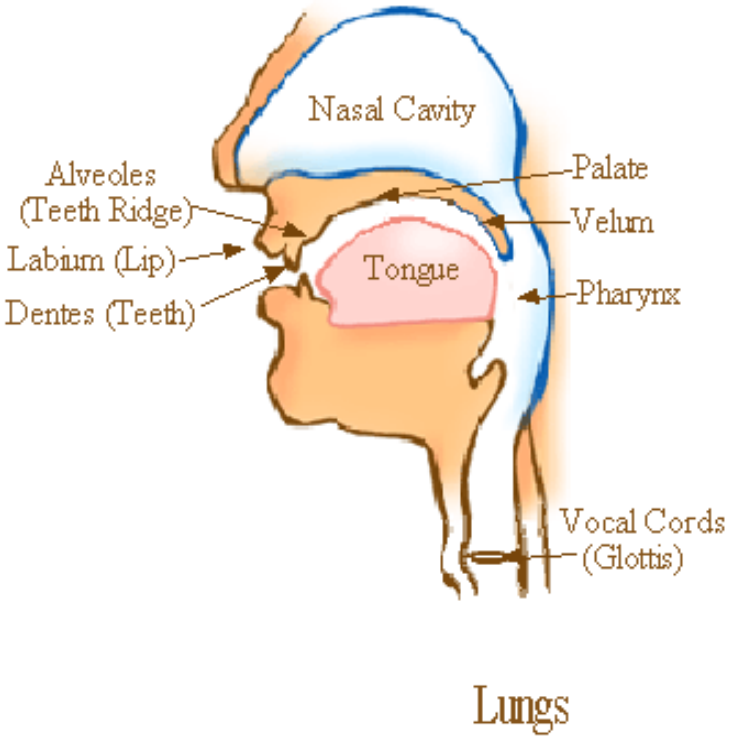
Speech Sound Development

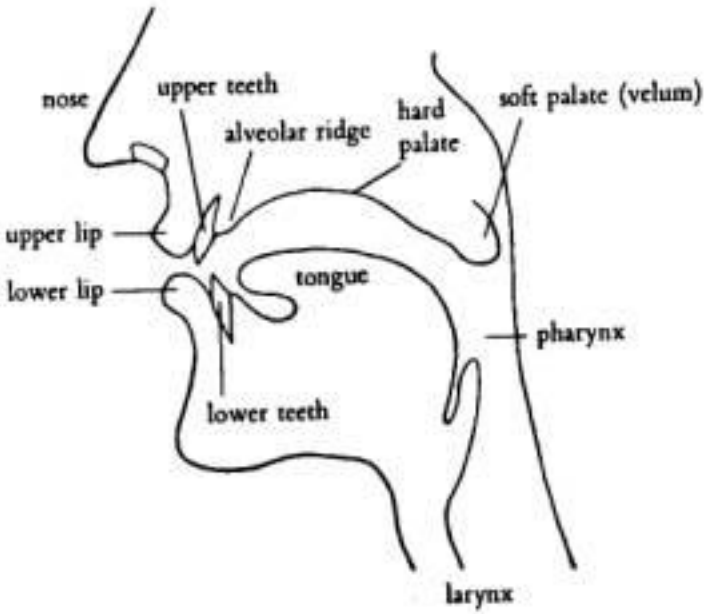
How are speech sounds made?



- Air comes up from the lungs
- Air goes through the mouth and/or the nose
- **Vocal cords** either vibrate or do not vibrate as air comes out
- As air goes out, our various **articulators** assume different positions to make different vowel and consonant sounds
- We coordinate all of these stages without even having to think about it for every sound and word, so it's no wonder that some children can have difficulties producing their sounds.

The articulators

1. Pharynx – The throat
2. The Velum or soft palate – this moves to allow air to pass through the nose and mouth or to prevent air from passing through
3. The Hard palate – the roof of the mouth
4. The Alveolar Ridge – between the back of the top front teeth and the hard palate
5. The tongue – a very important articulator and can be moved into many different places to create speech sounds
6. The Teeth
7. The lips – They can be pressed together, brought into contact with the teeth or rounded



English Consonants

Key features of English consonants

- **Voicing** – our vocal cords vibrate or do not vibrate
- **Place of Articulation** – where are the articulators positioned?
- **Manner of Articulation** – how the air is pushed out through the nose and/or mouth

Voicing

- The air flowing past the vocal folds causes them to vibrate against each other.
- We call this process voicing.
- Sounds which are made with vocal fold vibration are said to be voiced.
- Sounds made without vocal fold vibration are said to be voiceless.
- If you place your hand on your throat (below the Adam's apple area) when making voiced and voiceless sounds, you should feel no vibrations when making voiceless sounds.

Voiced and Voiceless sounds

•There are several pairs of sounds in English which differ only in voicing -- that is, the two sounds have identical places and manners of articulation, but one has vocal fold vibration and the other doesn't.

•The ‘th’ of thigh and the ‘th’ of thy are one such pair.

•The other sounds of English do not come in voiced/voiceless pairs.

•‘h’ is voiceless, and has no voiced partner.

•The other English consonants are all voiced: r, l, w, m, n, ng.

voiceless	voiced
p	b
t	d
k/c	g
f	v
th (in thigh)	th (in thy)
s	z
sh	The sound in measure
ch	j

Nasal/Oral sounds

- Nasal sounds allow air to escape through the nose; oral sounds do not
- Say ‘mmmmm’ and ‘zzzzzzzzzz’
- So, when we have a cold, instead of sounding ‘nasal,’ we sound ‘oral’.

Vowels

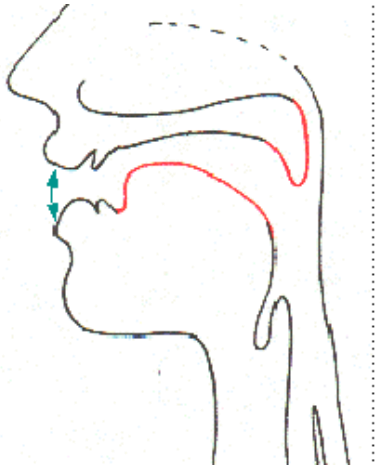
- Vowels are formed by changing the shape of the space inside the mouth by using the articulators
- Say:

beet, bit, bait, bet, bat, but, bite, bout, bought, boot, book, boat

Placement of articulators

- The position of our articulators affects the sound that is produced.
- Here's what the consonant sounds look like as they are produced in the vocal tract.

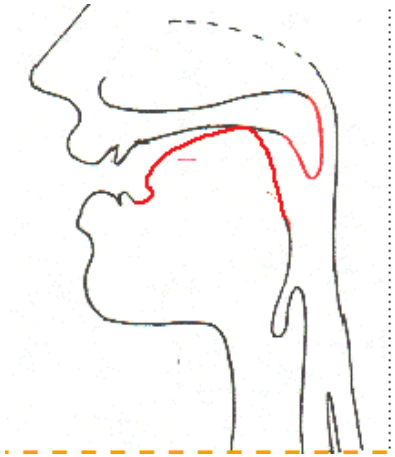
Bilabial = two lips. Bilabial consonants are produced by creating a closure with both lips.



Labial

b, p, m

Velar = the back of the tongue to the soft palate making the sounds – g, k and ng

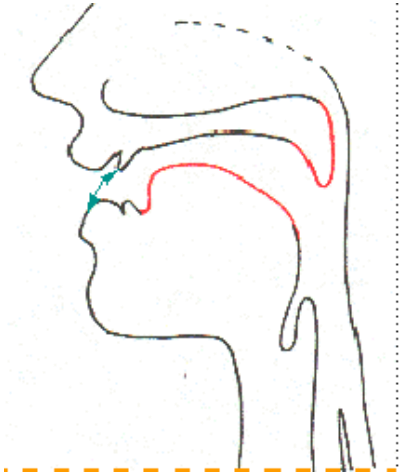


Velar

g, k, ŋ

Placement of articulators

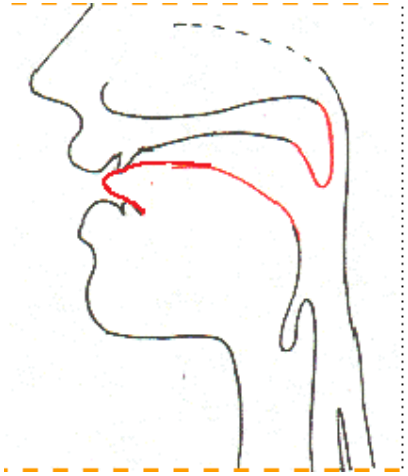
Labiodental = lower lip and upper teeth, produced by raising the lower lip to the upper teeth.



Labio-dental

f, v

Interdental = tongue between the teeth or just behind the upper teeth – making the ‘th’ sound.



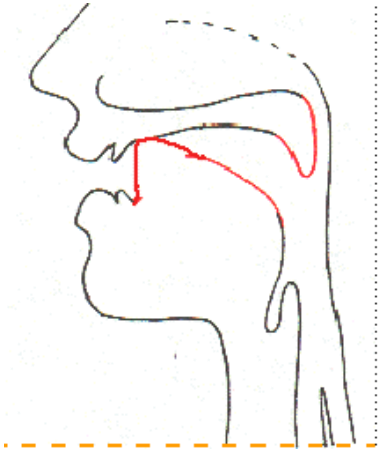
Interdental

θ, ð

Placement of articulators

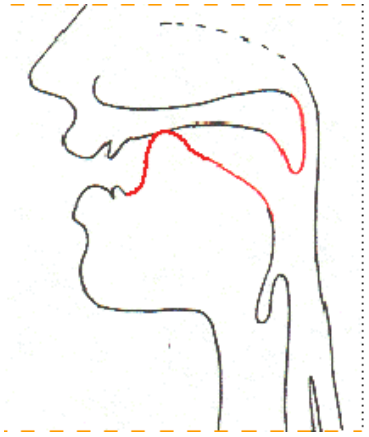
Alveolar = tongue tip at the alveolar ridge, behind the top teeth.

Palatal = the front or the body of the tongue raised to the palatal or domed area at the roof of the month – making s, and z.



Alveolar

d, t, s, z, n



Palatal

š, ž

Manner of articulation

…or, how the air escapes the vocal tract

- The oral passage is closed and then a burst of air is released – we call this a **plosive** or **stop**
- As in the sound (p) in *pit* or (d) in *dog*

- The opening between two articulators is narrowed so that the airstream is obstructed partially. This results in a turbulent airflow – this is called a **fricative**
- As in the sound (s) in *snake* or (z) in *zip*

- When we lower the soft palate, air is able to travel through the nose – this is known as a nasal
- As in the sound (m) in *my,* (n) in *nose* and (ng) in *swing*

Manner of articulation - continued

- When the airstream flows over the sides of the tongue this is known as a **lateral**
- As in the (l) in *leaf*

- When one articulator is close to another but to a lesser degree than for a fricative this is called an **approximant**
- As in the (w) in *wet*

- And finally…..
- When a plosive or stop is followed by a fricative in the same place of articulation, this is called an **affricate**
- As in the (ch) in *chair*

Acquisition of speech sounds

Sound	Approximate age at which children can normally produce sounds:	
	50% of children	90%of children
Common vowel sounds	1.5 - 2 years	3 years
p, b, m, n, t, d, w.	1.5 - 2 years	3 years
K, g, f, h, y.	2.5 – 3 years	4 years
ng, s	2.5 – 3 years	5 years
l	3 – 3.5 years	6 years
sh, ch, j, z, v	3.5 – 4.5 years	6 years
r	4.5 – 5 years	7 years
th (in thigh), th (in the) zh (in vision)	4.5 – 5 years	7 years

Consonant clusters/blends

- A consonant cluster is two or more consonants in a sequence without any vowels between them
- Consonant clusters or blends can be positioned at the beginning, middle or end of a word
- They are first used at the beginnings of words at about 3.5 years and may take a further three to four years for all types of consonant blends to be used correctly

Consonant clusters/blends

Examples:

Consonant clusters	Words
/sp/	speak, spot
/skr/	scrape, scream
/st/	question, investigation
/ry/	crying, trying
/nt/	meant, development
/ld/	child, bald

The development of consonant blends

Sound	Age
At the beginning of words: bl, cl, fl, gl, pl, qu (ku), br, cr, dr, fr, gr, pr, tr.	4 – 4.5 years
At the end of words: ks, ls, ms, ps, ts, ys.	4 – 4.5 years
At the beginning and/or end of words: sp, sm, sn, sk, sl, sw, st.	5 years
At the beginning or in the middle of words: str, skr, spl, spr, thr, shr.	5.5 years plus

Common speech sound errors

There are a number of different errors that children with speech sound difficulties make.

These speech patterns can appear in isolation or in a combination of a few speech sound errors

These are called **phonological processes**

The next few slides show just a few types of speech sound errors that children may demonstrate:

Common speech sound errors

Voicing: This is when children replace **voiceless** sounds for **voiced** sounds
Think back to the voiced and voiceless partners

t becomes d	two realised as do
p becomes b	pie realised as bye

Devoicing: Where children replace a **voiced** sound for a **voiceless** sound

k becomes g	*back* realised as *bag*
z becomes s	*zoo* realised as *soo*

Common speech sound errors

Cluster reduction: this is when clusters/blends are reduced to one consonant at the beginning or end of a word

st becomes t	star realised as tar
tr becomes t	truck realised as tuck
sk becomes s	school realised as sool

Unstressed Syllable deletion: when children do not say an unstressed syllable

computer is realised as *puter*

banana is realised as *nana*

Common speech sound errors

Backing: this is when sounds that are made at the front of the mouth, are made at the back

t becomes k	top realised as cop
p becomes k	pig realised as kig

Fronting: this is when sounds that are made at the back of the mouth (velar sounds) are made at the front

k becomes t	*car* realised as *tar*
g becomes d	*girl* realised as *dirl*

Common speech sound errors

Stopping: this is when hissy fricative sounds become stopped and made into plosive sounds

s becomes t or d	*sun* realised as *tun* or *dun*
f becomes t or d	*fire* realised as *tire* or *dire*
z becomes t or d	*zoo* realised as *too* or *doo*

Speech sound development

Children's attempts at producing speech sounds can continuously improve until they get it right

	2 year old	3 year old	4 year old
spoon	bu	poon	spoon
cup	tu	tup	cup
hospital	obi	hodel	hospital

Speech sound development

This training session has been produced by Integrated Treatment Services.