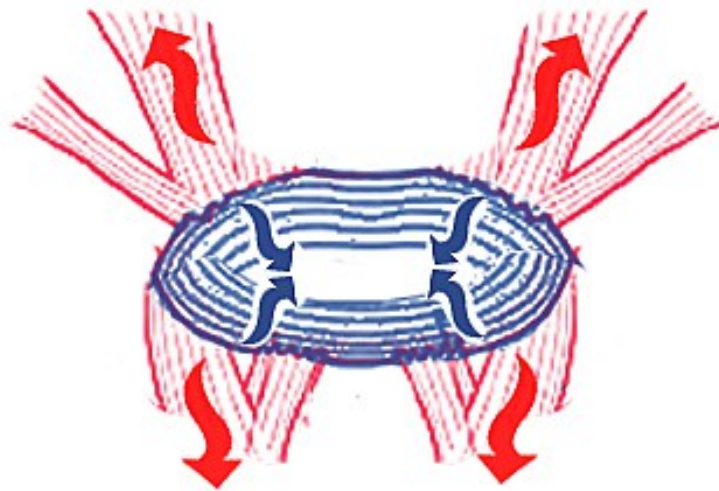


How to Form a Trumpet Embouchure

by Charlie Porter



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What is an Embouchure?

The embouchure is the formation of the lips and supporting muscles of the face required to play a wind instrument. All wind instruments have a particular type of embouchure that fulfills certain requirements needed to play them.

Some basic requirements of a brass-wind instrument embouchure are as follows:

1. To provide a stable connection with the mouthpiece in all range and dynamics.
2. To direct and control wind velocity.
3. To form the lips into reeds which are taut and ready for vibration.
4. To provide a supple aperture (opening), open enough for wind to travel through, yet closed enough to facilitate vibration.

There are many different ways in which players try to fulfill these requirements or compensate for the absence of them. Physical attributes, such as teeth formation, size of the lips, lip deformity or scar tissue, braces, etc. can have a great impact on how someone forms their embouchure.

The abundance of literature expressing many differing opinions on the subject of embouchure, coupled with the inability of many trumpet teachers to successfully explain it and direct their more troubled pupils on the subject has lead many to the politically correct conclusion that the embouchure is highly individual and that there is no single embouchure that works for everyone. While it may seem that many great players play with differing methods, they must all adhere to certain core principles.

“How To” vs. “Why”

Allow me to make an analogy. Say you are starting a job as a stocking clerk. On your first day, your supervisor shows you how to stock the milk. First he has you stack all of them in a cart by alternating box color. Then, to help you unload them in the storeroom he draws a color coded diagram showing you where to put the red boxes, the

blue boxes, the white boxes, etc. The diagram also shows you how many of each to put in each row. Additionally, there are other instructions as well, in which he explains various special stacking techniques and even exercises to help you get better at stacking! The diagrams don't really make sense to you and seems a bit overly complex for a stocking clerk, but you do it anyway, hoping that it all works out in the end.

The supervisor obviously gave you a detailed way to do the job. He told you, in the best way he could think of, *how* to stock the shelves. He even gave you special stacking exercises he created! However, he forgot to tell you the most important thing...the thing that would have allowed you to figure it all out, your own way. He forgot to tell you *why*...not how, but why. Instead of just giving you the specific directions, he could have said “The red is whole milk, the blue is 2% milk and the white is skim milk, so they should be stacked under the labels that say whole, 2% and skim. The new boxes go in the back, and the old boxes go in the front, so they get used first.” Knowing the reason behind his specific, personal method would not only make following the method easier; it would give you the information you need, so you can understand what needs to be done, for yourself, in case his method doesn't quite work for you. It empowers you to even create your own method.

Many brass teachers make the same mistake as the supervisor in the previous analogy. Instead of informing their pupils of the requirements of a good embouchure, they only give them lots of specific instructions based on their own perception of what works for themselves, expecting it to work for the pupil in the same way.

The problem here is two-fold:

1. The teacher may be correctly or incorrectly perceiving how things are happening in their body, despite the reality of what actually *is* happening.
2. The way in which the teacher explains the “how to” might be correctly or incorrectly understood by the pupil and applied with varying results (good and bad).

Knowing the “why” of embouchure formation will help the teacher to correctly perceive how they are forming their own embouchure and better formulate the “how to” for the student. Showing the pupil the “why” as well as the “how to” will narrow down the possible ways in which they will interpret the teacher's specific instructions.

There are lots of wonderful players who have learned through many different approaches, from self-taught to conservatory-trained. The best case scenario is when a student with musical talent and dedication to practice has the opportunity to study with a teacher, from the very start, who can successfully communicate, not only the “how to” of trumpet playing, but the “why” as well. This empowers the trumpeter to eventually become their own teacher and to think for themselves.

With the information that follows, it is my aim to provide brass players both the “how to” and “why” of properly forming an embouchure and to give this information as objectively as possible. The four-step method, that I present, will demystify the subject of embouchure and make its function more clear to the reader.

The Four Step Embouchure Set-up

Step 1. Hide The “Red”



a.) Photo illustration of step No.1

In the first step, you want to first touch the teeth together to align them. Do not bite all the way down, but just touch the front teeth together as if you were biting your nails. While keeping them in this alignment, press the soft part of the lips (pink, red or dark-red for most, hence the title) together until they disappear (see illustration *a.*, above).

The object is to curl the lips inward, towards each other, in front of teeth. Make sure not to open the teeth and curl the lips over the teeth! This first step will ensure that we have alignment of the teeth and that the red of the lips is not exposed. These are both crucial for the success of step two.

Step 2. Create the Seal



b.) Photo illustration of step No.2

In the second step, you will need some sort of embouchure visualizer. I find that a pair of scissors (commonly found in most homes) usually does the trick. Of course, you can also use a real visualizer if you have it. Just be sure that whatever you use is somewhat close to the size of a trumpet mouthpiece (it doesn't have to be exact).

For the second step, simply hold the teeth and lips (as we set them up in step one) and bring the visualizer to the center of the lips. Without opening the lips, press the visualizer equally on to the lips, which are supported by the teeth (see illustration *b.*, above). If done properly, you should feel an equal weight on both the top and bottom teeth.

The angle of the visualizer should be flat, so as to distribute the pressure to the front, flat part of the teeth. If you have a tooth or teeth that point out and cause discomfort or make it impossible to find a level position in the center, experiment going a little to either side until you find a level position (with equal pressure on the top and bottom). Be sure not to pull the mouthpiece up or down so as to push the rim onto the red of the lips, when looking for a level surface.

Be sure not to use an excessive amount of pressure (pressure that hurts!). You only need to use enough to create a firm seal all the way around the rim, which should never hurt. Again, if your teeth are crooked, you may need to experiment to find a level spot to avoid any unnecessary discomfort caused by normal pressure. If you press too little and do not create a good seal, then air and vibration will be allowed to escape from the inside of the mouthpiece (visualizer), which will result in instability of the embouchure, diminished quality of sound and poor dynamic range (see illustration *c.*, below).



c.) Example of too little pressure and/or unaligned teeth. Notice the lack of seal around the perimeter of the rim. Also, the “red” of the lips has been prematurely stretched open before the seal was properly formed.

When you press on the lips, you will see the “red” start to bulge out. This is normal (see illustration *b.*, above). However, this is not to be confused with purposefully opening the lips. Notice that from the outside of the visualizer the lips still appear to be hidden. Seeing this is a good indication that you have done step two correctly.

Once you have created the seal, you can now relax the inward contraction of the lips from step one. The pressure of the mouthpiece on the teeth (or seal) will hold the lips securely, similar to how a ligature holds the reed of a saxophone mouthpiece in place. So, be sure to relax the muscles you activated in step one. Not doing so will jeopardize the success of step three.

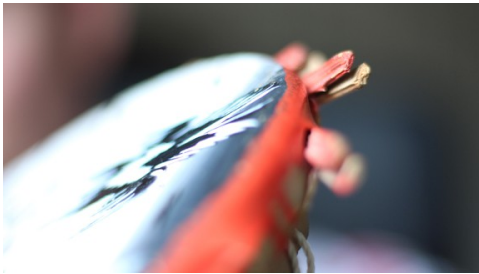
Step 3. Create the Aperture and Tautness of Lips



d.) Photo illustration of step No.3

This is, without a doubt, the most crucial step in the set-up process. It is also the easiest step to do incorrectly, so pay close attention and re-read to ensure you understand completely.

Like a drum or guitar string, the lips need to be taut to achieve a state of readiness to vibrate easily.



e.) Taut surface of a drum



f.) Taut strings of a guitar

The lips literally act as reeds. The trumpet mouthpiece, like the saxophone mouthpiece, is incomplete without a reed or vibrating source...the LIPS!

The lips also need to form an aperture or opening, to allow for the air to flow through them. This is also true for single and double reed wind instruments (saxophone, bassoon, etc.)



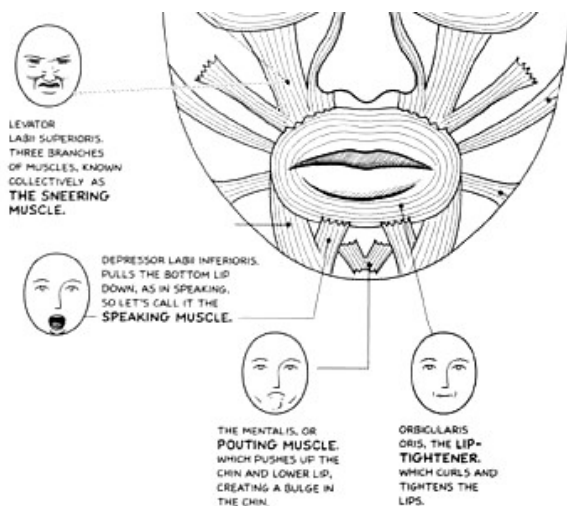
g.) Aprture of a saxophone mouthpiece



h.) Aperture of a bassoon double-reed

In step three we will position the lips so that they are taut and form an aperture that is close enough to allow vibration yet open enough to easily allow air to pass through them.

To achieve this, you will need to pull the top lip up and the bottom lip down, so as to stretch them outward (up and down) out of the mouthpiece, despite the pressure that is pinning them down to the teeth. When doing this, you will feel the lips move away from each other and, in doing so, you will feel them rub against the rim of the mouthpiece on their way out. At the same time, begin to drop the jaw and allow the teeth to open, which will also help to create tautness and space between the lips. However, do not rely on merely opening the teeth to accomplish this. The muscles of face must lift the upper lip and pull down the lower lip as previously described. You will stretch the lips outward until you have about a 1/16th to 1/8th line of space between them. This opening is your aperture.



Muscles used in Step No.1

The *Orbicularis Oris* tightens the lips toward each other.

The *Mentalis* is primarily used initially during Step No.1, but if used too much while playing, can cause the airstream to become too thin and eventually strangle the air.

Muscles used Step No.3

The *Levator* muscles pull the top lip up.

The *Depressor* muscles pull the lower lip down.

The main idea is to slightly stretch the lips outward, while opening the teeth, and allow the pressure of the seal of the mouthpiece to hold the lips in the new taut formation when they stop at the appropriate aperture setting (see illustrations *i.* and *j.*, below)



i.) Stretching lips outward



j.) relaxing lips, after stretching (held in place by rim)

Many of my students have found it quite helpful to overdo the stretch, at first, to get a better understanding of the movement, since the action of pulling the lips out can seem quite foreign at first, or go against the habits a student may have already formed.



k.) Illustration of stretching lips completely out of the rim to better understand the motion

This will look and feel a bit strange, but the idea is to pull the lips outward, as described above, until they come out completely, leaving the mouthpiece on the teeth. Usually this is an easier action to make, than the more subtle movement required to actually set the lips (see illustration *k.*, above).

Once, this action is accomplished, simply do the same motion, but stop once the spacing of $1/16^{\text{th}}$ to $1/8^{\text{th}}$ is achieved between the lips (see illustrations *i.* & *j.*, above).

Things to Avoid Doing in Step No.3

1.) When opening the teeth, be sure not to open them too far apart. The rim of the mouthpiece should always have a connection to the teeth. If you open up too far, then the lips will not have any support behind them (see illustration *l.*, below).



l.) Teeth opened too far apart, allowing no support behind the rim of the mouthpiece.

2.) When stretching the lips outward (in an up & down motion), be sure not to accidentally pull the lips out to the sides, as when smiling. This will just thin the lips out, instead of creating the desired space between them (see illustration *m.*, below). Stretching the lips out to the side may temporarily aid the player in playing a little bit higher (similar to stretching the opening of a balloon to raise the pitch, while deflating it). However, this success will be short lived. Stretching the lips in this manner will ultimately lead to poor endurance and can make the normal pressure, necessary to proper playing, feel painful due to the lack of lip cushioning.

Furthermore, as the player ascends and stretches the lips further and further to the sides, the lack of lip cushioning can cause the inability to seal the rim to the lips, causing a downward spiral of exerting more and more pressure on the lips in an attempt to gain a seal, resulting in an excessive amount of pressure and possible long-term damage to the lips.



m.) Lips pulling out to the side, instead of up and down, do not create the space needed between.

3.) Do not pucker the lips forward when attempting to separate them. Instead, keep them flat to the teeth while pulling outward. Puckering the lips forward can cause of a bit of a conundrum; though this motion creates more cushioning in the lips, which can feel good for players that use excessive pressure, it is also a root cause of using excessive pressure.

You see, the lips, like other vibrating materials, need to be flat in order to vibrate easily. When puckering the lips forward and off the teeth, more pressure is needed to press them down into a flat state, more suitable for vibration. Even then, the lips will be uneven and the aperture distorted (see illustration *n.*, below).



n.) Puckering the lips forward and using excessive pressure to flatten them result in a distorted aperture and an uneven lip surface.

Step 4. Wetting the Lips, Breathing and Blowing

Now that you have completed steps 1-3, the final step will basically be to wet the middle of the lips, breathe in and to blow out. Once the four step set-up is mastered, you will eventually combine the moistening of the lips and the breath into the third step, but I have separated it for now. This enables you to focus completely on getting the aperture set in step three, without having to multi-task.

After completing step three, we will take a deep breathe. To do this properly, drop the jaw, as when saying “ah” or “oh” and inhale through the sides of the mouth. As long as part of the teeth are still supporting the mouthpiece rim, you can open them up without any negative consequence to the embouchure set-up.



o.) Dropping jaw to allow for more room to inhale, while maintaining contact of the teeth to the rim (behind the lips).

Next, just blow air through lips to make sure the aperture is open enough. You'll know it is open enough if you can easily get air through the lips without creating any vibration. The point is not to create sound but to test the airflow. Make sure the beginning of the air attack does not start with a “p”, but rather an “f” feeling in the lips. Using “f” for the air attack will ensure we keep the space between the lips when emitting the air and ultimately the sound (see illustration *p.*, below).



p.) Blowing air through aperture to test for openness.

After successfully testing the aperture, the next step is to wet the middle of the lips, to prepare them for buzzing. This moisture will help to reduce friction and allow for a smoother vibration. This is achieved by simply poking the tongue through the middle of the lips. Be sure to maintain a good seal, as this movement should not tamper with the aperture setting at all, but simply moisten the lips. This moistening of the lips, only need happen before the first note of a passage. The constant warm airflow will ensure the lips are kept moist for the subsequent notes (see illustration *q.*, below).



q.) Wetting the middle of the lips with the tongue.

Finally, the last part of step four is to blow the air again, but this time with the aim of creating a buzz. This is the last step in testing out the success of our aperture setting. Assuming the aperture was large enough, in the previous step, to achieve easy airflow without any disturbances, then we should have plenty of room to get a nice sounding buzz.

However, to get a buzz, you will need to firm up the lips slightly. To do this, gently pull them inward, flat, towards your teeth, rather than just pushing them together. The idea is to preserve the aperture, while also trying to create firmer lips. Ultimately this is achieved while playing by always maintaining a balance of the lips pulling inward (Obicularis oris) yet outward (Levator & Depressor muscles) at the same time. Think of it as a game of tug-of-war that neither side ever wins! Once the lips are slightly firmed up and wet, blow the air through to create a buzz (see illustration *r.*, below).



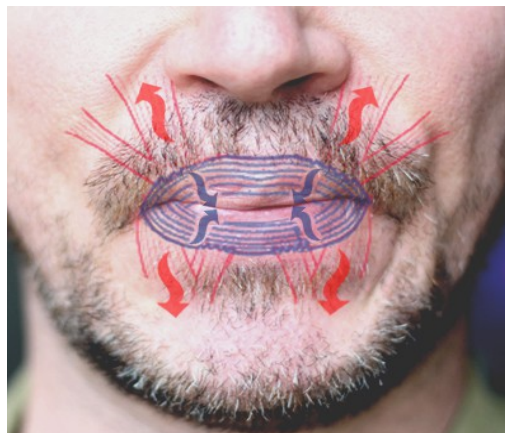
r.) Producing a "buzz" with the lips.

At this point, hopefully you have been successful in creating a clear sounding buzz. If the sound of the buzz is distorted, then the cause is almost certainly that the lips are getting in the way of the airstream. Make sure that the lips have enough space between them before attempting to buzz. This space should be visible. If you have correctly set the aperture, then be sure not to crush it closed when attempting to produce a vibration (see illustration *s.*, below).



s.) Pressing the lips together too firmly crushes the aperture and constricts the airway

Remember, that the lips must be supported in a tug-of-war type of balance, in that they pull towards each other but also pull away at the same time (see illustration *t.*, below). This ensures that the airway is never strangled shut (as in the previous example) and creates the desired tautness of the lips, necessary for easy vibration. The more taut the lips are, the higher the resulting pitch will be.

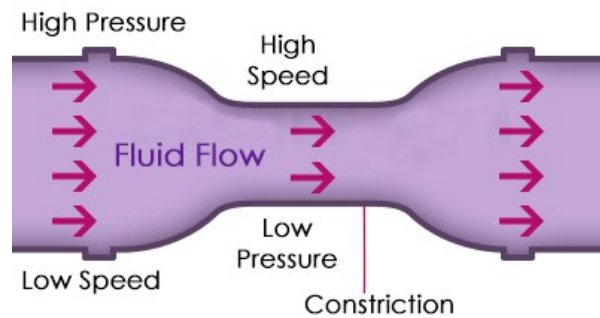


t.) The Orbicularis Oris (blue), and the Levator and Depressor muscles (red), in a constant balanced game of tug-of-war.

However, the taut state of the lips is not solely responsible for raising the pitch. The level of the tongue must work in tandem with the aperture. So, to understand how to transition from low to high, we must not only understand how to control the aperture, but the level of the tongue as well.

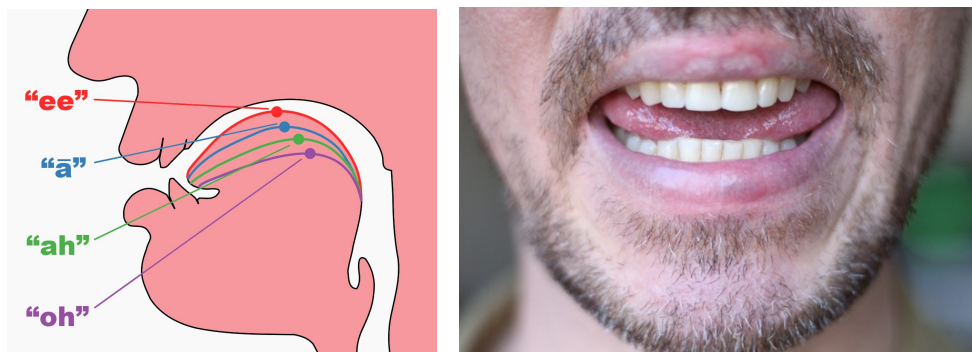
The Function of Tongue Level

Consider the nozzle of garden hose. Water travels through the hose when it enters the nozzle, it is directed through a tapered channel, or Venturi (see illustration *u.*, below) of the nozzle, which causes the water to travel faster. The raising of the tongue helps to create a Venturi in our mouth, before the air exits the smaller opening of the aperture. In this way, the tongue level works in combination with the aperture to direct the air column.



u.) Diagram of Venturi Effect

A simple way to demonstrate how tongue level effects the air column is to whistle from low to high and observe the movement of the tongue. If you can't whistle, then simply exhale with an "ah" syllable and gradually raise the tongue to an "ee" syllable, in which the tongue is sealed to the upper molars. You should be able to notice a very apparent difference in the speed of the air (see illustration *v.*, below).



v.) Creating an "ee" syllable with the tongue and sealing the top of the tongue to the upper molars.

Controlling the Aperture

The muscles in your body work together to not only expel air but to also create a resistance to that airflow, which is controlled by the size of the aperture. The size of the aperture is determined by the firmness of the lips. Though muscles are involved in this process, the student may find it easier to visualize the size of the airstream desired, thus indirectly triggering the muscles to adjust on their own.

Try blowing very lightly on your hand to produce a pin-sized airstream, as if you were cooling off a hot cup of soup. Next, try forming a larger stream of air, about the thickness of a “Sharpie” (permanent marker). Now try going back and forth a bit from a small airstream to a large airstream (see illustrations *w.* and *x.*, below).



w.) Large aperture



x.) Small aperture

Your body adjusts certain muscles automatically to make the small and large aperture setting, and in turn to produce the desired airstream. If you think about size of the airstream you are trying to produce, there is no need to consciously think about which muscles to contract. Your body is smart enough, on its own, to figure it out!

Now try the previous exercise, but with the visualizer in position. Be sure to follow the steps of the four-step process, one at a time. Once the visualizer is in position, practice alternating from a large aperture to a smaller one (see illustrations *y.* and *z.*, below) only blowing air. This flexing from a small to large aperture, working in tandem with the tongue level, controls the transitioning from low to high when playing.



y.) Large aperture, with visualizer



z.) Small aperture, with visualizer

Playing With YOUR Natural Angle

Though it is far from natural, trumpet playing should feel as natural as possible. This ease of playing is the result of balance. An important factor in that balance, which must not be over-looked, is the mouthpiece angle.

If the above steps are correctly followed, the resulting angle of the mouthpiece will be determined by the angle of the teeth, since the rim of the mouthpiece should always be supported by the teeth. This support provides the necessary stability and seal of the embouchure.

One easy way to find your angle, is to place the rim of your mouthpiece directly on your teeth. Start with the teeth touching, as in step one. Position the mouthpiece so that it is flat on the face of the teeth. This may reveal to you, based on your teeth formation, the most level and comfortable location for the mouthpiece (which is not always in the middle!). After the mouthpiece is in position, open up the teeth, about $\frac{1}{2}$ an inch, but be sure to keep contact with the front of the teeth, beneath the rim. The resulting position should reveal your natural playing angle (see illustration *aa.*, below).



aa.) finding the best position for the mouthpiece on the teeth.

Next, follow the four step setup and make sure the angle feels the same with the lips positioned between the teeth and mouthpiece. It should feel the same, assuming the teeth are still supporting the rim of the mouthpiece.

All players, whether they have an overbite or underbite, must align the teeth, somewhat, when they play. Since the teeth support the lips, the alignment of the teeth is essential to the alignment of the lips. However, aligning the lips and teeth doesn't always result in the angle of the mouthpiece being straight out. In fact, most players with an overbite, even when aligning, will still have a slight downward angle. Likewise, players with a perfect bite may play straight out and players with an underbite may play with a slight upward angle.

Don't force yourself to play with any one particular angle, but instead find the one that agrees with your physiology. Some teachers insist upon students getting their bells straight out, which can be devastating to the embouchure development of a player with an overbite.

There are many habits that players form which, though they give short term quick

results, slow down or stunt their overall development. I call these habits crutches. A pair of crutches are great to use when you can't walk, due to a broken leg, etc. However, it wouldn't make sense to use crutches in lieu of walking normally.

Take, for example, the use of excessive pressure. I discovered when I was younger, as many players do, that if I used a LOT of pressure, I could get a substantial increase in my range for a limited period of time – limited, due to the fact that my lips would swell up and eventually not even produce a sound! Some players jokingly refer to this as the “octave key.” Well, most of us can agree that this is a “crutch,” and a common one, at that. We've all done it at one point or another. There are better ways to learn to play higher, but they take time, practice and discipline.

The reason I bring this up, is because there is another crutch, involving angle, that some players aren't aware of and should avoid. If the player attempts to raise their trumpet up, higher than their natural angle, it typically causes them to thrust their jaw forward in such a manner, that it causes their lower teeth to press into their lower lip. This, in turn, stretches out the lower lip. The more this is done, the tighter the lower lip becomes, which may help the player achieve some higher notes. However, this stretch is different than the taut state of the lips that is created with a nicely balanced flex of the facial muscles. Instead, this thrusting motion presses the lower teeth into the lower lip, creating a misalignment of the teeth and an imbalance between the lips (see illustration *bb.*, below). This also results in a distorted aperture (which one can rarely get a good lip buzz with), which causes problems with flexibility and sound.

One tell-tale sign a player is using this crutch is if, despite having an overbite, they have a significant raise in the angle of the bell when ascending. Although this raise may be normal for a naturally upstream player, it is very unlikely for a naturally downstream player to have any real success with sound, flexibility or attack, when playing in this manner. This over-thrusting of the jaw typically leads to painful issues with the jaw, such as T.M.J.



bb.) Just thrusting forward too far, causes lower lip to be tighter than the top lip, and distorts the aperture.

Reviewing The Four Steps:

Step 1. Hide The "Red"



Step 2. Create the Seal



Step 3. Create the Aperture & Tautness of Lips



Step 4. Wetting the Lips, Inhaling and Blowing



Putting the Four Step Setup Into Practice

Once you understand the “how to” and “why” regarding the four step set-up method, its time to put these concepts to the test, through systematic practice. If you do not yet fully understand the aforementioned principles of the setup method, then be sure to reread and/or watch the [video tutorial](#) again before beginning to practice.

I recommend first completing the four step setup on the visualizer many times, with the aid of a mirror, followed by the mouthpiece and finally the trumpet. Be sure to spend more time, at first, with the visualizer. Since the visualizer will allow you to see what goes on inside the mouthpiece, it can help you to more quickly spot problems and attain correct form and muscle balance, which you will commit to muscle memory through much repetition.

After practicing the entire setup, step by step (without combining the steps yet), give it a try on the mouthpiece. When switching to the mouthpiece, the muscle memory that you develop during practice with the visualizer will help you to “feel” what the correct placement and setting is. Do this a couple times and then give it a try on the trumpet. At first, just attempt to play a long open tone, such as middle “C” or “G.” Repeat the entire process over and over.

Once the long tones become easy enough to play with a good, focused sound, try playing some simple flexibilities. Make sure to practice alternating from a large aperture to a small aperture (while looking in the mirror) with just the air, and memorize the feel of it. It is this very same motion, or “flex,” that you will use when playing flexibilities on the trumpet (low=large and high=small).

Remember, when following step three, to test the aperture's ability to provide a free and easy airstream, without creating any vibration at all. Do this, not only on the visualizer, but on the mouthpiece and trumpet as well.

After you start to become more comfortable with the setup process, you can start to combine step three with the wetting of the center of the lips and breath in from step four, so they all happen simultaneously. Eventually the entire setup process will meld into a mere reflex that you need not think of anymore. However, remember that the body needs time to correctly form a new habit. Even if you “get it,” several days of hard practice are not enough to form a lasting habit. In a study published in the *European Journal of Social Psychology*, professor Phillipa Lally and her research team found that, on average, it takes more than 2 months before a new behavior becomes automatic – 66 days to be exact! So, give your body time and realize that the slow path IS the fast path.

Last, but not least – FOLLOW THE SOUND! Breaking down the steps of forming an embouchure can lead some folks to focus solely on what they are seeing or feeling. However, the sound will tell you if you are playing right or not. Constantly monitor the quality of the tone you are producing, whether free-buzzing, mouthpiece buzzing or playing the horn and set a high standard for the quality of your sound. Good luck!

About the Author



As a multi-genre trumpeter, Charlie Porter has a rich diversity of experience ranging from performing with small & large jazz ensembles to performing classical solos, chamber music and orchestral literature with major symphony orchestras.

Charlie holds a Bachelor's degree from The Juilliard School in classical trumpet performance and a Master's degree from Manhattan School of Music in jazz performance. His mentors have included Wynton Marsalis, Raymond Mase, Mark Gould, Jon Faddis, Lew Soloff, Laurie Frink, Guy Touvron, Pierre Thibault, Dominic Derasse, Cecil Bridgewater, Sy Pryweller & Wayne Daniels.

Charlie has taught masterclasses throughout the United States and abroad, including India, Africa, China, Southeast Asia and Estonia.