Try saying....

“eat” ....then... “ott”
Try saying....

“eat” ....then... “ott”

as in:

or:
Vowel space idealizes the mouth

“eat”

“ott”
low front versus mid back

“at”

æ

“awe”
height of front vowels

- high
- mid
- low

- seat
- set
- sat

\( \varepsilon \)

\( \ae \)
height of back vowels

- high: Luke
- mid: caught
- low: lock
backness of mid vowels

- front
- central
- back

- \( \varepsilon \)
- \( \Lambda \)
- \( \digamma \)

- cut, dull, sun
the schwa

unstressed: above, another
English: just [u], [ʊ] and [ɔ] vs. French
Figure 4-4. A. Adjustment of the tongue as it glides from the vowel /e/ to vowel /ɪ/ and corresponding levels of vocal tract opening. The dotted line shows the lower position of the vowel /e/, and the solid line shows the slightly higher position of the vowel /ɪ/. B. A sound spectrogram illustrating the acoustic representation of the sound /eɪ/. The abscissa is arbitrarily marked in three segments: the steady state for the vowel /e/, the process of moving from /e/ to /ɪ/, and the stabilizing of the tongue position into the production of the vowel /ɪ/.
comparing diphthongs

Large diphthongal movements:

- say [ej]
- ploy [əj]
- cow [aw]

Small diphthongal movements:

- hake [ei]
- cobra [ou]
F1 x F2 space
<table>
<thead>
<tr>
<th>word</th>
<th>unshifted</th>
<th>Northern Cities process</th>
</tr>
</thead>
<tbody>
<tr>
<td>stack</td>
<td>[æ]</td>
<td>[ɪə]</td>
</tr>
<tr>
<td>stalk</td>
<td>[ɔ]</td>
<td>[ɑ]</td>
</tr>
<tr>
<td>stock</td>
<td>[ɑ]</td>
<td>[ɑ]</td>
</tr>
<tr>
<td>stuck</td>
<td>[ʌ]</td>
<td>[ɔ]</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>dipthongization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lowering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fronting towards æ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pushed back</td>
</tr>
</tbody>
</table>

![Diagram](image-url)
Possible vowels
# Actual vowels

<table>
<thead>
<tr>
<th>i</th>
<th>u</th>
<th>e</th>
<th>o</th>
<th>a</th>
</tr>
</thead>
</table>

Basque, Hawaiian, Japanese, Spanish, Swahili...

<table>
<thead>
<tr>
<th>i</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>i</td>
</tr>
<tr>
<td>e</td>
<td>o</td>
</tr>
<tr>
<td>a</td>
<td>a</td>
</tr>
</tbody>
</table>

Three-vowel system
Gudanji (Australia)

Four-vowel system
Navajo (Arizona)

Seven-vowel system
Ge’ez (Ethiopia)
Length:

Japanese vowels
“and” [to]
“eastern” [toː]
“seat” [séki]
“century” [séːki]

“side” [joko]
“rehearsal” [jokoː]
“books” [tőʃo]
“the beginning” [tőʃo]

Table 2.20  Short and long consonants in Italian

<table>
<thead>
<tr>
<th>fato</th>
<th>[fatɔ]</th>
<th>‘fate’</th>
<th>fatto</th>
<th>[fatɔ]</th>
<th>‘fact’</th>
</tr>
</thead>
<tbody>
<tr>
<td>fano</td>
<td>[fanɔ]</td>
<td>‘grove’</td>
<td>fanno</td>
<td>[fanɔ]</td>
<td>‘they do’</td>
</tr>
<tr>
<td>casa</td>
<td>[kasa]</td>
<td>‘house’</td>
<td>cassa</td>
<td>[kasːa]</td>
<td>‘box’</td>
</tr>
</tbody>
</table>
Length x Rounding

Swedish