



This speech banana has been updated to include new research for the Count-the-Dot** audiogram (2010). It shows key frequency areas needed by the ear/brain for each consonantal phoneme. Phonemes have other frequency information not key to recognition. **Word Initial** phonemes: loudest, **Word Final**: quietest, **Medials** are quieter than Initial (2nd formant transition both sides helps HF losses perceive Medials better than Initials). The banana shows 'normal' voice level in a quiet room, the ear 1 metre from the speaker. New placement of phonemes allows for the 10 to 12 dB above pure tone threshold needed to perceive the phoneme. Phonemes in boxes cover all area. The levels are dBHL (not dBA or dB SPL). Raising voice or shouting increases low frequencies, not high. Normal voice level moved closer will increase sound level for all phonemes equally, giving better amplified speech perception. P Keen has separate sheet for vowels.

| Non-alphabet symbols: | |
|-----------------------|---------------------|
| ŋ | as in <u>si</u> ng |
| j | as in <u>yo</u> |
| ʃ | as in <u>shi</u> p |
| tʃ | as in <u>chi</u> p |
| ʒ | as in <u>bei</u> ge |
| dʒ | as in <u>ju</u> st |
| θ | as in <u>thi</u> nk |
| ð | as in <u>the</u> |

Voiceless phonemes: p t ʃ k tʃ s f θ
used with *Low frequency element of voiced sounds*
become voiced phonemes: b d ʒ g dʒ z v ð
BOTH the voiceless phoneme AND the low frequency element must be heard to identify the voiced consonantal phoneme.

*Normal hearing: hearing allowing perception of 95% - 100% of speech phonemes at 1 m: ≤20dBHL SNR
**Meuller & Killion: A New Count-The-Dots Method, The Hearing Journal, January 2010 Vol 63 No 1