

## 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