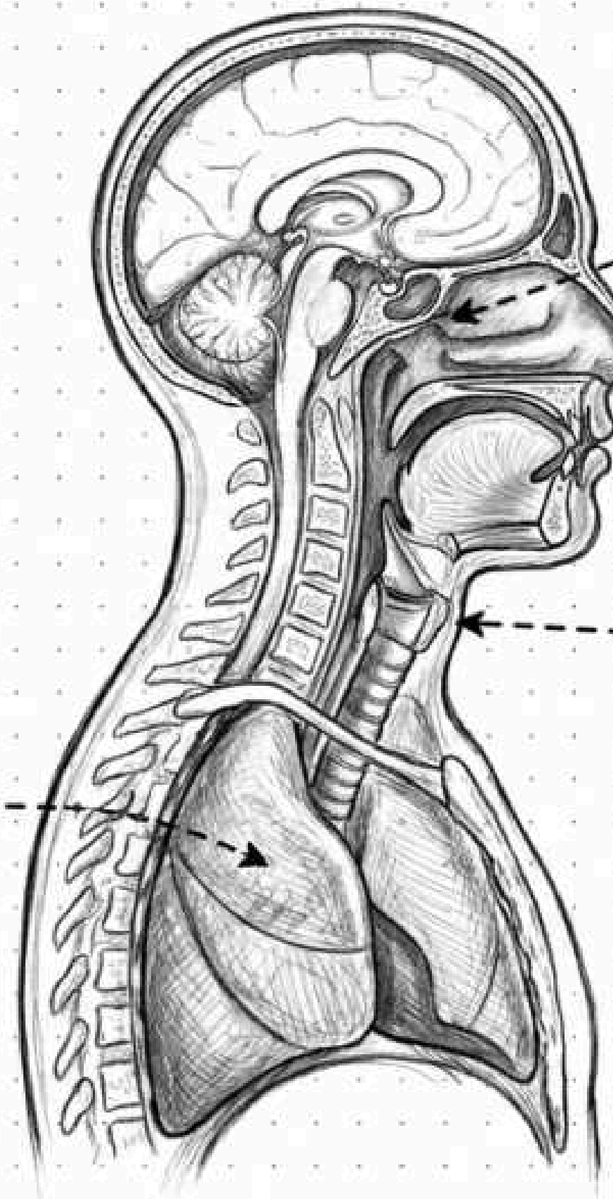
LING 150 B Lecture 2: How Speech Is Made



Velum
(oral vs. nasal)

Active & passive articulators
(places & manners)

Larynx & voicing
(pitch & breath groups)

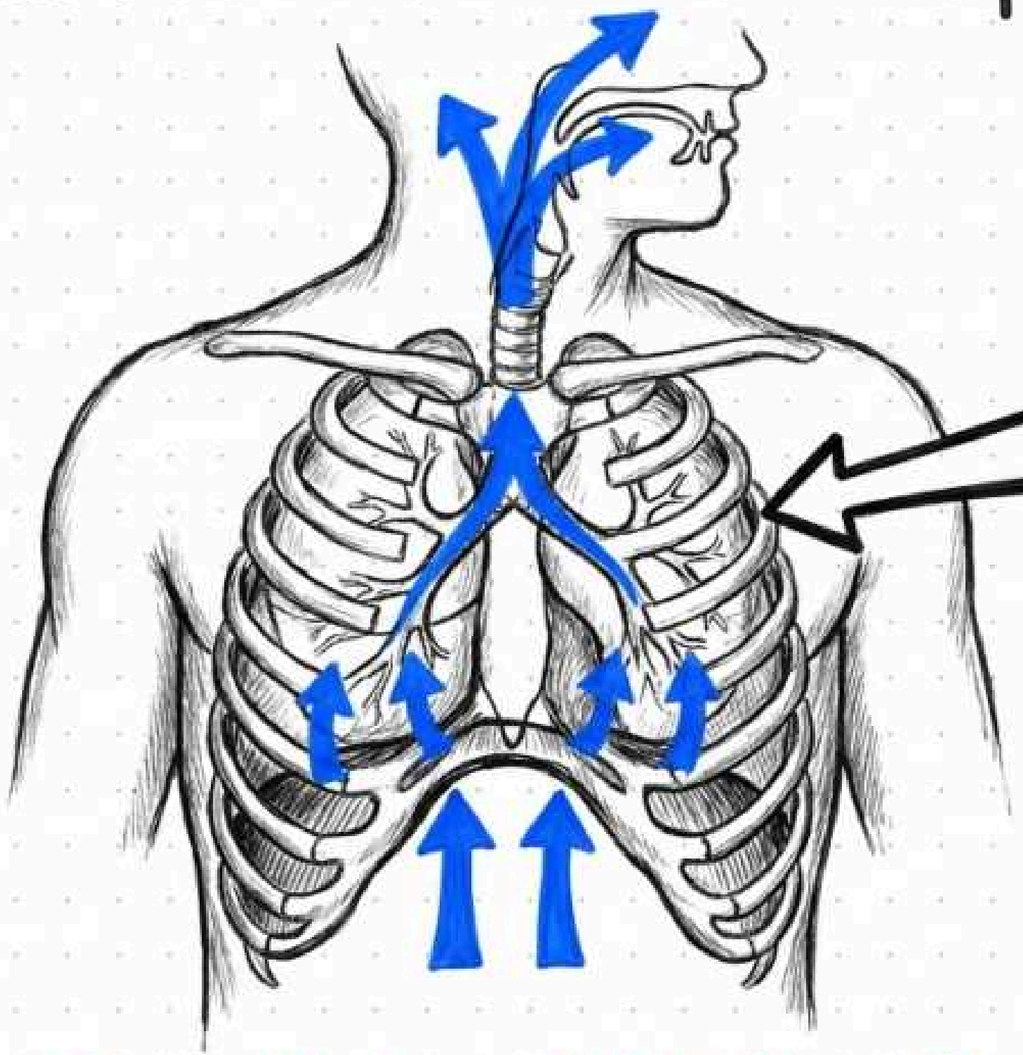
Lung airstream

At a glance:
The lung airstream, the larynx and voicing, pitch and breath groups, the velum, active and passive articulators, places and manners of articulation, the three-part label for a consonant, other airstreams, and coarticulation.

Gemini Notebook

The Raw Material of Speech

¶ 2.1



Pulmonic Egressive Airstream

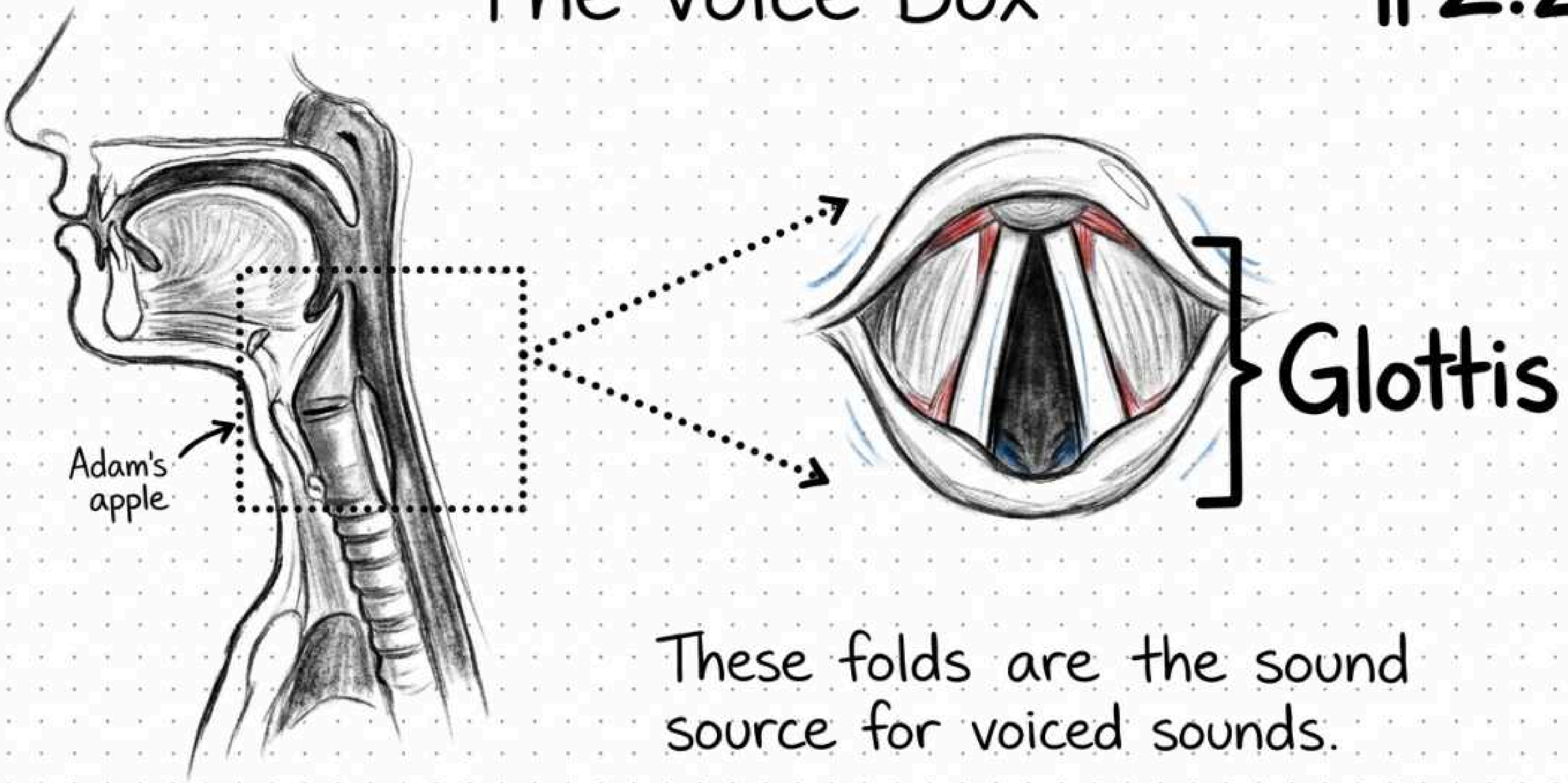
(air pushed out of the lungs by chest/diaphragm muscles)

Speech = Raw Material (Air) + Body (Shaping)

Gemini Notebook

The Voice Box

¶2.2



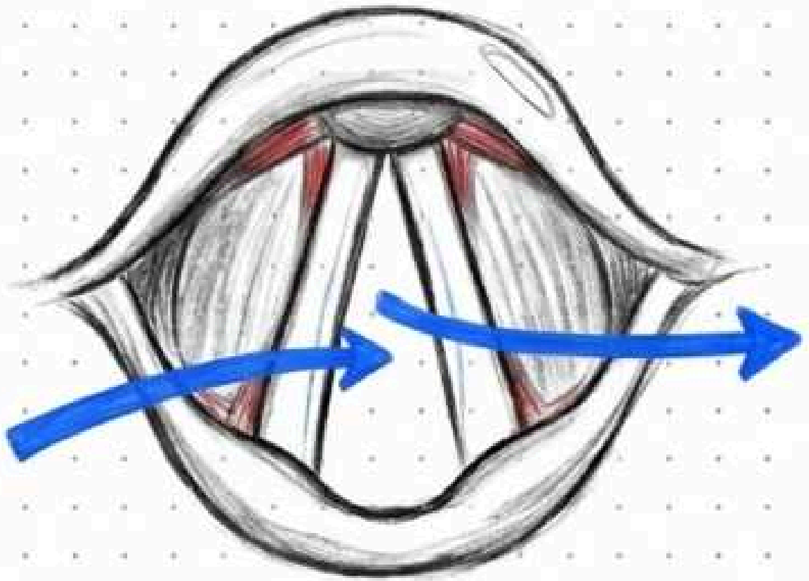
These folds are the sound source for voiced sounds.

Gemini Notebook

The Sound Source: Voicing

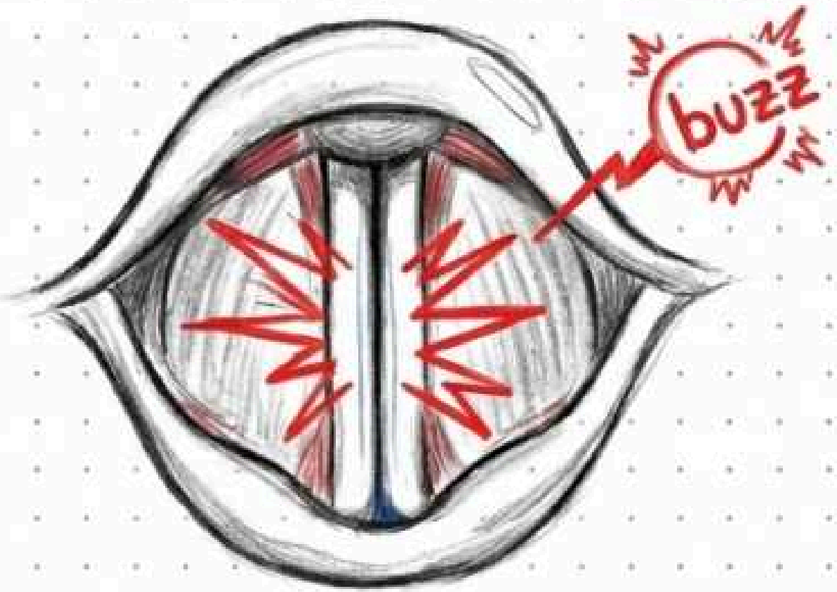
¶2.3

Voiceless



Air flows silently through the gap.

Voiced



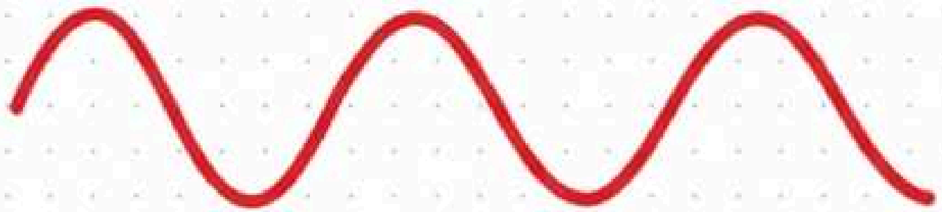
Folds vibrate hundreds of times a second = buzzing tone.

Whispering = Speech with NO voicing at all.

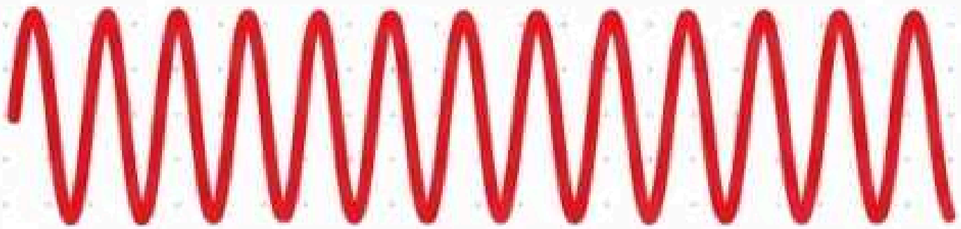
Gemini Notebook

The Physics of Pitch

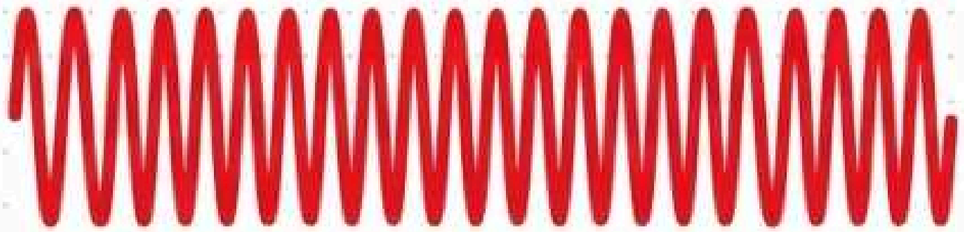
¶2.4



Adult Man (~100 vibrations/sec)



Woman (~200 vibrations/sec)



Child (>200 vibrations/sec)

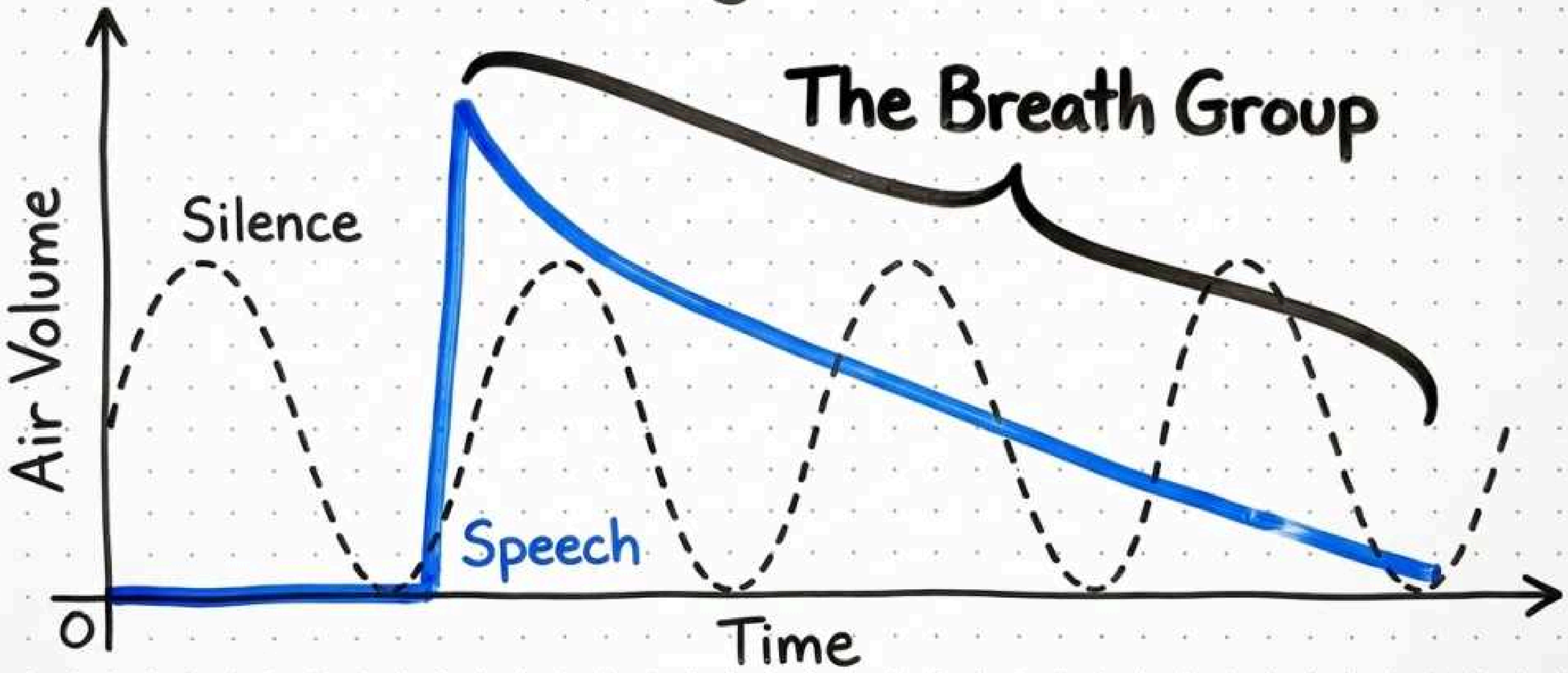
$$\text{Pitch}(f) \propto \frac{\text{Tension}}{\text{Length}}$$

Voicing sets the pitch. The faster the vibration, the higher the pitch. Tension and length of the folds control this speed.

Gemini Notebook

Reshaping the Breath

¶2.5



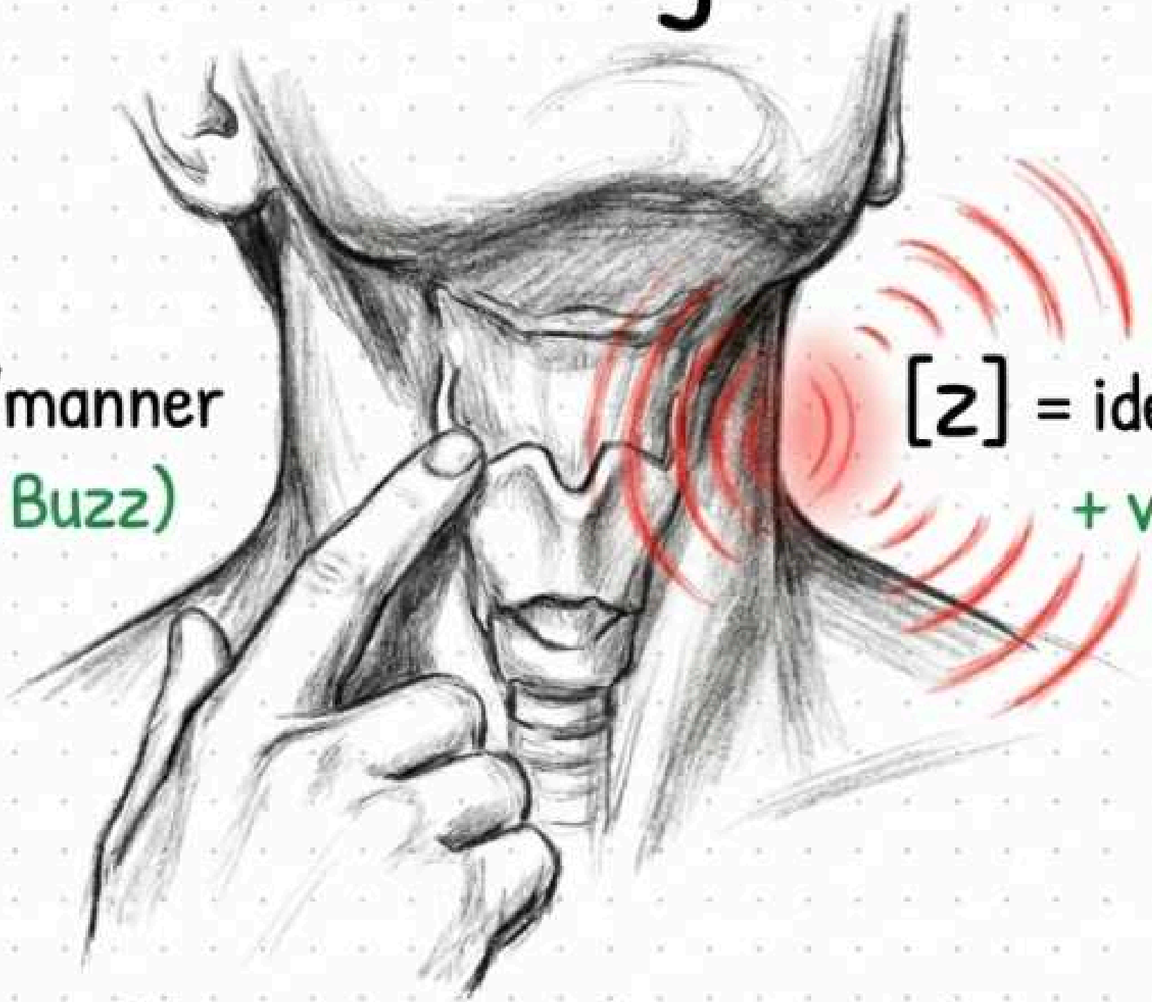
Each breath group usually matches a phrase or short sentence. This is why you pause where you do.

Gemini Notebook

The Voicing Test

¶ 2.6

[s] = identical place/manner
- voicing → (No Buzz)



[z] = identical place/manner
+ voicing → (Buzz)

Try it: Prolong sss like a snake, then switch to zzz like a bee.
Voicing alone separates s from z.

Gemini Notebook

Voiceless and Voiced Pairs

¶2.7

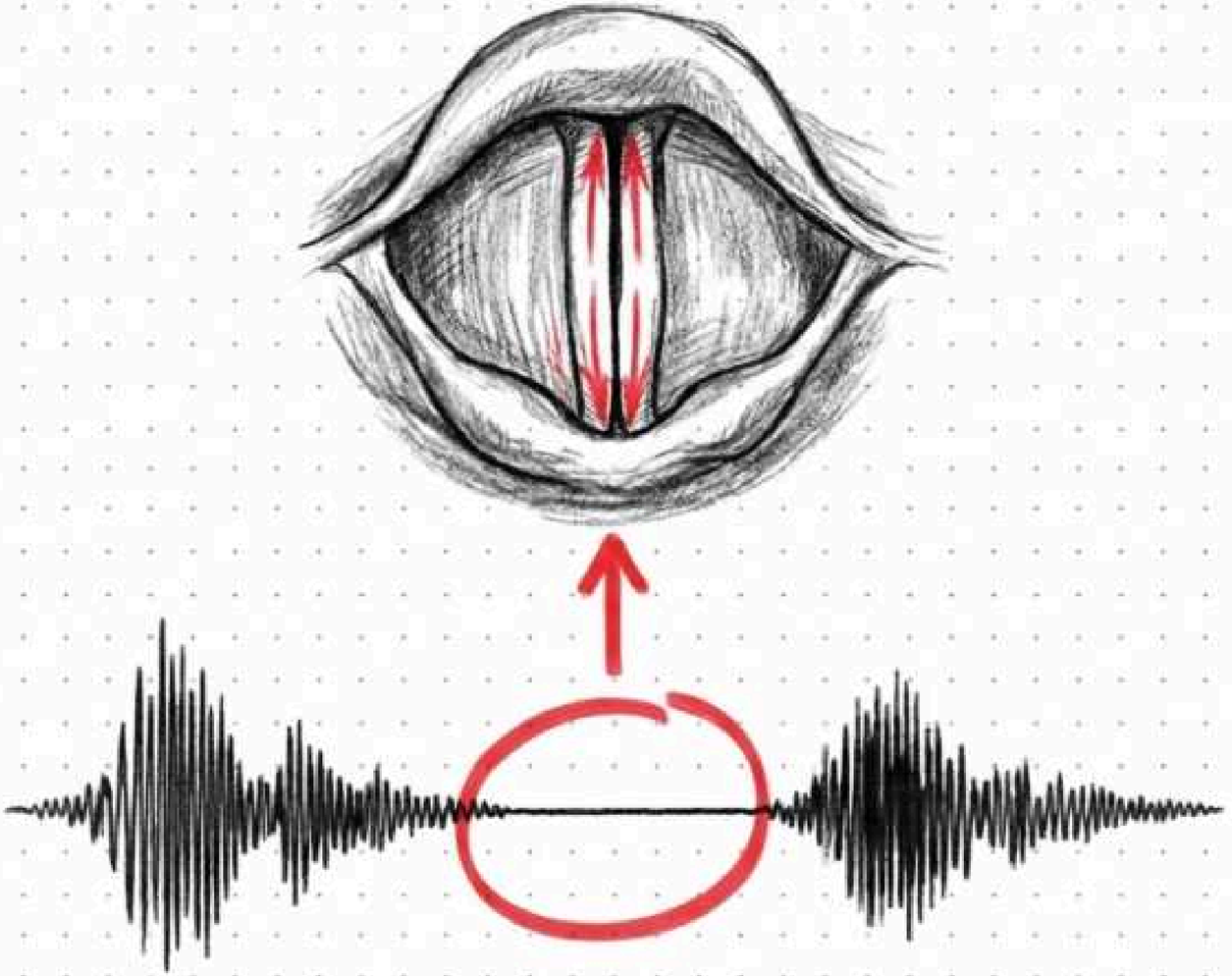
Voiceless	Voiced
p	b
t	d
k	g
f	v
θ	ð
s	z
ʃ	ʒ
tʃ	dʒ

Made in exact same place and manner. Differ ONLY in voicing.

Gemini Notebook

The Glottal Stop [ʔ]

¶ 2.8

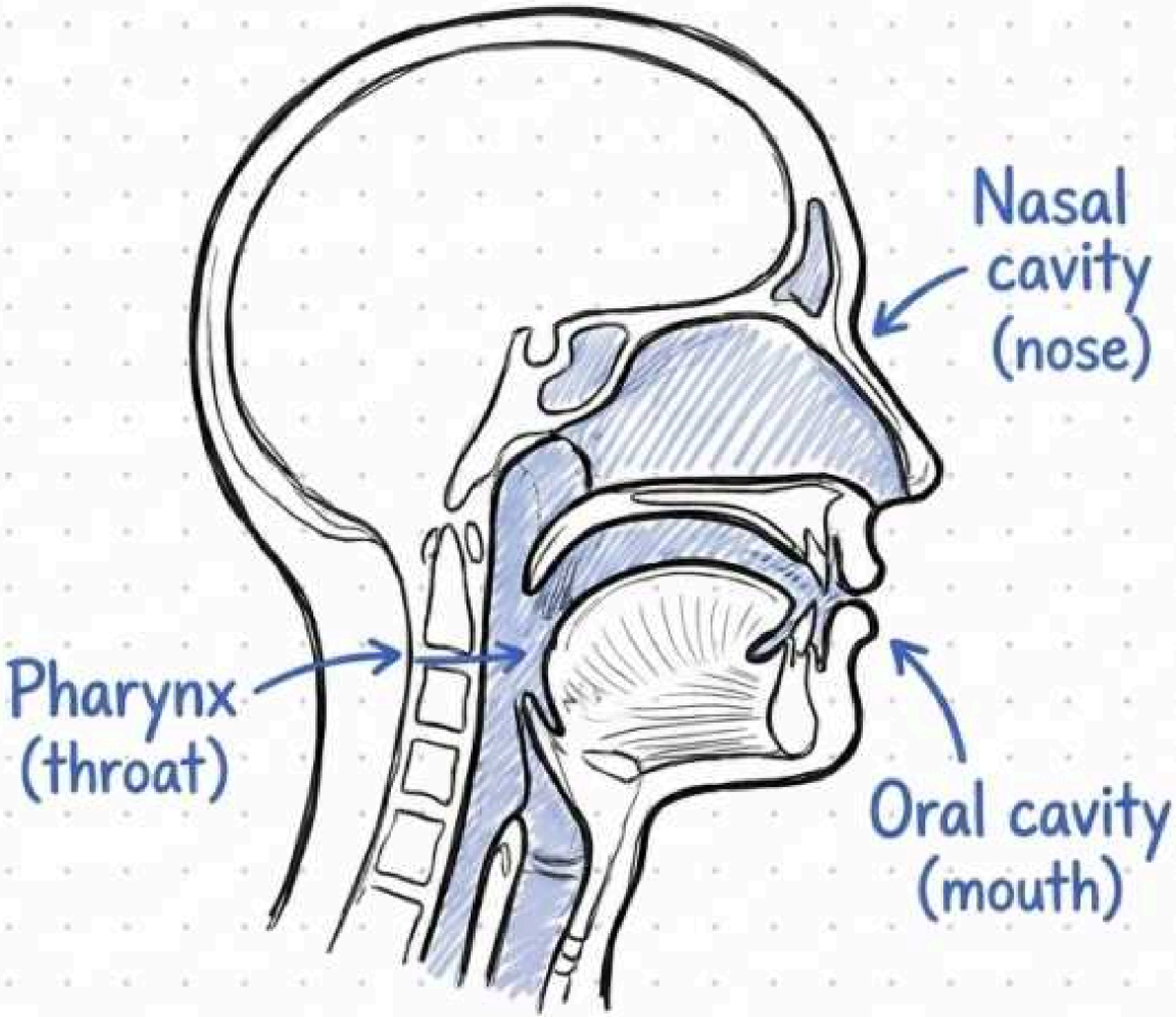


If you close the glottis completely and release, you make a **glottal stop**. You use it twice in the middle of "uh-oh"—it is the catch in the throat before the second vowel.

Gemini Notebook

¶ 2.9

The Vocal Tract Tubes



1 Buzzing Source × Changing Tube Shapes = Hundreds of Sounds

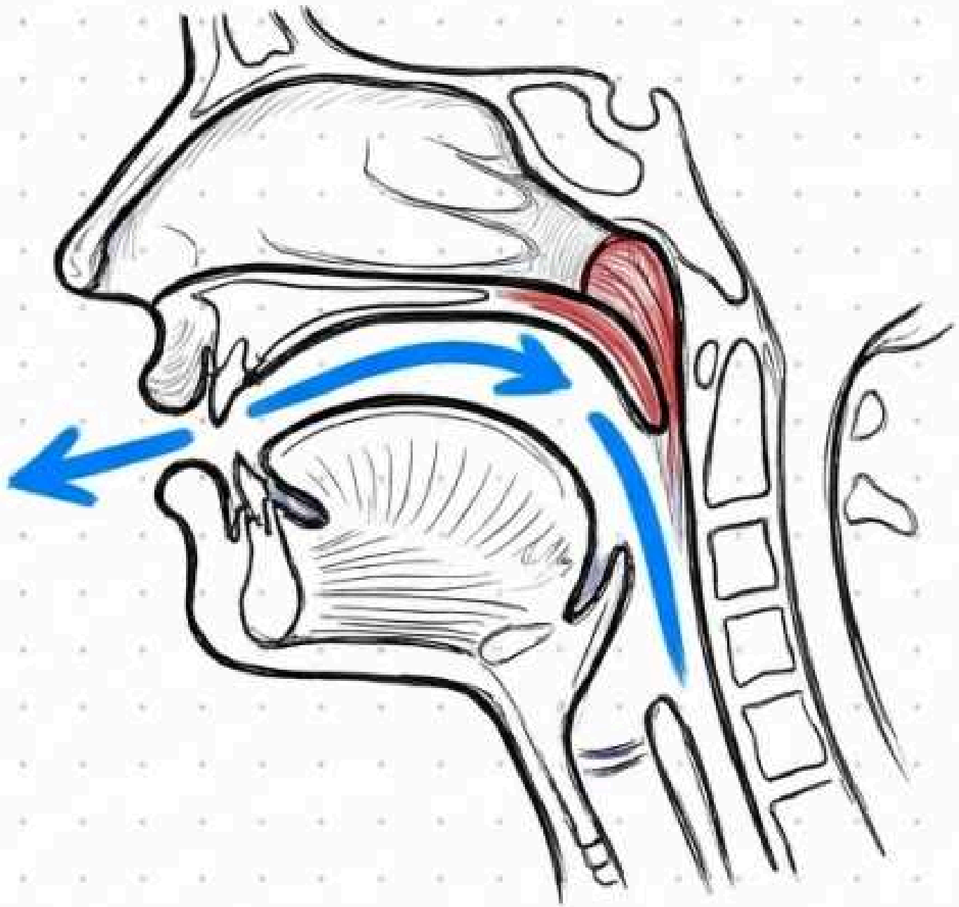
Above the larynx, a set of tubes shapes the sound.

Gemini Notebook

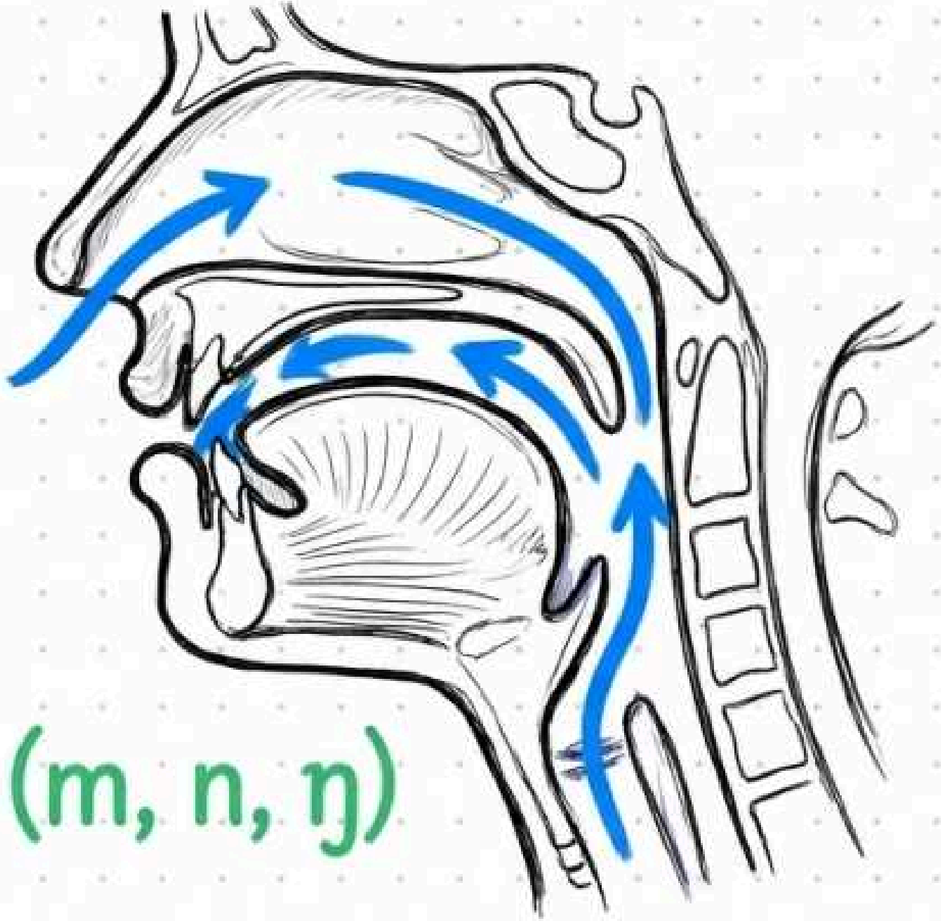
The Velum Gate

¶ 2.10

Oral Sounds



Nasal Sounds



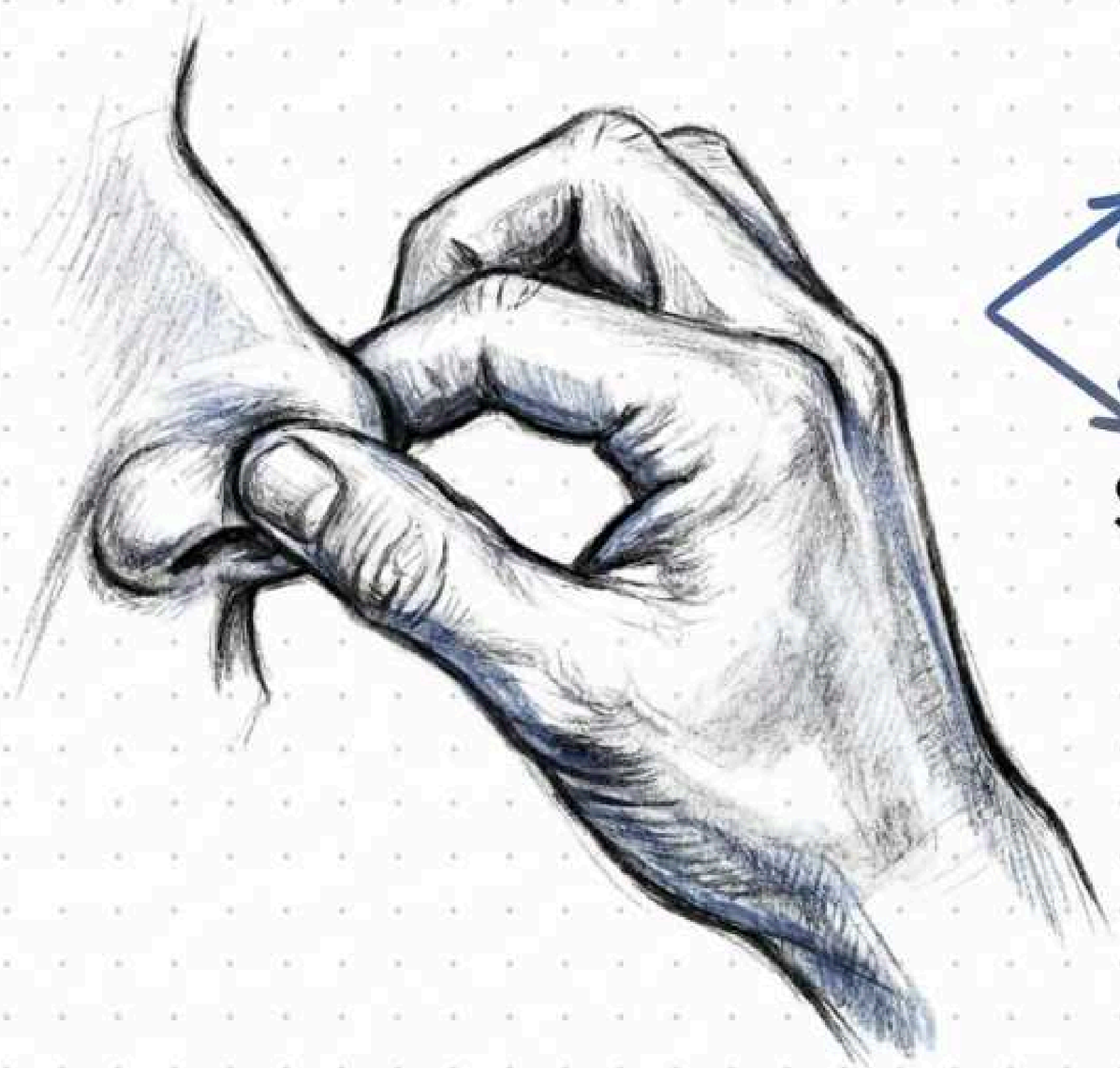
(m, n, ŋ)

The soft palate (velum) is a movable flap. Raised = Oral sounds. Lowered = Nasal sounds.

Gemini Notebook

The Pinch Test

¶ 2.11



Say “papa” → Nothing changes.
([p] is an oral sound).

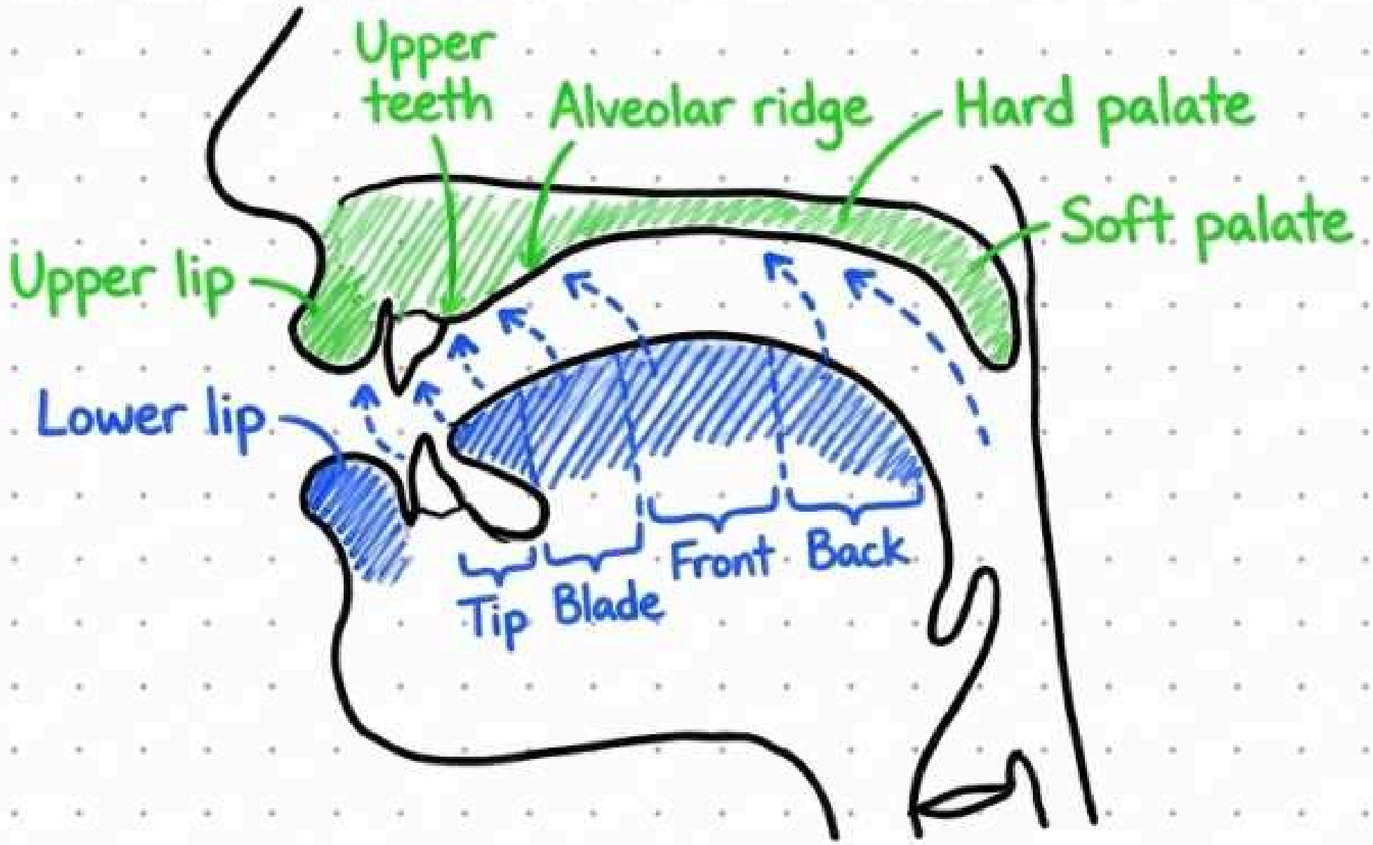
Say “mama” → Sound is blocked and muffled.
([m] needs the nose).

Real-world analogy: The same thing happens when you have a cold and cannot say m or n properly—your nasal passage is blocked.

Gemini Notebook

¶ 2.12

Active vs. Passive Articulators

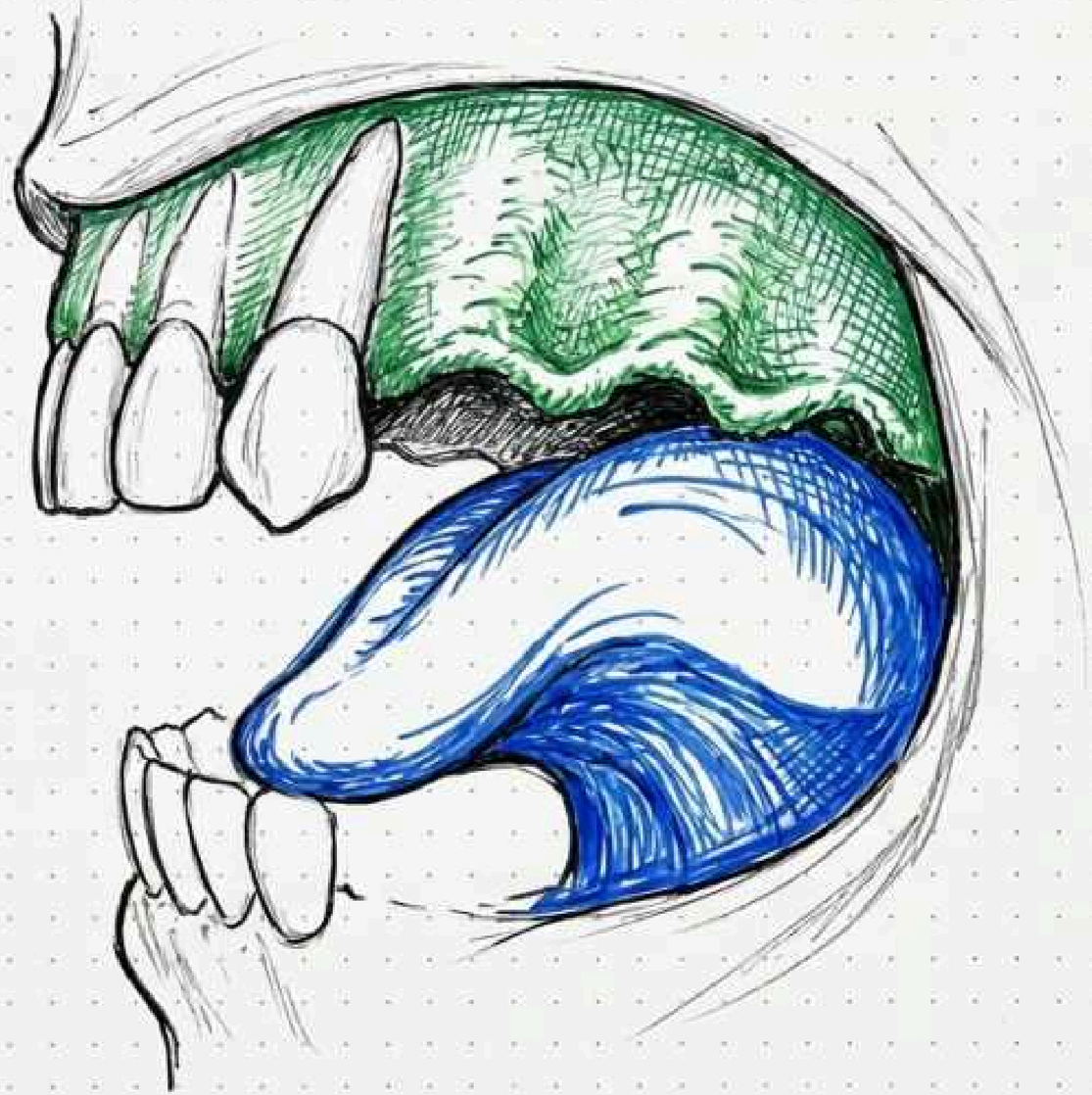


Every sound is made by an active articulator moving toward a passive articulator.

Gemini Notebook

¶ 2.13

The Alveolar Ridge



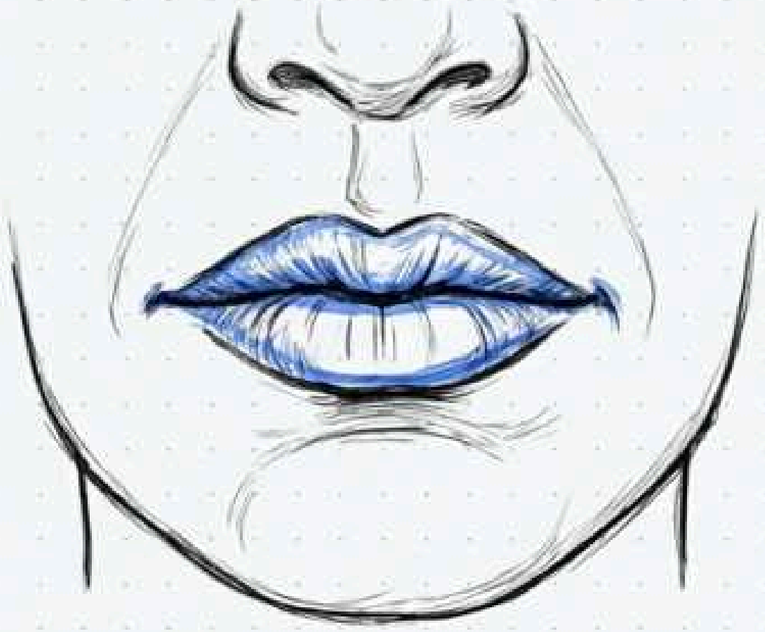
- Feel the bumpy ridge by running your tongue tip back from your upper teeth.
- 'Alveolar' simply means of the ridge.
- Home to many English sounds: t, d, s, z, n, l.

Gemini Notebook

¶ 2.14

Forward Places of Articulation

Bilabial



(Sounds: p, b, m, w)

Labiodental



(Sounds: f, v)

Dental



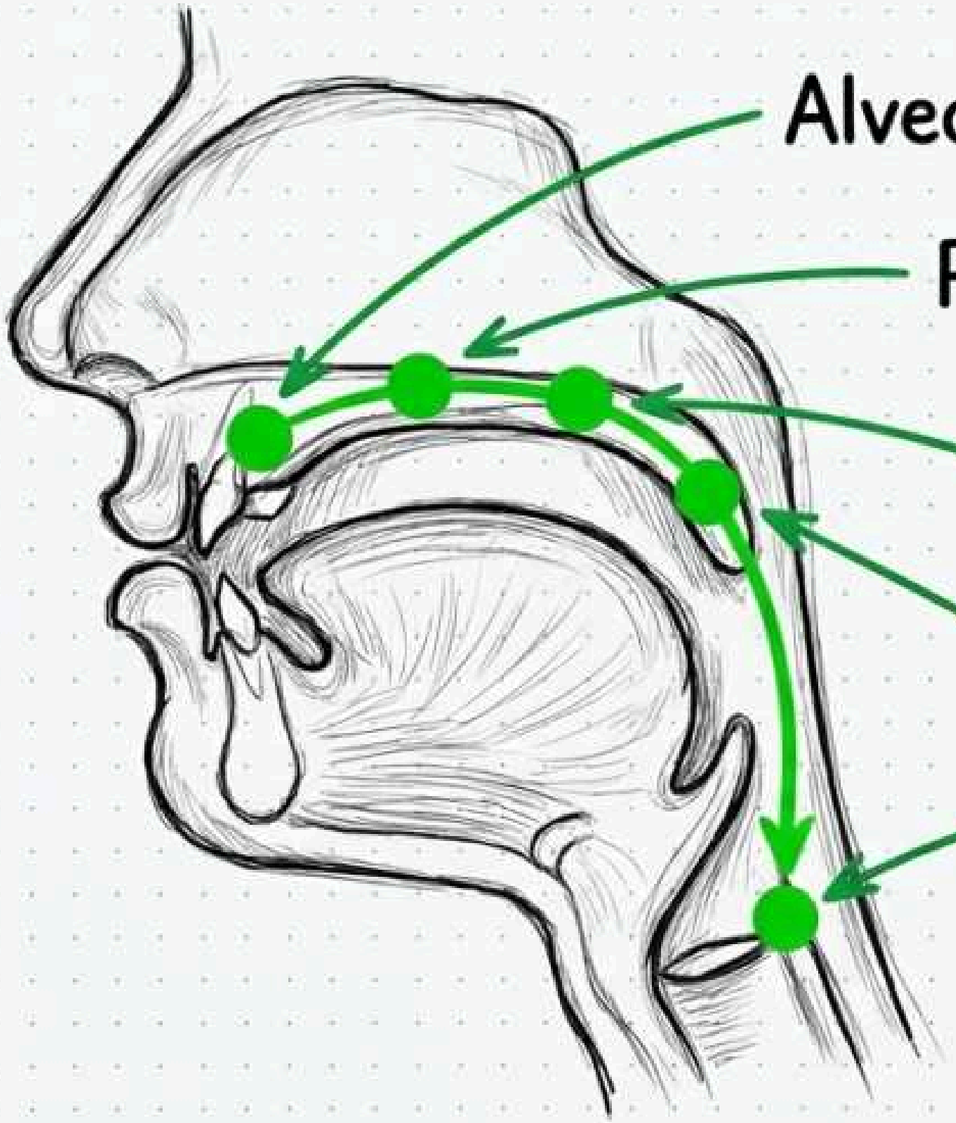
(Sounds: θ, ð)

The place of articulation tells where the sound is made.

Gemini Notebook

¶ 2.15

Rear Places of Articulation



Alveolar: t, d, s, z, n, l

Postalveolar: ʃ, ʒ, tʃ, dʒ

Palatal: j

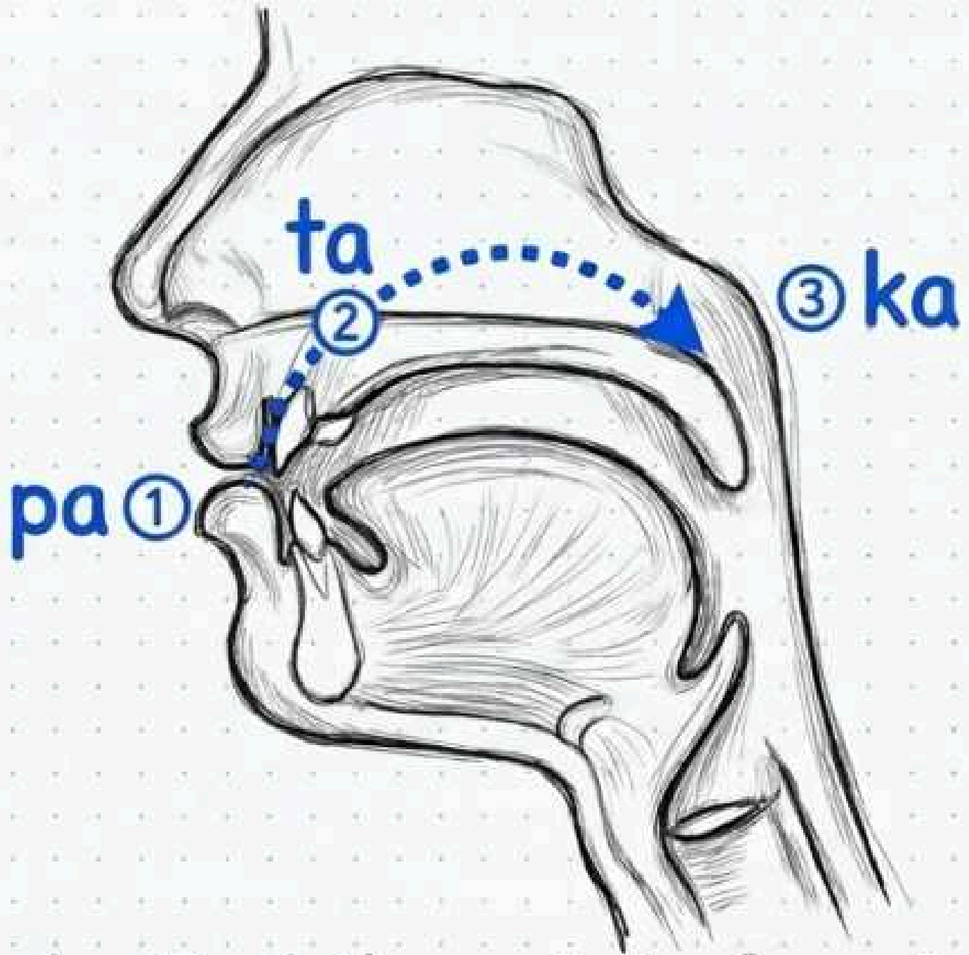
Velar: k, g, ŋ

Glottal: h, ʔ

Gemini Notebook

¶ 2.16

The Articulation Journey



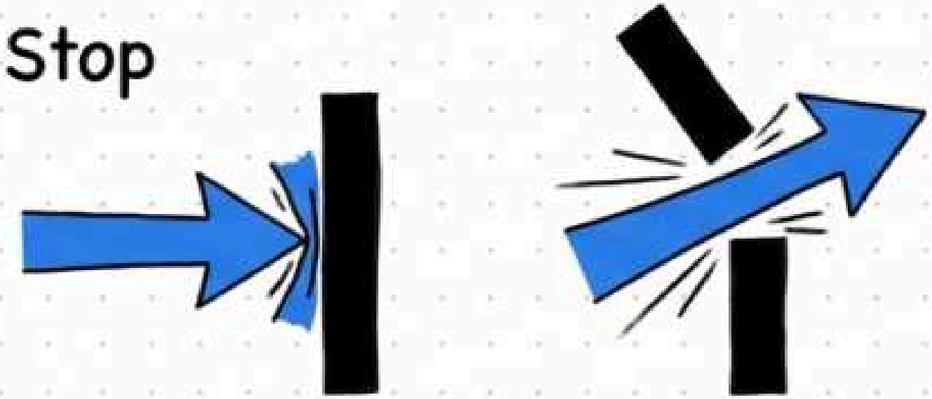
Say pa, ta, ka slowly. Feel the point of contact travel backward.
You have just visited three places of articulation in a row.

Gemini Notebook

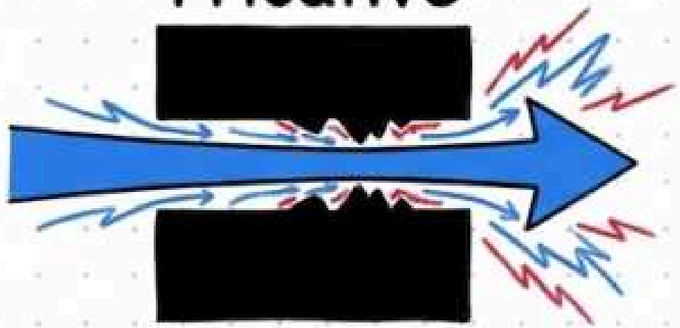
¶ 2.17

Manners of Articulation (Obstructions)

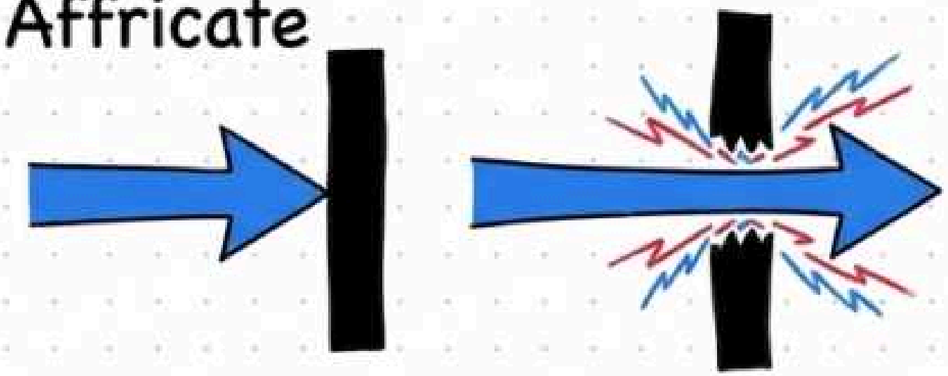
Stop



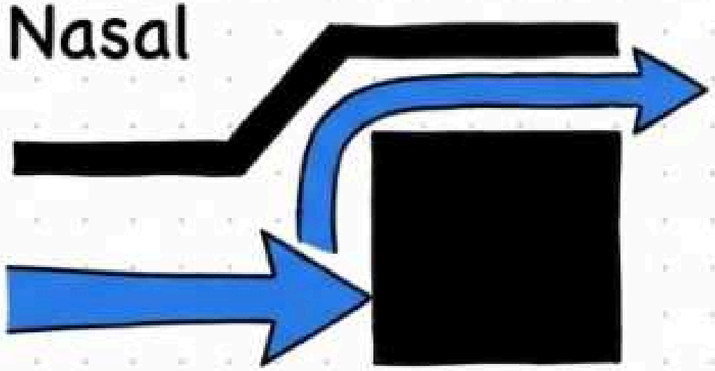
Fricative



Affricate



Nasal

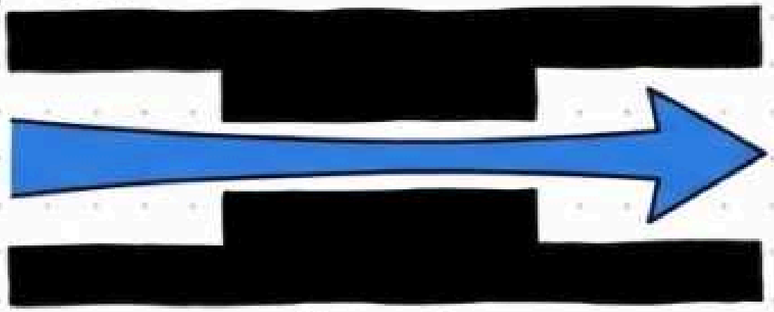


The manner of articulation tells how the airstream is shaped.

Gemini Notebook

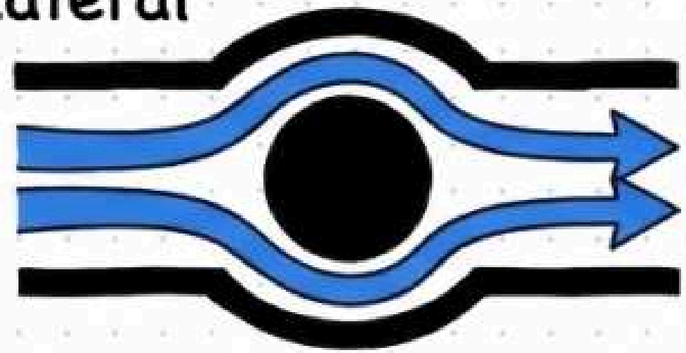
Manners of Articulation (Other Gestures)

Approximant



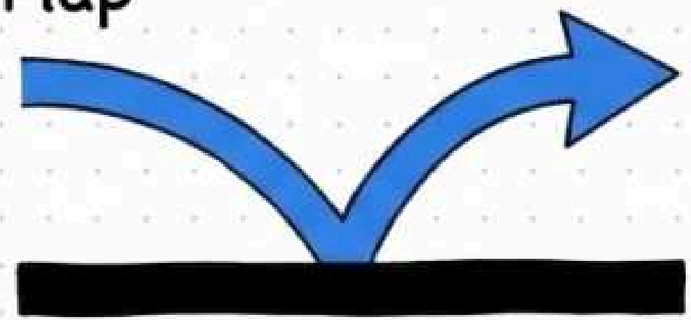
(w, j)

Lateral

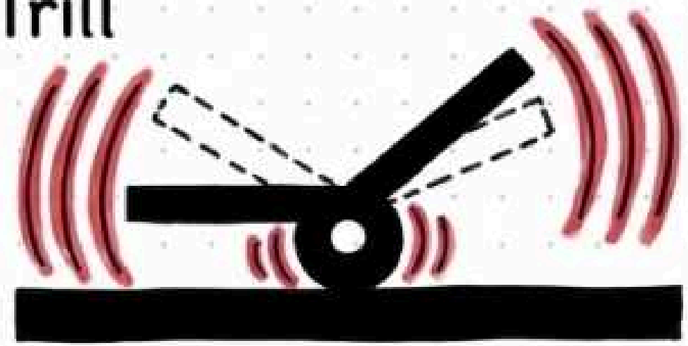


(l)

Tap/Flap



Trill



Articulators can also come close without friction, flow laterally, touch quickly, or vibrate.

Gemini Notebook

The Consonant Equation

C = V + P + M

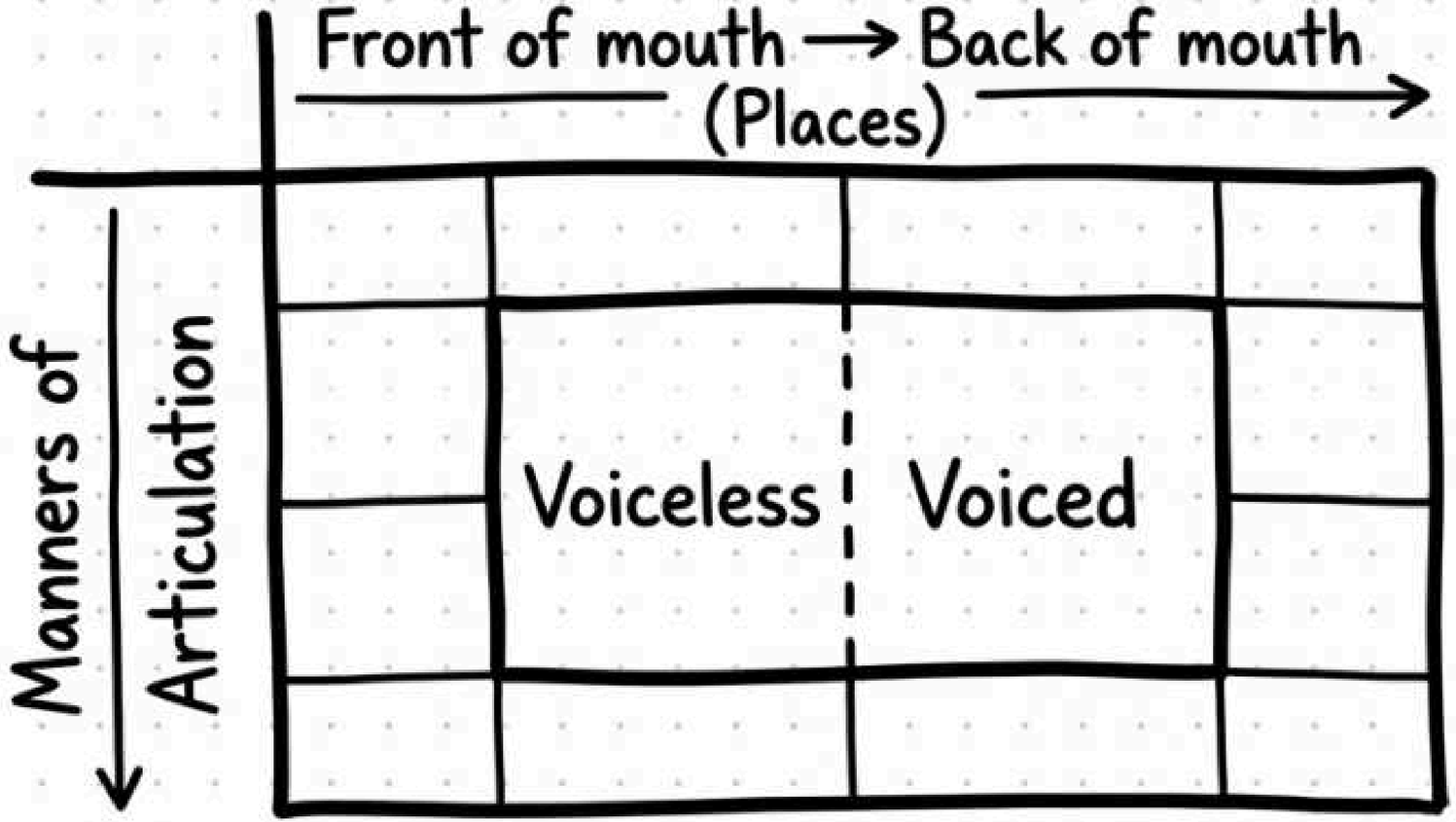
(Consonant = Voicing + Place + Manner)

[t] = Voiceless + Alveolar + Stop
[z] = Voiced + Alveolar + Fricative
[m] = Voiced + Bilabial + Nasal

Any consonant is just a combination of these three choices, always in this exact order.

Gemini Notebook

The Master Map (The IPA Chart)

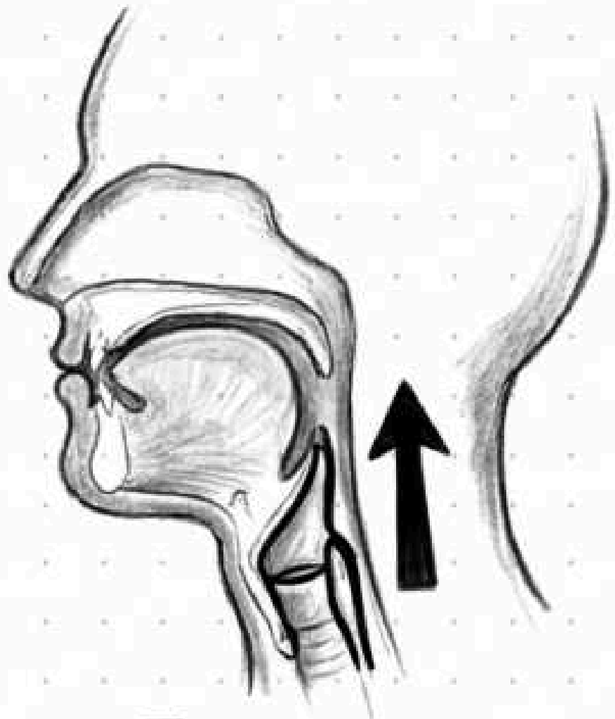


The entire IPA consonant chart is organized by this logic.
The whole chart is a literal map of the vocal tract.

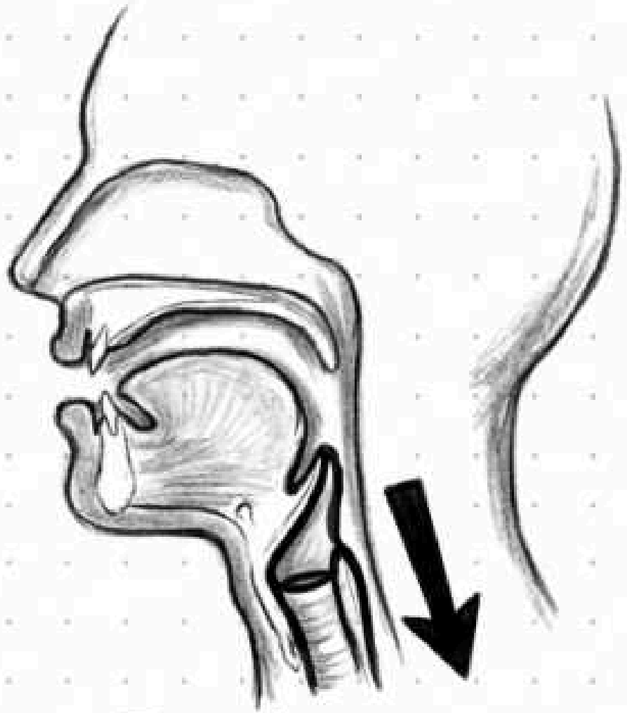
Gemini Notebook

Non-Pulmonic Airstreams

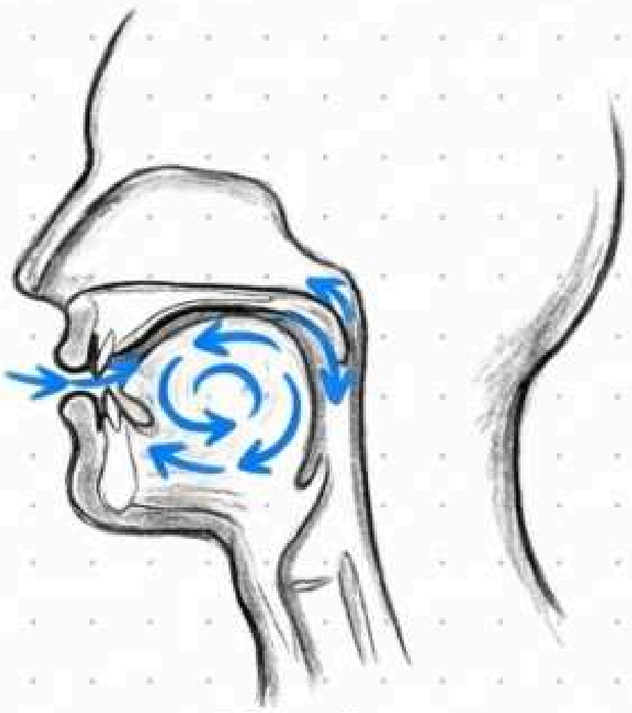
¶ 2.21



Ejectives



Implosives



Clicks

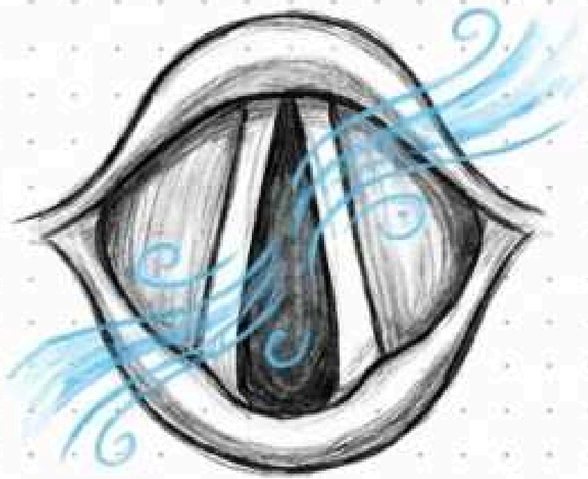
English uses only the lung airstream. Other languages use the larynx or mouth suction (like Zulu and Xhosa). English speakers do make one click without knowing it: the tsk tsk of disapproval.

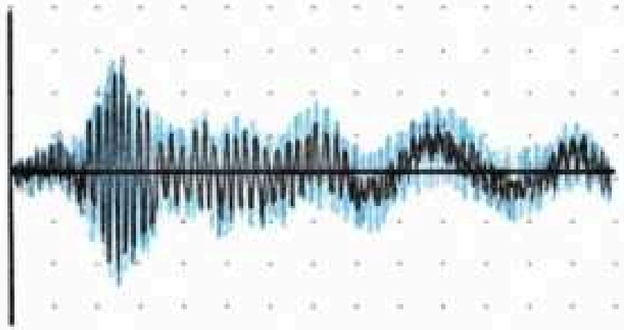
Gemini Notebook

Variations in Phonation

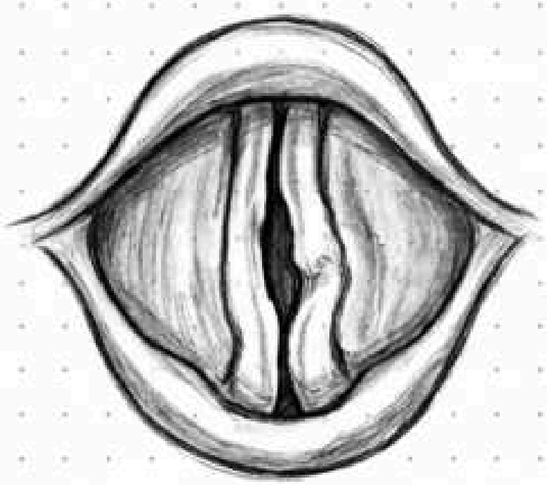
¶ 2.22

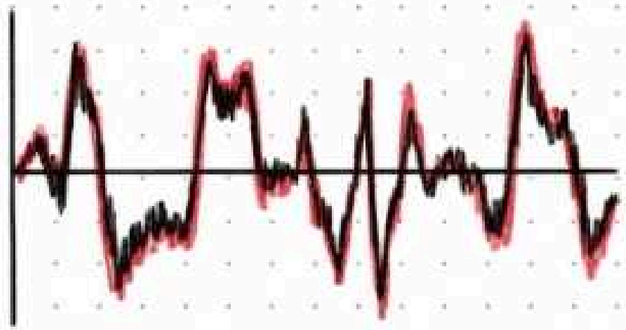
Breathy



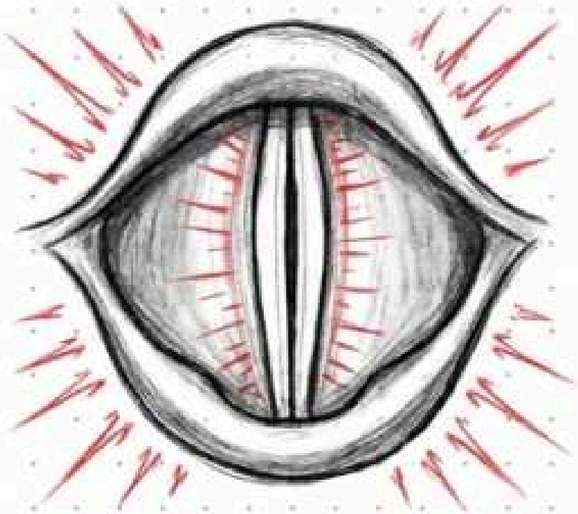


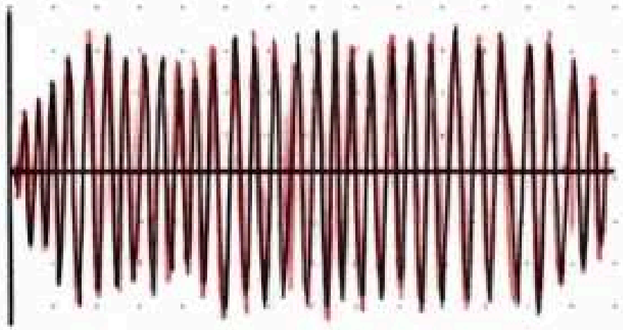
Creaky (Vocal Fry)





Falsetto





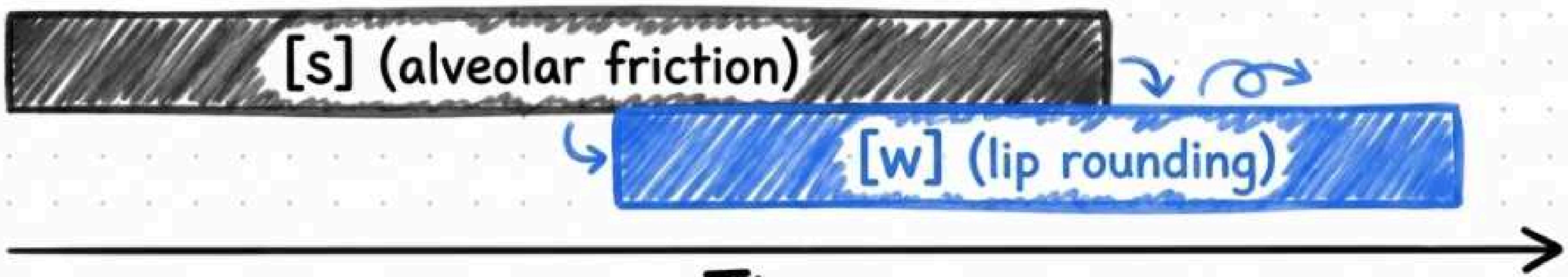
English uses these for style and emotion. Other languages use them to tell words apart.

Gemini Notebook

¶ 2.23

Coarticulation

swim

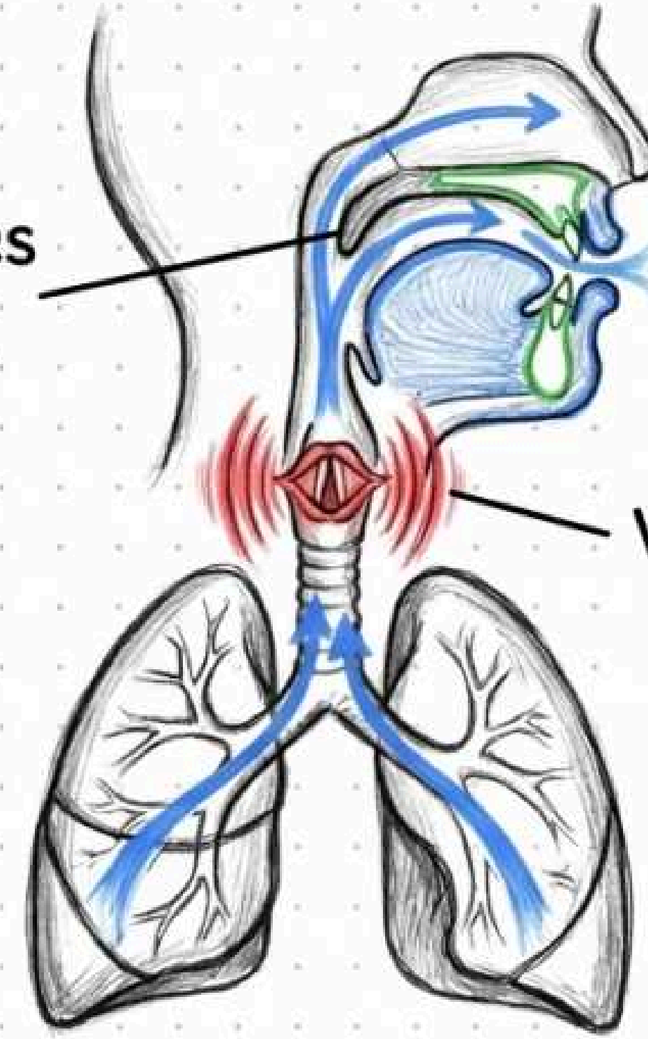


- Speech is not a string of separate beads. The articulators move continuously and overlap.
- While you say the s in swim, your lips are already rounded for w. These are smooth, overlapping gestures.

Gemini Notebook

The Grand Summary

¶ 2.24



Velum chooses oral or nasal.

Tongue and lips shape the sound.

Vocal folds add voicing.

Lungs push air.

Every consonant = Voicing + Place + Manner. Next: The consonants of English.

Gemini Notebook