

Vowels are produced with the vocal tract open. For that reason, they are said to be articulated with an **open articulation**, in opposition to consonants. We know that in the production of a sound, several elements participate: vibration and resonance. In the case of English vowels, they are all produced with vibration of the vocal folds, so they are **voiced sounds**. The escape of the airflow coming from the lungs is always made through the mouth only, because the soft palate is in its raised position, that means they are **oral sounds**. More has to be said about the resonance effect produced by the position of the articulators in the oral cavity, mainly. In this respect, the only possible articulation is that of the tongue position, being more or less raised, more or less advanced, because the mouth will be open, as we have just stated. Two parameters are then firstly considered: **height of the tongue** and **backness of the tongue**. One more parameter has to do with the position of the lips, which are considered as another **resonator**. So, the **rounding of the lips** is also considered to describe how a vowel is produced.

According to the height of the tongue, vowels can be **high, mid** or **low**. According to the backness of the tongue, vowels can be **front, central** or **back**. According to the **rounding of the lips** vowels can be **spread, rounded** or **neutral**.

In the picture below we can see the position of the tongue for the production of two different vowels in English: /i:/ and /ɑ:/. The black dot means the highest point of the tongue and it determines the articulation for that vowel. So, in the first case, we can clearly see that it is the front of the tongue being raised which produces the sound, whereas, in the second case, it is the back of the tongue in its lowered position which produces the vowel.

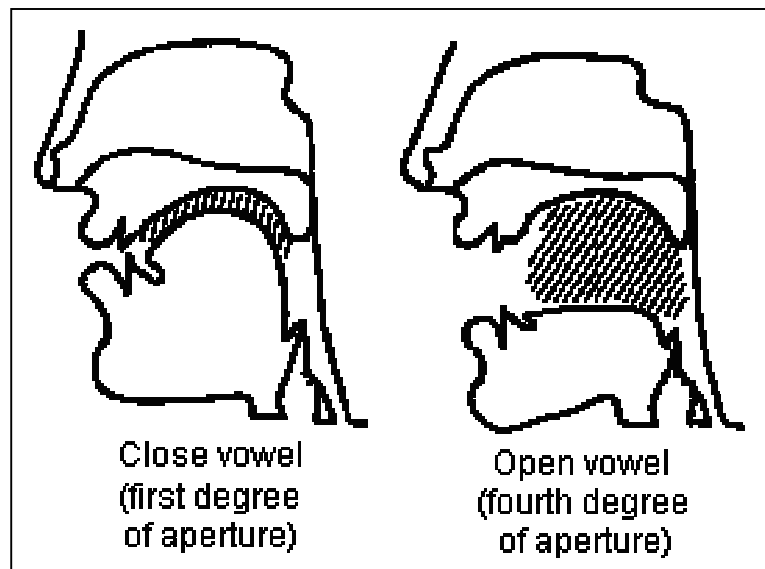


Figure no. 1: Sagittal section for a close vowel and an open vowel

As we can infer from the picture, vowels can be pronounced with a more or less degree of aperture, going from completely closed (as in the case of /i:/) or completely open (for /ɑ:/) in English. The articulation is done with a more or less openness of the mouth, which, in fact refers to a more or less elevated tongue (as we can also infer from the picture).

These diagrams are called **sagittal sections** and are very useful to see how vowels are pronounced. If we consider the different heights that the tongue can adopt in English, and imagine a maximum point of elevation, we can define the different types of vowels that exist in this language. Here we have a picture that shows the different elevations of the tongue.

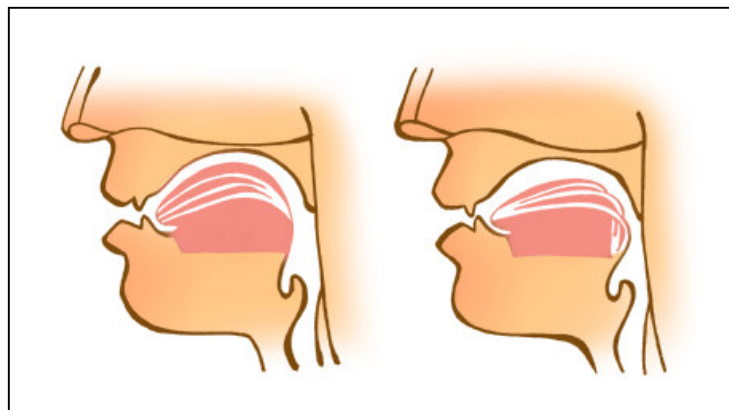


Figure no. 2: Different height for the tongue

If we pay attention to the picture, we will see that the elevation can be of the front part of the tongue or of the back part of the tongue. To be precise, that elevation can be of the following parts of the tongue:

- a) Front
- b) Centre
- c) Back

According to which part is more elevated, we will have:

- a) **Front vowels**
- b) **Central vowels**
- c) **Back vowels**

The elevation, as we see, can be low, mid or high. That elevation will result in a more or less openness of the mouth, too. According to the degree of elevation of the tongue, vowels can be:

- a) **High vowels**
- b) **Mid vowels**
- c) **Low vowels**

If, instead of the height, we consider the openness of the mouth, the same vowels can be termed as being:

- a) **Close vowels**
- b) **Half-close vowels / Half-open vowels**
- c) **Open vowels**

Close here means approximation. We must remember that all vowels are produced with open articulation.

We can see all vowels incorporated into one single diagram that shows the imaginary high points of the elevation of the tongue:

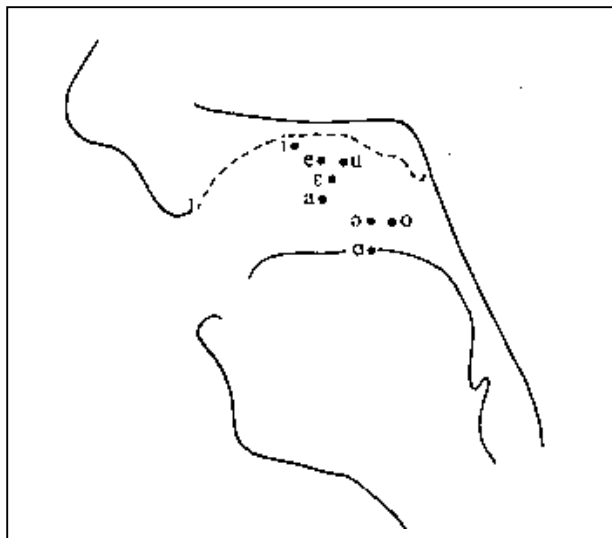


Figure no. 3: different (imaginary) positions for the tongue for English vowels

The picture shows only several English vowels. There are more, as we will see. However, this picture can serve us to understand the vowel chart (or diagram) which is normally used by phoneticians to represent vowels. This vowel chart is intended to represent the oral space, and every dot represents the height of the tongue. If the dot appears at the front area, then the highest point of the tongue is in the front of the tongue, if the dot is shown in the central area, then we are referring to a central tongue, etc. Below we can see this general vowel chart which is called **cardinal vowel scale**. The reason it is considered "cardinal" (and, therefore, general) is that it represents general parameters which every specific language can take as a point of reference to represent specific vowel sounds.

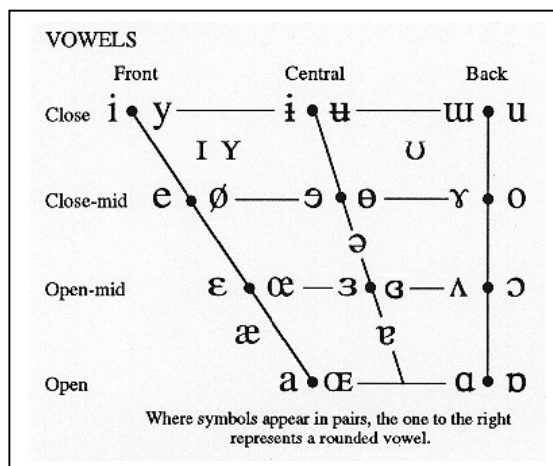


Figure no.4: The Cardinal Vowel Scale

The representation of the vowel in this scale follows specific parameters, as we can infer from the following picture.

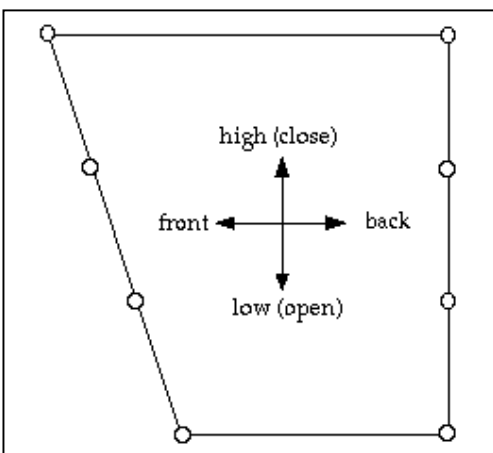


Figure no. 5: Organization of the vowels in the vowel scale

That is, as we were saying before: front vowels will be situated at the left of the diagram, high vowels at the top, etc. Vowels can then be more or less high, more or less front/back, and that degree of aperture/height can be easily represented in the vowel scale.

Below we have a vowel scale that includes all English vowels, with examples:

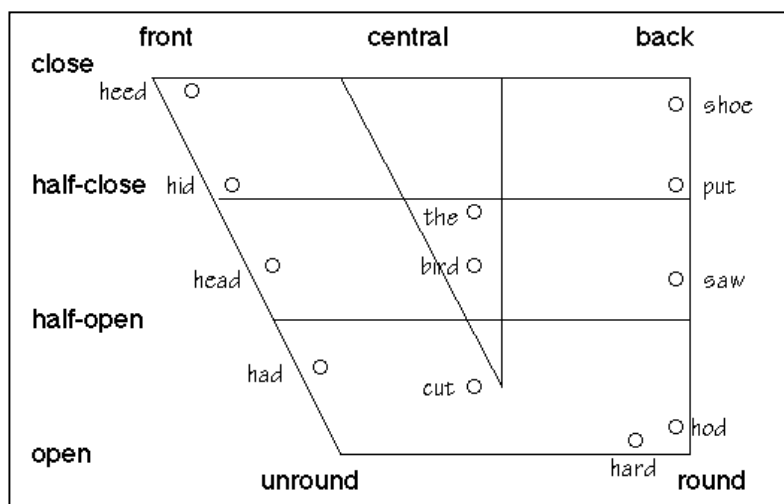


Figure no. 6: British English vowels

The vowels represented are from British English. The scale also shows how front vowels tend to be unround while back vowels are usually rounded. As far as the position of the lips (the fourth resonator), vowels can be defined as being:

- a) **Neutral**
- b) **Spread**
- c) **Round**

The following picture shows the different positions of the lips:

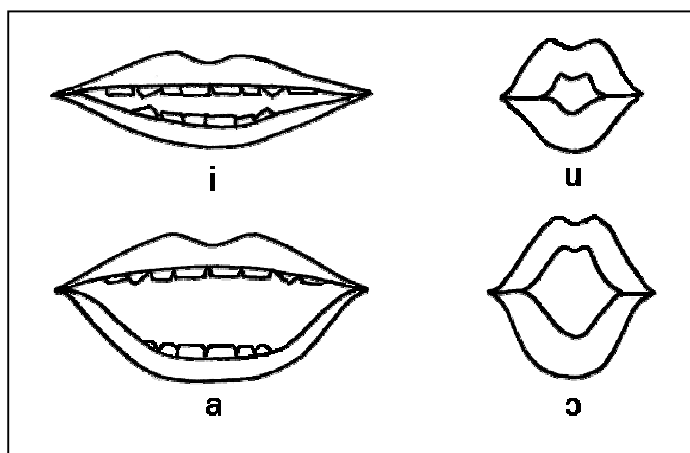


Figure no. 7: Lip posture

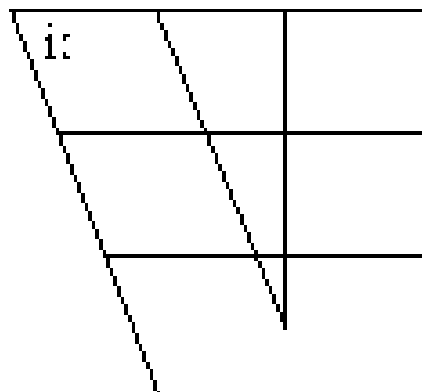
Below you will find a table that summarizes the **articulatory description** of English vowels:

i:

as in *beat, receive, see, unique*

Examples:

- -ee- in see
- -ea- in eat
- -ie- in yield
- -ei- in seize
- -e- in scene
- -i- in police
- -eo- in people
- -ey- in key
- -ay- in quay



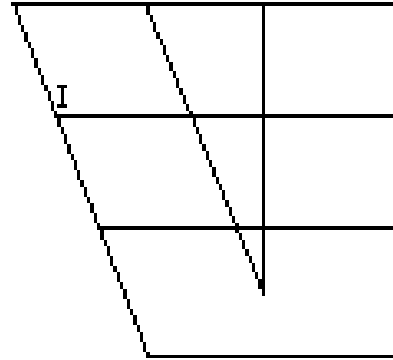
Being a long vowel, it almost sounds like a diphthong in RP. It is long enough to be one, but it does not actually glide into another vowel sound. The lips are only slightly spread.

I

As in wit, mystic, thick, finish.

Spelt as:

- -i- in fifth, rich, with, sit (61%)
- -y- in city, rhythm, symbol (21%)
- -e- in wicket, pretty, wicked (16%)
- -ie- in ladies, sieve
- -a- in village, private
- -o- in women
- -u- in busy
- -ay- in Monday, Sunday
- -ai- in fountain



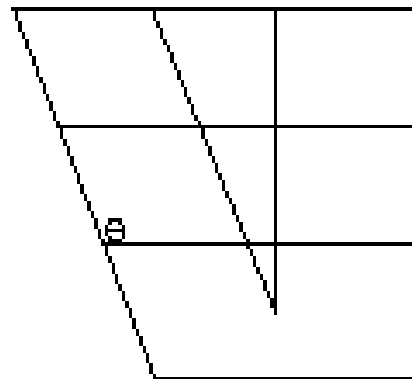
When you say this vowel sound, the front of the tongue is raised towards the palate. In fact, the position of the whole tongue is relatively high in the mouth, making it a closed vowel. The lips are slightly spread.

e

as in fell, set, many, meant.

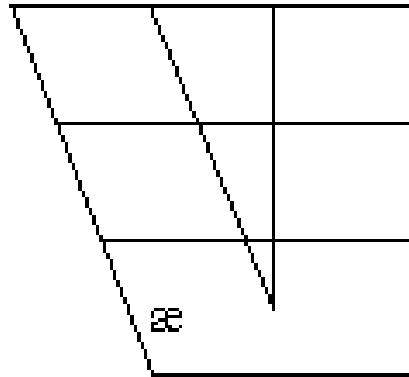
Can occur as :

- -e- in egg
- -a- in any
- -eo- leopard
- -ea- in realm
- -ei- in leisure



The front of the tongue is used in the production of this vowel, making it a front vowel. It is also a close/middle vowel in that the position of the tongue and jaw is slightly raised. The lips are slightly spread.

æ



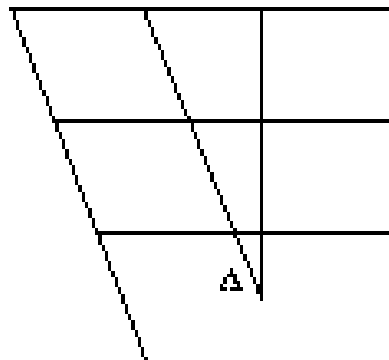
as in hat, man, cash, cap.

In conventional spelling, this sound is spelt with an 'a' 99% of the time. Alternatively, it can be spelt with an 'ai' as in plait or plaid.

This vowel is a front vowel since the front part of the tongue is raised when it is articulated. It is also an open (low) vowel. This means that the tongue is in a low position with the jaw also being lowered. The lips are slightly spread.

This traditionally short vowel has become slightly longer than the other short vowels. This lengthening is apparent before voiced consonants such as in cab, bad, badge and man.

ʌ



as in cut, bus, come, rough.

Can occur as:

- -o- in come
- -oo- in flood
- -u- in sun
- -ou- in trough
- -oe- in does

This is a central vowel, and one which is more open than mid-ranged. The lip position is a neutral one.

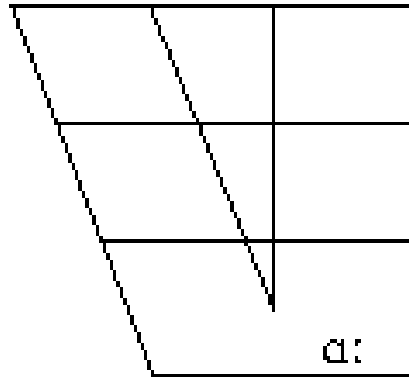
a:

as in cart, half, pass, laugh.

Can occur as:

- -a- in pass
- -ar- in art
- -au- in aunt
- -er- in clerk
- -ear- in hearth
- -al- in calm

This is an open vowel. The lip position is neutral



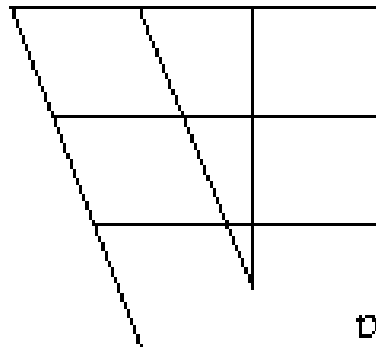
ɒ

as in cot, what, cost, mop.

Can occur as:

- -o- in sorry
- -au- in because
- -a- in what
- -ou- in cough
- -ow- in knowledge

The tongue and jaw are lowered as the back of the tongue is used to articulate this vowel. Hence it is a back, open (low) vowel. The lips are slightly rounded.

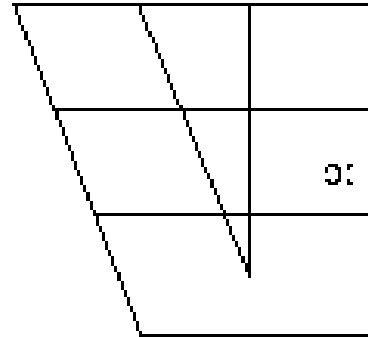




as in caught, port, talk, thought.

Can occur as:

- -aw- in law
- -ou- in bought
- -au- in taught
- -a- in all
- -or- in horse
- -oor- in door
- -oar- in hoarse
- -our- on pour
- -oa- in broad



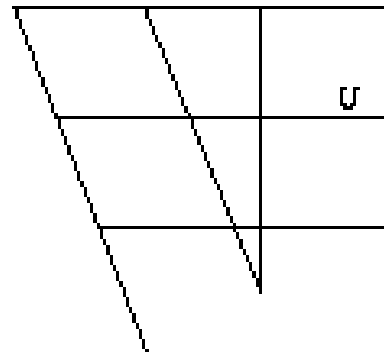
The vowel is pronounced with rounded position for the lips. It is the back part of the tongue that rises to a low position.



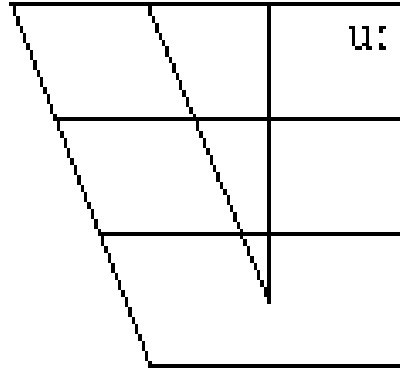
as in book, wood, could, put.

Can occur as:

- /o/ in woman
- /oo/ in good
- /u/ in full
- /ou/ in could



The tongue and jaw are raised as the back of the tongue is used to articulate this vowel. Hence it is a back, close (high) vowel. The lips are rounded.

As in spoon, you, blue, balloon.

Can occur as:

- -o- in who
- -oo- in fool
- -u- in rude
- -ou- in soup
- -ew- in few
- -ue- in blue
- -eu- in feudal
- -oe- in shoe
- -ui- in fruit

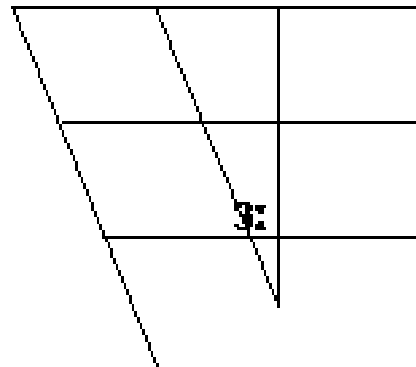
This vowel is towards the back and is a close sound. The lips are rounded.



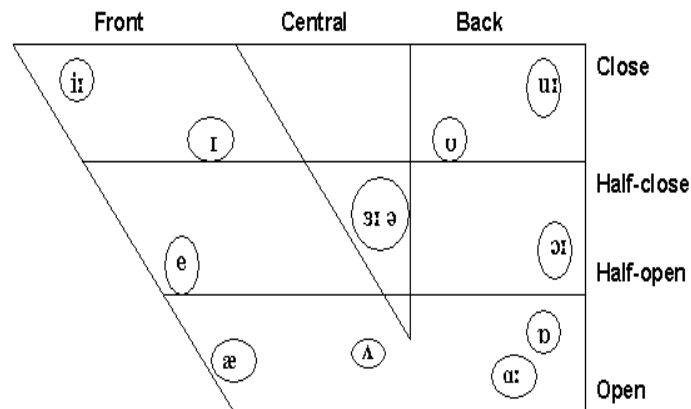
as in hurt, bird, hearse, word.

Can occur as:

- w + -or- as in word
- -our- in scourge
- -ir- in bird
- -yr- in myrtle
- -er- in serve
- -ur- in fur
- -ear- in earth



This is a central vowel. It is commonly used by English speakers as a hesitation sound (spelt 'er'). The lip position is neutral.



as in another, brother, the, postman.

The schwa is an unstressed central vowel and is the most common vowel to appear in English. It is one of the problems of English teaching that the most common vowel has no regular character to represent it.

4.2 Glides, moving vowels (diphthongs and triphthongs)

We entitled the previous section with the term “pure vowels”. But what does “pure vowel” mean? Well, maybe we can understand better if we see what the opposite of a pure vowel is. The **open articulation** kind has one special characteristic: the sound can be held as long as there is airflow coming out of the lungs. But that does not mean that the vocal cavity must remain still while the sound is being produced. Keeping the articulation wide open, we can slightly alter the position of the tongue and then modify the quality of the sound that is being pronounced. When we keep the articulators still while the air is going out through the open mouth, we say that we are producing a **pure vowel**. Pure here means that there is no alteration of the lingual position. On the contrary, if we slightly change the position of the tongue while the vowel is being produced, we speak of a **gliding vowel**, or, simply, a **glide**.

Other terms are **monophthongs** for pure vowels and **diphthongs, triphthongs** for moving vowels.

In short, glides are **moving vowels**. They really imply the tongue moving from one vowel position to another vowel position. That movement has to be done quickly: the tongue adopts one position that quickly shifts into a different and steadier position. So, in the production of a glide there are two stages:

- a) First, the tongue adopts a **starting position** that remains for a **short period of time**
- b) Then, the tongue adopts a **final position** that remains **longer** than the first one

There are two glides in English, and they combine with different vowels:

/j/ and /w/

/j/ yell, yawn, you

/w/ what, we, why, wet, would, wit, wand

4.3 Diphthongs and Triphthongs

Diphthongs and **Triphthongs** are also other types of vocalic sounds. They are very similar to glides in the sense that they also **imply the movement from one vowel position to another vowel position**. In opposition to glides, diphthongs and triphthongs imply a **starting position** that lasts longer than the following positions.

Diphthongs:

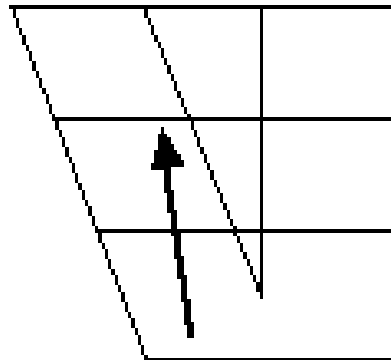
For many authors, a diphthong is merely the combination of a vowel plus a glide /j/ or /w/. For other authors, two clearly distinguishable vowels participate. In our case, we will stay with the second opinion and will classify diphthongs according to the following parameters:

- a) **Closing diphthongs** are those diphthongs whose final position is that of a **close vowel**, we can say that the tongue moves from a more open to a less open/close position: /aɪ/, /eɪ/, /ɔɪ/, /aʊ/, /əʊ/.
- b) **Centering diphthongs** are those diphthongs whose final position is that of a **central vowel**; that is, the part of the tongue that moves from the front/back to the center: /eə/, /ʊə/, /ɪə/.

Pure vowels can be easily represented using a **sagittal section** diagram. The **Cardinal Vowel Scale** is also very productive for the same task. However, glides, diphthongs and triphthongs are not easily represented on such a graph, as they imply movement. For that reason, arrows are used on the original vowel scale to show that motion.

ai

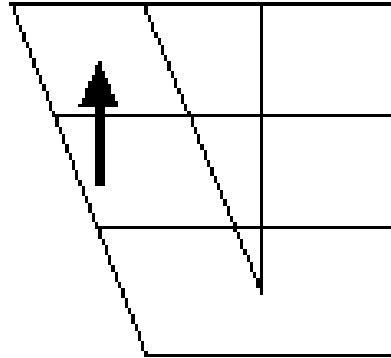
as in buy, fine, sight, file.



This diphthong begins with an open vowel which is between the front and back position. It is quite similar to the vowel sound found in 'cut' and 'sun'.

eɪ

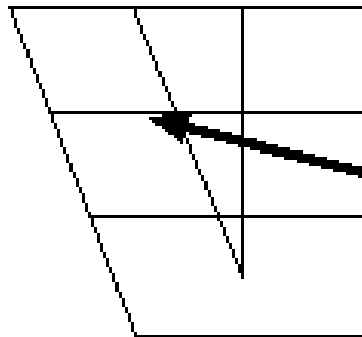
as in late, day, vein, fail.



This diphthong begins with the same /e/ as in 'get' and 'men'. The sound then glides from a relatively more open to a more closed vowel position.

ɔɪ

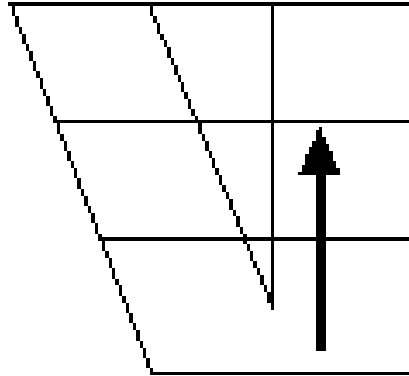
as in boy, join, voice, foil.



The first part of this diphthong is the vowel sound found in 'caught' and 'born' before gliding to the front, close position

au

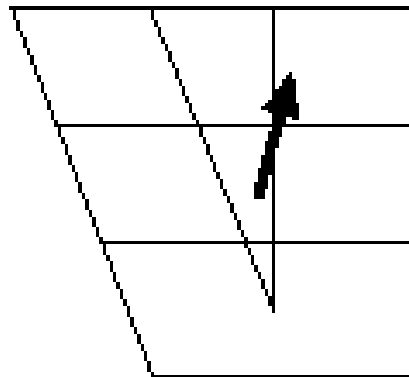
as in boy, join, voice, foil.



The first part of this diphthong is the vowel sound found in 'caught' and 'born' before gliding to the front, close position.

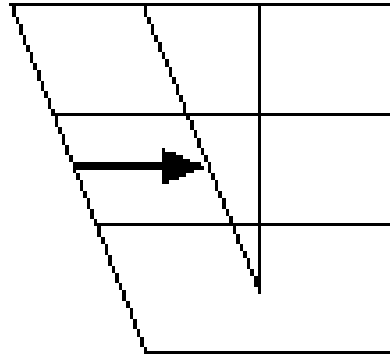
əʊ

as in slow, go, dough, coat.



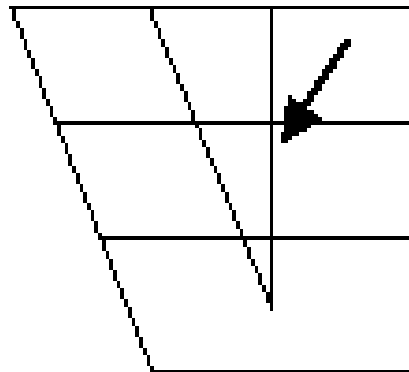
This diphthong starts in the central schwa position. The sound then glides to the back, close position of the vowel sound found in 'put' and 'pull'.

as in share, care, fair, bear.



This vowel starts with the vowel found in 'get' and 'beg' before gliding to the central schwa position.

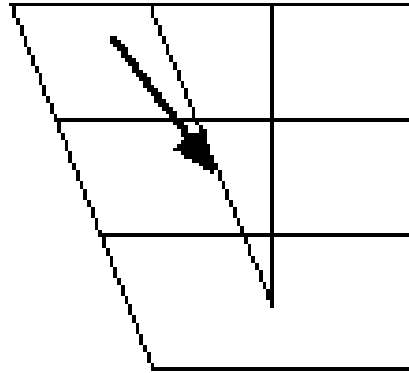
as in sure, endure, lure, pure



This diphthong starts in a slightly closer position than the vowel in 'put' and 'push' before gliding towards the central schwa position.

ɪə

as in sure, endure, lure, pure



This diphthong starts in a slightly closer position than the vowel in 'put' and 'push' before gliding towards the central schwa position.

Triphthongs:

Triphthongs imply the combination of **three different positions of the tongue** in the production of a vowel. Triphthongs in English are always the result of the combination of a **closing diphthong plus a schwa**.

leɪə layer

laɪə liar

lɔɪəl loyal

pəʊə power

məʊə mower