

BIOLOGY CONNECTIONS

Lesson 2: How Do Singers Use Their Body To Produce Sound?

Prior Knowledge:

Lesson #1 gave us a foundation of understanding about how the human voice works through an examination of the anatomy of the upper respiratory system. We practiced phonating to produce sound.

Overview:

Now let's examine how singers use their anatomy to create sound. Training to become a classical singer takes a great deal of commitment. One of the first things a singer must think about is breathing, space and focus.

Vocabulary:

Diaphragm: a thin muscle stretched at the based of the thorax. The bottom of our lungs and heart also rest on the diaphragm. When the diaphragm is engaged, it expands the thorax cavity to make more space for air.

Soft Palate: located just past the roof of the mouth, the soft palate is stretchy cartilage. It is also the location of the gag reflex.

Hard Palate: located at the roof of the mouth. Because this palate is hard sound bounces off it. This can help direct sound and make it resonant.

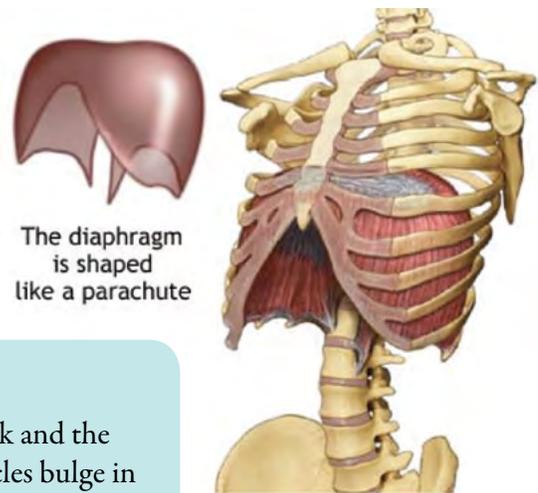
But First A Little Information About Opera Singers!

Opera singers produce beautiful sound without any electronic amplification. They create this sound through vibrations on the soft, flexible parts of the respiratory system and the hard or rigid parts of the respiratory system. Their voices are so powerfully trained that they can be heard over a full orchestra. Breath control is a key element to their success.



Breathing:

Imagine that you press a full balloon against a table. The pressure makes the balloon flatten out and bulge on the sides. This is similar to what the diaphragm does when you breathe in. Here are some experiments that you can do to replicate the process a singer goes through as they produce sound.



Try This!

Lie down on your back. Slip your hands between your back and the floor at your waist. Take in a slow breath and feel the muscles bulge in your back. Just like the balloon the muscles pushed out. When a singer engages their diaphragm they control their exhalation to sustain the sound they need to sing.

Lie down again on your back, place a book on your stomach, take a belly breath and as you exhale work to keep the book level and forward. Do you feel how your ribs pull up slightly? What else do you feel?

Find Your Hard And Soft Palate:

To find your soft and hard palates, use your tongue to trace the roof of your mouth from the teeth to the back of your throat, observe the change from hard to soft, the hard palate is in the front, the soft palate is behind it. Can you feel the difference?

Space:

Raise your soft palate to open the throat wider. The wider the opening of the throat, the more space you have for sound and resonance.



Try This! Locate Your Soft Palate:

To stretch and lift your soft palate, yawn and raise your eyebrows. Your soft palate is now open and lifted, hold it open, and now phonate. Your larynx, vocal cords and folds are working together to make sound. Repeat the exercise to lift the soft palate and phonate at the same time. The sound is different! It is a vertical sound and sounds sort of like an echo in your head. By lifting the soft palate there was more space inside the mouth and more room for sound, especially for high sounds! Now engage your belly breath as you exhale, lift your soft palate and phonate. Do you feel how much bigger your sound is now?

Focus:

When singers are working on developing their vocal placement they may work so hard to create an open sound that the focus of their voice gets pushed back, which can make the voice sound muffled. Placing the voice forward into the hard palate helps the placement of the sound stay forward, understandable and clear.

***Try This! Locate Your Hard Palate:***

Take a belly breath, lift the soft palate and phonate. With that big open sound in place, speak or sing. The sound is very open but difficult to understand; it sounds like an echo in your head. Now concentrate on focusing the sound forward toward the hard palate. As you focus this sound, your sinus cavity and hard palate will begin to vibrate with the energy of the air. Speak or sing again. The sound is rich and vibrant!

Wrap Up:

We explored using our diaphragm to breathe properly for singing, to lift our soft palate to open up our throats and to focus sound using our hard palate, just like an opera singer.