

## ENGLISH SPEECH SOUNDS

### (2) Vowel Sounds

In the production of English vowel sounds there is generally no obstruction of the outward flow of the breath stream. Breath is expelled from the lungs by the movement of the chest muscles, and passes out freely through the mouth. The phonetic nature of a vowel sound produced depends upon the size and shape of the mouth cavity, and these are determined by the position of the tongue both horizontally and vertically.

The definition of a vowel sound is generally given in terms of the following:

- 1- General tongue height in the mouth (the vertical position), being either *high*, *mid*, or *low*.
- 2- General tongue placement in the mouth (the horizontal position), being either *front*, *central*, or *back*.
- 3- Shape of the lips, being either *rounded* or *unrounded*.
- 4- State of the muscles of throat and tongue, being either *tense* or *lax*.

#### Vowel Sounds Chart

The following chart conveniently indicates the various positions of the tongue within the mouth cavity during the pronunciation of English vowel sounds.

The chart has three vertical divisions which represent the general height of the tongue within the mouth cavity: *high*, *mid*, and *low*. The higher part of each division is marked T to indicate tense muscles of throat and tongue; the lower part is marked L to indicate *lax* muscles of throat and tongue. The chart also has three horizontal divisions which represent the general placement of the tongue within the mouth cavity: *front*, *central*, and *back*.

|             |          | Front | Central | Back |
|-------------|----------|-------|---------|------|
| <b>High</b> | <b>T</b> | [iy]  |         | [uw] |
|             | <b>L</b> | [i]   |         | [u]  |
| <b>Mid</b>  | <b>T</b> | [ey]  | [ə]     | [ow] |
|             | <b>L</b> | [e]   |         | [o]  |
| <b>Low</b>  | <b>T</b> | [æ]   |         | [ɔ]  |
|             | <b>L</b> |       | [a]     |      |

When we multiply the three vertical divisions of the vowel chart by the three horizontal divisions, we get nine sections which represent the basic tongue positions within the mouth cavity during the production of English vowel sounds.

The following chart conveniently indicates the nine basic positions of the tongue. Each position is indicated by a separate number.

|             | Front | Central | Back |
|-------------|-------|---------|------|
| <b>High</b> | 1     | 4       | 7    |
| <b>Mid</b>  | 2     | 5       | 8    |
| <b>Low</b>  | 3     | 6       | 9    |

Thus the nine basic tongue positions within the mouth cavity may be defined as follows:

1. The high-front position.
2. The mid-front position.
3. The low-front position.
4. The high-central position.
5. The mid-central position.
6. The low-central position.
7. The high-back position.
8. The mid-back position.

9. The low-back position.

### **Description of English Vowel Sounds**

#### **1. Simple vowel sounds:**

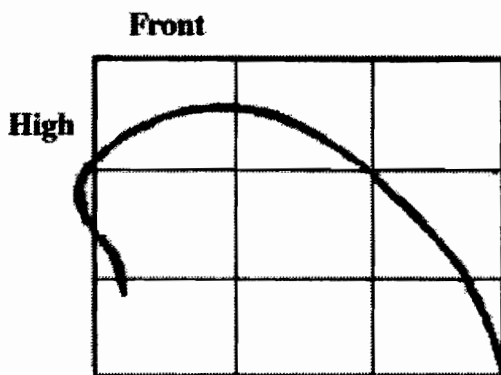
|      |   | Front | Central | Back  |
|------|---|-------|---------|-------|
| High | T | 1     | 4       | 7     |
|      | L | [i]   |         | [u]   |
| Mid  | T | 2     | 5       | 8     |
|      | L | [e]   | [ə]     | [o]   |
| Low  | T | 3 [æ] | 6       | 9 [ə] |
|      | L |       | [a]     |       |

[i] as in the words *it* [it], *his* [hiz], *bitter* [bitə (r)], *myth* [miθ], *busy* [bizi] and *pretty* [priti].

In the writing system the sound [i] is represented by i, y, u, and e.

This sound is made when the tip and front of the tongue lie parallel to and slightly below the curve of the hard palate, that is in the high- front position (1). The velum is raised high, closing off the nasal cavity. The lips are spread (unrounded), and the muscles of the throat and tongue are held lax.

Thus, [i] is defined as a *high, front unrounded, lax vowel*.  
[e] as in [met]. head [hed] said [sed], and berry [bəri].

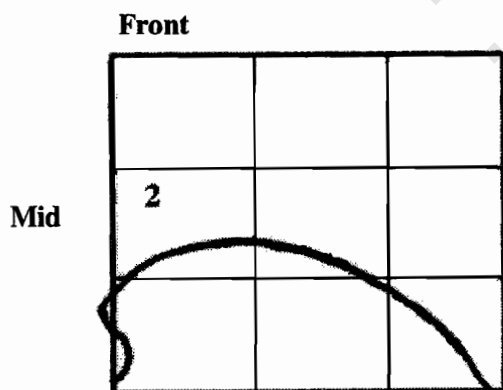


Tongue position for [i]

In the writing system, the sound [e] is represented by e, but sometimes by ea, and ai. It is uniquely represented by u in the word *bury*.

In the production of [e] the shape and position of the tongue within the mouth cavity are normally similar to those for [i]. But the space between the tongue and the hard palate is somewhat greater throughout, the tongue being in the mid-front position (2). The velum is raised high, closing off the nasal cavity. The lips are either neutral or slightly spread, and the muscles of the throat and tongue are held lax.

Thus, [e] is defined as a *mid, front, unrounded, lax, vowel*.

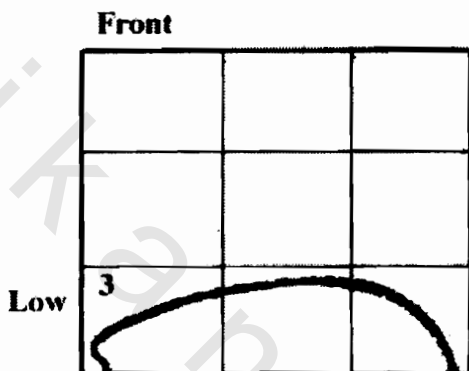


Tongue position for [e]

[æ] as in act [ækt], catch [k<sup>h</sup>ætʃ], hat [hæt] and plaid [plæd].

In the writing system the sound [æ] is almost always represented by a, though rarely by ai as in plaid [plæd].

This sound is made with the tongue lying in the bottom of the mouth cavity in the low-front position (3). The tip of the tongue touches the back of the lower teeth. The velum is raised high, closing off the nasal cavity. The lips are spread (unrounded), and the muscles of the throat are held tense.



Tongue position for [æ]

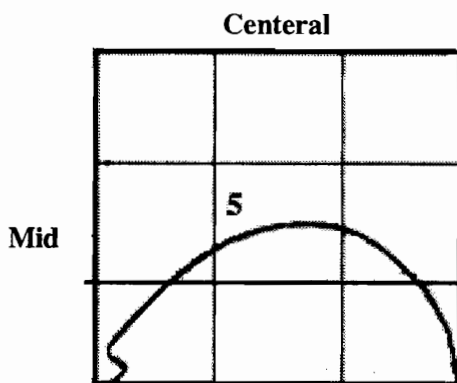
Thus, [æ] is defined as a *low, front, unrounded, tense, vowel*.

[æ] as in cup [k<sup>h</sup>æp], but [bæt], about [əbawt], honey [hə'ni], some [səm] and dove [dəv].

When stressed, the sound [æ] is commonly represented in the writing system by u, and often by o before n, m, and v. When unstressed, it is represented by any of the vowel letters.

In the production of [ə] the tongue lies in the mid-central position (5). The velum is raised high, closing off the nasal cavity. The lips are unrounded, and the muscles of the throat and tongue are held lax.

Thus, [ə] is defined as a *mid, central, unrounded lax vowel*.



Tongue position for [ə]

[a] as in garden [gá:dn]-[gárdn]\*, part [pa:t]-[part]\*, hard [há:d]-[hárd]\*, and sergeant [sá:dʒənt]<sup>1</sup>.

In writing, this sound is usually represented by a especially before [r], and seldom by e before [r].

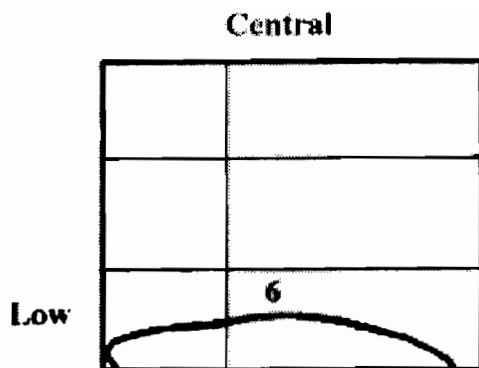
In American English it is commonly represented by o as in hot [hat] and orthodox [ɔ'rθədáks].

This sound is made with the tongue relaxed in the bottom of the mouth cavity, but further back than for [æ]. In other words the tongue is in the low-central position (6). The velum is raised high, closing off the nasal cavity. The lips are less spread than for [æ] and the opening of the mouth is larger. The muscles of the throat and tongue are held lax.

Thus, [a] is defined as a *low, central, unrounded, lax vowel*.

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<sup>1</sup>In British English, where the post- vocalic [r] is usually not pronounced, [a] is always relatively long and is therefore generally written with the length mark [:] Here length compensates for the loss of r.

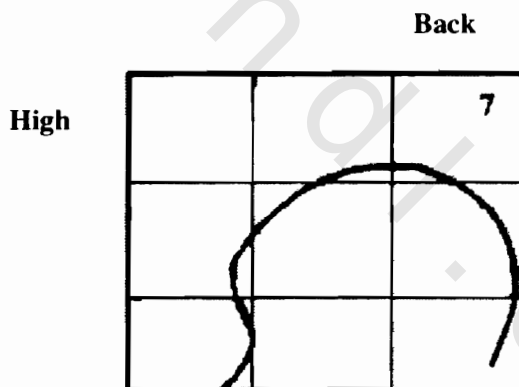


Tongue position for [a]

[u] as in put [p<sup>h</sup>ut,], foot [fut], should [ʃud], and wolf [wulf].

In writing, the sound [u] is usually represented by u, but sometimes it is written oo, ou, and o.

This sound is made with the back of the tongue lying parallel to and slightly below the curve of the soft palate, that is in the high-back position (7).



Tongue position for [u]

The velum is raised high, closing off the nasal cavity. The lips are strongly rounded, and the muscles of the throat and tongue are held lax, (Figure 25).

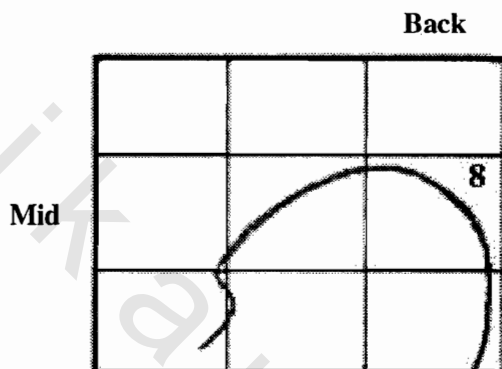
Thus, [u] is defined as a *high, back, rounded, lax vowel*.

[o] as in *obey* [obéy], *oblivion* [oblívyən], *oblique* [oblíyk], and *phonetics* [fonétiks].

In the writing system, the sound [o] is represented by o.

In the production of this sound the tongue assumes the **mid- back position (8)**. The velum is raised high, closing off the **nasal cavity**. The lips are rounded, and the muscles of throat and tongue are held lax.

Thus, [o] is defined as a *mid, back., rounded, lax vowel*.



Tongue position for [o]

[ɔ] as in *dog* [dɔg], *cot* [kʰɔt], *sorry* [sɔ'ri], *fought* [fɔ:t], and *ball* [bɔ:l].<sup>1</sup>

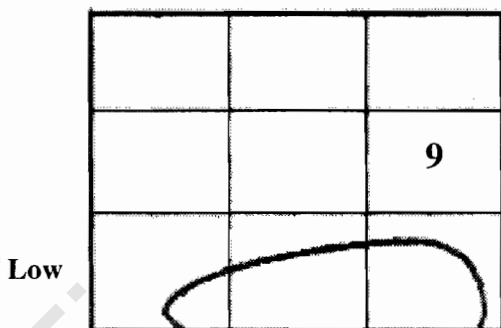
In writing, the [ə] is represented by o, ou, and a.

In the production of this sound, the tongue is strongly **retracted** at its base towards the back wall of the throat assuming the **low-back position (9)** in the mouth cavity. The

<sup>1</sup>In British English [ɔ] has a relatively long form which is usually written [ɔ:]. This long form is the regular sound of *aw* and *au*: examples: *saw* [sɔ:], and *auther* [ɔ:θə]. It is also the regular sound of *or* when final or followed by a consonant: example: *nor* [nɔ:], and short [ɔɔ:t]. It also occurs in words with final [l] or [t] followed by a consonant; examples: *all* [ɔ:t] *ball* [bɔ:t], and *halt* [hɔ:t].

velum is raised high, closing off the nasal cavity. The lips are strongly rounded, and the muscles of the throat and tongue are tense.

Thus, [ɔ] is defined as a *low, back, rounded, tense vowel*.



Tongue position for [ɔ]

[ɪ] as in houses [haʊzɪz], and it is usually found in the American English dialect; and in British English it is replaced by [ə], as in [haʊzəz] or [haʊsəz].

## 2- Glided Vowel Sounds:

|      |   | Front | Central | Back |
|------|---|-------|---------|------|
| High | T | [iy]  |         | [uw] |
|      | L |       |         |      |
| Mid  | T | [ey]  |         | [ow] |
|      | L |       |         |      |
| Low  | T |       |         |      |
|      | L |       |         |      |

The characteristic qualities of an English glided vowel sound are:

1. A glided vowel sound consists of two elements: a basic vowel sound and a glide.

2. Both elements belong to the same general category, that is, both are either front as in [iy] and [ey], or back as in [ow] and [uw].
3. The first elements, namely, the basic vowel is more pronounced acoustically and is usually longer than the second, namely the glide.

[iy] as in he [hiy], see [siy], believe [bilív], receive [risíyv], key [k<sup>h</sup>iy], people [p<sup>h</sup>iypɫ], and machine [məšíyn].

In writing, the sound [iy] is represented by e, ee ei ie, ey, eo, and i.

In the production of [iy] the tongue first assumes the same position for [i], and then glides further up within the mouth cavity. The velum is raised high, closing off the nasal cavity. The lips are spread, and the muscles of the throat and tongue become tense during the glide. The tongue-glide to the extreme high-front position is here represented by the symbol [y].

Thus, [iy] is defined as a *high, front, unrounded glided, tense vowel*.

[ey] as in ray [rey], obey [obéy], hate [heyɫ], rain [reyn], break [breyk], and reign [reyn].

In writing, the sound [ey] is represented by, ay, ey, a, (followed by a consonant letter and silent (e), ai, ea, and eig.

In the production of [ey] the tongue starts from the position for [e] and glides further up in the mouth cavity. The velum is raised high, closing off the nasal cavity. The lips are spread, and the lip opening is slightly larger than it is for [iy]. The muscles of the throat and tongue-glide to the high-front position is here represented by the symbol [y].

Thus, [ey] is defined as a *mid, front, unrounded, glided, tense vowel*.

[uw] as in fool [fuwl], fruit [fruwt], lose [luwz], and blew [bluw].

In the writing system, the sound [uw] is represented by oo, ui, o, and ew.

In the production of [uw], the tongue starts from the same position for [u] and glides further up towards a higher back position. The velum is raised high, closing off the nasal cavity. The lips are considerably rounded with protrusion and the muscles of the throat and tongue become tense during the glide. This tongue-glide to the higher-back position is here represented by the symbol [w].

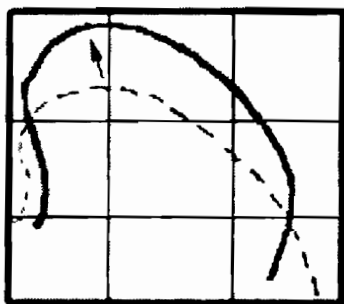
Thus, [uw] is defined as a *high, back, rounded, glided, tense vowel*.

[ow] as in *go* [gow], *bow* [bow], and *know* [now], *toe* [tow], *boat* [bowt], and *though* [ðow].

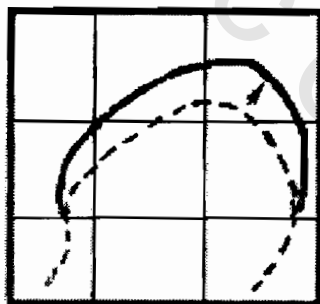
In writing, the sound [ow] is represented by o, ow, oe, oa, and ough.

In the production of [ow] the tongue starts from the same position for [o] and glides upwards to the high- back position. The velum is raised high, closing off the nasal cavity. The lips are rounded usually with protrusion, and the muscles of the throat and tongue become tense during the tongue- glide. This glide to the high-back position is here represented by the symbol [w].

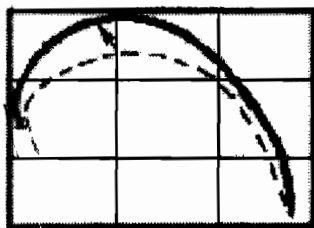
Thus, [ow] is defined as a *mid, back rounded, glided, tense vowel*.



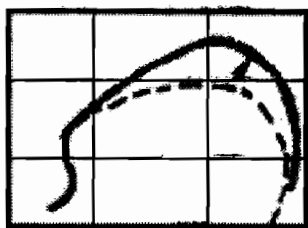
[iy]



[uw]



[ey]



[ow]

Tongue-glides for [iy], [ey], [uw], and [ow]

### 3- Diphthongs:

[ay]      [aw]      [ɔy]

[ay] as in *high* [hay], *die* [day] *either* [aɪðə(r)], *height* [hayt] and *buy* [bay].

In the writing system, the sound [ay] is represented by igh, ie ei, eigh, and uy.

It is made with the tongue starting from the position for [a] and gliding to that for [i].

This tongue-glide from the low-central position to the high-front position is here represented by the symbol [y].

[aw] as in *now* [naw], *cow* [kaw], *bough* [baw], and *round* [rawnd].

In writing, the sound [aw] is represented by ow, ough and ou.

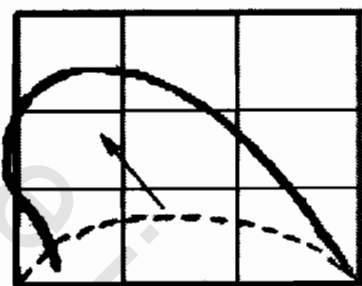
It is made with the tongue starting from the position for [a] and gliding to that for [u].

This tongue-glide from the low-central position to the high-back position is here represented by the symbol [w].

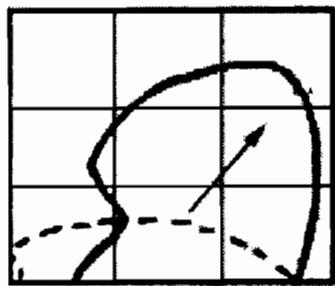
[ɔy] as in *boy*, [bɔy] *annoy* [ənɔ'y], and *boil* [bɔyl].

In writing, the sound [ɔy] is represented by oy, and oi. It is made with the tongue starting from the position for [ɔ] and gliding to that for [i].

This tongue-glide from the low-back position to the high-front position is here represented by the symbol [y].



[ay]



[aw]



[ɔy]

#### Changes in tongue position for diphthongs

Thus, we see that each diphthong consists of two elements, a basic vowel and a glide. However, unlike a glided vowel where the glide belongs to the same general category of the basic element, the production of a diphthong requires the transition in sound from the quality of a low vowel to that of a high vowel, and therefore the appropriate tongue movement from the position of the low to that of the high vowel. The range of this movement is thus considerably greater than that characteristic of glided vowels.

## **Centering Diphthongs**

In the dialects of English where final [r] is not pronounced, five diphthongs have been developed, the second and less prominent element of which is the mid-central unrounded, lax vowel [ə]. Thus the words *hear*, *there*, *four*, and *tour* are pronounced [híə], [ðéə] [fó'ə] and [túə] and *far* [faər] or [fa:]<sup>1</sup>. These five diphthongs are known as centering diphthongs, since in each there is a tongue glide to the mid-central position.

## **Triphthongs**

In English when [ə] combines with a diphthong, such as [ay] or [aw], the result is a triphthong as in *higher* [háya], and in *flower* [fláwa]<sup>2</sup>. In *seer* [siyə], *layer* [leyə], *lawyer* [loyə] and *lower* [lowə] we have 6 triphthongs.

A triphthong may thus be defined as “a syllabic element that begins with one vowel sound and glides through a second to a third vowel sound within the same syllable.”

## **Syllabic and Non-syllabic Speech Sounds:**

In every spoken word there is at least one sound which is perceived to stand out more prominently than sounds surrounding it. For example, in English, in the pronunciation of the word *man* [mæn], the sound [æ] is heard more prominently than [m] or [n]. Similarly in the pronunciation of the word *contain* [k<sup>h</sup>əntéyn], the sounds [ə] and [ey] are heard more prominently than [k] [t], or [n]. The prominence of sounds may be due to inherent sonority, to length, to stress or to special intonation, or to combinations of these.

The relative sonority or carrying power of speech sounds depends on their inherent or natural quality. Prominence depends on combinations of quality with length, stress and intonation. When length and stress are kept constant and

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<sup>1</sup> [fa:] in British English.

<sup>2</sup> In American English, *higher* and *flower* are pronounced [hayə] and [flawə].

intonation kept level, vowels are generally more prominent than consonants; tense vowels are mostly more prominent than lax vowels; voiced consonants are more prominent than voiceless consonants.

Thus in a spoken word there is a kind of variation (ups and downs) of prominence which is easily perceived by the hearer. This variation may be visualized as a wavy line with 'peaks' and 'valleys'; the peaks denoting points where prominence is maximum, and the valleys denoting points where prominence is minimum.

Each speech sound that constitutes a peak of prominence is said to be *syllabic* and a word is said to contain as many syllables as there are peaks of prominence. For example, in the word *man* [mæn], the sound [æ] constitutes a peak of prominence and is therefore called 'syllabic' and the word is said to contain one syllable. On the other hand, in the word *contain* [kʰəntéyn] there are two peaks of prominence, and therefore two syllables, and the word is said to contain two syllables.

Thus, we see that the essence of a syllabic is that it is acoustically the element of major sonority in its syllable, or phonetically, the chief carrier of the emitted breath pulse (push) of the syllable.

The classification of English speech sounds on the basis of their function in the syllable gives us two basic groups: *syllabics and non-syllabics*. *Syllabics are generally vowels; and non-syllabics are generally consonants*.

### **Syllabic Consonant Sounds**

Although the non-syllabics are generally consonant sounds, the nasal consonant sounds [m] and [n], and the lateral consonant sound [l] frequently function as syllabic elements. Examples are the unstressed syllables of *rhythm* [riðm], *button* [bʌ'tŋ], and *bottle* [bɒ'tl].

The consonants [m], [n] and [ŋ] in unstressed position form syllables without any vowel whatever. They form syllables either alone or with other consonants: *button* [bə'tn̩] and *buttoned* [bə'tn̩d].

One evident difference between a syllabic consonant sound and a vowel sound is that the former may occur as a syllabic in an unstressed syllable, or as a non-syllabic in a stressed syllable, whereas a vowel sound can only occur as syllabic in both stressed and unstressed syllables.

In the production of syllabic consonant sounds we should notice the following:

1. If the preceding consonant sound is of the same point of articulation as the syllabic consonant sound, as in *button* [bə'tn̩] and *saddle* [sæd̩l], then the point of the tongue remains in contact with the teeth bridge throughout: the [-t̩n̩] in the first word, and the [-d̩l] in the second.
2. If the preceding consonant sound is of a different point of articulation as in *bottom* [bə'tm̩] and *apple* [æp̩l] the transition from that consonant sound to the syllabic consonant sound is so slight that no vowel sound intervenes.
3. For speakers of Arabic, the English vowel system presents difficulties, since classical Arabic has three important simple vowels: /i/, /a/ and /u/. So the nine simple vowels of English have to be carefully observed in learning English.

This is also clear from the meaning of the word vowel, which comes originally from Latin *vox* which means *voice*; whereas consonant means the sound which accompanies the vowel.

## THE ENGLISH VOWEL SYSTEM

### 1. The Simple Vowels

(9 vowels)

|             | Front            | Central                 | Back               |
|-------------|------------------|-------------------------|--------------------|
| <b>High</b> | /i/<br>sit /sit/ | /ɪ/<br>glasses /glasɪz/ | /u/<br>put /put/   |
| <b>Mid</b>  | /e/<br>set /set/ | /ə/<br>cut /kʌt/        | /o/<br>obey /obey/ |
| <b>Low</b>  | /æ/<br>sat /sæt/ | /a/<br>glass /glas/     | /ɔ/<br>pot /pɒt/   |

### 2. The Complex Vowels

(7 vowels)

|             | Front                           | Central                                   | Back                            |
|-------------|---------------------------------|-------------------------------------------|---------------------------------|
| <b>High</b> | /i/      /iy/<br>see      /siy/ |                                           | /u/      /uw/<br>pool    /puwl/ |
| <b>Mid</b>  | /ē/      /ey/<br>hay      /hey/ |                                           | /o/      /ow/<br>goal    /gowl/ |
| <b>Low</b>  |                                 | /ay/      /aw/<br>high /hay/<br>how /haw/ | /ɔ/      /ɔy/<br>boy      /pɔy/ |