BIOLOGY CONNECTIONS

Lesson 1: What Is The Anatomy Of The Human Voice?

What are the parts of the upper respiratory system and how do they function to make sound? The human body is so efficient that it uses the same bones, muscles and tissue for a variety of different things. This lesson gives us a foundation for our understanding of how the human voice works by examining the anatomy of the upper respiratory system.

Vocabulary:

Vocal System: the upper part of the human respiratory system, it is used to breathe, eat, speak and sing.

Pharynx: a portion of the throat located just behind the mouth and nasal cavity. It is an important part of the digestive system, respiratory system and is used for producing sound. It splits into two muscular tubes.

Trachea: sometimes called the windpipe, it sends air into the lungs. It is open almost all the time.

Esophagus – it allows food to pass from the pharynx into the stomach. It is only open when you swallow or vomit.

Epiglottis: an elastic cartilage flap attached to the entrance of the larynx. It covers the larynx so that we don't choke when we drink or eat.

Larynx: Sometimes called the voice box, the larynx is an organ that helps breathing and sound creation by manipulating pitch and volume.

Vocal folds: located inside the larynx. The vocal folds make phonation possible. They are located where the pharynx splits between the trachea and esophagus.

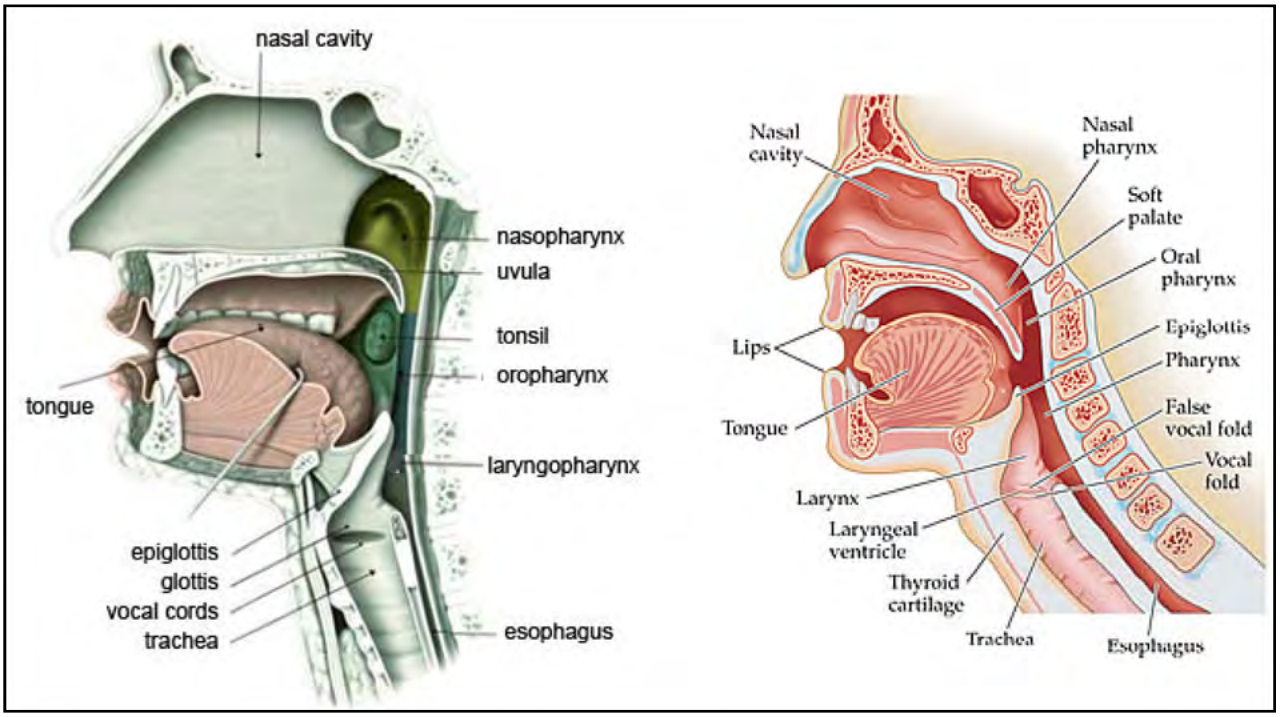
Vocal cords: twin membranes that stretch horizontally across the larynx. They are smaller than a nickel. They are open during inhalation, closed when you hold your breath and vibrate when you speak or sing.

Glottis: the combination of the vocal folds and the space in between the folds.

Phonation: the process of making vocal sound.

Big Idea:

What happens when you drink water too fast? The water goes down your trachea, instead of your esophagus and you start to choke or cough up the water. When you swallow air into your esophagus instead of it going down into your trachea, you burp!



Air enters our body through the nose or through the lips. When air passes through the nose it goes through the nasal cavity. When it goes through the lips it goes through the oral cavity. At the back of the mouth these cavities connect to something called the **pharynx**, which is a single tube, located at the back of the mouth. The pharynx does something incredible. It divides into the **trachea**, which takes air to the lungs and the **esophagus**, which takes food and liquid into the stomach. At the top of the trachea is the **larynx** and inside the larynx are the **vocal folds** and **cords**.

Body of Lesson

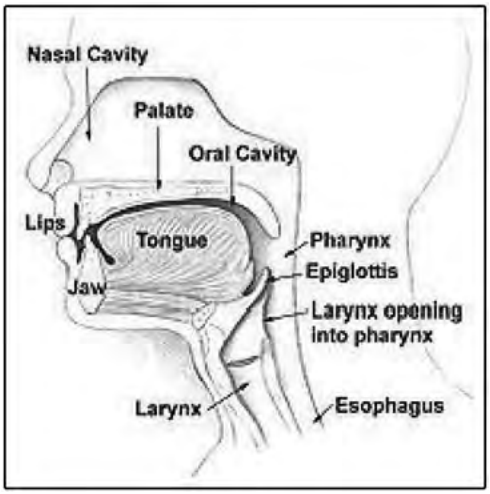
First, let's look at the two paths for air to pass into our body.

Air Passing Into Our Body Through Our Nose:

Take a breath through your nose. Feel the air move through your nasal cavity and into the back of your throat, down your pharynx, through your trachea and into your lungs.

Air Passing Into Our Body Through Our Lips:

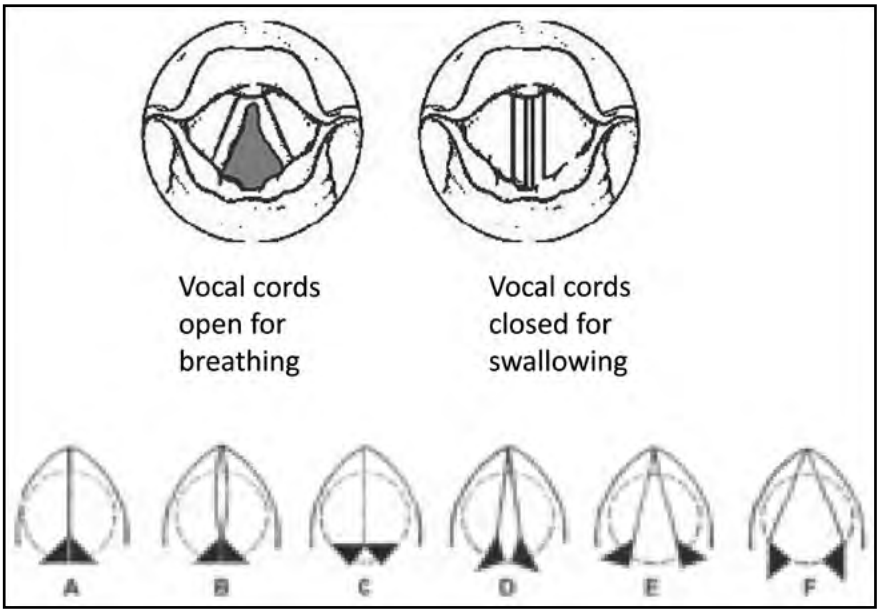
Take a breath through your mouth. Notice how the tongue and jaw relax with the intake of air. Feel the air move into the back of your throat, down your pharynx, through your trachea and into your lungs.



Where is the epiglottis located? What does it do?

Take a sip of water. Notice how the tongue works to push the liquid to the back of the throat and the muscles just below the tongue activate to close the trachea so you don't choke. The liquid goes down the esophagus and into the stomach. That muscle is the epiglottis flap in action.

Where is the epiglottis located? What does it do?



Breathe in and out slowly. Avoid making any type of vocal sound or **phonation**. Notice how the trachea is like an open tube allowing air to enter and exit your body.

Phonate and feel the vibration in your throat. Pause for a moment of silence, breathe quietly and then phonate again. Feel the muscle just below the throat engage. That is your larynx, vocal cords and folds working to make sound. The sound created is the force of air being pushed through the vocal cords which vibrate when they are engaged.

Wrap Up:

During this lesson we examined the human upper respiratory system and how its multiple functions produce sound and music.