C notated at the same time as Euphonium BC would have a Bb notated, matching concert pitch. This notational practice is due to the frequency of having trumpet players switch to euphonium or baritone. The notation of Euphonium TC parts eliminated the student's need to relearn fingerings and clef in the transition to a new instrument.

5. Tone Production Fundamentals on Brass Instruments

While further instrument specific techniques will be discussed in later chapters, many of the critical types of exercises for tone production are transferable across all brass instruments. It is important that students remain attentive to their progress throughout these exercises, so that they serve the function of developing technical competency. They should know both how to properly execute the exercise and what they are listening for as they complete them.

Consistency

Mouthpiece exercises are the starting point for tone consistency, as the mouthpiece provides a great diagnostic tool for small changes in consistency. In addition to continuing to work on mouthpiece exercises, brass players of all levels regularly use the following sorts of exercises.

Consistency Exercises

Long Tones—Similar to long tone studies on the mouthpiece, long tone studies on the instrument are highly effective for developing consistency and embouchure muscle tone. When on the instrument, students should start on an open fingering of a lower partial that is comfortable. Long tones should be played for a pre-decided number of counts (start at 8 counts, and gradually add 4 counts based on proficiency), and make sure to play at a soft dynamic with a consistent tone without interruption. After each long tone, take the instrument away from the embouchure, allowing for as much time off the face as on the face. Play one chromatic step lower using the same number of counts and technique.



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Broken Remington/Reverse Broken Remington—The Remington study is a variation on the long tone study. For beginner students, it is suggested to focus on one pitch change at a time, inserting a rest between changes. This exercise can be played starting on any partial, though the ones on which it is written are suggested for beginners. When playing the Broken Remington, students should focus on tone consistency and pitch centering. This exercise can also be used as an intonation study once students' embouchures are thoroughly developed. For students who have not yet developed the embouchure strength for playing in multiple partials, the Reverse Remington is a

good starting point. Students should only ascend as far as they can with an open relaxed sound. It is fine if beginner students only play the first few measures of this exercise.



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Remington/Reverse Remington—Once embouchure strength has developed, the rests can be removed from the two Remington exercises. Again, the focus should be on two factors: tone consistency and pitch centering. If the pitch or tone become unstable, the student should stop,

pause, and restart from the beginning as pitches become more difficult to center as the pitch interval becomes larger.

Lip slurs

Lip slurs are unarticulated movements between partials without altering fingerings. To move between partials, brass musicians use more focused air, resulting in a faster buzz of the lips. There are many ways to visualize this change.

- **Vowel change**—Lower notes use a more relaxed, open vowel, such as “Ohhh”. To move up a partial, this vowel changes to “Ahhhh” or “Eeeee.” The result is a smaller oral cavity with an embouchure that pulls more from the corners of the mouth.
- **Air direction**—Thinking about air direction is another way to make the change that results in partial change. Higher partials need more forward moving air. This results in a more directed air stream and a smaller aperture.
- **Air speed**—Faster air produces a faster buzz, resulting in a higher partial. Focusing on air stream narrows the air passages from lungs through the embouchure, allowing the same amount of air to move more quickly.

Regardless of the visualization, it is important that a few fundamentals remain in place:

- The cushion for the mouthpiece in the center of the embouchure remains soft and fleshy
- The body remains relaxed throughout the torso, arms, neck, and embouchure
- Pressure from the mouthpiece on the embouchure is limited
- Air is allowed to dictate the change in partial, not tension

An important note is that brass embouchure development is gradual, and unlike other band and orchestra instruments, initial progress is very slow. While woodwind and string players are typically able to play an octave of pitches in their first few days, many brass students will take a month or more to competently move between shelves. This is normal, and students should be encouraged to work on other concepts of articulation and creativity while developing strength in their embouchure to allow for an expanded register.

Lip Slur Exercises

Mouthpiece Sirens (from chapter 3) are a great way to develop the flexibility for pitch change between partials as they rely on more focused air and provide immediate

feedback to the effectiveness of the change. Each of the exercises below can also be performed on the mouthpiece to facilitate greater flexibility and allow for diagnosis of problems such as tension or thin tone.



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Lip Slur 1 2 3-These three lip slur exercises become gradually more advanced, but are built on the same basic concept. Students move between adjacent partials by altering the focus of their air. When ascending, students

should focus on using air and monitoring their embouchure and posture to ensure that they are not introducing additional pressure or tension. On descending intervals, students should focus on maintaining a consistent tone as tone will frequently become less full as the embouchure becomes less focused. Lip Slur Exercise #1 should be able to be played without any issues of tension or tone before moving on to Lip Slur Exercise #2. The same is true when moving from Exercise #2 to #3. Students should be encouraged to make up their own exercise patterns as a way to maintain variety.



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Chromatic exercises-Many beginning players will find difficulty in ascending between partials. Chromatic practice can help, as it harnesses the chromatic characteristics of the mouthpiece allowing for more gradual adjustment. Starting on the open lower partial, students should ascend chromatically using proper fingerings using long tones. Advancement from one chromatic pitch to the next should not happen unless the student can play the chromatic pitch with good tone without tension.

Common Issues for Lip Slurs

Excessive pressure-Beginning brass players quickly discover that they can alter partials by applying pressure to the mouthpiece. For trumpet players especially, the pinky ring is used as “the octave key” by pushing into the face. Tell tale signs of excessive pressure are lingering pressure rings on the embouchure and thin tone. Students should be encouraged to set, not force, the mouthpiece into the embouchure. Returning to mouthpiece exercises can also help make excessive pressure more apparent. Make sure the student is lightly holding the mouthpiece between the first finger and thumb to avoid applying pressure.

Changing tone quality-As shelves change, beginning

students often fail to adjust their air support to accommodate the changing oral cavity, resulting in fluctuations of tone quality. Importantly, students should not advance on to higher partials until they have been able to alternate between lower partials with good tone. Rushing to play high notes is common, and can result in the development of bad habits involving excessive pressure, lip pinching, and poor air support. If students are struggling to ascend between two specific partials, they should do long tones starting on the highest well played partial advancing chromatically higher. Students should not pass a chromatic tone until they can play it with good tone and technique. Always emphasize tone controlled by less tension and more air.

If students are struggling with good tone quality when descending through lower partials, they are probably losing embouchure focus. While it is important to encourage students not to pinch their embouchure, they do need to maintain firmness, particularly in the corners of the mouth, as they descend. Frequently, students will over-relax their embouchure as the oral cavity becomes larger, particularly on low brass instrument, resulting in an unfocused tone. Air support can also become an issue in lower registers, so breathing exercises to increase capacity can help. Similar to upper register development, lower register should be developed through chromatic descending long tones, stopping on notes that lack good tone focus.

Dexterity

Finger dexterity is not a major concern with beginning players, as they are working on developing embouchure strength and control. With that said, dexterity exercises, coupled with melodic pieces with limited range, can give beginning players a sense of mastery that can often times be limited. As students become more advanced, dexterity becomes a greater concern, particularly related to full exchanges of valves where all fingers switch position (e.g. 1 to 2-3 or 2 to 1-3).

When practicing dexterity exercises, students should pay close attention to precision and play no faster than they can accurately. Additionally, students should be reminded that finger (or slide) movement is always quick, regardless of the tempo of the music. Brass players have a tendency to slow down their fingers as the music becomes slower, which results in smears or muted tones. Care should also be taken to pay attention to and adjust for intonation inconsistencies that occur when using fingerings that are more characteristically out of tune, specifically 2-3, 1-3, 1-2-3. Great examples of dexterity exercises can be found in several books, notably the Arban and Clarke studies.

Dexterity Exercises

[Dexterity Exercise #1](#) – This is an adaptation from Clarke’s Second Study to make it more accessible for beginners. As with all dexterity exercises, this should be

played no faster than the student can play with accuracy at its most difficult part. Each key should be played separately, allowing for a break between keys. Common keys are shown here, but once students are familiar with these keys, they can move on to less common keys. In particular, pay attention to intonation tendencies.

Dexterity Exercise #2-This exercise challenges the students based on chromatic tendencies within a narrow register. Each key should be played as a separate exercise, allowing for space between notes. Students should start this exercise in the key which most closely matches their best register with an emphasis on maintaining a relaxed embouchure on ascending lines and good tone on descending lines. This is a particularly effective exercise for students who are having issues with partial shifting. The third and fourth measures in each key can be played in isolation to help students build embouchure strength and control for partial movement.

Common Issues with Dexterity

Stiff/Angular Hands/Wrists-Beginning players will often flatten their fingers or collapse their wrists as they play, creating stiff, inflexible joints that hinder good

performance. Students should be reminded to play with the tips of their fingers on the valves or slide with a continuous curve extending from the lower arm through the wrist and into the fingers. While sharp angles will not inhibit dexterity at beginning levels, it will become an increasing problem as students progress forward.



Complete Exchanges-Complete exchanges are fingerings that involve movement from all the fingers, for example 1 to 2-3 or 2 to 1-3. Beginning brass players often struggle with these complete exchanges by either having the fingers not move in time simultaneously or creating excessive movement when doing these exchanges. They should be practiced in isolation, with an emphasis on continuous tone without lack of clarity.

Slow fingers-Younger brass players will often have their fingers match the tempo of the music. When music is fast, their fingers exchange quickly. When it is slow, they slow down the speed of their fingers. This slow movement creates smears between notes as the valves are only partly depressed. When doing dexterity exercises, students should remain focused on quick finger exchanges, regardless of tempo.

Creativity

Creative activities are important for all beginning musicians. Students who are early adolescents arrive in our classrooms seeing themselves as creative beings. If beginning instruction on instruments focuses on playing the right notes the right way, they can quickly stop seeing themselves as creatively competent, which becomes an issue when we ask them to interpret, improvise, or compose music.

Particularly for beginning brass musicians, students can quickly become frustrated in their slow growth, especially if there are a small number of students who develop mastery of partial movement quickly. Creative activities that involve short improvisation and aural imitation can keep students engaged and allow them to see that they are creative beings.

Creativity Exercises

Three note jam-Ask students to identify three notes that they feel confident playing. Have each student play a short melody on those three notes. You can also assign additional criteria (e.g. specific length, specific rhythm, etc) as students become familiar with this exercise.

Call-and-response-As the teacher, play a four count “call.” Have each student respond back to the call with an imitative response utilizing similar notes, rhythms, structure, etc. This can also be done with students creating the calls for one another. As the students become comfortable with this activity, you can extend the duration of each part or apply additional criteria. For the reluctant student, keep the call simple, such as a quarter note scale or rhythmic pattern on a single note. For the more adventurous student, challenge them with longer or more complex patterns to imitate.

Show-and-Tell-Have students compose a short melody with specific criteria (e.g. utilizing newly learned notes, applying a specific rhythmic pattern). At the beginning of class, have each student show-and-tell their composition for one another. This can be extended by having students teach one another their melodies.

Drone-Drone activities can be a great way to allow for low risk creativity as all other students are actively playing

while individuals create their new parts. Establish a drone within the ensemble by splitting the group into two parts. Perfect intervals work well, but you can certainly use more dissonant intervals for variety. Each individual student is then responsible for playing over the drone. Instructions should be given to ensure that the drone is kept quiet enough for the soloist to be heard. The drone can serve as a low tone study for those on in the ensemble and a projection study for the soloist as they learn to play fully over the rest of the group.

Warming Up

While important for all musicians, warm ups are critical for brass players. Without a quality warm up, students will experience fatigue at best and physical injury at worst. While the specific activities in a quality warm up can vary, the following elements should be included in each warm up session. Activities that have been listed so far in this text are good warm up exercises for beginning brass players.

Warm Up Sequence

- Mouthpiece buzzing

- Long tones
- Sirens
- Chromatic long tones
- Lip slurs
- Chromatic and diatonic dexterity exercises



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6. Pitch and Intonation

As you have certainly noticed, pitch on brass instruments is primarily controlled by the embouchure. The valves, rotors, or slides serve to alter that fundamental pitch, but in the end, embouchure adjustment controls pitch at the macro level when moving between shelves and the micro level when adjusting intonation. While each instrument has unique ways to deal with intonation (e.g. the trombone slide, adjustable valve slides on trumpet, 4th valves on euphonium and tuba, right hand in the bell of the horn), the embouchure serves as the primary method of intonation adjustment.

Relationship between Pitch and Tone

One of the challenges of adjusting pitch on brass instruments is that when adjusting pitch, the tone also changes. Brass players refer to the center of a pitch, which is the point at which the embouchure is buzzing at the exact same pitch as the instrument is playing. This creates the fullest tone, and serves as the target for each pitch.

The embouchure can be adjusted to address intonation issues due to tendencies of partials or fingering combinations. By firming up the embouchure and making the oral cavity smaller, the pitch will move sharp. By relaxing the embouchure and opening up the oral cavity, the pitch will move flat.

Unfortunately, by adjusting the embouchure, the brass player also alters the tone quality of their instrument. By tightening the embouchure and jaw, the pitch goes bright and loses the richness of its overtones. By relaxing the embouchure and jaw, the tone becomes under-supported and unfocused. Increasing the amount of air can counteract many of these tendencies, but the more

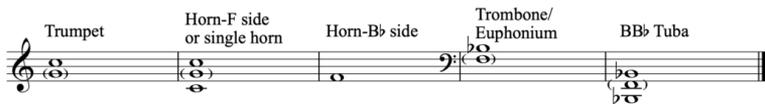
dramatically the player needs to adjust the embouchure for pitch, the more apparent the tone problems.



Embouchure change for tone and pitch are integrally related to one another. A change in embouchure for one impacts the other.

Adjusting Intonation

Due to the relationship between pitch and tone, it is important that brass instruments are regularly adjusted by their main tuning slide to be in tune. Due to the pitch tendencies of various partials, brass instruments tune best to octaves of their fundamental pitch, typically at the third partial. For some young players, this may be too high to play without placing extra stress on the embouchure in which case the perfect fifth at the second partial can be used. On horn, the B \flat side of the horn should be tuned first and then the F side.



When initially tuning brass instruments, the instrument should be tuned to the most comfortable octave of the fundamental to set up the instrument for more successful intonation adjustment. Notes in parentheses can be used as secondary tuning notes or as substitutes for students with limited range.

In addition to daily tuning of the main tuning slides, valve/rotor slides on horn, euphonium, and tuba should be tuned to accommodate for intonation inconsistencies on an occasional basis, especially if weather or circumstances significantly change. While more advanced players may do adjustment based on specific musical demands of literature to be played, in general the first valve should be tuned to a major second below the fundamental noted above and the second valve to a minor second below the fundamental above. The third valve/rotor slide should be tuned using the 2-3 fingering a Major 3rd below the noted fundamental. For instruments with a 4th valve, tune the slide a perfect fourth below the optional note as this will be the most frequent application of the 4th valve.

Valve	Horn Tuning Pitch	Euphonium/ Tuba Tuning Pitch
1	Bb (on F side) Eb (on Bb side)	Ab
2	B (on F side) E (on Bb side)	A
3 (using 2-3 fingering)	Ab (on F side) Db (on Bb side)	Gb
4	N/A	C

Once the instrument is “in tune,” it is important to remind students that all the notes will not be in tune (see the [Acoustics](#) chapter for details). With all beginning instrumentalists, a common myth is assumed of “I tuned, therefore, my instrument is in tune.” They still need to be prepared to listen and adjust pitch, either by manipulating the instrument or adjusting the embouchure.

Explicitly teaching the tendencies of each valve combination and partial will assist in making these adjustments.

When there is a way to adjust pitch mechanically, this should be done first as it also adjusts where the instrument's tone will be centered. These options include the following:

- Trumpet—Adjusting the 1st or 3rd slides, particularly for a5, d4, and c#4
- Horn—Adjusting the hand in the bell to further open or close the bell flare
- Trombone—Adjusting the hand slide (As this works on every pitch, trombonists seldom adjust pitch with the embouchure)
- Euphonium/Tuba—Using the 4th valve as a substitute for 1-3 and physically adjusting the main tuning slide while playing (for more advanced players)

If there is not a way to physically adjust the instrument, the embouchure should be used to lower or raise the pitch by relaxing or firming the corners and opening or closing the oral cavity by changing vowel shape. The process is similar to adjusting pitch between shelves. By changing mouth shape and tongue placement from *ahhh* to *ohhh*, the pitch will become flat. By changing the mouth shape and tongue placement from *ahhh* to *eeee*, the pitch will move sharp. With any changes from centered tone, more air is needed to ensure that the quality of tone remains the same when altering pitch.

Exercises for Intonation Awareness and Adjustment

Mouthpiece Sirens—As opposed to their use when first learning how to play brass instruments, mouthpiece sirens can be used by established brass musicians to focus interval control. Students should start on a specific pitch and intentionally adjust both above and below that pitch by a specific interval. This can build awareness of embouchure adjustment for different spaced intervals.

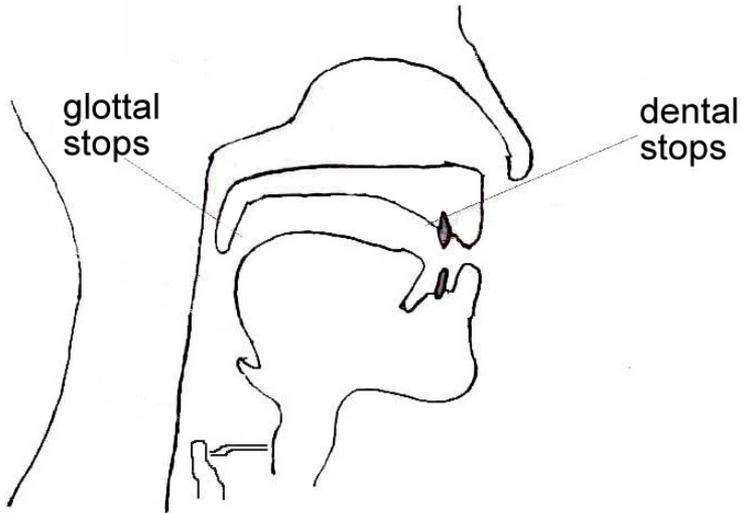
Lip Bends—Starting on a comfortable pitch, students should play the pitch and then relax the embouchure to bend the note flat and then return to the original note. The goal is to have pitch change with as little tone change as possible. With practice, they should be able to control the interval. Initially, students will only be able to bend pitches flat by a minor second, but with time, they should be able to bend pitches by a third or more. **VIDEO**

Remington Exercises—With a tuner in hand, students should play through both [descending](#) and [ascending](#) Remington exercises. For each pitch, students should make sure that the pitch is in tune and that the tone is centered. If individual intervals pose a problem, they should stop on that note and isolate it, ensuring that it is accurately played in tune and in tone.

7. Articulation on Brass Instruments

Articulation on wind instruments refers to the use of the tongue to start and occasionally stop the airstream. Typically, brass players use dental stops, which places the tongue against the base of the upper palate at the top of the teeth. They typically use the syllable *tu* or *du* to articulate a note.

In a few specialized techniques, specifically double tonguing, a glottal stop is used. For glottal stops, the tongue rocks back in the mouth to meet the soft palate at the top of the throat. The syllable *gu* or *ku* are used to articulate these techniques.



Tongue placement for most articulations occur against the base of the upper palate at the top of the teeth. Some specialized techniques utilize glottal stops at the back of the soft palate.

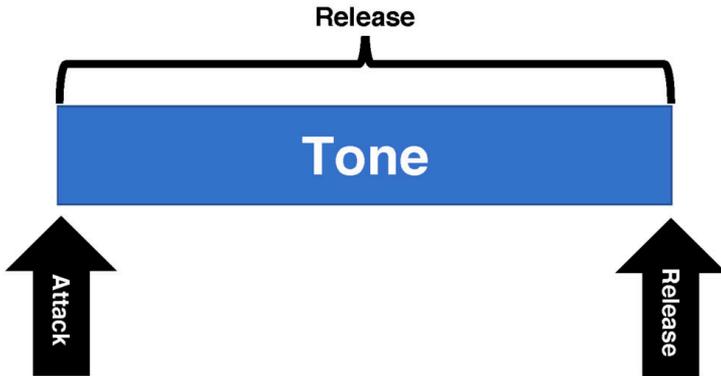
It is critically important that the tongue quickly flick into the air stream and then return to a neutral “Ah” or “Oh” position. The articulation should merely interrupt the flow of the air to create separation of consecutive pitch, not bring the air stream to a full stop. An imperfect visualization is a hand slipping through a stream of water. The water does not come to a full stop: rather, it is merely interrupted.



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Parts of an Articulation

Each articulation has three parts that are treated differently dependent on the interpretive intent of the articulation.



All tones have three parts: attack, sustain, and release. Articulation on brass instruments primarily impacts the attack.

The **attack** initiates the tone and is controlled by the tongue. The choice of starting consonant dictates the intensity of the articulation attack. *Tu* provides a stronger attack. *Du* provides a more legato attack. *Lu* is used by trombonists to mask slide movement to create an extremely light articulation. To play slurs, no tongue is used, allowing the air to move without interruption from one note to the next.

The **sustain** is the tone itself and is largest controlled by the space in the oral cavity. When the tongue is placed higher in the mouth, using an *Eeee* (as in *mEEt* or IPA: *i*) or *Ahhh* (as in *fAther* or IPA: *a*) vowel, the tone is brighter and more direct. When a more open vowel such as *Ooo* (as in *shOE* or IPA: *Ū*) or *Ohhh* (as in *rOW* or IPA: *u*) is used, the sustained tone is darker and fuller.

The **release** is the end of the note. For nearly all standard articulations (*marcato* is the one exception), the tongue is not engaged for the release of the note. For connected notes, the attack of the following note serves as the release of the previous tone. For notes with separation, the air column remains engaged between notes but a soft glottal stop of *h* is used to hold the air.

Importantly, after every attack, the tongue returns to a neutral position at the bottom of the mouth. While the vowel shape may vary with brighter vowels for higher notes and darker vowels for lower notes, care should be made to make sure that the tip of the tongue moves quickly down from the top of the mouth.

Initial Exercises for Articulation

Speak and Play-Have students vocally practice articulations and then imitate them in performance. Start with four notes of even duration and the same pitch. With a metronome, say “Tah, Tah, Tah, Tah,” set the mouthpiece, and play. When students are speaking, make sure they are using the same consonant and vowel with each note. As they play, make sure that the tone starts immediately with the first note and that the tone stays consistent from one note to the next. **VIDEO**

Legato Articulation-Have students first focus on clear legato playing. This is the foundation of brass articulation. The initial attack should be played clearly without surging the sustain that follows. The goal is consistency of attack and sustain with each note. Once repeated legatos can be played on a repeated note at the same rate, the rate should be increased or scale patterns can be added to increase complexity.

Melodies by ear-Have students learn simple melodies by

ear. While the play, focus on their consistent use of legato articulation and consistency of sustained tone.

Call and Response Patterns-Play short 4 note patterns using legato articulation for students to hear and then respond to. At first, the teacher should provide these patterns, but students should quickly assume the responsibility of pattern maker. The teacher can put parameters on what is played (e.g. all notes must be of the same length or notes must be selected from a specific key). As students play, listen carefully for consistency of pitch and attack. As students become more adept at imitative performance and articulation, variations can be included in this activity by extending the length of the played pattern.

Common Articulation Issues

Slow/heavy tongue-Articulation should interrupt the air flow very quickly with just the tip of the tongue fully stopping the air flow. If too much of the tongue is used, the articulation will become slow and the air will be stifled, creating lack of clarity in the attack of the tone and instability in the sustain. Often, students are trying to

articulate too heavily. To remedy this issue, have the students vocally articulate before playing using the *Speak and Play* activity. For students with heavy tonguing, encourage them to think *Dah* instead of *Tah* to lighten the weight of the tongue. Incorrect modeling is also a good technique by having students use the wrong syllables. Start with “*Nah, Nah, Nah, Nah*” followed by “*Dah, Dah, Dah, Dah.*”

Tongue between teeth/Embouchure “tonguing”-It is not uncommon for students to use their lips and jaw to articulate notes, using a *pa* or *ma* syllable. This creates issues for tone production as it introduces tension in the middle of the embouchure and distorts the tone of the subsequent sustain. Similarly, many students will over use the tongue, pushing it between the teeth using a *tha* syllable, causing the jaw to move as they play, again destabilizing the embouchure. To remedy this issue, return to *Speak and Play* activities, emphasizing good tone on every tone. **VIDEO for 1 & 2**

Uneven articulations-Students will often become sloppy in their articulations as more elements are introduced into their performance, such as new notes, faster passages, and expressive markings. When this occurs, their tongue placement becomes irregular, either by not using the same syllable for all articulations or not allowing the tongue to fully return to a neutral position. Simplification of task is critically important for this student. Simplification can mean many things: slower tempo, less demanding technical demand, less attention to expressive markings, etc. Once the student has demonstrated consistent articulation, begin to reintroduce more complexity.

Weak starting articulations-Timing is a critical element

for articulation, and this becomes very apparent with first note articulation. The air and the tongue need to be timed perfectly with one another. If the tongue is moving early, the articulation will be weak or non-existent followed by a *wah* start to the note as the air becomes full. The tongue is needed to support the clear attack of first notes. If the tongue is moving too late, the note will have a double attack with the first established by air and the second established by the tongue. To work on this issue, have students practice starting and stopping to make sure that they can time the air and the tongue together. **VIDEO**

Articulation Details

All articulations are a variation on the same basic articulation concepts:

- A clear attack using a *dah* or *tah* syllable with the tongue
- A consistent sustain without tension using an open vowel (usually *ahhh* (IPA: *a*) or *ooo* (IPA: *U*))
- An open air release without tongue movement, ending with an *h* consonant

With that said, each notated articulation has slightly different conventions:

Legato/Tenuto—Follows the basic articulation concepts listed above. The attack of the following note is the release of the previous. Legato and tenuto typically use a *dah* articulation.

Accent—The attack of the note is stronger, using a *tah* articulation. Because of the heavy attack, care needs to be made to not distort the sustain that follows. In some cases, air usage may be increased

for the attack, especially when additional markings (e.g. **fp**, **sfz**) are included.

Staccato-The attack is typically light, using a *dah* syllable. Because of the shortened sustain and separation from the following note, the back of the tongue rises slightly for the release to allow the air column to remain engaged without producing additional sound.

Marcato-The attack is similar to the accent in its use of a strong *tah* articulation. The sustain is shortened like in the staccato. The release can be (especially in jazz and global music styles like Mariachi and Romani music) be tongue stopped, using a *taht* syllable.

Brass instruments also utilize a variety of other advanced articulations, such as multiple tonguing, flutter tonguing, and growling. More details on these advanced techniques can be found in [Advanced Techniques](#).

Exercises for Developing Articulation Contrast for Beginners

Articulation Contrast Studies-When first introducing contrasting articulations, students should isolate each type of articulation on a single pitch over a repeated rhythm. Emphasis should be placed on articulation consistency and quality tone. Once the students can play with consistent, high quality tone and articulation, they should alternate different articulations, emphasizing the contrasts between them.

Change It Up—One student starts with a simple musical pattern or melody. The students then pass it around by playing the same notes but altering the articulation to create a different interpretation. As they play, they can alter the articulation however they wish, but should play with consistent articulation and quality tone.

8. Instrument Care

If a few regular tasks are done, brass instruments require little professional maintenance, provided that dents are avoided; slides, valves, and rotors are lubricated; and the inside of the instrument is kept clean.

Mouthpiece Care

The mouthpiece is the primary point of contact with the instrument, and therefore, should be kept clean. The mouthpiece should ideally be rinsed every day and washed at least once a week with dish soap. This will keep it clean and hygienic.

Lubrication

Depending on the instrument, different oils and greases are used on brass instruments. As an brass instructor, you should have the following lubrications on hand:

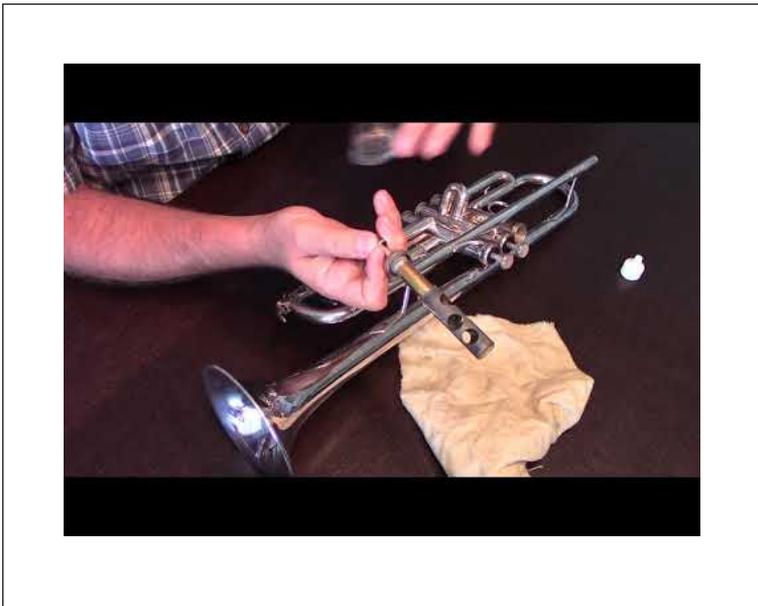
- valve oil
- rotor oil
- trombone slide grease
- slide grease

Valves, rotors, and slides should be lubricated on a regular basis. Once a week is a good rule of thumb, though if rubbing or dragging are felt when playing, more lubrication should be added

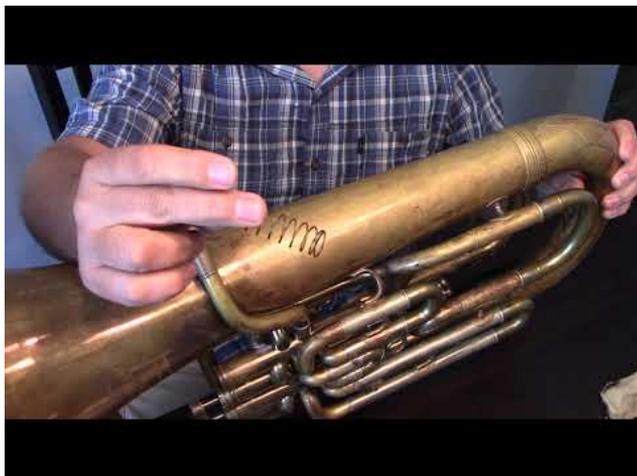
immediately. All valves, rotors, and slides should be lubricated immediately following a cleaning of the instrument as well.

Valves

Valves pistons on trumpets, euphoniums, and tubas should be removed from the valve casings prior to oiling with valve oil. A few drops of **valve oil** should be placed around the ports on the valve piston. The valve piston should be placed back in the casing and rotated until it locks in place. After the valve cap is screwed down, the valve should be pushed up and down several times to ensure that it is fully lubricated. **Pay close attention to where the valve is removed from, as the valve should return to the same valve casing.** Most instruments have a number etched in each valve piston to ensure that they are returned to the correct valve casing.



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Rotors

Rotors on horns, F attachments on trombones, and some tubas should be lubricated with **rotor oil**, which is slightly thinner than valve oil. Rotors should not be removed as they can be very difficult to calibrate. If rotors need to be removed, they should be taken

to a qualified repair shop. Instead, the cap on top of each rotor should be removed and two to three drops of oil should be placed on the center of the rotor. If the rotor is still sluggish, the slide can be removed for each rotor and oil can be dropped down the slide casing. The paddles should be quickly fluttered to ensure that the oil is evenly distributed around the paddle.

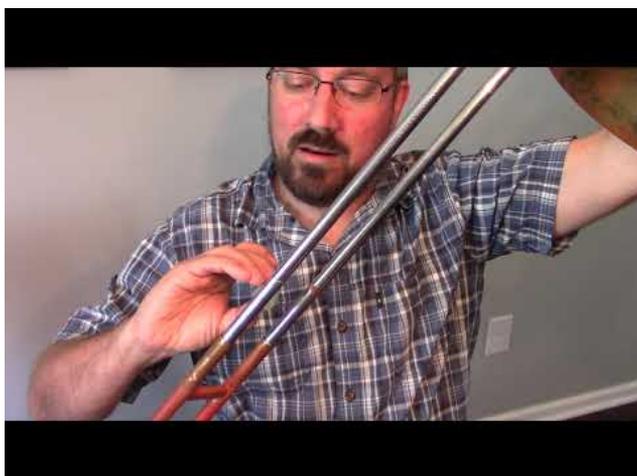


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Trombone Slides

The trombone slide should be greased with **trombone slide grease**, which is thicker than valve oil but thinner than slide grease. When applying slide grease, a narrow band of grease should be placed all the way around the circumference of the slide toward the end of

the inner slide, near 7th position. The slide should then be moved back and forth several times to ensure distribution of the grease. If there is any drag, the slide should be inspected for damage or dirt. If nothing is a problem, another coat of grease should be added.



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Tuning and Valve/Rotor Slides

All slides except for the main trombone slide should have **slide grease** used on them. Slide grease is thick so it tends to stay on the slides, including those that are seldom moved. A light coating of grease should be placed around the circumference of the inner slide near the tube opening. When inserting the slide back in, the slide should be moved in and out to ensure that it receives a full coating

of grease to prevent stuck slides which will require professional removal.



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Cleaning Brass Instruments

Regular washing of brass instruments (once every other month) will keep instruments in top shape and will dramatically reduce the need for professional maintenance of instruments. Beginning students are fully capable of washing brass instruments by following a few simple directions. The following materials are needed:

- Instrument cleaning snake
- Valve brush

- Mouthpiece brush
- Multiple soft clothes for washing and drying (ideally 100% cotton or microfiber)
- Dish soap
- Lubricants for valves, rotors, and slides

The water for washing brass instruments should be similar in temperature to that which would be used to wash dishes. Never use boiling water, especially on lacquer instruments as the integrity of the lacquer may be affected. Similarly, a mild detergent should be used on the instruments. Liquid dish soap with a degreaser works just fine.

Each brass instrument should be completely disassembled with the exception of rotors when washing a brass instrument. Make sure to depress the valves when removing valve slides to avoid creating vacuum pressure within the valve. The body of the instrument and the slides should be placed in the warm water and be allowed to soak.

Valves should be placed in a separate container of warm water and soap which allows the felts at the top of the valve to remain dry.

Once instruments have soaked for at least 10 minutes, a cleaning snake should be pulled through all tubing. If the snake brush comes out particularly dirty, rinse, and run through the tubing again. The exterior of all parts of the instruments should be scrubbed with a soft cloth, paying particular attention to raw brass parts of slides and slide receivers and screw mounts on the valve casings where grime frequently collects. Place instrument parts back in the water after snaking and allow to soak for at least 10 more minutes.

Valve pistons should be lightly scrubbed with a soft cloth. Felts should be kept dry to ensure that they do not absorb moisture which can lead to mold. Additionally, nothing should be pushed through the valve ports to avoid damaging the passages.

When removing instruments from their water bath, make sure to run clean, warm water through all tubing to rinse out any remaining soap. Immediately dry the instrument with a soft cloth and set aside

for 10-15 minutes to ensure that the instrument is completely dry before lubricating.

Follow the rules above for appropriate lubrication of instruments. Lubrication should be done before reassembling the instrument to avoid stuck slides, valves, and rotors.

If polishing of the instrument is desired after washing, make sure to use either a clean soft cloth or a polishing cloth specific for the finish of the instrument. Silver instrument polishing clothes should not be used on lacquer instruments and vice versa.



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Basic Classroom Repairs

In general, brass instruments are fairly durable and should not need

regular professional service if regular home maintenance is done. There are a small number of common problems that can be easily fixed at home or in the classroom.

Stuck mouthpieces

It is imperative that a brass instructor has a mouthpiece puller readily available. They come in many designs, but the concept remains the same. Set the base of the mouthpiece remover against the top of the receiver and the top of the remover is placed under the rim of the mouthpiece. A set of screws are used to pull the mouthpiece free from the instrument.

A stuck mouthpiece should not be removed using any workshop tool or by twisting and yanking on the mouthpiece. This can break the braces that hold the instrument together or spiral the lead pipe.

Never use pliers to remove a stuck mouthpiece!

To prevent stuck mouthpieces, when placing the mouthpiece in the mouthpiece receiver, give it a quarter twist. This twist will make a stuck mouthpiece come out more easily with gentle twisting from the hand.



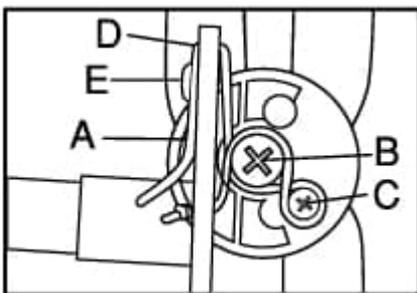
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When mouthpieces are dropped, they can often become dented along their shaft. By using a mouthpiece trueing tool, dents can be removed to return the base of the shaft to round. The trueing tool should be inserted into the base of the mouthpiece and gently rotated while applying gentle pressure toward the cup. Care should be made to work slowly, so regularly check the shape of the mouthpiece shaft. If correction is done too far, the shaft can become flared and will damage the mouthpiece receiver.



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Broken rotor strings



Rotor strings break regularly.

Using a nylon or multi strand cord, students should learn to restring their own horn.

1. Tie a knot in the cord and thread it through the hole without a screw at the base of the rotor paddle.
2. Make a figure 8 around screws B & C. The cord should go clockwise around screw B and counterclockwise around screw C.
3. Thread the cord through hole D.
4. Tighten screw C after checking that the rotor paddle is even with the other two paddles.
5. Wrap the cord around screw E and tighten the screw to hold the cord in place.



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Stuck valve caps

Valve caps frequently become frozen. They can be loosened by tapping on them lightly with a rawhide hammer. Be careful not to strike the valve casings themselves. Then, twist the caps with your fingers.

Stuck slides

Before trying to remove a slide, inspect the instrument to make sure there are not any dents or other damage done to the slide. If no damage is visible, liberally grease any exposed slide and apply firm pressure to see if the slide can be pushed back in. If it still does not move, thread a polishing cloth through the slide and give a firm tug.

If there is damage or the slide does not move after trying the steps above once each, send the instrument to a qualified shop for repair.

Stuck valves

Before trying to remove a valve, check the valve casings for damage or dents. Provided that the valve is stuck up, drip valve oil through the bottom cap. Then, take a small raw hide hammer and gently tap the valve button. Make sure to tap straight down. Once the valve moves, add more oil until the valve can be removed. Re-oil and insert into the instrument.

If there is damage or the valve does not move after a small number of gentle taps, send the instrument to a shop.

Repairs that Require Professional Service

- Dents
- Bent tubing
- Stuck rotors
- Stuck slides or valves that do not move easily
- Misaligned slide posts

9. Advanced Techniques

The techniques that follow are ones that are called for in advanced settings. As a non-brass music educator, you are not necessarily expected to be able to perform all of these techniques, but you should be familiar with their concept so that you advise students and recognize poor execution.

Vibrato

Vibrato is not extensively used in most settings with brass instruments. There are several methods by which vibrato can be introduced. For all types of vibrato, students should practice it slowly at first with a metronome. Setting the oscillation at $\text{♩}=72$ is a good way to start. Once students can play vibrato at that rate with consistency and control, they should gradually increase the tempo.

Jaw Vibrato

Jaw vibrato is achieved by slightly adjusting the jaw and tongue. Saying the syllable “yah-yah” establishes the fundamental movement. The amount of movement by the jaw dictates the severity of the vibrato. Jaw vibrato is the most common sort of vibrato used on brass instruments.

Hand/Slide Vibrato

Trumpet and trombone will occasionally use hand vibrato, particularly in jazz settings where a particularly wide vibrato can be

desired. When using hand vibrato on trumpet, the pinky is placed in the finger hook and the right hand is **gently** shaken to alternate pressure on the embouchure. The movement should come from the wrist and only be as big as is needed to create a vibrato effect. Particularly with young players, hand vibrato should be used sparingly, as it is very easy to place too much pressure on the embouchure causing damage.

On trombone, a variation of hand vibrato is with slide vibrato. Slide vibrato is a wrist based movement in which the pitch is moved in and out of tune by 10-15 cents. Again, care should be made to keep movements small so not to place undue pressure on the embouchure.

Diaphragm vibrato

Diaphragm vibrato is typically used on larger brass instruments for slower vibrato effects. Diaphragm vibrato surges air both through the manipulation of abdominal muscles and tongue placement. The syllable “Ho, ho, ho” will help to establish the tongue and muscle movement that creates this vibrato effect.



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Multiple Tonguing

Multiple tonguing involves the use of both dental and glottal articulations so that students can articulate excerpts that are faster than they are able to while single tonguing. The development of multiple tonguing takes time, and at first, will be significantly slower than single tonguing. While it can be used for extended excerpts, it is most commonly used for short sections, sometimes for a beat or less, to allow for greater clarity in technical sections.

Practicing multiple tonguing should start slowly on a single pitch to ensure that the student can evenly control the tongue motion with consistency. Care should be made that the tongue returns to a

neutral position so that tone is not interrupted. Tempo can then be increased until double tonguing is faster than single tonguing alone.

Double tonguing

Double tonguing occurs by a rocking motion of the tongue, whereby notes are alternately articulated by the dental and glottal articulations. The syllables “tah-kah” or “dah-gah” are often used to establish this rocking motion.

Triple tonguing

Triple tonguing utilizes a similar motion as double tonguing, but rather than alternating between dental and glottal articulation, it intersperses glottal articulation between repeated dental articulations. The most common patterns are “tah-tah-kah” or “tah-kah-tah” (or “dah-dah-gah” or “dah-gah-dah”). The choice of pattern is dictated both by the music and performer preference. Importantly, the musician should know that the dental articulation (“tah” or “dah”) will have a stronger accent, leading to necessary musical decisions.



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Jazz and Special Effects

Bends, Scoops, and Doits

Bends involve quick adjustment of the embouchure while increasing air flow. For bending pitches up, the embouchure should start fixed on the given written pitch. At the point that the pitch is to be bent up to its release, the corners of the mouth should quickly firm while increasing air speed. The same is true for scoops or doits, only the embouchure starts relaxed and bends up to a fixed note which has sustain.

To bend down, the corners of the mouth should be quickly relaxed

and can include jaw movement as well the exaggerate the dropped pitch. As this drop occurs, more air will be needed to keep the embouchure engaged.

To make the bend more chromatic, half valves can also be used. Half valves are exactly what they sound like. The valves are depressed half-way down, allowing air to move through the open fingering and the valve slides simultaneously. This creates a muffled tone with indefinite pitch that smooths out the drop between partials.

Flutter Tonguing and Growls

Flutter tonguing and growls both occur when the tongue is inserted and held in the moving air stream. With both techniques, more air is needed than would normally be required to allow the tongue to “flutter” or “growl” while still fully engaging the embouchure in tone production.

For flutter tonguing, the tip of the tongue is placed near the articulation point at the base of the teeth and held there. The sensation is similar to the one needed for the Spanish rolled “rr.” As air moves over the tongue, the tip of the tongue flutters in and out of the air stream, creating a very quick multiple articulation.

For growling, the back of the tongue is placed near the articulation point for glottal tonguing and held there. The German consonant “ch” will help to position the tongue properly. Similar to flutter tonguing, the back of the tongue vibrates, creating a gritty tone. Care should be taken not to over exaggerate this effect as it can damage the throat.

Shakes

Shakes are a favorite audio and visual effect in jazz settings,

particularly found in parts for trumpet and trombone. The movement for the shake is about pulling the mouthpiece away from the embouchure, as opposed to pushing it into the face. Younger players can often do serious damage, such as cuts to their inner gums, by widely shaking the instrument.

Similar to vibrato, the shake should be taught slowly with a metronome. Have the students start on a long tone. They should pull the instrument away from the face, leading to a drop of air pressure and pitch. They should then return it to regular playing position. At no time should the mouthpiece be pushed into the lip harder than normal.

Typically when playing a shake, the intention is for the pitch to bend up. To execute this, the player should focus on playing the higher partial, allowing the pitch to drop back down to the lower partial. The change of pitch is then because of a reduction of pressure while still maintaining good technique.

Multiphonics

Multiphonics involve playing one pitch with the embouchure while singing a second pitch in the throat. Multiphonics are occasionally written in solo literature for low brass instruments. The key to making multiphonics work is being able to buzz while humming. Practicing initially on a mouthpiece is a key activity. Concern should not be about specific intervals but rather getting both mechanisms occurring at the same time. It is important that both the embouchure and the throat remain relaxed and not tight. Air support is critically important to ensure there is enough air to create tone through both the embouchure and the throat without tension.

Circular Breathing

Circular breathing is a favorite trick to learn for intermediate students. It entails breathing in through the nose while filling the mouth with air, which then acts as a bellows. The key skill to develop is the use of the mouth as a chamber for holding air. Visualizing pushing air out of the mouth (the analogy of spitting water works well) at the same time as breathing in through the nose is key. When transitioning back to having the lungs providing air support, think about the syllable “Ha” to get the air moving again.

PART II
INSTRUMENT SPECIFIC
TECHNIQUES AND
PEDAGOGIES



The Trumpet

The Horn

The Trombone

The Euphonium

The Tuba

10. The Trumpet

The trumpet is the treble most standard member of the brass family. Trumpet-like instruments have a long lineage, as fanfare style trumpets have been found in ancient Egypt, China, and South America. The primary identification of a trumpet is its cylindrical shape, distinguishing it from the equally ancient horn. Unlike the horn, the trumpet has historically always been made of metal, giving it its characteristic brightness and strong presence. The modern trumpet exists in many keys. The standard “beginner” trumpet is keyed in B \flat , though C and E \flat are commonly used in orchestral and solo literature. The piccolo trumpet, which is pitched an octave higher than the standard trumpet, is often found in the keys of B \flat and A. Other instruments in D, F, G, and A are also occasionally used for specific purposes.



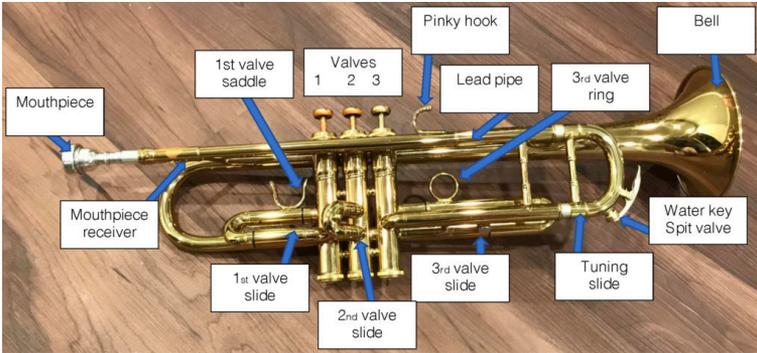
On left-Flugelhorn

Center (top to bottom)-B \flat Trumpet, E \flat Trumpet, Piccolo Trumpet

Right-Cornet

The trumpet has numerous close brass relatives which utilize the

same fundamentals as trumpet regarding embouchure and performance practice. The cornet was one of the most common instruments in bands at the beginning of the 20th century, and differs from the trumpet in its conical bore, more compact construction. It has a smoother, warmer tone than the trumpet. The flugelhorn is another common relative, frequently used in jazz settings. It is characterized by a mellow tone.



Anatomy of a trumpet

Characteristics for Beginning Trumpet Players

It should be noted that the best instrument for a student is the instrument that the student wants to play. This is no different for the trumpet. With very few exceptions, any student can be an effective trumpeter. With that said, there are characteristics that make for a stronger beginning trumpet player.

Mouth shape and specifically dental characteristics are important. The top and bottom teeth should be roughly aligned with one another or there can be a slight underbite. The front top teeth are particularly important as they form the foundation for the mouthpiece. Students with braces or other orthodontics

may experience pain when playing trumpet. Wax or various mouthguards can be placed on top of the teeth to reduce pain.

Lip shape can be an issue for some students who have a teardrop in the center of their lip. This can impede the formation of an effective aperture. The fullness of lips is seldom a major issue for trumpet players, but some students with extremely full lips may find it difficult to control tone in the upper register. Students who have unusual lip structures may be better suited for low brass, but again, trumpet players with all sorts of face structures have been highly effective musicians. Passion for the instrument should be the first and biggest determinant of a future trumpet player.

Setting Up the Trumpet

Most of the fundamentals of good brass playing are common for instruments, including trumpet, as outlined in [Getting Started with Posture, Breathing, and Embouchure](#). When first playing the trumpet, it is critically important that students are set up with good posture that allows for free breathing and limited tension throughout the body.

When playing trumpet, both hands should be in the shape of a relaxed C. The weight of the trumpet is supported by the left hand. The thumb should sit wrapped around the valve casing and resting comfortably in the 1st valve slide saddle. The middle or ring finger (which ever is more comfortable) should be inserted into the 3rd valve slide ring. On many instruments, this ring is adjustable to the size and shape of the player's hand. The other fingers should sit on top of or to the side of the 3rd valve slide. Avoid wrapping the fingers underneath the slide as this increases hand tension and limits movement of the slides.

The right hand controls the valves, which are number 1, 2, and 3 starting closest to the mouthpiece. The thumb should sit loosely underneath the lead pipe between the first and second valve

casings. The index finger, middle finger, and ring finger should set on top of the valves. Contact should always be made with the valve with just the tip of the finger. Make sure to keep fingers arched, both to limit tension and to reduce the amount of movement required to push down valves. The pinky should either sit on top of the pinky hook or be allowed to float freely. The pinky hook is only used for one handed playing (e.g. when using hand held mutes) or for visual effects (e.g. marching band).

When bringing the instrument to the face, make sure to set posture first and then set the mouthpiece lightly on the embouchure. While there is much discussion of the “perfect” embouchure, the mouthpiece should be centered left to right and be positioned roughly 50/50 on the top and bottom lips. Ideally, the extreme top and bottom of the rim should sit on the non-red part of the top and bottom lip.



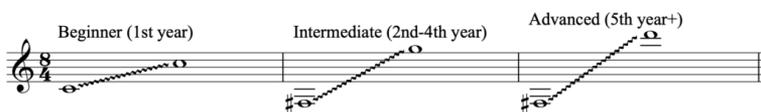
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Trumpet-specific details and concepts

As mentioned in the previous chapters, many of the details of trumpet playing are common to all brass playing concerning technique, tone, and practice. Make sure to reference the general sections regarding each of these issues in addition to the trumpet specific details below.

Range development

As with all brass instrument, range development tends to be slow compared to woodwind and string instruments. Because there is muscle development required to move between shelves, beginning trumpet players often have very limited ranges of around an octave. It is critical that students are not rushed to play higher notes than they can control without pressure and with good air control. Long tones and interval studies are critically important for beginning trumpet players, more so than other brass instrumentalists, so that they build the muscle tone and control to be able to play in higher registers.



These are approximate ranges for performers at different levels. Beginners typically have ranges from c4-c5. Intermediate literature will typically call for a range from f#3-g5. Advanced literature calls for ranges of f#3-d6 (higher for jazz and some solo literature)

Follow this link for a [trumpet fingering chart](#).

Intonation Control

Two of the valve slides are adjustable as students play 1st and 3rd. These adjustments should be considered part of the fingering for the instrument. As students develop their consistency and ability, they should spend time with tuners to identify exactly how far to move the slides.

The 3rd valve slide (often referred to as the D ring) is used for 1-3 and 1-2-3 combination, specifically d4 and c#4. Both of these pitches are extremely sharp and the adjustment of the 3rd valve slide extends the length of the trumpet, moving the pitch flat. The exact distance will vary by instrument and player, but should be roughly 1/3" for d4 and 1/2" for c#4. Student should be reminded to pull the 3rd valve slide back in for eb4 and other 2-3 combinations, as these are already extremely flat.

For intermediate students, they will need to pay attention to 1st valve intonation in the upper register, particularly for a5 using the 1-2 fingering combination. The 1st valve slide (also called the A saddle) is pushed out by 1/2" to lengthen the tubing for high A, lowering the pitch the flat.

Otherwise, intonation adjustment is made entirely through embouchure and air adjustment.

Mutes

Of all brass instruments, trumpet players are expected to have the greatest variety of available mutes. Mutes serve to alter timbre and projection of instruments.

Standard Mutes

Straight mute-This is the most common mute for trumpet players. If a part calls for “with mute” or “con sordino,” a straight mute is typically being expected. Straight mutes come in many different materials, each of which have a different timbre. The most common variations are fiber board “stone lined mutes” (characterized by their red and white painted finish) and metal mutes of aluminum, steel, copper, or brass. The straight mute is pushed into the bell and is held in place by its three corks. The straight mute greatly reduces the volume of the trumpet and removes lower overtones to create a bright, almost metallic sound. Depending on construction, the straight mute may also make the trumpet sharp, so adjustments should be made either to the tuning slide or the embouchure.

Cup mute-The cup mute looks like a straight mute with a bowl attached to its base and comes in both fiber board and metal. The cup mute muffles the tone of the trumpet by redirecting the upper overtones back into the instrument.

Specialty Mutes

Wah-wah or Harmon mute-The wah-wah mute is a fixture of certain jazz styles, comprised of a bulb shape with a small hole in its base, which can be expanded with a stem. The cork completely seals the bell, so all air must pass through the hole in the mute’s base. When the stem is out, the tone is very mellow with greatly reduced volume. When the stem is in, the tone is very direct and buzzy. By placing the hand or a plunger over the stem opening, the characteristic “wah-wah” sound can be made, which bends both pitch and tone. This must makes instruments extremely sharp, so the tuning slide should be adjusted when using the wah-wah mute.

Plunger mute-The plunger mute is exactly that-a sink plunger.

The plunger mute is held in the hand of the player by placing their wrist on the bottom of the bell, which acts as a hinge to open and close the bell. When closed, the plunger lowers the pitch of the instrument and cancels upper overtones. The plunger mute is often opened and closed to create a “wah” effect, especially when combined with a wah-wah mute. Opening and closing will be notated in the music using + to show closed and o to show open, placed above or below the note. A variation of the plunger mute is a hat mute, from the period when men commonly wore bowler hats which were used similarly.

Bucket mute-The bucket mute is a bowl or bucket with three springs on the rim that attach over the trumpet bell. The bowl is full of batting to soften the tone and dynamic of the trumpet.

Practice mute-Practice mutes look like straight mutes stuffed with batting. They are designed for quiet indoor practice. Caution should be used with practice mutes as they add a great deal of back pressure that can cause harm and develop bad habits.

Other mutes-As long as there have been trumpet players, there have been many various additional mutes, most of which are variations on those listed above such as pixie, buzz, and solotone mutes. The ones listed above will be commonly requested in literature, where additional mutes are often used for specialty settings. They are great to have for the purpose of contrast, especially for the jazz musician, but will seldom be requested specifically in a given piece of music.



*From left to right:
Plunger, Straight mute, Cup mute, Straight mute, Adjustable
cup mute, Practice/Whisper mute, Wah-wah/Harmon mute*

Unique Issues for Trumpet

Tension-While tension can be an issue for all brass players, trumpet players frequently encounter pressure and tension when working on expanding their upper register. This can be seen in strain in the throat, pinching in the center of the embouchure, and tightness in the arms. This tension can inhibit good tone development and over time cause longterm injury. To address this concern, make sure that students are not forced to expand their register too quickly, something that often happens as they transition into split parts in ensembles. Second, encourage students

to warm up thoroughly and continue to practice long tone and interval studies which build muscle tone and control which aid upper range development.

Anchored pinky finger-The most common source of inappropriate pressure comes from the pinky finger on the right hand when students use the finger hook, sometimes referred to sarcastically as the “octave key.” By encouraging students to keep the pinky on top of the finger hook or allowing it to move freely, students will not develop the habit of using the pinky ring to push pressure on the embouchure when playing in higher registers.

Slide adjustment-Many beginning trumpet players will not use the third valve slide to adjust D and C#, leaving these two notes extremely out of tune. The use of the third valve slide should be taught as part of the finger for these pitches, while the specific placement of the slide can be refined once students have developed greater consistency in pitch and tone.

Flat fingers-It is common for student trumpeters to develop flat fingers on top of the valves, where the valves are depressed by the joint on the finger rather than the tip. This creates two issues. First, flat fingers require more movement to depress the valves, leading to slower fingering transitions. Second, flat fingers introduces tension into the hand, which can lead to tendinitis, carpal tunnel, or other repetitive stress injuries.



When the fingers flatten, technique can be more difficult and tension can be introduced into the hand.



The tips of the fingers should be used when playing trumpet, with the thumb placed between the first and second valve and the pinky allowed to move freely.

Equipment changes-Trumpet players are renowned for being finicky about their instruments, specifically their mouthpieces. While there is some merit for advanced players to have specific mouthpieces for specific tasks (e.g. small shallow mouthpieces for extreme register, deep cupped mouthpieces for darker tone), beginning and intermediate players should choose a standard mid-sized mouthpiece upon which they can develop consistent technique and tone. For beginners, a 5C or 7C mouthpiece

is recommended. For intermediate players, they will want to transition to a slightly larger mouthpiece, such as a 3C (These sizes use Bach's sizing system. Charts can be found on line easily that translate different sizing systems for mouthpieces). Frequent changes in mouthpieces for young players can lead to poor development of embouchure and inconsistent fundamentals that inhibit later growth.

II. The Horn

The horn has its origins in primitive times, taking both its name and original shape from animal horns which served as the first musical horns. Over time, the modern wound design has become the standard instrument, starting with natural horns without valves and eventually developing the rotor systems we are familiar with today.

The origins of the horn without valves or rotors leads to one of the reasons it comes in many different keys. Originally, horns had crooks, which were additional slides added to a horn to change their length and, by extension, key. While the horn in the key of F has become the norm, keyed horns were used frequently through the Classical period and horns in Eb and Bb are still found in music for brass and concert bands.



In order to change the key of a horn, allowing for a different pitched partial series, crooks of various lengths needs to be added to the instrument.

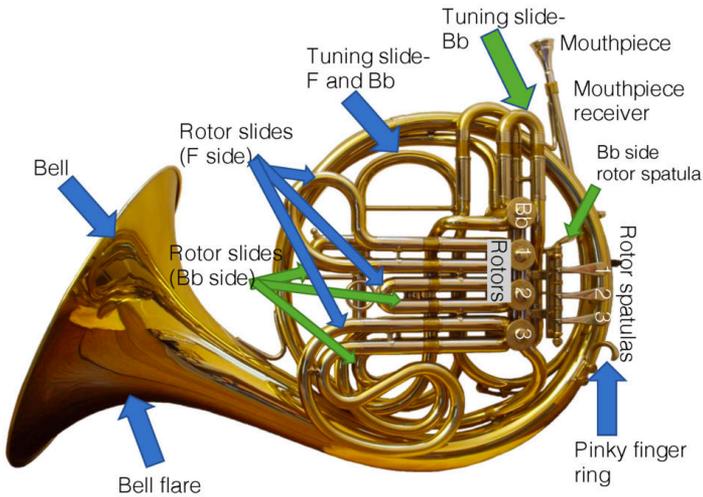
The modern horn is often found in two varieties: the single horn (pitched in F) and the double horn (pitched in F and Bb). The difference between the single and double horn is that the double horn has a fourth rotor, controlled by the thumb on the left hand, which changes the instrument from F to an instrument pitched a fourth higher in Bb. This rotor removes around four feet of tubing from the horn, allowing for a different set of possible fingerings and improved precision in the upper register. While some students will start on a single horn because it is a lighter and less expensive instrument, it is advised that they transition to the double horn for its greater versatility and improved intonation.

Until the second half of the 20th century, it was common for schools and school band literature to include parts for Bb and Eb horn. The Bb horn is smaller than and is pitched up a perfect fourth from the F horn, while the Eb horn is larger and is pitched down a Major second. Different variations of double horns have also been used. Teachers will want to be aware of these variations in case they encounter an older horn still in use with unusual pitch tendencies.

A commonly used relative to the horn is the mellophone, which can be found in marching bands. The mellophone is a bell front instrument and is ideally designed for outdoor projection without the finesse of tone found in the horn. Its timbral qualities fall somewhere between trumpet and horn. Similar to horn, it is pitched in F, allowing it to serve as an alto voice in the ensemble. Dependent on manufacturer, the mellophone can have two primary differences. First, many use a trumpet mouthpiece (allowing trumpet players to easily switch to the mellophone). Second, the mellophone is technically pitched an octave higher than the horn, so while still keyed in F, it utilizes the same fingerings as the trumpet when reading the music. A less common variant today is the marching horn which is pitched in Bb.

A quick side note—in the United States, the horn is frequently called the French horn. The origins of “French” are the thing of horn myth, but it should be noted that the proper name of the instrument is “horn.” Ironically, the design of horn used today finds

its origins in German instrument makers in the 1800s, as opposed to a contrasting model made in France that is seldom used today.



The double horn is two instruments in one. By depressing the Bb rotor, around 4 feet of tubing are removed from the instrument. The Bb slides are located behind the F slides.

Characteristics for Beginning Horn Players

It should be noted that the best instrument for a student is the instrument that the student wants to play. This is no different for the horn. With very few exceptions, any student can be an effective hornist. With that said, there are characteristics that make for a stronger beginning horn player.

Most importantly, it is imperative that horn players have strong aural skills due to the close placement of partials in the functional register of the horn. They need to be able to readily distinguish between adjacent partials, particularly because horn players often

do not have the difficulties with range that are found in other brass instruments.

While lower pitched than the trumpet, the horn has the smallest diameter mouthpiece of any brass instrument. While lip and face structure varies greatly between horn players, relatively even vertical placement of the upper and lower teeth without major orthodontic issues is a benefit. Similar to trumpet, students with braces may find horn playing to be painful. Students with thick lips may find it more difficult to initially set up a controlled embouchure.

The horn can be a slightly ungainly instrument to play, so extremely small students may find difficulty in setting up their bodies correctly to play the horn. Make sure that the student can establish the proper posture discussed in the next section, and does not distort the spine alignment or head placement to get to the instrument.

Many music programs find themselves with a shortage of horn players, requiring students to move to horn from other instruments. Trumpet players typically make good candidates for switching to horn, recognizing that there will be a slight adjustment in embouchure and tone production. Flute players will frequently make good candidates for horn as well due to similar aperture size and air usage.

Setting Up the Horn

The horn has one of the more unusual and non-symmetrical posture set ups in the instrument world. It is extremely important that students set their posture before adding the horn in place, placing emphasis on an alignment of the shoulders over the hips and placement of the head straight forward. Attention should always be placed on reducing tension and maintaining relaxed air flow as discussed in [Getting Started with Posture, Breathing, and Embouchure](#).

The left hand controls rotors as well as supports the weight of the instrument. The left hand should have the shape of a C with the pinky resting in the finger hook that supports the weight of the instrument. The index, middle, and ring fingers should be placed on the rotor spatulas with the pad of the finger resting on the middle of the spatula. If the instrument is a double horn, the thumb should be placed on the Bb rotor spatula. The thumb will help support the instrument through contact on the first knuckle.

The right hand is placed in the bell of the instrument. The students should be taught to use the right hand immediately, as the instruments are designed to play sharp with a slightly unfocused tone, both of which are controlled by the right hand. The role of the right hand is to redirect the sound in the bell, not stifle it. The right hand should be relaxed with the fingers together, as though it were to be used to cup water. It should rest against the bell wall at around a 2:00 position. The weight of the instrument should rest of the first knuckle of the thumb and base knuckle of the right hand, which should be positioned right around the bell flare.

As the instrument is brought to the embouchure, it is important that the torso remains vertically aligned and relaxed without twisting. The bell should point past the right side of the body, taking care to not allow the stomach to mute the sound. The upper part of the right arm should stay roughly even vertically with the torso of the body, with both arms comfortably away from the rib cage to allow for relaxed breathing. The weight of the instrument should be on the hands, and not placed on the leg as it will encourage twisting, mute the sound of the instrument, and inhibit good tone production.

The embouchure on the horn should be slightly higher than other brass instruments, roughly two-thirds on the upper lip and one-third on the lower lip. Care should be taken to make sure the embouchure is as flat as possible vertically, with the lower jaw pushed slightly forward. The horn embouchure will typically have a slight pucker to it, though this will develop naturally. In most cases,

students should not be told to pucker, as they will over-exaggerate the motion.



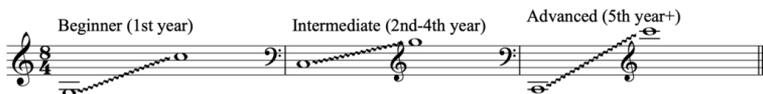
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Horn-specific Details and Concepts

As mentioned in the previous chapters, many of the details of horn playing are common to all brass playing concerning technique, tone, and practice. Make sure to reference the general sections regarding each of these issues in addition to the horn specific details below.

Range development

Most beginning horn students comfortably find the middle of their register around the 3rd–6th partials and are able to access multiple partials relatively quickly, compared to the other brass instruments. This quick access poses a challenge for many students as the partials are close together in this register, and they quickly find themselves a second or third off of their desired pitch. As students develop more competency on the instrument, they will want to closely attend to intonation tendencies on the instrument and learn which notes should use the Bb side of the horn for easier access and improved pitch.



These are approximate ranges for players at different levels regarding the range they should have for standard literature.

Follow this link for a [Horn Fingering Chart](#).

Right hand

The right hand plays a critical role for the horn in adjusting intonation and focusing tone. It is imperative that beginning horn players place the right hand in the bell appropriately, at least in a neutral position, to ensure that they can play in tune with good tone.

The hand can be adjusted while playing to allow for the bell to be opened or closed. When the bell is more open with the hand pulled away from the bell flare, the tone becomes brighter and the pitch will adjust higher. When the bell is made more closed by pushing the

hand further up the bell flare or rotating the wrist to close off the bell, the pitch becomes darker and the pitch becomes flat.

As horn players play, they primarily adjust their pitch through the manipulation of the right hand. As horn players seldom use 1-3 and 1-2-3 fingerings, the majority of the most out of tune fingering combinations are avoided, allowing for this subtle manipulation of pitch.



The right hand should rest at around a 2:00 position inside the bell right at the bell flare.



Double horn

Once students reach an intermediate level, they should be playing on a double horn. In many cases, beginners students start on these instruments. Double horns provide greater versatility and better intonation as compared to the single horn, though they are heavier than a single horn.

When the Bb rotor is not pressed, the horn is pitched in F. The tuning in F positions horn as an alto voice in the ensemble with access to the register that traditionally spans the treble and bass clef (for this reason, horn players should be able to readily read both clefs and be familiar with alto clef). When the Bb rotor is pressed, the instrument transposes up a Perfect 4th. It is important to note that the written notation does not change and most notes can be played on both the Bb and F sides of the instrument.

There are multiple reasons to use the Bb side of the horn. Most importantly, the Bb side of the horn provides more accurate access to the upper register of the horn, as the partials are spaced further apart and are typically more in tune. Bb fingerings are typically used for all notes on the middle of the treble clef staff and higher.

Additionally, the Bb side of the horn fills in the gap in the lower register of the instrument between the 1st and 2nd partials, allowing for full chromatic access to the complete range of the horn. The Bb side of the horn can also be used to provide for alternative fingerings, either to correct characteristically out of tune pitches or allow for greater speed due to simplified fingerings.

When learning horn, students with a double horn should learn double horn fingerings first. While the F side of the instrument and single horns are fully capable of playing all chromatic intervals, the use of both sides of the double horn will help students play with greater dexterity and better intonation. Once students have learned primary fingerings, they should be exposed to alternate fingerings that provide more options in specific settings requiring agility.

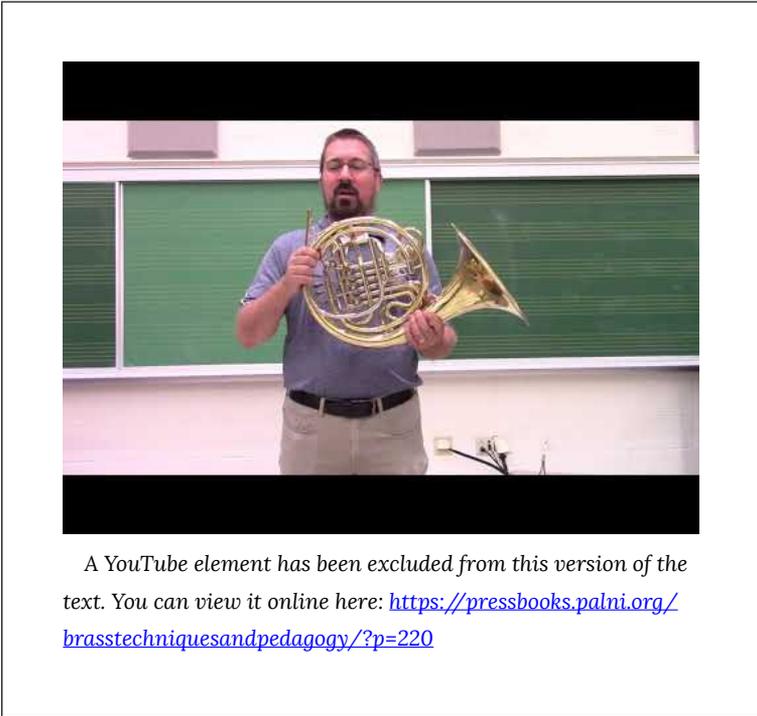
Tuning the horn

Whenever the horn is tuned, the right hand should be in the bell, as hand placement alters the pitch of the instrument. When playing on a double horn, the Bb side of the horn should be tuned first, using a written C. Once the Bb side is in tune, the F side of the instrument should be tuned, ideally to a written C or G. Periodically, the individual slides for each rotor should also be tuned (see [Pitch and Intonation](#) for details).

Spit draining

Unlike other brass instruments, most horns do not have water keys or spit valves on them. In order to empty spit and condensation from the instrument, slides are removed and rotated to allow all moisture out of the instrument. Two complete rotations of the

instrument toward the mouthpiece will allow all water out of the instrument.



Mutes

Stopped horn—The most common method of muting on horn is called stopped horn. The right hand pivots forward to “stop” the air by completely closing off the bell. This creates a very bright, brassy tone with greatly reduced volume. It also raises the pitch a half step, requiring the player to transpose all written pitches down by a half step.

Stopping mute—The stopping mute is an alternative to hand

stopping, and allows for greater control of pitch, dynamic, and timbre.

Straight mute—The straight mute for horn also creates a brighter sound, but does not require pitch transposition. It is held in place by the right hand while being used, often coming with a strap to allow it to hang from the wrist for quick removal.



*On the left—non-transposing stopped horn mute
On the right—horn straight mute*

Unique Issues for Horn

Hand placement-Placement of the right hand is critically important for both pitch and tone control on the horn. Beginning players will often see the right hand as unnecessary, particularly if they rest the horn on their right leg as they play. This leads to a fractured, sharp tone. Students will also allow the wrist to collapse across the bell flare or insert the hand too far into the bell, effectively stopping the horn. Students should be reminded of proper hand positioning, with the hand gently cupped and fingers together. The weight of the horn should sit on the thumb and first finger right at the point where the bell begins to flare. Picturing the hand as an extension of the natural curvature of the bell can help students understand how to position the hand. Using aural cues can help as well, by having students first exaggerate hand position to stop the horn, and then adjusting to proper position. Finally, remind students that there should be no angles in the wrist and fingers—these sharp angles can lead to improper hand position.

Partial placement-Due to the small intervals between horn partials, students will frequently over or under pitch notes, landing on the adjacent partials. Interval studies such as the [Broken Remington](#) exercises can help students identify intervals more accurately. Pitch matching games can serve the same purpose, by having students imitate a

pitch played by the teacher. Teaching students about the specific intervals between partials and making sure they can identify them can also help them in at home practice so that they can ensure that they are on the correct starting pitch. For example, if the students hear a Major 3rd between two adjacent partials with open fingerings, they will know that the lower pitch is c4 and the upper pitch is e4 as that is the only spot that a Major 3rd exists in the partial series.

Trumpet embouchure-Since many horn players are transplanted trumpet players, it is important to recognize the differences in embouchure placement. The lips should be slightly puckered and the ratio of top to bottom lip should be 2:1. The horn has a warmer, less direct sound than trumpet, so students should be encouraged to keep the jaw relaxed and open, with an emphasis on full, warm air.

Double horn confusion-More advanced players become very specific about when and how they use the double horn. For beginning players, too many options can be an issue as they haphazardly use the Bb side of the instrument. When first learning the horn, keep the description of the theoretical function of the Bb side to a minimum. Instead, treat the Bb rotor as another fingering. Students should be taught that pitches above g4 utilize the Bb trigger fingerings. Pitches from g4 down should use F fingerings. Once students are more advanced, they should be taught how the Bb side of the horn functions and be introduced to alternative fingerings to adjust technique and intonation concerns.

12. The Trombone

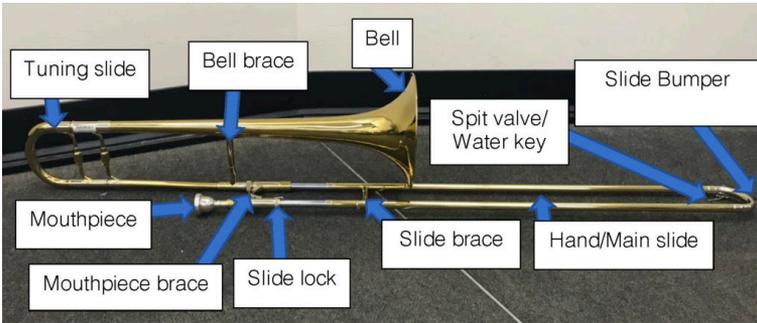
The trombone's origin is in the medieval sackbut, which developed from the trumpet. The instruments differ in some construction details, but in essence, the practice of the trombone has remained unchanged. The trombone is unique in its use of a slide for pitch manipulation, making it the only standard wind instrument with a fully continuous range at the microtonal level. Originally, the sackbut and later trombone was viewed as a religious instrument due to its ability to perform chromatically as a double to voice parts in SATB settings.



Collection of late Renaissance soprano, alto, and tenor sackbuts

The standard school trombone today is the tenor trombone, but several variations exist. The bass trombone is a relatively common instrument in jazz and concert bands, and the alto and contra-bass trombone can be found in some orchestral and solo literature. Many

tenor trombones and all bass trombones will have a trigger on them, located near the player's left shoulder, which drops the instrument's pitch by a perfect fourth to allow for alternate slide positions and full chromaticism through the instrument's fundamental. The valve trombone is another variant, which replaces the slide with valves. This instrument is most commonly used to allow euphonium players the opportunity to play in jazz ensembles which require the brighter, directional timbre of the trombone.



Parts of a standard tenor trombone

Characteristics of Beginning Trombonists

It should be noted that the best instrument for a student is the instrument that the student wants to play. This is no different for the trombone. With very few exceptions, any student can be an effective trombonist. With that said, there are characteristics that make for a stronger beginning trombone player.

Outstanding aural skills are critical for a trombonist. Due to the trombone slide, the trombone is capable of continuous pitch, requiring the player to listen carefully for intervals and their fellow musicians. While pitches have fixed slide positions, these slide positions vary based on partials and environmental conditions. The trombonist is constantly adjusting their pitch to ensure that it is

centered in tune. Students who cannot orally match pitch frequently find difficulty in playing trombone.

Student size is a critical consideration for the trombone. Due to the length of the slide, students need to have long enough arms to reach the outer positions. For the student who is small, there are grip extenders which can be added to the trombone to allow for reaching outer positions, but these are less than ideal as they change the way the instrument is handled, making it less ergonomic. Especially when starting younger students, family height can be a consideration to identify if the student is likely to grow into the instrument. It is not uncommon for beginning trombonists not to be able to reach the outer positions.

The embouchure for the trombone is fairly forgiving, making the trombone a possible instrument for students with braces or other orthodontic issues.

Setting Up the Trombone

The trombone is the only brass instrument requiring assembly for playing. Of greatest importance is making sure that the slide is always carefully handled, as even small dents can make it unusable and difficult to repair. When not in use, the slide lock beneath the mouthpiece should always be locked.

The slide of the trombone should be held in the right hand at the slide brace. For beginning players, encourage them to hold the slide vertically with the rubber stopper on the bottom of the slide resting on the floor.

With the left hand, place the bell section onto the receiver that is on the longer side of the slide. The bell should go on smoothly; if force is needed to get it on, lubrication may be needed. A graphite pencil can be scribbled on the inner tubing to provide light lubrication. The angle between the slide and bell should be slightly less than 90 degrees. The bell lock should be screwed down to

finger tightness. No tools should ever be used to tighten a trombone bell lock.

The left hand supports all the weight of the trombone. An “L” should be made with the thumb and first finger. The thumb should wrap under the bell tubing above the bell brace. The index finger should rest across the mouthpiece brace, pointing toward the mouthpiece. The other three fingers should wrap around the tubing between the mouthpiece and slide braces.

The right hand controls the movement of the slide. The slide should be positioned between the tips of the thumb and index and middle fingers. The other fingers should not make contact with the instrument, but rather should curl gently into the palm of the hand.

After proper posture is set ([see the Posture chapter](#)), the trombone should be brought to the embouchure. Arms should remain in a relaxed position away from the rib cage to allow for unrestrained breathing.

The embouchure for the trombone varies extensively across players. Ideally, the mouthpiece should be positioned in the middle of the embouchure from left to right with roughly a 50/50 division between the upper and lower lips. Many professional players also use two-thirds, one-third division between top and bottom lip. The best embouchure is the one which produces the fullest tone for the student.



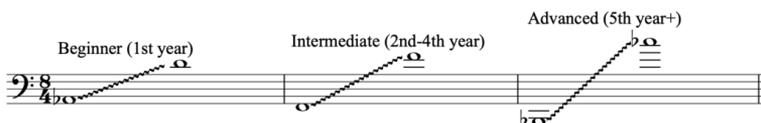
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Trombone-specific details and concepts

As mentioned in the previous chapters, many of the details of trombone playing are common to all brass playing concerning technique, tone, and practice. Make sure to reference the general sections regarding each of these issues in addition to the trumpet specific details below.

Range development

As with all brass instrument, range development tends to be slow compared to woodwind and string instruments. Because there is muscle development required to move between shelves, beginning trombone players often have very limited ranges of around an octave. It is critical that students are not rushed to play higher notes than they can control without pressure and with good air control. Long tones and interval studies are critically important for beginning trombone players, so that they build the muscle tone and control to be able to play in higher registers.



This chart shows the characteristic range called for in standard literature at various levels for trombone.

Follow this link for a [Trombone Fingering Chart](#).

The slide

The slide is the obvious unique characteristic for the trombone, allowing it to play every beginning trombonist's favorite glissando. The slide also creates some challenges for beginning trombonists, namely that there is no easy way to guarantee that they are close to the correct pitch. The slide makes it critical that trombonists have strong aural skills.

The slide is divided into seven positions, each of which is a half step apart. The distance between positions gradually increases from 3" for 1st to 2nd position to just over 4" for 6th to 7th position. Due

to the different intonation tendencies of each partial, the position for each position is not identically the same across the range of the instrument. Students should learn their slide positions through a combination of muscle memory and careful listening. Discourage students from using their fingers to feel for the bell to place 3rd and 4th position, as this creates strain in the wrist and a false sense of confidence.



1st position



2nd position



3rd position



4th position



5th position



6th position



7th position

There is some variance in the exact location of positions based upon partials.

The wrist leads the movement for the slide. The first two fingers and the thumb should be able to rotate around the slide brace as the wrist makes small adjustments. The wrist should stay loose and pliable, so that small adjustments can be made. The larger the movement of the slide is, the more involvement is introduced from elbow. Very little movement should occur from the shoulder, which should be limited to 6th and 7th positions.

Very importantly, slide movement should always be quick to limit the amount of slide movement between notes to avoid glissandos.



The slide is controlled by two fingers and the thumb, which should be loose enough to easily rotate around the slide brace.



F-attachment

More advanced trombones will often have what is termed an F-attachment. The F-attachment is an alternative bell segment that adds additional tubing to the instrument to lower the pitch by a perfect 4th when the rotor is engaged. The F-attachment serve two critical purposes:

- eliminates the need for large slide movements as alternate slide positions can be used for outer positions
- gives the trombone the pitches from b1-eb2 that allow for full chromaticism through the fundamental bb1.

The F-attachment can serve as an alternative also for particularly small trombonists, though this does add additional weight to the instrument which they will need to contend.



The F attachment on the trombone is controlled by the left hand thumb and drops the pitch by a perfect fourth.

When looking at bass trombones, it is common to have a double rotor system. The first rotor drops the instrument into F. The second rotor, in combination with the first, drops the instrument into Eb or D, functionally extending the lower octave of the instrument and providing more alternative positions to allow the larger slide to stay in the close positions. The construction of this second rotor can vary. In instruments with dependent (or stacked) rotors, the second rotor is built into the tubing for the F rotor, so the second rotor only functions with the first attachment opened. In independent (or in-line) rotor instruments, the second rotor is built into the main tubing, allowing it to function without the F attachment. For independent instruments, the second rotor drops the instrument into G or Gb when used on its own.

Slur or legato tonguing

The slide presents a problem for trombonists when they play parts that require slurring. Since the slide needs to move between notes, there is no way to have unarticulated notes without a glissando between them. To remedy this, trombone players use a “lah” syllable to very lightly divide notes. The tongue merely interrupts the air flow as lightly as possible while the slide moves as quickly as possible.

Intonation

Unlike other brass instruments, intonation on the trombone is primarily controlled mechanically. Since the slide is continuous in pitch, the trombone player adjusts the slide to address pitch inconsistencies. This allows the embouchure to remain centered, allowing for consistent tone control. This also means that slide

positions vary slightly based upon the intonation tendencies of different partials.

Mutes

The trombone utilizes the same collection of mutes as the trumpet.

Standard Mutes

Straight mute-This is the most common mute for trombone players. If a part calls for “with mute” or “con sordino,” a straight mute is typically being expected. Similar to trumpet, they come in a variety of different materials, each possessing slightly different timbral qualities. In general, the mute cancels lower overtones making for a bright, brassy tone with reduced dynamic.

Cup mute-The cup mute looks like a straight mute with a bowl attached to its base and comes in both fiber board and metal. The cup mute muffles the tone of the trombone by redirecting the upper overtones back into the instrument.

Specialty Mutes

Wah-wah or Harmon mute-The wah-wah mute is a fixture of certain jazz styles, comprised of a bulb shape with a small hole in its base, which can be expanded with a stem. The cork completely seals the bell, so all air must pass through the hole in the mute’s base. When the stem is out, the tone is very mellow with greatly reduced volume. When the stem is in, the tone is very direct and buzzy. By placing the hand or a plunger over the stem opening,

the characteristic “wah-wah” sound can be made, which bends both pitch and tone. This must makes instruments extremely sharp, so the tuning slide should be adjusted when using the wah-wah mute. The wah-wah mute with stem in creates the famous “Charlie Brown’s teacher” effect.

Plunger mute-The plunger for trombone is a standard toilet plunger. There is a bit of challenge for trombonists in using the plunger, as it is held by the left hand. The bell rests against the wrist, which serves as a hinge to open and close the bell. When using the plunger, the left hand is simultaneously manipulating the plunger and supporting the weight of the instrument. This posture can easily lead students to put more pressure on the embouchure, so care should be made to ensure that excessive pressure is not put on it.

Bucket mute-The bucket mute is a bowl or bucket with three springs on the rim that attach over the trombone bell. The bowl is full of batting to soften the tone and dynamic of the trombone.

Practice mute-Practice mutes look like straight mutes stuffed with batting. They are designed for quiet indoor practice. Caution should be used with practice mutes as they add a great deal of back pressure that can cause harm and develop bad habits.



From left to right:
Front row: Plunger mute
Back row: Straight mute, Cup mute, Wah-wah mute

Unique Issues for Trombone

Fist grip—Beginning trombone players will often wrap their entire hand around the slide brace, making the wrist rigid and losing the ability to pivot around the grip. Remind students to hold the slide brace between the finger tips of the first and second fingers and the thumb. Practice moving between 1st and 2nd position using only the wrist, allowing the slide brace to pivot between fingers when doing that motion.



Gripping the slide with the entire fist reduces agility and increases tension.

Glissandos between notes-If students are using slow slide motions, glissandos will be heard between notes, even when students articulate appropriately. Students should be reminded to move the slide quickly between positions. Intervals studies like [Broken Remington](#) can be particularly useful in isolating this movement. Start with close movements between notes that are a second apart and then progress to larger intervals.

Collapsed posture-Due to the off centered posture of the trombone, it is common for trombonists to slump to the left, either by tilting the torso or allowing the neck to tilt. At times, beginning trombonists may try to rest trombone bell segment on their shoulder to lessen the weight on the left hand. This collapsed posture inhibits air flow and creates issues for quick, smooth slide movement. Students should lift the trombone off of their shoulder and make sure that

the back remains straight and head remains elevated by always setting posture first and then introducing the instrument to the established posture.

13. The Euphonium

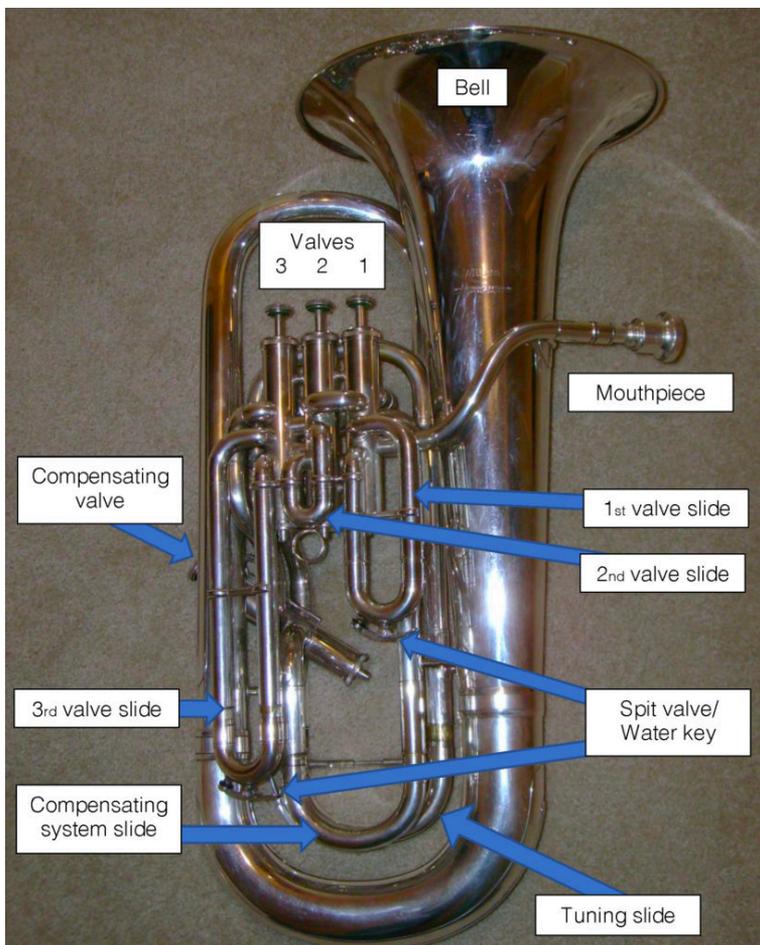
The euphonium is the newest standard member of the brass family having been invented in the 1840s. It was developed as an immediate response to the development of valves, as it was seen as a melodic low voice with a warmer sound than the trombone. In terms of voicing, it serves the same role as the trombone as a tenor or baritone voice. The youth of the euphonium can be seen in the many different variations of design that are used by different manufacturers of the instrument.



Double Belled Euphonium which played a melody accompanied by a drone.

The euphonium is closely related to the baritone, and the distinction between the instruments is somewhat unclear.

Technically speaking, the euphonium has a more conical bore and a fuller tone than the baritone, but historically, the instruments have frequently been interchanged with one another in band music. In the United States, the bell front baritone was a fixture of the first half of the 20th century, but more recently, the euphonium has risen to prominence in both school and professional bands. It serves a versatile role in the ensemble, including as a melody instrument, tenor voice accompaniment, and bass line.



Basic parts of a compensating system euphonium

Characteristics for Beginning Euphonium Players

It should be noted that the best instrument for a student is the instrument that the student wants to play. This is no different for the euphonium. With very few exceptions, any student can be an effective euphoniumist.

The euphonium is quite possibly the most forgiving instrument of all for beginners. While mastering the instrument takes a great deal of time due to the wide range of musical expectations for the instrument, the instrument's size makes it appropriate for nearly any musician and the embouchure is very accommodating to orthodontic issues.

The one challenge that beginning musicians often have with the euphonium is the large amount of air required for full tone. The construction of the instrument is very free blowing, so it requires a large amount of consistent air to maintain good tone.

The euphonium makes an ideal transfer instrument for students who have encountered physical issues with other instrument. In particular, high brass players with braces often make extremely strong euphonium players as the musical demands of euphonium as a melody instrument are often similar but the larger mouthpiece reduces pressure on the face

Setting Up the Euphonium

While there are several designs for the euphonium, nearly all have the same fundamentals in terms of posture. The left arm supports the weight of the instrument while the right hand manipulates the valves and stabilizes the angle of the instrument.

For instruments with a compensating valve, the left arm wraps

around the front of the euphonium so that the left index finger can press the compensating valve. The left arm is less responsible for holding the euphonium up as it is for creating leverage against the lower torso on which the euphonium rests. Importantly, students should establish their posture first and then bring the euphonium to themselves. Except for extremely small players, the euphonium should not be resting on the lap. If a student finds the weight of the instrument difficult to support, they may position a cushion under the instrument, making sure that the height of the cushion allows for proper torso posture.

The right hand should be in the shape of a C with the thumb positioned under the valve brace and the fingers positioned on the fingertips on the valve caps. Care should be taken to make sure that the fingers stay close to their assigned valve and do not wander together or curl back toward the palm of the hand.

When bringing the instrument to the body, make sure that the torso and head are in position first. The mouthpiece should rest in the center of the lips roughly evenly divided between the upper and lower lips. The mouthpiece cushion should remain very relaxed and supple to allow for a very free and vivacious buzz.

The exact angle of the instrument is based in part on the player's body and size. The euphonium typically leans slightly to the right while playing at an angle that allows the left arm to comfortably wrap around the instrument and the right arm to come up to the valves without compressing the rib cage or pulling the shoulder out of line.



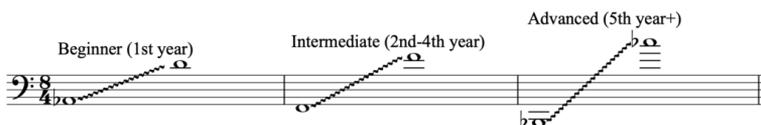
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Euphonium-specific Details and Concepts

As mentioned in the previous chapters, many of the details of euphonium playing are common to all brass playing concerning technique, tone, and practice. Make sure to reference the general sections regarding each of these issues in addition to the euphonium specific details below.

Range development

As with all brass instrument, range development tends to be slow compared to woodwind and string instruments. While most players find that the first sound on euphonium comes very easily, it can take beginning euphoniumists a fair amount of time before they are able to play a full octave across three partials. It is critically important that beginners are not pushed too quickly to develop range and that they are encouraged to play long tones and interval studies that can develop their muscle tone and control.



This chart shows the characteristic range called for in standard literature at various levels for euphonium.

Follow this link for a [Euphonium Fingering Chart](#).

Intonation control

Intonation on euphonium is primarily controlled through the embouchure, though many instruments include a 4th valve or a compensating system that allows for more in tune alternatives to problematic fingering combinations.

4th valve vs. Compensator systems

Two different systems commonly exist on euphoniums to adjust

particularly out of tune intervals and extend the full chromatic range of the instrument. On the surface, they work in very similar ways. The 4th valve or compensator system serves to provide an alternative fingering for 1-3 and 1-2-3 fingerings and fill in the gap between the fundamental of bb1 and e2. The way these systems function is distinctly different and has ramifications for in tune playing and for extreme low register.

4th valve

The fourth valve is typically positioned alongside the first three valves and functions exactly the same way as the other valves on the instrument by lowering the pitch by a fixed amount, in this case, a perfect 4th. The 4th valve can be used as a substitute for the 1-3 fingering combination and can provide an imperfect partial between the fundamental Bb and first partial Bb. The problem develops as the low Bb is approached as the tubing is not quite long enough to compensate for register, causing the pitch to sit relative sharp.

Compensating system

Compensating systems work by a more complex but more effective system. The compensating valve is typically found on the side of the euphonium. When pressed, the compensating system opens up an additional set of tubing that is attached to each valve. This system compensates for the additional tubing needed not only for the initial interval of the perfect fourth, but also the additional tubing needed for each additional depressed valve. This compensating system is preferred over the 4th valve system as it allows for better intonation as more valves are depressed in the low register.

For an outstanding video explanation of how compensating systems function, check out [this explanation](#) by David Werden.

Mutes

Mutes are seldom used in concert literature for the euphonium. When called for, the straight mute is most commonly used for the euphonium. It is inserted while the instrument is vertical in playing position by reaching over the top of the instrument to place it in the bell.



The straight mute is used on the rare occasion a mute is required for the euphonium.

Unique Issues for Euphonium

Air support issues-Due to the large size of the euphonium, air support is a frequent problem for more novice euphonium players. Students should work on building both lung capacity and exhale capacity and consistency. Exercises found in the [Breathing](#) chapter can help students build this capacity.

Technical dexterity-The large size of the valves coupled with the melodic responsibilities of the euphonium can pose problems with technical dexterity. Students should be reminded to maintain a rounded C shape in the right hand so that the finger tips are on the valves. By keeping the fingers rounded and on the valve buttons, students are better prepared for quick movements. Euphonium players should also include technical exercises such as [Dexterity Exercise #1](#) and [Dexterity Exercise #2](#) as part of their every day practice.

14. The Tuba

The tuba is the modern representative of a long history of brass instruments that have attempted to serve as the bass voice of the ensemble. Some of these instruments, such as the ophicleide and the serpent, took their design from bassoons and other bass woodwind instruments. Others attempted to capture the characteristics of smaller brass instruments scaled up for size, such as the bass saxhorn and Wagner tuba. This evolution can still be seen today as there is not a single standard design for the tuba, although the principles have been broadly standardized.



Many instruments have been developed to assume the role of bass brass instrument.

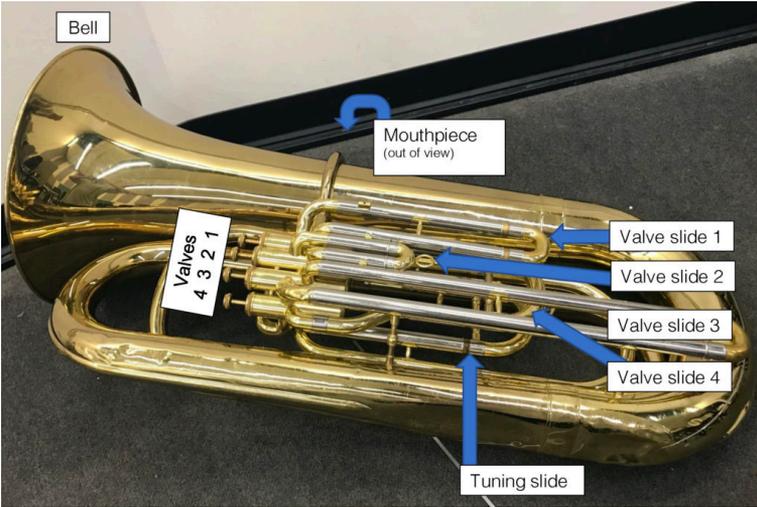
A. Wagner tuba B. Serpent C. Ophicleide D. Bass Saxhorn E. Russian bassoon

By the early 1900s, the modern tuba assumed its current form. By default, the modern tuba is a vertical projecting, conical bore instrument with at least three valves or rotors. In classrooms, it is not uncommon to still find bell front tubas, which have a 90 degree curve placed just before the bell flair. The BBb tuba is the standard

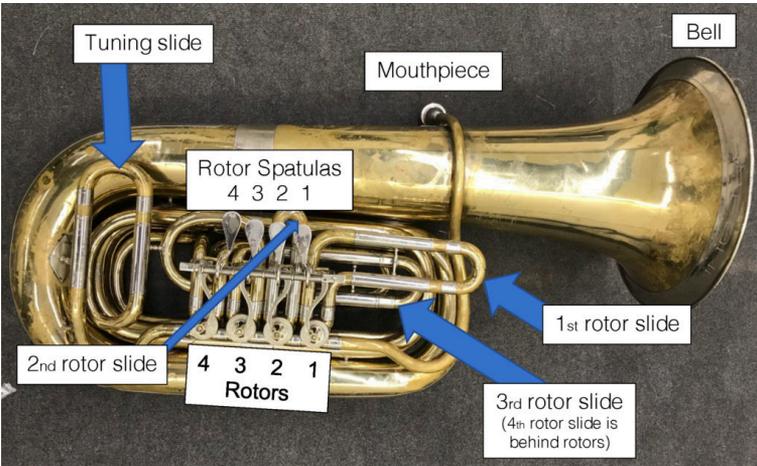
tuba found in schools, while the CC tuba is typically preferred by professional players, especially in orchestras. Tubas can also be found regularly in Eb and F, which are typically used as solo and chamber instruments as they are smaller instruments allowing for greater agility. To accommodate players of different sizes, tubas also come in scaled versions, sometimes referred to as junior tubas, with many schools utilizing 1/2 or 3/4 size tubas.

Regarding construction, tubas are commonly found with valves and rotors. They can have as many as six valves, allowing for different combinations to improve intonation and extended low register. For beginners, a 3- or 4-valve BBb tuba is preferred, as it is more durable than the rotor versions and allow for the development of solid fundamentals without the confusion of extended fingerings. While tubas of a given key have the same length of tubing, different manufacturers have wound their tubas differently, which affects both timbral and handling aspects of the instrument.

Two common variants of the tuba can be found in many schools, specifically for marching band. The sousaphone wraps around the player's body with a front facing bell. It is more cylindrical than the tuba, and has a very directional sound that is conducive for the marching field. Those timbral aspects also make it less desirable for the concert ensemble. Another alternative is the marching contra (short for "contrabass bugle"). This instrument was developed for the drum and bugle corps tradition. It is carried on the right shoulder and has timbral aspects more similar to the tuba than the sousaphone in its warmth and depth. Some schools will use a convertible version of the contra that has a moveable lead pipe that allows for shoulder carriage for marching band, and traditional seated posture for the concert setting.



Basic anatomy of a 4-valve tuba



Basic anatomy of a 4 rotor tuba

Characteristics for Beginning Tuba Players

It should be noted that the best instrument for a student is the instrument that the student wants to play. This is no different for the tuba. With very few exceptions, any student can be an effective tubist. With that said, there are characteristics that make for a stronger beginning tuba player.

Lung capacity is the single most important variable for effective tuba playing. While a tuba player does not need to be physically large, they do need to develop significant lung capacity to play the tuba.

Because of the register in which the tuba plays, tuba players should be able to distinguish low pitches well. Many students are able to match pitch in their singing register well, but may struggle to be able to transfer that pitch matching to the low register that falls beyond the regular human voice.

While it may seem that player size should be a concern, there are several ways that small students can be successful on tuba without any issues. The one concern regarding size is hand spread. The valve spacing on tubas can be rather broad, and students should be able to reach all three (or four) valves simultaneously. The hand position can be uncomfortable at first, so the concern should be about whether they have the spread in the hands as opposed to whether they can comfortably do it at first.

Tuba is a frequent candidate for transferring students to from other instruments. Out of the brass instruments, euphonium players are logical candidates for tuba as there is a similar (though not identical) approach to performance on the instrument. Students should have well developed low registers on euphonium if they are to be successful on tuba. Similarly, horn can be a highly effective transfer for the student who has a strong low register and potential weak upper register (or orthodontic issues).

Surprisingly, woodwind players frequently make some of the easiest transfers to tuba. Due to similar demands for air, flute

players often make strong tuba players. The student with great tone but issues with the dexterity required for flute can make for highly effective tubists. Saxophone can be another particularly strong transfer, especially for the student who at times has a woofy tone in the low register or on tenor or baritone saxophone. That woofy tone is frequently due to an oral cavity that is too large and too much air support. The characteristics that make for an unfocused saxophone tone also make for a full tuba sound.

While any student can potentially be successful on tuba, double reed, clarinet, and trumpet players often struggle in making the transfer to tuba. The embouchure required for these instruments is quite tight, and these instruments utilize less air and more back pressure. Additionally, for the reed instruments, the embouchure is rolled in, which will be a habit that will need to be quickly broken to be successful on tuba.

Setting Up the Tuba

There are many different designs for the tuba, so no one set of instructions will work for all instruments. With that said, nearly all tubas are balanced similarly and have similar characteristics regarding handling.

The weight of the tuba is placed upon the player's leg, their chair, or a tuba stand, dependent on the size of the tuba and the tuba player. The left arm serves two purposes. First, it helps to balance the tuba by ensuring that it is stable on its resting surface. Second, the left hand can be used to adjust slides (often the 1st valve slide) to adjust intonation, as the size of the tuba makes intonation issues become exaggerated). For most tuba players, the tuba rests on the inside of their thighs. Shorter players may use the chair between their legs or a specially designed tuba stand to hold the tuba. Importantly, the tuba's position should be dictated by the pre-set posture of the player with the shoulders aligned over the hips, the

back straight, and the head elevated. While the size of the tuba may require slight alterations, good posture should not be compromised to accommodate the tuba.

The right hand controls the valves or rotors. In some cases, the valves will be vertical, as on the euphonium. In this case, the right hand is in the shape of a C, with the thumb placed against the support brace across the back of the valve. Importantly, the finger tips should rest upon the key caps of the valves. Students should not allow their fingers to float freely or curl back to the palm as they play.

For instruments that have horizontally aligned valves or rotors, the right arm will wrap around the side of the instrument. The hand should still have a relaxed position, but the fingers will be slightly flatter than they are with vertical valves. The pads of the fingers should rest on the valve keys or rotor spatulas in a way that minimizes movement when playing.

The embouchure of the tuba is extremely relaxed, with nearly no tension in the corners of the mouth. Ideally, the tuba mouthpiece should sit close to a 50/50 division between top and bottom lips, but this will be dependent on the size of the player's face. The bottom of the mouthpiece should not sit on the chin bone, and the top of the mouthpiece should not make contact with the player's nose.



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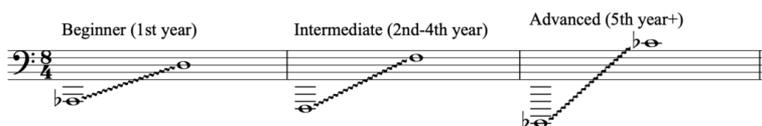
Tuba-specific details and concepts

As mentioned in the previous chapters, many of the details of tuba playing are common to all brass playing concerning technique, tone, and practice. Make sure to reference the general sections regarding each of these issues in addition to the tuba specific details below.

Range development

As with all brass instrument, range development tends to be slow

compared to woodwind and string instruments. The starting range of beginning tuba players can vary greatly. Some beginning students quickly achieve the extremely relaxed embouchure required for the low register. Others start with a range that borders on tenor voices. While early literature will emphasize the mid-low register at the bottom of the bass clef staff, variability across students will be broad. When initially developing embouchure fundamentals, emphasize a relaxed embouchure without smiling or cheek puffing to allow the entire embouchure to fully engage in vibration.



The range notated is a rough estimate of the expected range of tuba players at various levels in standard ensemble and solo literature.

Follow this link for a [Tuba Fingering Chart](#).

Instrument handling

One of the initial challenges of the tuba is being able to handle it appropriately. Students need to be taught and reminded that their instrument takes up quite a bit of space, and be prepared to clear the area around them to avoid damage to the tuba or others. There is a temptation to set the instrument down on its bell, but this should be discouraged as the weight of the instrument along with the momentum of setting it down can cause the bell to buckle. Instead, it should be laid on its back with the valve slides facing up whenever possible.

When trying to identify proper playing position for the tuba, the student should start with proper posture first (see [Posture](#)). They

should then bring the tuba to their body, with an emphasis on having the mouthpiece meet their embouchure without adjusting back, neck, or head angles. Having the teacher or another adult help situate the tuba can help. The tuba itself can be at a slight angle to accommodate embouchure provided that the student can balance the weight with their left arm. There are a few options for supporting the tuba.

- resting the tuba on the leg or between the thighs.
- resting the tuba on the seat of the chair between the legs. This works particularly if there is an angle that the tuba can be held at to ensure that the mouthpiece is in the right position.
- purchasing a tuba stand to support the instrument from the floor. If the student is using a tuba stand, they should sit on the front part of the chair so that the instrument is still situated against their body so that they do not need to lean forward or lean the tuba backward to comfortably reach the mouthpiece.

The general rule for all brass posture stays the same—establish proper playing posture that limits tension and maximizes air support first, and then introduce the instrument in a way to maintain that posture.



When playing rotor or front facing valve tubas, the right arm wraps around the side of the tuba. The left hand is positioned for easy adjustment of the 1st rotor tuning slide



When playing valve tubas, the right hand is positioned behind the tuba in the shape of a C. When possible, the left hand reaches around the instrument to the 1st valve tuning slide. The weight is resting on the insides of player's thighs.

Additional valves

Many intermediate and advanced tubas include additional valves that serve to provide for more in tune alternates to 3-valve combinations and to extend the lower register of the instrument past the fundamental. For student instruments, 4-valve models are quite common and are advised. Many advanced tubists will play instruments with up to 6 valves or rotors to allow them greater pitch flexibility. While there is variation based on manufacturer, the following chart is the general rule of thumb for tubas:

Valve	Effect on partial
1	Major 2nd down
2	minor 2nd down
3	slightly sharp minor 3rd down
4	Perfect 4th down
5	flat Major 2nd down
6	flat minor 2nd down

On most instruments, the role of the 5th and 6th valves are to allow for in tune playing when combined with the 4th valve. They also serve to extend the range of the instrument further. By utilizing the 4-6th valves in combination with the first 3 valves, advanced tuba players can correct pitch tendencies. Again, beginners should have no more than 4 valves to start so that they can master fundamentals before focusing on intonation details.

Intonation control and additional valves

Dependent on the instrument, there are three mechanisms by which intonation is adjusted on the tuba. In the end, embouchure adjustment is always a possibility, and due to the large size of the instrument, small changes in the embouchure can have a significant impact on pitch without affecting tone provided that quality air support is always present.

Second, on tubas with additional valves or rotors, alternative fingerings can be used by more advanced players to adjust characteristically out of tune notes. Most notably, the 1-3 combination should be replaced with 4 and 1-2-3 should be replaced with 2-4 as these are characteristically quite sharp.

Additionally, due to the additional slides, each slide should be tuned to play in tune based on its relationship to the open tuning pitches (see [Intonation](#)). Each slide is designed to play slightly sharp

with the expectation that the slide length will be adjusted prior to performance.

Third, many tubas are designed to allow for easy access to the valve slides. Many tuba players will adjust the 1st valve slide in particular while playing to correct particularly out of tune notes using the 1st valve, notably pitches with the 1-2 combination.

Articulation

Due to the particularly wide embouchure, the approach to articulation on tuba is slightly different than that of other brass instruments. Rather than just attack the note with the tongue at the front two teeth, the tongue flicks up to interrupt the air flow across the entire front of the mouth. Additionally, due to the large amount of air needed for the tuba, the oral cavity is nearly always completely open. Instead of using a “tah” syllable, tuba players will often use a “thoh” syllable which allows for a broader strike zone for the articulation and a lower tongue position when playing.

Mutes

The use of mutes on tuba is relatively uncommon, both because of the ungainly size of tuba mutes and functional impact. When called for, the straight mute is the common mute for the tuba. It typically has a handle on the side to allow for easier insertion and removal. The mute is placed in the bell when the tuba is in upright position.



Tuba mutes have a handle on their side to assist in the process of inserting them into the bell.

Unique Issues for Tuba

Posture problems-Due to the ungainliness of the size of the tuba, many tuba players develop posture that collapses their torso, twists their bodies in unusual ways, and creates ergonomic problems that can make playing difficult and lead to long term health concerns. Make sure that students are establishing their initial posture correctly (see [Posture](#)) and then introduce the instrument to that posture.

Importantly, make sure that your students have what they need to be successful to support the instrument. They may need a different chair or a tuba stand, so that they have a wider lip to rest the instrument upon. They also need to have enough space around them to allow them to bring the instrument down safely and controlled while resting.

Weak tone-The biggest performance issue that young tuba players encounter is weak tone from a lack of air. It is important that the expectation for tone duration between breaths is different for tuba players than other instrumentalists. While high brass or woodwind students should be able to use four measure phrasing fairly quickly, tuba players may take a year or more to develop the lung capacity to sustain long phrases with good tone. They can develop bad habits of weak air support by being rushed to develop long phrasing too early.

Regular use of breathing activities is critically important for tuba players (see [Breathing](#)). [Long tone](#) work on the tuba, as opposed to the mouthpiece, can also help build this capacity. The low register of the tuba in particular uses a great deal of air, so students can do capacity building activities in the middle register where sustain is easier. Finally, students need to be taught to monitor their own air usage so to know when they need to breath and recognize the markers of weak, under supported tone.

Double buzzing-When the lips vibrate at different rates, a double buzz will be created, which manifests itself as thin tone with highly apparent overtones. This can be a sign of mouthpiece anchoring, where the mouthpiece is being pushed into one lip or the other, thereby deadening the buzz. It can also be a sign of a smile or pucker embouchure where muscles are being unevenly engaged. Remind students of the fundamentals of good embouchure positioning, emphasizing the neutral position of the lips that are not smiling, frowning, or puckering (see [Embouchure](#)). Have them then practice with only the mouthpiece, paying attention they are not anchoring the mouthpiece onto the upper or lower lips. They should also make sure they are using full air support, as weak air can cause only one lip to fully vibrate.

Cheek puffing-Because of the very relaxed embouchure, tuba players will often find their cheeks puffing or air leaking through the corners of the mouth. (Old cartoons with red cheeked tuba players in polka bands probably do not help the situation.) This can also be a sign of fatigue in playing. While the embouchure needs to be tension free for clear, full tone in the lower register, the corners of the mouth should be firm enough to keep the cheeks pulled in.

By puffing the cheeks, the oral cavity is expanding, creating eddies of slow moving air.

Importantly, have students practice by a mirror so that they can become aware of what cheek puffing feels like. They will often find that their cheeks puff as they start to tire. This is a good sign that they should take a break. When playing, encourage students to think about focusing the air toward the center of the embouchure, which will firm up the cheek muscles. Practicing in the middle register where there is more presence in the embouchure will also help to develop the muscles needed to keep the embouchure focused when relaxed in the low register.

PART III

GUIDED PRACTICE LESSONS



This book is intended to support a one semester Brass Techniques course of 12-16 weeks, meeting twice a week. The presumption is that students spend 3-4 weeks on each of four brass instruments, developing familiarity and technique on trumpet, horn, trombone, and euphonium/tuba. Any instrument may be the starting point, and the structure of these activities allows for homogenous or heterogenous groupings.

The Guided Practice Lessons serve to guide students through appropriate practice approaches as developing brass musicians. The

intention is that the Guided Practice Lessons serve as an example of a 10-15 minute practice session that should happen between in class meetings. Students are encouraged to mix and match similar activities using the Guided Practice Lessons as a guide. For lessons with a video, students can play along with the video to pace their lesson.

To develop the fundamentals and embouchure to be a consistent brass musician, it is imperative that practice occur every day. Shorter practice sessions daily will be more effective at developing and maintaining muscle control and strength than longer sessions on a more sporadic basis.

Instrument 1 Rotation

[GPL 1.1](#)

[GPL 1.2](#)

[GPL 1.3](#)

GPL 1.4

GPL 1.5

GPL 1.6

Instrument 2 Rotation

GPL 2.1

GPL 2.2

GPL 2.3

GPL 2.4

GPL 2.5

GPL 2.6

Instrument 3 Rotation

GPL 3.1

GPL 3.2

GPL 3.3

GPL 3.4

GPL 3.5

GPL 3.6

Instrument 4 Rotation

GPL 4.1

GPL 4.2

GPL 4.3

GPL 4.4

GPL 4.5

GPL 4.6

15. Guided Practice Lesson 1.1

Objectives

Students will be able to:

- establish proper posture
- control deep breathing inhale
- control deep breathing exhale
- establish a standard embouchure for brass playing
- buzz a consistent tone on the mouthpiece
- buzz a consistent tone on the instrument

Materials

- Instrument
- Metronome

Activities

1. **Roll up** to establish proper posture.
2. **Timed Breathing** Set the metronome at $J=72$.
 1. Do 4 repetitions of 4 counts in, 4 counts out
 2. Do 4 repetitions of 2 counts in, 4 counts out
 3. Do 4 repetitions of 1 count in, 4 counts out
 4. Do 4 repetitions of 1 count in, 8 counts out
3. **Vowel Shaping** to establish open oral cavity
4. **Hum** to establish embouchure and set mouthpiece

5. **4 on, 4 off** Set the metronome at $\text{♩}=72$. Focus on consistent tone production of a comfortable pitch
 1. Do 4 repetitions of 4 on, 4 off
 2. Rest for 15 seconds
 3. Repeat steps 3, 4.1, and 4.2 three more times
6. **Long tones** Assemble the instrument and set proper embouchure using step 3. Focus on producing a consistent tone on any comfortable pitch. Repeat 4 times



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Guided Practice Lesson 1.2

Objectives

Students will be able to:

- control deep breathing inhale
- control deep breathing exhale
- control a focused tone on the mouthpiece
- control a focused tone on the instrument

Materials

- Instrument
- Metronome
- Tissue

Activities

1. Marionette Pull the “string” from the top of the head to establish proper posture.
2. [Paper Airplane](#) Set the metronome at $\text{♩}=72$.
 1. Do 4 repetitions of 4 counts in, 4 counts out
 2. Do 4 repetitions of 2 counts in, 4 counts out
 3. Do 4 repetitions of 1 count in, 4 counts out
 4. Do 4 repetitions of 1 count in, 8 counts out
3. [Santa](#) to establish strong exhale
4. [Deep Breath Exhale and Pea Spitting](#) to establish embouchure

and set mouthpiece

5. **Short Instruments** Set the metronome at $J=72$. Focus on consistent tone production of a comfortable pitch
 1. Sustain consistent pitch as long as possible with good tone
 2. Take mouthpiece off of face and rest for duration of playing in 5.1
 3. Repeat 4 & 5.1 three more times.
6. **Long tones** Assemble the instrument and set proper embouchure using step 4. Focus on producing a consistent tone on any comfortable pitch. Repeat 4 times



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Guided Practice Lesson 1.3

Objectives

Students will be able to:

- play a sustained consistent tone on the mouthpiece and the instrument
- alter pitch on the mouthpiece
- play a specific open tone on the instrument
- articulate a single pitch using legato articulation and consistency tone

Materials

- Instrument
- Metronome

Activities

1. **Sizzle** for sustained 4 counts, taking a one count breath. Repeat 4 times. Sizzle for sustained 8 counts, taking a one count breath.
2. **Long tones** on a comfortable pitch on the mouthpiece or on short instruments. Take as much time off the face as on the face. Sustain tone as long as possible with consistent tone quality. Repeat 4 times.
3. **4 counts on, 4 counts off** on long tones on the instrument.

Make sure that there is a clear tongued attack, steady sustain, and an open release on every tone.

4. **Sirens** on the mouthpiece. Hold a low pitch for 1 count, and glissando up and down to return to the original pitch. Sustain the original pitch for 1 count. Repeat 4 times.
5. **One directional lip slurs** on the instrument. Start on the upper partial (for most students, this will be F concert on trumpet, trombone, euphonium and tuba and C concert for horn). Hold the upper partial for 4 counts and slur down to the lower partial for 4 counts. Make sure there is continuous air between pitches and that tone is consistent. Repeat 4 times. Start on the lower partial (for most students, this will be Bb concert on trumpet, trombone, euphonium, and tuba, and A concert on horn). Hold the lower partial for 4 counts and slur up to the upper partial. Make sure to keep air continuous between notes and to avoid pinching the lips. Repeat 4 times.
6. **Speak and play** legato quarter notes. On a comfortable open fingering, speak 4 quarter notes on *tah*. Rest for 4 counts. Play for 4 counts. Make sure to keep air consistent between notes, and listen for a clear but light articulation to start each pitch. Consistency is the key for this exercise.



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16. Guided Practice Lesson 1.4

Objectives

Students will be able to:

- adjust pitch between two adjacent partials
- play chromatic and diatonic sequences

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **Three sips-sizzle breathing exercise**—Breathe in for 4 counts, take three sips, sizzle out for 4 counts. Repeat 4 times to build lung capacity.
2. Buzz a melody of your choice on the mouthpiece, focusing on pitch centering and consistency in tone.
3. **Long tones**. Play by starting on concert F (concert C for horn) descending chromatically. Use a tuner to ensure that pitch is staying centered and focus on consistent tone.
4. **Lip Slurs #2**. Focus on consistency of air between notes and tension free transitions, particularly on the ascending partial. Take 4 counts off between each passage.

5. **Broken Remington**. Set the tuner to a concert F (C for horn) drone to ensure that the open partial is in tune. Focus on centering on that pitch each time you return to it.
6. **Dexterity Exercise #1** . Practice no faster than you can play with good technique and accurate pitch with correct fingerings.



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17. Guided Practice Lesson 1.5

Objectives

Students will be able to:

- control lip slurs between adjacent partials
- play chromatic and diatonic sequences
- play a simple melody with consistent tone, pitch, and articulation control

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **Paper Airplane.** Breath in on 1 count and exhale for 4 counts. Make sure that the air stays full and steady across all 4 counts. Use your hand to visualize the inhale and exhale. Repeat 4 times to work on building good breath control.
2. **Mouthpiece Sirens.** Start on a low tone. Sustain to establish center of pitch and gradually glissando the note higher and back down to the starting tone. Make sure to use air and corner firmness to lead the glissando. Avoid pinching and creating tension in the embouchure. Repeat 4 times.

3. **[Reverse Broken Remington](#)**. Set a drone on the tuner to concert Bb (horns will use actual fingerings for this exercise). Using the lower fundamental as a point of stability, slur up to the higher note, paying attention not to pinch the lips or choke the tone. If a particular interval poses issues, repeat that interval again.
4. **[Lip Slur #2](#) or [Lip Slur #3](#)**. Focus on consistency of air between notes and tension free transitions, particularly on the ascending partial. If three partials can be played comfortably, use lip slur #3. If not, use lip slur #2. Take 4 counts off between each passage.
5. **[Dexterity Exercise #2](#)**. Choose four keys that are comfortably in the middle of your register. Set the metronome at a rate that you can accurately play each note with proper fingerings. Pay close attention to intonation tendencies, particularly 2-3, 1-3, and 1-2-3 combinations. Make sure to adjust using proper techniques (e.g. 3rd valve slide, 4th valve, hand position)
6. Melody. Select one of the simple melodies from **[Practice Materials](#)**. Pay particular attention to accurate fingerings, consistent tone, and good phrasing.



A YouTube element has been excluded from this version of the text. You can view it online here: <https://pressbooks.palni.org/brasstechniquesandpedagogy/?p=500>

18. Guided Practice Lesson 1.6

Objectives

Students will be able to:

- control articulations with varying attacks and releases with good tone
- play chromatic and diatonic sequences
- play a simple melody with consistent tone, pitch, and articulation control

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **Santa**. Breath in on 4 counts and exhale on three counts saying (Ho, Ho, Ho). Focus on fast air attack and full resonance on the vowel. Repeat 4 times.
2. **Chromatic long tones**. Start in the middle of the register and play a 4 count long tone with the metronome. Rest for 4 counts. Play a half step lower for 4 counts. Rest for 4 counts. Continue for at least 7 half steps.
3. **Lip Slur #2** or **Lip Slur #3**. Focus on consistency of air

between notes and tension free transitions, particularly on the ascending partial. If three partials can be played comfortably, use lip slur #3. If not, use lip slur #2. Take 4 counts off between each passage.

4. **Broken Remington**. Set a drone to concert F (concert C for horn). Play through the Remington exercise without breaks between measures (except to breath). Pay attention to returning to the fundamental with the drone.
5. **Articulation Contrast**. Play on a comfortable pitch. Focus on keeping consistent tone between adjacent notes. Particularly with the accent articulation, pay close attention to control of the attack of the note. On the staccato articulation, make sure that the air column stays engaged between notes by use of a glottal stop after the release of the note. Once notes can be played accurately on a single pitch, add a melodic pattern (e.g. scales, pentachords, interval patterns).
6. **Dexterity Exercise #3**. Choose four keys that are comfortably in the middle of your register. Set the metronome at a rate that you can accurately play each note with proper fingerings. Pay close attention to intonation tendencies, particularly 2-3, 1-3, and 1-2-3 combinations. Make sure to adjust using proper techniques (e.g. 3rd valve slide, 4th valve, hand position)
7. **Melody**. Select one of the simple melodies from **Practice Materials**. Pay particular attention to accurate fingerings, consistent tone, and good phrasing.



A YouTube element has been excluded from this version of the text. You can view it online here: <https://pressbooks.palni.org/brasstechniquesandpedagogy/?p=502>

19. Guided Practice Lesson 2.1

Objectives

Students will be able to:

- apply common brass characteristics including air support and embouchure from their Rotation #1 instruments to their Rotation #2 instruments
- establish proper posture
- control deep breathing inhale
- control deep breathing exhale
- establish a standard embouchure for brass playing
- buzz a consistent tone on the mouthpiece
- buzz a consistent tone on the instrument

Materials

- Instrument
- Metronome

Activities

Note: Throughout this first practice on your new instrument, focus on maintaining good brass fundamentals while observing the primary differences between your Rotation #1 and Rotation #2 instruments. All brass instruments should use a relaxed embouchure, open posture, and air-driven tone. Particular issues

to pay attention to are the amount of air required to produce a full tone, the exact placement of the mouthpiece, and unique characteristics of posture. Make sure to review the setup video for your new instrument before starting your first practice

1. **Mouthpiece buzzing 4 on, 4 off** Set the metronome at $\text{♩}=72$. Focus on consistent tone production of a comfortable pitch
 1. Do 4 repetitions of 4 on, 4 off
 2. Rest for 15 seconds
 3. Repeat steps 3, 4.1, and 4.2 three more times
2. **Long tones on the instrument** Focus on producing a consistent tone on any comfortable pitch. Repeat 4 times.
3. Vowel shaping exercise. Place your hands along the side of your face and sing through the vowels Eeee, Ahhh, Ohhh, and Oooo. Pay attention to tongue placement, jaw placement, and oral cavity size.
4. **Lip Slur #1** If you have problems producing the specific pitch that is notated, choose the two adjacent partials that are most comfortable for you. Focus on producing a smooth, consistent tone and a stable pitch on both partials. Focus on moving between partials using Ahhh and Ohhh consonants.
5. **Reverse Broken Remington** When doing this exercise, focus on making sure each note fully speaks. While pitch centering is important, even more important right now is the clarity with which the tone is produced. Pay particular attention to not having the embouchure be pinched when moving to higher partials.
6. **Legato Articulation – Full Score** Set the metronome at $\text{♩}=90$. Listen closely to the initial attack in each measure. Additionally, listen that there is an even attack on each re-articulated note. Do not move on to faster rhythms until you can play slower rhythms with accuracy and consistency.
7. **Dexterity Exercise #2** Choose one key for this exercise. Play no faster than you can play with accuracy. At first, isolate out each measure, making sure that you have developed familiarity

with these fingerings. Then, combine all measures together to play the entire exercise through the single key.

20. Guided Practice Lesson 2.2

Objectives

Students will be able to:

- utilize proper finger/slide technique on passages requiring dexterity
- maintain a consistent tone across the functional register of the instrument
- move freely between adjacent partials

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **[Mouthpiece Sirens](#)** Start on a comfortable pitch in the lower register. Glissando up and back to that original pitch in one breath. Focus on consistent tone and smooth pitch transitions without interruption. Repeat 4 times.
2. **[Long tones on the instrument](#)** Focus on producing a consistent tone on any comfortable pitch. Repeat 4 times.
3. **[Lip Slur 2](#)** Focus on producing a smooth, consistent tone and a stable pitch on both partials. Focus on moving between partials

using Ahhh and Ohhh consonants.

4. **Broken Remington** Set the tuner to play a drone on concert F (concert C for horn). When performing, do not leave the upper pitch until it is stable and matched with the drone. Eliminate the rests that are notated in this exercise, but breathe as necessary.
5. **Articulation contrast exercise** Set the metronome at $J=90$. Listen closely to the initial attack in each measure. Additionally, listen that there is an even attack on each re-articulated note. Do not move on to faster rhythms until you can play slower rhythms with accuracy and consistency.
6. **Dexterity Exercise #1** Play through each of the keys of this exercise at a tempo with which you are comfortable. Pay close attention to pitch accuracy and the attack of each note, using a clear and consistent articulation.

2I. Guided Practice Lesson 2.3

Objectives

Students will be able to:

- utilize proper finger/slide technique on passages requiring dexterity
- maintain a consistent tone across the functional register of the instrument
- move freely between adjacent partials

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **Mouthpiece Sirens** Start on a comfortable pitch in the lower register. Glissando up and back to that original pitch in one breath. Focus on consistent tone and smooth pitch transitions without interruption. Repeat 4 times.
2. **Long tones on the instrument** Focus on producing a consistent tone on any comfortable pitch. Repeat 4 times.
3. **Lip Slur #3** Focus on producing a smooth, consistent tone and a stable pitch on both partials. Focus on moving between

partials using Ahhh and Ohhh consonants.

4. **[Broken Remington](#)** Set the tuner to play a drone on concert F (concert C for horn). When performing, do not leave the upper pitch until it is stable and matched with the drone. Eliminate the rests that are notated in this exercise, but breathe as necessary.
5. **[Dexterity Exercise #1](#)** Play through each of the keys of this exercise at a tempo with which you are comfortable. Pay close attention to pitch accuracy and the attack of each note, using a clear and consistent articulation. Alter the articulation for each exercise by creating a pattern by which to play in each key utilize slur, staccato, and legato articulations.
6. **[Dexterity Exercise #2](#)** Choose four keys to practice. For each key, pay close attention to centering the pitch as you transition from diatonic to chromatic passages.
7. **[Melody for playing test #2](#)**. This should be a different piece than you used for Playing test #1. For this first practice, focus on correct pitch and good articulation technique.

22. Guided Practice Lesson 2.4

Objectives

Students will be able to:

- utilize proper finger/slide technique on passages requiring dexterity
- maintain a consistent tone across the functional register of the instrument
- adjust pitch to correct intonation errors
- move freely between adjacent partials

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **Mouthpiece Remington**. Play long tones using the Remington series pattern on the mouthpiece. Emphasize the centering of pitch and consistency of tone.
2. **Pitch bending long tones** Start in the middle of your register, playing at a **mp** level. Focus on consistent tone and pitch throughout the long tone, using a tuner to check pitch stability. Once pitch is established, relax the embouchure and

slow the air, allowing the pitch to bend flat; then, return to the original pitch, making sure it returns in tune. Chromatically move down from the open fundamental doing the same exercise on each pitch.

3. **Lip Slur #3** Focus on producing a smooth, consistent tone and a stable pitch on both partials. Focus on moving between partials using Ahhh and Ohhh consonants. Use the tuner to check pitch on each partial.
4. **Dexterity Exercise #1** Play through each of the keys of this exercise at a tempo with which you are comfortable. Pay close attention to pitch accuracy and the attack of each note, using a clear and consistent articulation. Alter the articulation for each exercise by creating a pattern by which to play in each key utilize slur, staccato, and legato articulations.
5. **Dexterity Exercise #2** Choose four keys to practice that are different from GPL 2.3. For each key, pay close attention to centering the pitch as you transition from diatonic to chromatic passages.
6. **Melody for playing test #2.** This should be a different piece than you used for Playing test #1. For this first practice, focus on correct pitch and good articulation technique.

23. Guided Practice Lesson 2.5

Objectives

Students will be able to:

- perform a simple melody using proper technique and demonstrating consistent tone, pitch, and articulation
- play basic melodic patterns with accuracy in fingerings/slide positions

Materials

- Instrument
- Metronome
- Tuner

Activities

1. **Long Tones** focusing on centered pitch and characteristic tone.
2. **Lip Slur #3** Focus on producing a smooth, consistent tone and a stable pitch on both partials. Focus on moving between partials using Ahhh and Ohhh consonants. Use the tuner to check pitch on each partial.
3. **Dexterity Exercise #1** Play through each of the keys of this exercise at a tempo with which you are comfortable. Pay close attention to pitch accuracy and the attack of each note, using a

clear and consistent articulation. Alter the articulation for each exercise by creating a pattern by which to play in each key utilize slur, staccato, and legato articulations.

4. **[Dexterity Exercise #2](#)** Choose remaining four keys to practice that are different from GPL 2.3 & 2.4. For each key, pay close attention to centering the pitch as you transition from diatonic to chromatic passages.
5. **[Melody for playing test #2](#)**. This should be a different piece than you used for Playing test #1. For this first practice, focus on correct pitch and good articulation technique.
6. Record playing test #2.

24. Guided Practice Lesson 3.1

25. Guided Practice Lesson 3.2

26. Guided Practice Lesson 3.3

27. Guided Practice Lesson 3.4

28. Guided Practice Lesson 3.5

29. Guided Practice Lesson 4.1

30. Guided Practice Lesson 4.2

31. Guided Practice Lesson 4.3

32. Guided Practice Lesson 4.4

33. Guided Practice Lesson 4.5

PART IV
RESOURCES AND
ACTIVITIES

Fingering Charts

[Trumpet Fingering Chart](#)

[Horn Fingering Chart](#)

[Trombone Fingering Chart](#)

[Euphonium Fingering Chart](#)

[Tuba Fingering Chart](#)

Practice Materials

Technical Exercises

[Mouthpiece Sirens](#)

[Long Tones](#)

[Broken Remington](#)

[Reverse Broken Remington](#)

[Lip Slurs](#)

[Speak and Play](#)

[Legato Articulation](#)

[Contrasting Articulation](#)

[Dexterity Exercise #1](#)

[Dexterity Exercise #2](#)

Performance Pieces

[Arirang](#) (Traditional Korean Melody)

[God Save the Queen \(America\)](#) (British Anthem)

[Horses Brangle](#) (French Renaissance Dance from Arbeau's Orchesographie)

[La Negra](#) (Traditional Mariachi Melody)

[Simple Gifts](#) (Traditional American Shaker Song)

[Siyahamba](#) (South African Protest Song)

[Symphony #1-Theme from Movement III](#) (Gustav Mahler)

[Symphony #9-Theme from Movement II](#) (Antonin Dvorak)

Recommended Equipment

The following lists are by no means complete, and exclusion from these lists does not imply an inferior instrument. Rather, these are recommendations collected from expert brass players based on their own experiences, meant to guide the music educator in advising their students. These recommendations are intended for beginning through pre-collegiate students.

In addition to new instruments which are listed below, used instruments made by Bach, Bundy, Conn, Getzen, Holton, King, and Yamaha have a long history of quality and durability.

Trumpet

Bb Trumpets

Beginner:

Bach 300 series
Yamaha YTR 2335

Intermediate:

Bach Stradivarius
Yamaha 6000/7000 series

Mouthpieces

Beginner:

Bach 5C, 7C
Yamaha 16C4

Intermediate/Advanced:

Bach 3C

Shilke 11, 12

Yamaha 11C4, 15

Horn

F Double Horns (ideally, start beginners on double horns)

Conn 8D, 10D

Holton Farkas 179, 180, 181

Yamaha YHR 567, 667, 668

Mouthpieces

Conn 5N, 5W, 7N, 7W

Holton Farkas MDC, DC

Yamaha 30C4, 31D4

Mutes

Denis Wick

Humes & Berg

Tom Crown

Trombone

Tenor Trombones

Beginner

Bach 200

Bundy 1523

Conn

Yamaha YSL-354

Intermediate/Advanced

Bach 42B, 36B

Conn 78H, 88H

Yamaha YSL-684, YSL-820 (Xeno)

Bass Trombones

Bach 50B

Conn 110H

Yamaha YBL-613, YBL-622

Mouthpieces

Beginner

Bach 12C

Schilke 47

Intermediate/Advanced

Bach 6 1/2AL, 5G

Schilke 50, 51

Bass Trombone

Bach 1G

Schilke 57

Euphonium

4-Valve Euphoniums

Willson 2704

Yamaha YEP-321, YEP-621

Compensating Euphoniums

Besson 967, 968

Hirsbrunner

Willson 2901

Yamaha YEP-641

Mouthpieces

Bach 6 1/2 AL

Denis Wick 5AL, 6AL

Shilke 50, 51

Tuba

BBb Tubas

Besson 997

Conn 5J

Meinl-Weston 20 (rotary)

Miraphone 1864U (rotary)
Yamaha YBB-301

Mouthpieces

Bach 18
Conn 18
Conn-Helleberg 1205
Yamaha 18

Mutes

Tom Crown
Vincent Bach
Denis Wick
Humes & Berg
Harmon
Jo-Ral

Important Brass Terminology

Instrument names

English	German	French	Italian
Trumpet	Trompete	trompette	tromba
Cornet	Kornett	cornet à piston	cornetto
Flugelhorn	Bugle	bugle	flicorno
Horn	Horn	cor	corno
Trombone	Posaune	trombone	trombone
Euphonium	Baryton	basse à pistons	baritone saxhorn
Tuba	Basstuba	tuba basse	tuba di basson

Brass Specific Terms

English	German	French	Italian
with mute	gedämpft	avec sourdine	con sordino
Hand stop (horn)	gestopft mit Dämpfer	bouché	chiuso

34. Additional Resources

A general note should be made about one specific text that should find a home in every instrumental music educator's collection. The J.B. Arban *Complete Conservatory Method* is the standard-bearer for all brass techniques. While individual exercises are frequently disputed, this single text (originally written for trumpet/cornet but since edited for all brass instruments) contains a comprehensive set of exercises for brass players at all levels. If you have one book in your collection, this is the single one to have as it includes a little bit of everything for every type of player.

General

Bachelder, Dan and Norman Hunt, *Guide to Teaching Brass*, 6th ed. (Boston: McGraw-Hill, 2002).

Bailey, Wayne, et al., *Teaching Brass*, 2nd ed. (Boston: McGraw-Hill, 2008)

Maxwell, Steven. *Teaching Low Brass*. (Manhattan, KS: New Prairie Press, 2018) (CC 4.0). <https://newprairiepress.org/ebooks/22/>

Vining, David. *Teaching Brass: A Guide for Students and Teachers* (Flagstaff, AZ: Mountain Peak Music, 2010)

Trumpet

Texts

Method books

Arban, J.B. Complete Conservatory Method for Trumpet. (Carl Fischer, 1894/1936/1982)

Bousquet, N. *Thirty Six Celebrated Studies for Cornet.* (Carl Fischer).

Brandt, Vassily. *Etudes for Trumpet.* (MCA Music, 1965)

Clarke. *Technical Studies*

Concone, Giuseppe, *Lyrical Studies for Trumpet or Horn.* (Brass Press, 1972).

Getchell, Robert, *First and Second Books of Practical Studies for Cornet and Trumpet.* (Belwin Mills, 1948/1972).

Irons *27 Groups of Exercises*

Small, J.L. *27 Melodious and Rhythmic Exercises for Cornet or Trumpet.* (Carl Fischer, 1928).

Schlossberg *Daily Drills & Technical Studies for Trumpet and Trombone* (Baron)

Vizutti, Allen, *Allen Vizutti Trumpet Methods, Books 1-3* (Alfred, 1991)

Horn

Texts

Farkas, Philip. *The Art of Brass Playing* (Rochester, NY, Wind Music, 1989)

Method books

Concone, Giuseppe, *Lyrical Studies for Trumpet or Horn*. (Brass Press, 1972).

Getchell, Robert. *First and Second Books of Practical Studies for Horn*.

Kopprasch *60 Selected Studies for Horn* (Fischer)

Little Embouchure Builders for Horn

Maxime-Alphonse *Deux cent Etudes Nouvelles* (LeDuc)

Pottag-Andraud *335 Selected Melodious Progressive and Technical Studies for French Horn* (Southern Music Company)

Tuckwell *Fifty First Exercises for Horn*

Trombone

Texts

Kleinheimer, Edward, *The Art of Trombone Playing* (Evanston, IL, Summy-Birchard, 1963)

Wick, Denis. *Trombone Technique* (London, Oxford UP, 1973)

Vernon, Charlie *A Singing Approach to the Trombone* (Atlanta Brass Society Press, 1985)

Yeo, Douglas, "Douglas Yeo FAQ: Bass Trombone Valve Systems," last modified 2013, http://www.yeodoug.com/resources/faq/faq_text/valves.html

Method books

Arban, J. B. *Complete Method for Trombone*.

Bordogni-Rochut, *Melodious Etudes, Books I-III* (Fischer)

Cimera 170 Studies
Cimera 79 Studies
Clarke Technical Studies (Fischer)
Kopprasch 60 Selected Studies for Trombone (Fischer)
Schlossberg Daily Drills & Technical Studies for Trumpet and Trombone (Baron)

Euphonium

Texts

Bowman, Brian, *Practical Hints on Playing the Baritone (Euphonium)* (Melville, NY: Belwin-Mills, 1983).

Werden, David, “The Three- and Four-Valve Compensating System,” last modified 2020, <http://www.dwerden.com/eu-articles-comp.cfm>

Method books

Arban/Randall *Complete Method*

Brasch *The Euphonium and Four Valve Brasses* (Brasch)

Clarke *Technical Studies*

Bordogni/Rochut *Melodious Etudes*

Tuba

Texts

Frederiksen, Brian Arnold Jacobs: *Song and Wind* (Windsong, 1996)

Method books

Arban, J. B. *The Arban-Bell Tuba Method*, (Colin)

Blazhevich *70 Studies for BB-flat Tuba, Volumes I & II*

Bordogni *43 Bel Canto Studies for Tuba*

Jacobs *Low Register Studies*

Kuehn *60 Musical Studies for Tuba, Books 1 & 2* (Southern Music Company)

Author Bio



Brian N. Weidner is the assistant professor of instrumental music education at Butler University. He holds a Ph.D. in Music Education from the Bienen School of Music at Northwestern University. Additionally, he holds an M.M. Music Education from Northern Illinois University, a M.Ed. School Leadership from Olivet Nazarene University, and a B.M.E. Music Education/B.A. English from Illinois State University.

Before coming to Butler, he was a lecturer in the music and education departments at Lake Forest (IL) College. Previously, he taught at McHenry (IL) High School for 12 years, serving as its Fine Arts Coordinator, Director of Bands, and Music Theory Instructor, and is a National Board-certified teacher.

He has published articles in the *Bulletin of the Council for Research in Music Education*, *Journal of Music Teacher Education*, *Journal of Research in Music Education*, *Music Educators Journal*, *Psychology*

of Music, and multiple state and local journals, was a contributing author of a chapter in *The Music and Literacy Connection*. He has presented nationally and internationally at conferences including NAFME, RIME, SMTE, and CMS. His academic interests include investigating the relationship between music and literacy, the development of independent musicianship through large ensemble instruction, and the use of disruption in self-replicating cycles in teacher education.

At Butler University, he teaches courses in the undergraduate and graduate music education program, including Brass Techniques. Additionally, he serves as the co-director of the Butler University Symphonic Band.

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