English vowels

IPA classifies vowels according to:

1. Position of the highest point of tongue on two-dimensional plane (close-open; front-back)

2. Posture of lips (unrounded-rounded)

3. Any secondary articulation(s) (e.g. nasality, rhoticity)

• Spacing of cardinal vowels designed to reflect equal articulatory steps that correspond to equal auditory steps

• These criteria yield the quadrilateral as a basic framework for description and classification

Vocal tract filter for vowels

• Vocal tract filter selectively passes energy in the harmonics of the voicing source
• It enhances the amplitudes of certain frequencies (=resonant frequencies) and dampens amplitudes of other frequencies

• Characteristic resonances of the vocal tract are called formants (F1, F2, F3)

• In the study of speech sounds we are mostly interested in the first 3-4 formants