Lesson one: ***Phonetics and Phonology***

I-Phonetics

The word phonetics comes from the Greek word 'phone' which stands for 'sound' or 'voice'. Usually used with a singular verb, it refers to the branch of linguistics that deals with the sounds of speech and their production, combination, description and representation by written symbols. This representation is usually referred to as the phonetic **transcription** in which systems of phonetic writing are provided and aim at the accurate representation of any sequence of speech sounds. These systems attempt also to facilitate the process of language learning, especially the foreign one. In this context, a uniform system has been put forward that caters for almost all possible sequences of human speech sounds. This system is known as the International Phonetic Alphabet (IPA) where human speech sounds are represented by specific symbols. All IPA symbols are enclosed in slashes to indicate that the transcription is phonetic rather than representative of a particular language. Phonetics also refers to the system of sounds of a particular language.

Branches of Phonetics

Phonetics has three main branches.

1) Articulatory phonetics is concerned with the positions and movements of the speech organs such as the lips and the tongue in producing sounds.

2) Acoustic phonetics is concerned with the physical properties of the sound waves.

3) Auditory phonetics is concerned with the perception of the speech sounds or the effect on the ear.

All phonetics are interrelated since human articulatory and auditory mechanisms correspond to each other and are mediated by wavelength and other physical properties of sounds. Indeed, any language learner, especially an advanced one (such as a teacher) needs to be aware of the three kinds of phonetics that actually describe the very stages or phases of human speech sounds production.

II- Phonology

The term phonology is derived from the Greek words 'phone' which stands for 'sound'/ 'voice' and 'logos' which means 'word'/ 'speech'. It refers to the study of speech sounds in languages or in a language with reference to their distribution and pattering and to tacit rules governing pronunciation. It also refers to the system of a language. In other words, phonology attempts to account for how speech sounds are combined, organized and convey meaning in particular languages. For example, the sound /θ/ in '**th**ink' often poses problems to many English learners such as French speaking learners.

In addition, combinations of sounds vary widely from one language to another. The combination '**kt**' at the beginning of a word, for example, would be impossible in some languages but is unexceptional in Greek. So, whereas phonetics deals with the nature of sounds per se, phonology describes the way sounds function within a given language.

III-Useful terminologies

➢ **A phoneme** is the smallest contrastive unit in the sound system of a language. In other words, phonemes are the smallest segment of the sound that, if changed would produce a different word with a different meaning. Thus while words carry meaning, phonemes are units from which words are built. /m/ and /b/ are different phonemes in English because /mʌg/ (mug) and /bʌg/ (bug) are different words.

➢ **Minimal pair:** a minimal pair is two words that differ in only one sound. Sounds which differ: /p/ and /b/ in **lab / lap** ('lab' and 'lap' are a minimal pair)

/I/ and /e/ in **sit / set** ('sit' and 'set' are a minimal pair)

IV- Importance of learning phonetics and phonology

As we have already seen, in any language, we can identify a small number of regularly used sounds (vowels and consonants) that we call phonemes. For example, the vowels in 'pin' and 'pen' are different phonemes, and so are the consonants at the beginning of the words 'pet' and 'bet'. Because of the confusing nature of the English spelling, it is particularly important to learn to think of English pronunciation in terms of phonemes rather than letters of the alphabet. So, it is important to learn the English phonetics mainly because there is not always a correspondence between the English spoken form and the written form.

a) One sound (phoneme) may have many graphical representations.

For example the English vowel /i:/ can be written

- 'ea' as in r**ea**d
- 'ee' as in sl**ee**p
- 'ie' as in bel**ie**ve
- 'ei' as in rec**ei**ve

The English sound (phoneme) /f / may be represented by many letters

- 'f' as in **f**rame
- 'ph' as in **ph**otogra**ph**
- 'gh' as in enou**gh**

b) One graphical representation may refer to many sounds.

For example the vowel 'a' can be pronounced

- /ei/ as in sh**a**pe
- /æ/ as in c**a**t
- /a:/ as in l**a**st
- /i/ as in short**a**ge

Lesson two : # *The production of speech*

I- Stages of speech sounds production

Any manifestation of language by means of speech happens through three stages.

1) The psychological stage: In the first place, the information of the concept will take place in the brain.
2) The articulatory stage or the physiological one: The nervous system transmits this message to the organs of speech. These in turn will produce a particular pattern of sounds.
3) The acoustic stage or the physical one: The movement of the organs of speech will create disturbance in the air which enables us to hear particular sounds and discriminate between them.

II- Organs of speech

The human body is made of different extraordinary organs with a plenty of functions. If you take the main organs of speech, you may notice that, in addition to their production of speech, these organs have a lot of survival functions. For instance, the lungs are responsible for providing the body with oxygen. The teeth, on the other hand, break up food while the tongue moves it within the mouth. So each of these organs has a basic survival function, or more, plus its role in the production of speech sounds.

The main organs of speech are represented in the diagrams below.

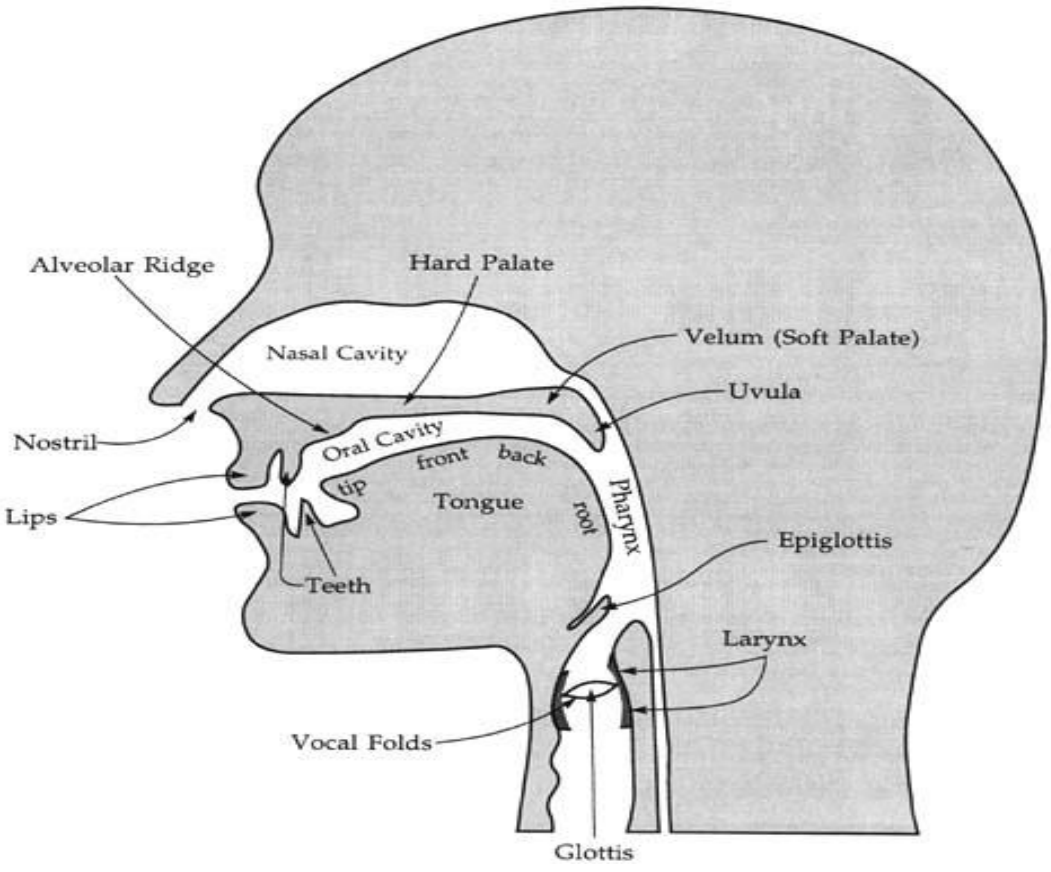

Figure 1: Diagram of the organs of speech above the trachea

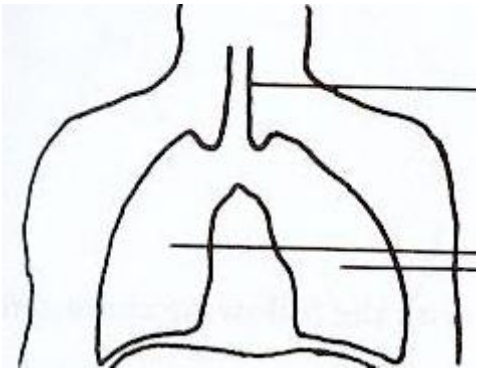

Figure 2: The lungs

III- Speech mechanisms

The production of any speech sound takes place through steps where each of the organs of speech has a particular role.

The air escapes from the **lungs** which serve as an air reservoir and energy source. It, then, passes through the t**rachea** (wind pipe) and through the **larynx** which lies behind the prominence in the throat called the 'Adam's apple. The larynx contains two stretched membranous cords called '**the vocal cords'** which are made of an elastic tissue. As they open and shut, the vocal cords regulate the amount of air that passes to the lungs. They can take different positions. Indeed, they can be:

a) Completely brought together: In this case, the air stream is cut.

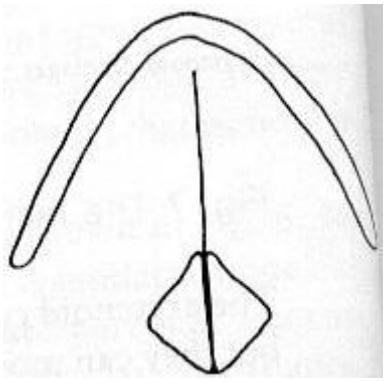

Figure3: Completely brought together vocal cords

b) Parted (folded back): The **glottis**, or the opening between the two folds of the vocal cords, is open. So, the air passes freely. This is the case of normal breathing and during the production of some consonants such as /p/ as in '**p**arent', /f/ as in '**f**ire' and /s/ as in '**s**un'.

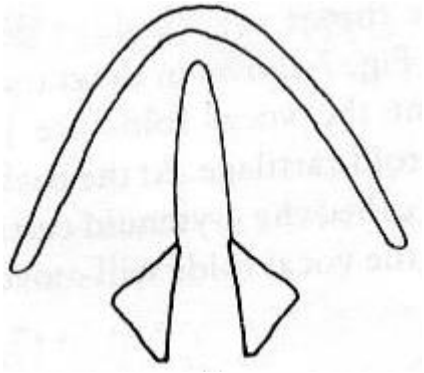

Figure 4: Parted vocal cords

c) Brought together but not completely: The vocal cords act as a vibrator set in motion by lung air. They are so close that when air passes through them they vibrate (air makes them shake or move). These vibrations produce voice. This is the normal feature of all vowels and some consonants like /m/ in **m**outh, /n/ in **n**ose, /l/ in **l**ips.

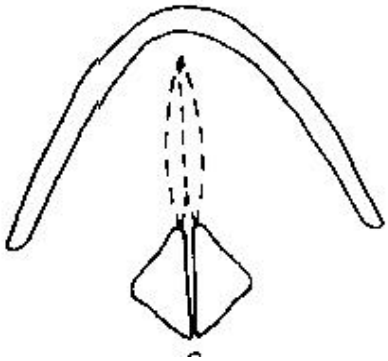

Figure 5: Brought together but not completely

The **pharynx** is a tube which begins above the larynx. It is about 7 cm in women and 8 cm in men. At its top end, it is divided into two, one part being the back of the mouth and the other being the beginning of the way through the **nasal cavity**. The escape of air through the pharynx may be affected in three different ways according to the position of the **soft palate** or **velum**.

- When the soft palate is lowered, the air escapes through the mouth and the nose, as in normal breathing. This is the case, for instance, in the production of the nasalized French vowels: **en**, in 'pr**en**d', **on in '**rép**on**d', **in in 'in**st**in**ct', etc.

- When the soft palate is lowered with an obstacle at some point in the mouth, the air escapes through the nose. This is the case in the production of the English nasal consonants /m/ as in **m**outh, /n/ as in **n**ose and /ŋ/ as in eati**ng.**

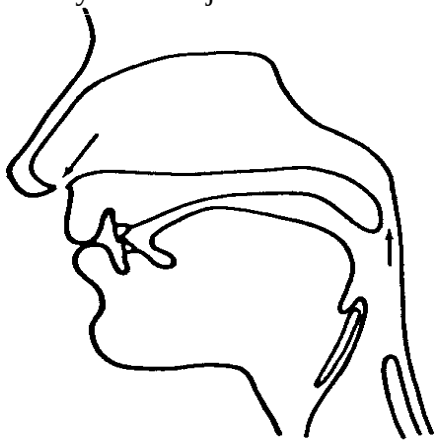

Figure 6: Air passing through the nasal cavity

- When the soft palate is raised, the nasal cavity being shut off, the air escapes through the mouth only (oral escape). This the way of production of all English consonants except for the nasal sounds /m, n, ŋ /

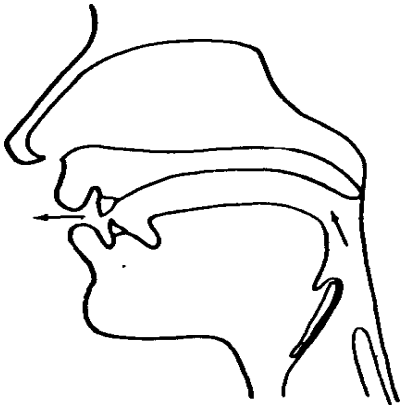

Figure 7: Air passing through the oral cavity.

The **mouth,** of course, plays an essential role in the production of sounds. Its shape determines the quality of the majority of speech sounds. The mouth consists of the 'roof' which is made of the alveolar ridge, the hard palate and the soft palate; the tongue, the teeth and the lips.

Of all the movable parts, the **tongue** is by far the most flexible one. It is capable of assuming a great variety of positions in the production of vowels and consonants. It is usually divided into different parts, though there are no clear dividing lines within the tongue.

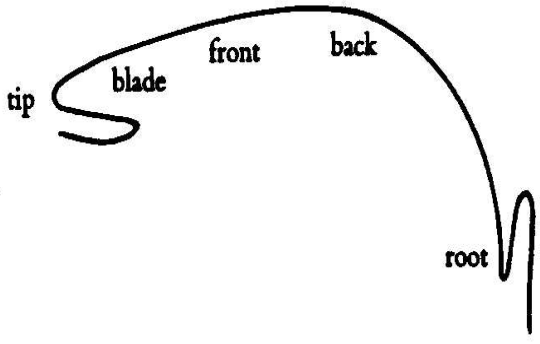

Figure 8: Subdivisions of the tongue

Lesson three:

Introduction to vowels

I-Definition: Vowels are sounds in which there is no obstruction to the flow of air as it passes from the larynx to the lips. In other words, air passes without any complete closure or narrowing between speech organs. The vowel is the sound which has a central, major, syllabic function (the vowel is usually in the middle of words). In English for example, the nucleus of a syllable is always a vowel or a diphthong. The consonant, however, is less important in the syllable.

II- The Difference Between Vowels and Consonants:

1. In the production of vowels, the organs of speech are approximately stationary; but, in the production of consonants, the organs of speech are in constant movement.
2. In the production of vowels, the air escapes freely; but, in the production of consonants, the air is either completely or partially blocked.

III- The Vowels Symbols:

/ i: / d**ee**d, r**ea**d, rec**ei**ve, bel**ie**ve.
/ ɪ / s**i**n, mon**ey**, luck**y**.
/e/ b**e**st, h**ea**d, s**ai**d.
/ɜ:/ b**ir**d, c**er**tain, h**er**b, b**ur**n, **ear**ly, l**ear**n, f**ur**
/ ə / b**e**lieve, el**e**ment, fam**ou**s, lab**our**, dat**a**, **a**head, fath**er**.
/æ/ h**a**ve, f**a**ct, **a**ct.
/ ʌ / sh**u**t, c**u**t, s**o**me.
/a:/ st**ar**t, p**ar**k, f**ar**, c**ar**, p**al**m, p**a**st, f**a**st.
/ ʊ / p**u**t, f**u**ll, c**oo**k, g**oo**d, l**oo**k, sh**ou**ld, w**o**lf.
/ u: / m**oo**n, m**o**ve, gr**ou**p, j**ui**ce, J**u**ne, fl**u**te, cl**ue**, fr**ui**t, incl**u**de.
/ɒ/ got, was, wh**a**t, bec**au**se.
/ ɔ: / m**ore**, **door,** t**al**k, s**aw**, b**ough**t, f**our**, b**oar**d, f**a**ll.

IV- Description of vowels

When describing a vowel, the following points must be taken into consideration:

1. The position of the soft palate.
2. The kind of opening formed by the lips. The lips can, generally, have three shapes. They can be:
    - **Rounded** such as in the vowel **/ ʊ: /** in words like: 'gr**ou**p', 'sh**oe**s', 'm**o**ve.' The corners of the lips are brought together towards each other, with the lips pushed forward.
    - **Spread** as in the vowel **/ i: /** in words like: 'gr**ee**n', 'ach**ie**ve', 'pl**ea**se'. The corners of the lips are moved away from each other, as for a smile.
    - **Neutral** such as with the vowel **/ɑ: /** in words like 'c**al**m', h**ea**rt', and 'f**a**ther'. The lips are not noticeably rounded or spread.
3. The part of the tongue which is mainly raised: Is it the front, centre, or back one?
4. The degree of raising of the tongue.

V- Categories of vowels

Vowels can be categorised in different ways. One of the principles of vowels classification is the **vowels' length**. Accordingly, there are long vowels where the articulation of the vowel takes more **time** and short vowels where the articulation takes less time. In English, the long vowels are /ɑ:/ /i:/ /ɔ:/ /u:/ /ɜ:/ (The colon " :" which is not always used refers to the length of the sound) whereas the short vowels are /ɪ/ /e/ /æ/ /ɔ/ /ʊ/ /ʌ/ /ə/.

Vowels can also be classified according to the part of the tongue involved in the articulation. Indeed, this method of categorization is the most common one for vowels. Accordingly there are three sets of vowels:

1. **Front vowels** or sounds in which the main raising is made by the front of the tongue toward the hard palate.
2. **Central vowels** or sounds in which the main raising is made by the centre of the tongue toward the hard palate.
3. **Back vowels** or sounds in which the main raising is made by the back of the tongue toward the soft palate.

VI- Cardinal vowel scale: Daniel Jones' Diagram

Daniel Jones, the late 19th c and early 20th century phonetician, introduced a diagram called the vowel **Quadrilateral** used as a reference for the description of vowels. Phoneticians are using this chart to represent the most important degrees of raising of the tongue and the parts which are involved in the articulation of vowels. In addition, the position and shape of the lips are also represented in the chart. They put on it the vowels corresponding to each position.

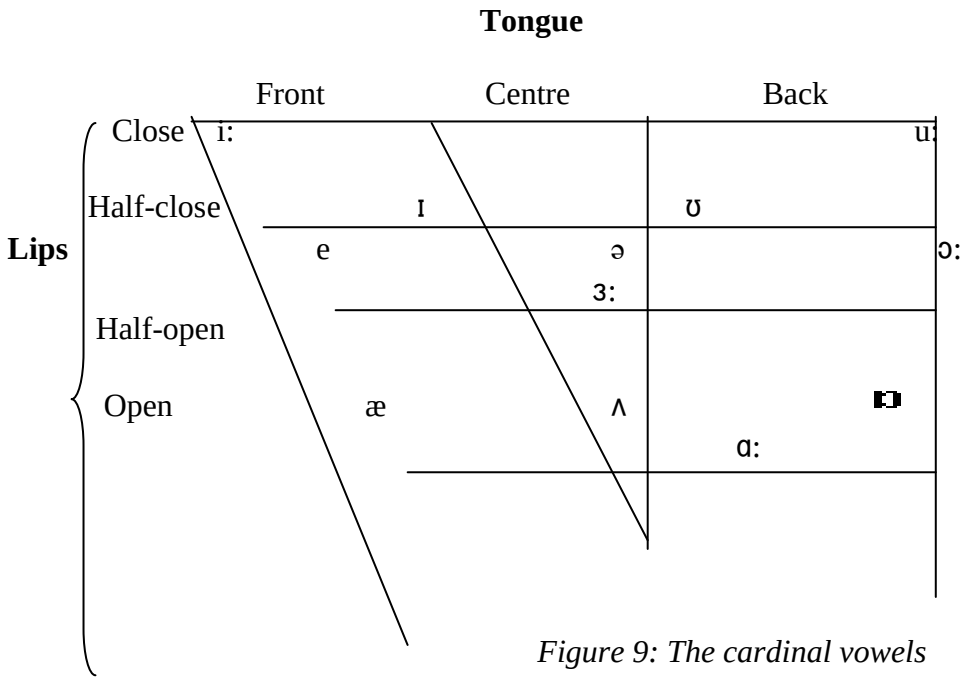

Figure 9: The cardinal vowels

This chart or scheme represents the Cardinal Vowels System. It accounts for the range of vowels that the human vocal apparatus can make.

Lesson four: # *Front vowels*

There are four front vowels in English **/ i: / , / ɪ / , /e/ , /æ /.**

I- Description of the articulation of / i: /

This vowel is identified as a front, close, long vowel. During its articulation:

- The soft palate is raised.
- The lips are spread.
- The front of the tongue is raised.
- The side rims of the tongue make firm contact with the upper molars.

The front, close, long vowel / i:/ appears in words like:

F**ee**t T**ee**th B**ee** Sh**ee**p S**ee** Ch**ee**se Tr**ee**	L**ea**ve T**ea**m Pl**ea**se S**ea** R**ea**son	P**ie**ce F**ie**ld Bel**ie**f	Rec**ei**ve Conc**ei**ve	Compl**e**te Th**e**se concede	Pol**i**ce Mach**i**ne	K**ey**

II- Description of the articulation of / ɪ /

It is a front, half-close, short vowel. During the production of this vowel:

- The soft palate is raised.
- The lips are slightly spread.
- The tongue is raised between the close and half-close positions and is near to the centre.
- The rims of the tongue make a slight contact with the upper molars.

The front, half-close, short vowel / ɪ / is found in words like:

S**i**t	Rh**y**thm	Need**e**d	Vill**a**ge	G**ui**lt	v**ee**r
W**i**th	S**y**mbol	Pr**e**tt**y**	Priv**a**te	b**ui**ld	
G**i**ve	C**i**t**y**	prefer	Sund**a**y (and days of the week)		
Sh**i**p	S**y**stem		Sav**a**ge		
Minute	S**i**ll**y**				
H**i**t					

III-Description of the vowel /e/

During the articulation of this vowel which is identified as a front, half-close, short vowel:

- The soft palate is raised.
- The lips are slightly spread or neutrally open.

- The front of the tongue is raised between the half-close and half-open positions. The tongue has more tension than with / ɪ /
- The side rims make a slight contact with the upper molars.

The vowel **/e/** can be heard in words like:

B**e**d W**e**st W**e**nt S**e**t L**e**t	H**ea**d D**ea**d Pl**ea**sure Spr**ea**d	Man**y** ver**y**	Ag**ai**n S**ai**d	L**EI**CESTER	fr**ie**nd	g**ue**st

IV-Description of the short vowel /æ /

This vowel is identified as a front, half-open, short vowel. During its production:

- The soft palate is raised.
- The lips are neutrally open.
- The front of the tongue is raised between the half-open and open positions.
- The side rims make a very slight contact with the back upper molars.

This vowel **/æ /** can be heard in words like:

C**a**t B**a**g C**a**tch B**a**t G**a**s P**a**t	B**a**th H**a**t B**a**d Th**a**n L**a**d L**a**tter	Pl**ai**d

Lesson five : # *Back vowels*

The back vowels are those sounds articulated with the back of the tongue raised toward the soft palate. There are five back vowels in English. **/ uː / / ʊ / / ɔː / /ɒ /**

I-Description of the articulation of the vowel / uː /

This vowel is identified as a back, close, long vowel. During the production of this vowel:

- The soft palate is raised.
- The lips tend to be closely rounded.
- The back of the tongue is raised.
- The side rims of the tongue make a slight contact with the upper molars.

The back, close, long vowel **/ uː /** can be heard in words like:

M**oo**n S**oo**n N**oo**n F**oo**d L**oo**se T**oo**l	M**o**ve L**o**se	Gr**ou**p Tr**ou**p S**ou**p	J**u**ne Bl**u**e	Ch**ew**	J**ui**ce	Sh**oe**s

II-Description of the vowel / ʊ /

This vowel is similar to**/ uː /** but it is rather shorter. During the production of this vowel which is identified as a back, half-close, long vowel:

- The soft palate is raised.
- The lips are closely but loosely rounded.
- The back of the tongue is raised.
- The side rims of the tongue make a slight contact with the upper molars.

The vowel **/ʊ/** appears in words like:

B**oo**k G**oo**d L**oo**k	P**u**t F**u**ll S**u**gar B**u**sh	W**o**lf W**o**man	C**ou**ld Sh**ou**ld W**ou**ld

III- Description of the articulation of the vowel / ɔː /

This vowel is sometimes represented by /ɔː/ or simply **/ ɔ /.** During the articulation of this vowel:

- The soft palate is raised.
- The lips are medium rounded.
- The back of the tongue is raised.

The vowel / ɔ: / is heard in words like:

S**aw** J**aw**	T**al**k W**al**k ('l' is not produced) S**a**lt	B**ou**ght S**ou**ght	F**au**lt D**au**ghter C**au**ght	Or**a**l W**a**ter **A**ll **A**lways	M**o**re Sh**or**t	D**oor**	F**our** C**ou**rt	B**oar**d

IV- Description of the articulation of the vowel /ɒ /

This vowel is slightly similar to / ɔ: / but is rather shorter. It is sometimes transcribed /ɔ/ in case the longer one is transcribed / ɔ: /. During its articulation:

- The soft palate is raised.
- The lips are slightly open rounded.
- The back of the tongue is raised.

The back, open vowel /ɒ / can be heard in words like:

D**o**g S**o**rry C**o**llar	W**a**ll W**ha**t W**a**nt W**a**s	Kn**o**wledge	**Au**stralia **Au**stria Bec**au**se	C**ou**gh

V-Description of the articulation of the vowel /ɑ:/

During the production of this long, back vowel:

- The soft palate is raised
- The lips are neutrally open (the mouth is wide open).
- The back of the tongue is raised.

This vowel, identified as a long, open, back vowel, can be heard in words like:

After Tom**a**toes F**a**ther P**a**ss	C**ar** M**ar**k F**ar**	H**ear**t	C**al**m H**al**f	**Au**nt L**au**gh

Lesson six: # *Central Vowels*

By central vowels, we refer to those sounds where the main articulator is the centre of the tongue. There are three central vowels in English. **/ ʌ / /ɜ:/ / ə /**

I-Description of the articulation of the central vowel / ʌ /

This vowel is usually labelled the 'tent'. During the articulation of this short vowel:

- The soft palate is raised and the nasal resonator is shut off.
- The lips are neutrally open.
- The central part of the tongue is raised just above the open position.
- There is no contact between the side rims of the tongue and the upper molars.

Examples of words containing the sound are:

C**u**t S**u**n B**u**t C**u**p	C**o**ver C**o**lour C**o**me	C**ou**ple Y**ou**ng C**ou**ntry En**ou**gh	Fl**oo**d Bl**oo**d

II-Description of the central vowel /ɜ:/

During the articulation of this long vowel which can also be represented by **/ə:/**

- The soft palate is raised.
- The lips are neutrally spread, not supposed to be round.
- The central part of the tongue is raised between the hard and soft palate.
- There is a very slight contact between the side rims and the upper molars.

This central, long vowel can be heard in words like:

B**ir**d F**ir**st G**ir**l	H**er** S**er**f F**er**n	H**ear**d **Ear**th L**ear**n	W**or**d W**or**ld W**or**k W**or**se	F**ur** B**ur**n

II-Description of the articulation of the central vowel / ə /

--This vowel is commonly labelled 'the schwa'. There is a very high frequency of this short vowel, especially in unaccented syllables and words final positions. During its articulation:

- The soft palate is raised.
- The lips are neutrally open.
- The central part of the tongue is raised.
- There is a slight contact between the side rims and the upper molars.

The 'schwa' can be heard in words like:

Ahead **A**bout	Moth**er** Bett**er**	Doct**or** Scis**or**s	Particul**ar** sol**ar**	Behav**ior**
Fig**ure**	Annab**a** Dat**a**	Fam**ous** Delic**ious** men**tio**n	Col**our** Lab**our**	Is**o**late Dec**o**rate **O**blige
Poss**i**ble Insp**i**ration	F**a**tigue m**a**chine	Gentlem**e**n B**e**lieve	Wom**a**n	**U**ntil Vers**u**s

		B**e**hind El**e**ment Heav**e**n		Col**u**mn Ind**u**stry S**u**ppose

-- The "schwa" is represented by a symbol resembling the letter "e" rotated 180 degrees. The name itself is German and originates from the Hebrew word "shewa," which means "a neutral vowel quality," or more literally, "emptiness." The term also translates as the absence of a vowel or as a mid-front unrounded vowel sound.
The linguistic term "schwa" first appeared in early 19th century German studies, notably by Jacob Grimm. Besides English, languages such as Albanian, Catalan and Indonesian use the schwa sound, sometimes in stressed and unstressed variations.