



# TOOLS for SCHOOLS

## SOUNDS OF SPEECH

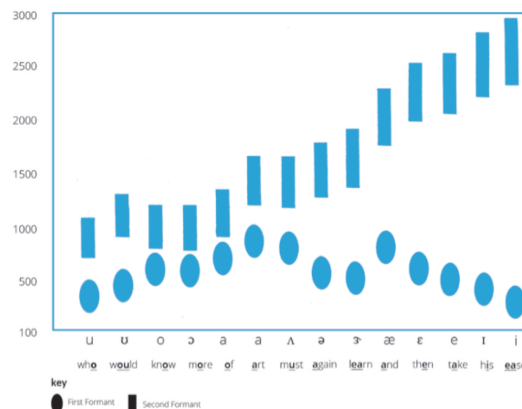
### Consonant Frequency Bands

(Maxon & Brackett, 1992; and Ling, 1979)

Consonant	Frequency Bands (Hz)			
	1	2	3	4
/w/	250–800			
/n/	250–350	1000–1500	2000–3,000	
/m/	250–350	1000–1500	2500–3500	
/ŋ/	250–400	1000–1500	2000–3,000	
/r/	600–800	1000–1500	1800–2400	
/g/	200–300		1500–2500	
/j/	200–300		2000–3000	
/dʒ/	200–300		2000–3000	
/l/	250–400		2000–3000	
/b/	300–400		2000–2500	
/d/	300–400		2500–3000	
/ʒ/	200–300		1500–3500	3500–7000
/z/	200–300			4000–5000
/ð/	250–350			4500–6000
/v/	300–400			3500–4500
/h/			1500–2000	
/p/			1500–2000	
/k/			2000–2500	
/t/			2500–3500	
/tʃ/			1500–2000	4000–5000
/ʃ/			1500–2000	4500–5500
/f/				4000–5000
/s/				5000–6000
/θ/				6000

### Vowel Chart

(\*adapted from Ling and Ling, 1978) Ling, D. & Ling, A. (1978) Aural Habilitation — The Foundations of Verbal Learning in Hearing-Impaired Children Washington DC: The Alexander Graham Bell Association for the Deaf.



### Tips for using The Sounds of Speech charts and tables:

1. These charts and tables with vowel and consonant formant information are designed to assist you during therapy. The values in the charts are estimated acoustic data and will be variable from speaker to speaker.
2. It is important to note not only the first formant of the target sounds during therapy, but also the subsequent formants as well. For example, some vowels share the same first formant F1. It is the second formant F2 which will make these vowels sound different. If a child can't detect F2 they will have discrimination problems for vowels which vary only by the second formant e.g. [u] and [i]. \* taken from <https://www.hear2talk.com/presentations/soda-bottles-submarines.php>
3. If the child doesn't have access to the sound(s), they cannot be expected to produce and/or imitate them. Review the child's audiogram to determine what sounds they are able to detect.
4. Remember to review the English Consonants—Age of Acquisition table before planning therapy goals for a young child. Also consider the three parameters for defining a sound – manner, place and voicing.
5. It is important to realize that low frequency information is typically easier and more accessible to children who are hearing impaired, without technology or who are using hearing aids. Cochlear Implants typically provide good access to the high frequencies. The information in the low frequency range would include: F1 of vowels and some F2 information; most consonant manner information; nasal murmur; and consonant voicing cues. In contrast, high frequency information is typically more difficult. The information in the high frequency range would include: remaining f2 of vowels; consonant place cues; and consonants of the fricative manner of production. \*taken From: <https://www.hear2talk.com/presentations/soda-bottles-submarines.php>

### English Consonants - Age of Acquisition

Adapted from Sanders 1972 and Templin 1957

