

BIOLOGY CONNECTIONS
Lesson 3: What Are Vocal Folds?**Prior Knowledge:**

During our first lessons we focused on the physiology of how human sound is created. We also explored how we use air and the diaphragm to phonate. We have specifically looked at the vocal cords and folds and how they are central to the process of making sound.

Materials you will need for this lesson:

- A shoebox
- Pipe cleaners
- Rubber bands
- A piece of red felt
- Construction paper (variety of colors)
- A balloon
- Clear plastic wrap

Vocabulary:

Vocalis muscle: the main body of the vocal fold.

Mucosa: covers the vocalis muscle. It is made up of two parts

Epithelium: tissue that lines the cavity of the larynx.

Lamina propria: a pliable connective tissue with three layers:

Superficial layer: is loose and pliable, but has the least amount of flexibility.

Intermediate layer: most elastic of all the layers

Deep layer: is less elastic and has more collagen

The intermediate and deep layers together create the:

Vocalis ligament: which is very elastic and full of collagen.

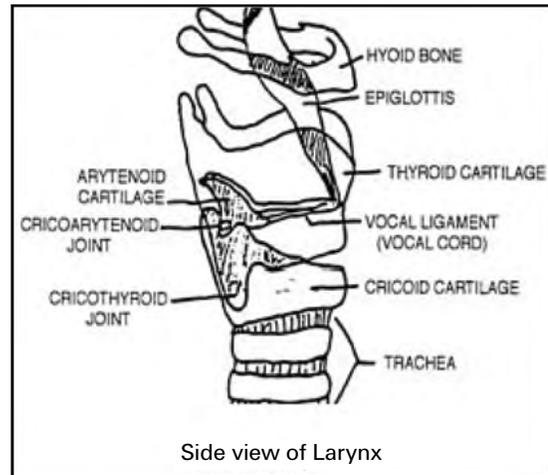
Together they create a parallel along the edge of the vocal fold.

Introduction:

Vocal folds are about the size of a nickel. They are paired structures in the larynx just below the trachea. They need to be all of the following things: sturdy, elastic, flexible, good at absorbing shocks and able to return to their original shape after they have been used. What are vocal folds made up of? When we look closely at these muscles we see that they are constructed to be very flexible and sturdy. Also what makes someone's voice high or low?

An adult vocal muscle is made up of five layers of tissue, mucus and collagen.

Collagen gives strength, structure and support. **Elastin fibers** make the muscle return to its original shape after it has been used. It is like elastic. **Interstitial molecules** are the space filler, shock absorber, wound healer and make the cells regenerate.



Take A Look At Vocal Cords!

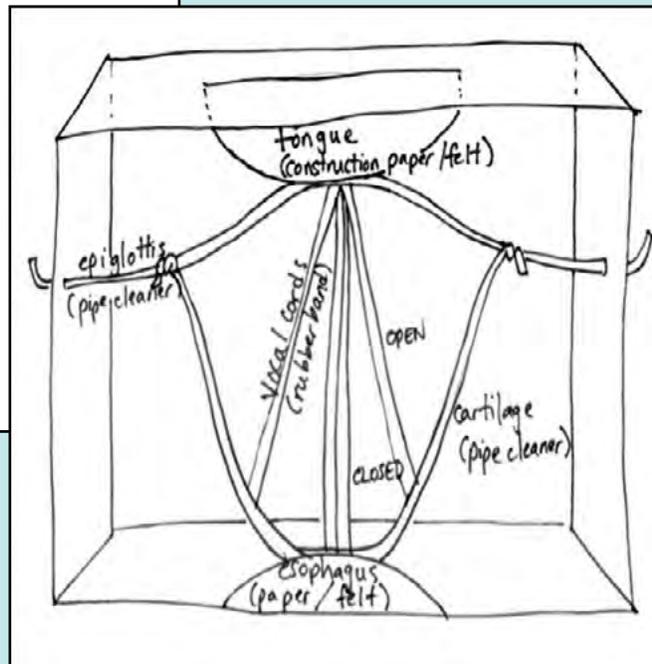
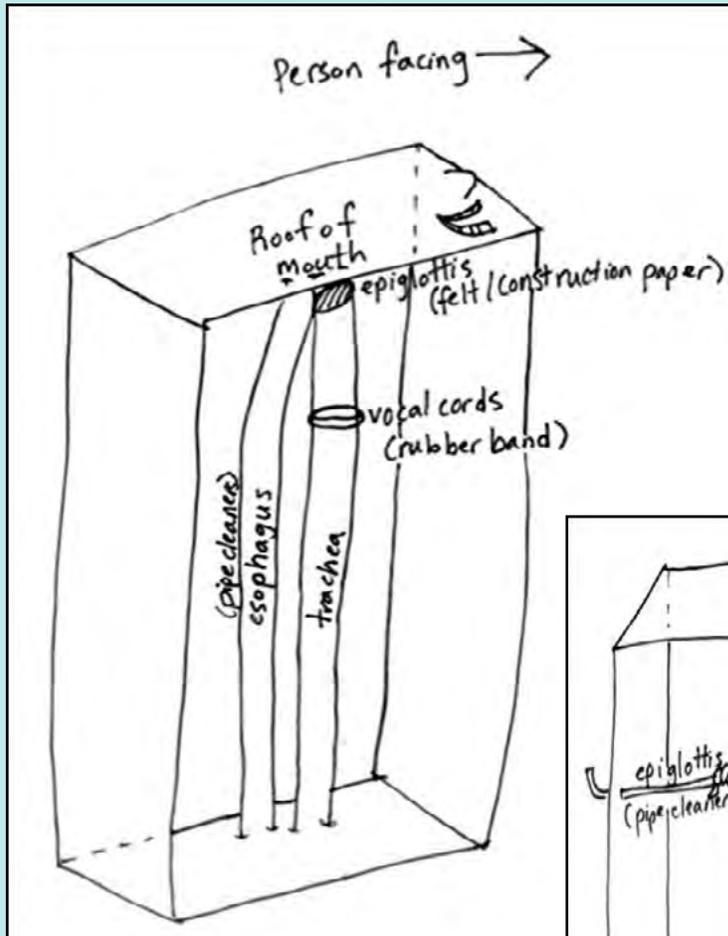
This link shows video of the human vocal cords in action!

 http://www.liveleak.com/view?i=a99_1290768370

Special thanks to Dr. Chin for allowing us to use this video!

Try This!

Here are two possible models that you can build in order to better understand vocal cords and the voice apparatus using a cardboard box (a shoebox would probably be best), a pair of scissors and pipe cleaners. By building either of these two models it will help you understand the relationship between organs such as the esophagus, trachea, epiglottis and vocal cords.



Wrap Up:

We learned about the tissue that makes up the vocal system, we looked at a video of vocal cords in action and we created our own voice box! Nice work!