**Phonetics 1st year lmd**

**i introduction to articulatory phonetics**

 **what is phonetics?**

Phonetics comes from the Greek word “phone”= sound. It is a science which studies the characteristics of human sound-making. It provides methods for their ***description, classification*** and ***transcription (***a way of representingall the sounds used in the different languages of the world by written symbols the International Phonetic Alphabet ‘IPA’)***.*** Phonetics is the systematic study of the way humans make, transmit, and receive speech sounds. It is divided into three branches:

* **articulatory phonetics**: investigates how speech sounds are produced and articulated by the vocal organs and their physiology (Place and Manner of articulation)
* **Acoustic phonetics:** studies the physical properties of speech sounds, as transmitted between mouth and ear. With attention to the sound waves generated and transmitted through the air.
* **Auditory phonetics**: studies the perception of speech sounds by the hearer's ears in terms of the physiology of hearing organs and how the brain interprets the information that is the psychology of perception.

**Phonetics vs. Phonology**

**Phonetics** is concerned with nature of speech sounds providing the materials for the description of their production; whereas **Phonology** a branch of linguistics dealing with the way speech sounds behave in a particular languages and how grammar governs the organization and combination of these speech sounds to convey meaning.

**Phonemes**

Phoneme is the smallest contrastive unit in the sound system of a language that distinguishes one word from another, a single sound having a symbol. An essential property of phoneme is that it functions contrastively (contrast in meaning). The classic way of finding the phonemes of a language is to use minimal pairs.

**minimal pair:** is a pair of words which differ in two ways: first they differ in meaning; and second, they differ in one and only one phonetic segment (sound). Minimal pairs are used to identify phonemes and distinguish between phonemes and allophones.

The words *cut and cat* or *will, wool, wall* all differ in meaning and different in one phonetic segment. Any two of these are therefore a minimal pair. If the substitution of a sound does not cause change in meaning we speak of an **allophones** of the same phoneme.

**Allophone**: is a variation in the pronunciation of the same phoneme. In phonemic transcription only phonemes are given symbols, usually placed between oblique lines //, compared to detailed phonetic transcription where allophonic details are introduced between square brackets [ ].

 **e.g.:** park spark. Phonemic transcription: /pa:k/, /spa:k/. In allophonic transcription: [pha:k], [spa:k ].

 [ph] and [p ] are allophones of the same phoneme /p/. Also the /l/ sound in *lip* is clear [l] and not in *doll dark* [˜l].

**Phones** are phonetic units that appear in square brackets. They are said to be the realization of the phoneme and the variants are referred to as allophones. Each phoneme in a particular language can have several phonetic realizations or allophones. Phones are universals, but phonemes are relative to individual languages.

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**Features of communication process**

**speech and writing**

When a person wants to convey a message, he/she can select any medium, the written, sign, or the spoken one. While communicating, the human being achieves an exchange of information by means of auditory and visual sensory stimulation. Children’s need to communicate and constant exposure to the spoken form of the language lead to rapid acquisition of the structure of the spoken language and of some conventional visual representation of speech. Most contemporary linguists assume that [spoken language](http://en.wikipedia.org/wiki/Spoken_language) is more fundamental than [written one](http://en.wikipedia.org/wiki/Written_language). The vast majority of messages are spoken. Speech evolved before human beings invented writing. In fact people learn to speak and process spoken language much earlier and more easily than [writing](http://en.wikipedia.org/wiki/Writing). Written form of the language usually reflects the spoken language and the different changes that might occur.

Speech is the only universal medium of linguistic communication among human beings (excluding deaf and dump), for about (5000) years before the development of writing systems at the beginning of recorded history. There have been many [cultures](http://en.wikipedia.org/wiki/Culture) and speech communities for which no system of writing has been developed and whose speakers are illiterate. However in communities with writing systems, speaking comes first in children’s language learning.

Each language has its own sounds, what makes the difference between languages is not so much the list of sounds but rather the way sounds are put together and the way in which they influence each other.

So phonetics is concerned with describing the speech sounds that occur in languages of the world. Its role is to try to find out what people are doing when they are talking and when they are listening to speech.

**Speech production**

**speech chain**

The speech chain consists of three events: the production of speech sounds through the vocal apparatus of the speaker, the travelling of the acoustic signal through the air and, finally, its reception by the ear of the listener. The brain of the speaker controls the production of speech sounds and the brain of the listener analyses the signal and converts it into meaning. The act of communication starts in the brain of the speaker and goes through different stages.

* 1. **Psychological stage**

Through it the message is conceived and formed also referred to as creative function. This function has three phases. The first: a need to communicate arises; this may be in response to some outside events or inner process. The second: what medium to use speech, writing, or sign language. It will often be determined by the circumstances. The third: a decision must be made as to the form the message will take: is it imperative, interrogative, or negative.

* 1. **Physiological stage**

The part of the brain can, with controlling muscular movement, send out instructions in the form of nervous impulses along the nervous pathway, connecting the brain to the muscles of the speech organs: the lungs, larynx, tongue… these instructions are to perform voice combination and seek to perform movements which will result in the right sounds produced in the right order also referred to as forwarding function.

* 1. **Physical stage**

At this stage the neurological activity which took place in the brain and along the nervous pathway is transformed into muscular activity. The lungs contracted, the vocal cords vibrate, the tongue shakes. All these movements are accurately controlled. The result of this action is to set air from the larynx which is obstructed, released by the vocal organs so that it comes out from the mouth in sequence of complex waves.

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**the production of speech sounds**

**II speech mechanism**

. Speech mechanisms are studied by the physiology and psychology of speech; and, in terms of their linguistic structure of utterances, they are studied by Psycholinguistics and Neurolinguistics. Articulatory phonetics is a branch of phonetics also called Physiological phonetics, concerned with sounds articulation by organs of speech. The speech of human being is the result of movements beginning at the diaphragm involving different parts of the chest, throat, mouth, and nasal passage. The great majority of speech sounds are generated by **the force of expiration**, which is part of biologically necessary processes of breathing. It may be said that the organs of speech are themselves not specifically devoted to speech production, but used for this purpose among others. In fact expiration is silent but the air passing under pressure if controlled or stopped, produces noises. Generally speaking, the mechanism for generating the human voice can be subdivided into three parts; the lungs, the vocal folds within the [larynx](http://en.wikipedia.org/wiki/Larynx#_blank), and the articulators.

**the organs of speech**

1. **The Lungs:**

Lungs are the breathing organs in the chest of man. The lungs produce an air pressure which is the fuel of the voice. Most sounds of all languages are made with the outgoing breath from the lungs (Egressive). As a result of the muscle movements, the air stream emerges from the lungs, passes through the trachea, larynx, pharynx, nose, or mouth.

1. **Source of Energy:**

The air stream expelled from the lungs is necessary for any vocal activity and for the production of most English sounds.

1. **The Larynx:**

The larynx ([/](http://en.wikipedia.org/wiki/Help%3AIPA_for_English)[ˈlærɪŋks](http://en.wikipedia.org/wiki/Help%3AIPA_for_English#Key)[/](http://en.wikipedia.org/wiki/Help%3AIPA_for_English)) (plural *larynges*), is made up of two cartilages attached to the top of the trachea, also called the voice box, is an [organ](http://en.wikipedia.org/wiki/Organ_%28anatomy%29) in the [neck](http://en.wikipedia.org/wiki/Neck) involved in breathing, sound production, and protecting the [trachea](http://en.wikipedia.org/wiki/Vertebrate_trachea) against food aspiration. The front of larynx has Adam’s Apple, which is in fact a box which contains vocal folds, which are situated just below where the tract of the [pharynx](http://en.wikipedia.org/wiki/Pharynx) splits into the [trachea](http://en.wikipedia.org/wiki/Vertebrate_trachea) and the [oesophagus](http://en.wikipedia.org/wiki/Esophagus).

1. **The Glottis**

The glottis is defined as the combination of the [vocal folds](http://en.wikipedia.org/wiki/Vocal_folds) (vocal cords) and the space in between the folds. The air expelled from the lungs passes up and out through the glottis, a part of the larynx, itself part of the throat. Across the glottis lie two membranes known as the vocal fold. They are like curtains, two thick flaps of muscles and can be pulled together completely, to cut off the outward stream of air, as in ‘holding a breath’. They can become less active and be folded back at each side, and permit the air to flow freely. A short blocking by the vocal cords followed by the freeing of air produces sounds. It may take three basic positions:

1. **Open glottis** When vocal cords are spread apart, the air from the lungs passes between them unimpeded (no vibration). Sounds produced in this way are described as **voiceless,** like /s,f/
2. **Vibrating/narrow glottis:** When the vocal cords are drawn together that is narrowed, the air pressure from the lungs repeatedly pushes them apart as it passes through, so it is rapidly opened and closed (about 200time/second) creating vibration effect. Sounds produced in this way are described as **voiced.** /z, v/

The distinction between these sounds can be felt physically if we place a fingertip gently on the top of your Adam’s apple and produce sounds like /zz/ or /vv/. Because these are voiced sounds you feel vibration. But with the voiceless sounds /ss/ or /ff/ there is no vibration.

1. **Closed glottis:** the glottis are tightly closed the air is not escaping freely there is obstruction, we call this glottal stop or plosive as in coughing gently /a?a?/.
2. **TheVelum /Soft Palate:**

The velum is the membranous part of the roof of the mouth also known as the soft palate. The velum can take three different positions:

**a**- **Raised position**: when the velum is lifted by muscles the nasal cavity is blocked and the air stream can only escape through the mouth, this known as the velic closure and the sound produced is oral. Most English sounds are produced this way.

**b**- **Relaxed position**: when the velum hang down the air stream may enter the nasal cavity (nose) as well as the oral one (mouth). This lowered state of the velum is referred to as velic opening, as in normal breathing.

**c**- **Lowered position**: the velum or soft palate may be lowered and the air stream may enter the nasal cavity but complete obstruction is made in the oral cavity (mouth closed) the sounds is nasal like: /m, n, ŋ/

1. **The Nasal cavity:** It is a fixed body and of fixed dimensions and shape. Its contribution to speech is entirely that of resonance.
2. **The Oral cavity:**

 Above the glottis and the vocal cords, control can be caused, mainly between parts of the tongue and parts in the mouth mainly the upper parts of the mouth called articulators: upper lips, upper teeth, alveolar ridge, hard palate, soft palate, velum or uvula. This is partly due to the mobility of the lower jaw. The main places used are the root, back, front, centre, the blade and tip of the tongue. The terms used to describe many sounds are those which denote their place of articulation.

1. **The Tongue:**

The tongue is most flexible part; it is a moveable organ and is responsible for varieties of articulation of both vowels and consonants more than any other speech organ. The position of the tongue helps modifying the quality of a sound. In phonetics the tongue is divided into: The part opposite the hard palate is called the front of the tongue, and that which faces the soft palate is called the back of the tongue, the section facing the teeth is called the blade and its extremity is the tip of the tongue. The movement of each of these parts modifies the space through which the air has to pass and thereby produce different sounds. Most consonant sounds are produced by using the tongue or other parts of the mouth to contract the shape of the oral cavity through which the air is passing.

1. **The Lips:**

Are moveable organs that participate in the production of different sounds. They may take different positions. Lips may be closed together as in /m/, may be relaxed or neutral with the lower jaw as in /e/ or may be held apart remaining close and spread as in /i:/.they may be held wide open as in /a:/, can be round position as in :u: or open round as in /o/.

**The Criteria for the Description of Speech Sounds**

The description of speech sounds depend on the variation of their place and manner of articulation that is different positions of articulators:

* 1. The air stream pulmonic /non pulmonic, egressie /ingressive.
	2. The position of the glottis (voiced/voiceless).
	3. the position of the velum (soft palate).
	4. the position of the lips (moveable part).
	5. The position of the tongue (most flexible part).

**Organs of Speech**



**Different Positions of the Glottis**



**Aspects of Sound Description**

To describe any sound, it is necessary to provide essential information:

1. The nature of the air stream usually expelled from the lungs (Egressive/Ingressive).
2. The action of the Vocal Folds whether they are closed, wide open or vibrating.
3. The position of the Soft Palate to decide whether the sound is nasal or oral.
4. The disposition of the moveable organs of the mouth.
5. The shape of the lips and the tongue.

 The lips contribute in the production of sounds they are moveable organs: they can have different positions:

1. They can be held together as in: Word
2. They can be held apart but remaining close together and spread as in :see
3. They can be held in relaxed position with lowering of the jaw, as in: said
4. They can be held wide apart this is called open position as in: car
5. They can be rounded this is the close rounded position as in: you
6. They can be held wide apart this is the open round position as in: cord

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**Description and classification**

**of speech sounds**

1. **VOWELS**
2. **Description of English Vowels**

Speech sounds are traditionally classified as consonants and vowels. All English vowels are pulmonic egressive and voiced, produced without obstruction of the air. Vowels are arranged according to their point of articulation in the mouth. Vowel sounds are differentiated mainly by three main factors, the position of the tongue in the mouth. These positions give: **front** and **back** according to the part of the tongue that is highest. Vowels can also be distinguished as **open** and **close** according to different degree of openness and closeness of the mouth, which involve the movement of the lower jaw. The shape of the lips as well as degree of **rounding** and **spreading** also influence vowel production, they may be **spread, neutral, rounded,** or **open**. Each of these positions determine the shape of the opening through which the breath has to pass, thus would result to different sound production.

**2)** **Categories of Vowels**

**Length:** Vowels can be classified into different ways the principle of vowel classification is the length. English has long and short vowels; long vowels take more time in its articulation (duration) whereas short vowels take less time in its articulation. English long vowels are: **/a:/, /3:/, /i:/, / ɔ:/, /u:/**

Short vowels are: **/ I, e, æ, ʊ, ʌ, ә, ɔ/**

**3)** **Classification of vowels**

Vowels are classified according to their point of articulation in the mouth: front, central, and back in addition to High, Mid, and Low, refers to the position of the tongue as well as shape of the lips.

**a)- Front vowels:** refers to the front of the tongue raised towards the hard palate. They are four: **/i:/, /I/, /e/, /æ/**

**b)- Central vowels**: refers to the centre of the tongue raised towards the hard or soft palate. There are three: **/3:/, /ʌ/,/ә/**

**c)- Back vowels**: refers to the back of the tongue raised towards the soft or hard palate. there are five: **/ɔ/,/ɔ:/,/u:/, /ʊ/,/a:/**

Vowels can also be classified according to the degree of rising of the tongue.

**- High**: refers to the tongue raised towards the roof of the mouth.

**- Low**: refers to the tongue not raised but rather lowered from the resting position.

**- Mid**: refers to the tongue mid position, we distinguish Low mid and High mid as in diphthongs **/eI/** in face and **/ǝu/** in goat.

Open and close refer to relative opening of the jaw.

Rounded and Unrounded refer to the shape of the lips.

 **English Vowels.**

**Front vowels**

- **/i:/** front close long vowel produced with spread lips. The front of the tongue is raised

Eg: Eat /i:t/, Receive /rɪsiːv/, Machine /məʃiːn/ See /si:/ Bee /bi:/

- **/I/** front half close short vowel produced with slightly spread lips. The front of the tongue is raised between close and half close. Eg: with/ wɪð/, little /lɪtl/, Bit /bɪt/, system /sɪstəm /

**- /e/** front half close short vowel produced with lips slightly spread. Front of the tongue is raised between half close and half open. Eg: spread, friend, went, again.

 **-/ae/** front open short vowel produced with neutrally open lips. Front of the tongue is raised between half open and open. Eg: add / æd /, hat / hæt /, catch /kætʃ/

**Back vowels**

**/u:/** back close long vowel produced with closely rounded lips. Back of the tongue raised in fully closed. Eg: food tool blue/blu:/ shoes /ʃuːz/

**/ʊ/** back half close short vowel produced with loosely rounded lips, Back of the tongue raised in closed to half closed. Good /ɡʊd/, Sugar /ʃʊɡə(r)/, Book, look

**/ ɔ:/**back half close long vowel produced with medium rounded lips, Back of the tongue raised half closed to half open. Eg: call /kɔːl/, bought /bɔːt/, water /wɔːtə(r)/

 /**ɒ/ɔ/** back half open short vowel produced with slightly open rounded lips. Back of the tongue raised open position. Eg: sorry /sɒri/, cough /kɒf/,what / wɒt/.

**/a:/** back open long vowel produced with neutral open lips, the back of the tongue is raised in fully open position. Eg: calm heart after father

**Central vowel**

**-/ʌ/** central half open vowel during its articulation lips are neutrally open. Central part of the tongue raised open position. Come /kʌm / cup/ kʌp/ mother /mʌðə(r)/

**/3:/** central half open long vowel produced with neutrally spread lips. Centre of the tongue is raised between soft and hard palate, Eg : girl bird heard curl /kɜːl/
**/ǝ/** central schwa half close vowel produced with neutrally open lips, centre of the tongue is raised between half open and half close. Eg: above əˈ/bʌv/ doctor /dɒktə(r)/

**Cardinal Vowels of Daniel Jones**

Daniel Jones a phonetician who introduced in the early 20th century a diagram system of cardinals.Where vowels were introduced according to different positions of the tongue and lips.



**Diphthongs and Glides**

English front vowels are mostly accompanied by lip-spreading, and back vowels by lip-rounding. Long vowels involve maintaining of an articulatory position relatively constant.

Articulation may be made by moving from one vowel position to another through the intervening positions. These are called diphthongs and English has many examples.

**English diphthongs**

/ai/ central open with lips neutral to close front with spread lips, as lie /lai/; might /mait/

/au/ central open with lips neutral to close, back with rounded lips, as in cow /kau/; now /nau/

/oi/ back open with rounded lips to front close with spread lips, as boy /boi/; coil /koil/

**English glides**

Glides that exist only in British English but not American are:

/iә/ front close with spread lips to central half close with lips neutral, as here /hiә/ near /niә/

/eә/ front half open with spread lips to central half close with lips neutral, as hair /heәr/; air

/uә/ back close with rounded lips to central half close with lips neutral, as poor /puә/

/әu/ back half close to close with rounded lips, as in hole /hәul/; go /gәu/

**Triphthongs**

Sequence of three vowels as in

/aiә / as in hired /haiәd/ tyre /taiә/

/auә/ as in hours /auәz/, tower /tauә/

/oiә/ loyal /loiәl/

**Chart of English vowels**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Front | Central | Back |
| Unrounded | Rounded | Unrounded | Rounded | Unrounded | Rounded |
| High Close  Open | I:I |  |  |  |  | u:u  |
| High Close  Open | eie |  |  | 3 ә |  | әu o |
| High Close  Open | æ |  | a |  |  | O: |

**DESCRIPTION OF SPEECH SOUNDS**

Relevant features for the description of speech sounds are of two broad categories: The first category contains description of the physical aspects of English sounds as precisely as possible. The second category contains those features that are both phonetically and phonologically relevant in English.

**Phonetic Features**

1. **Loudness**

Loudness is one of the main phonetic properties of spoken language; it is related to the breadth, or amplitude, of the vibration of the vocal folds, the greater the amplitude of the vibration, the louder the sound is.

1. **Pitch**

Pitch is also an important phonetic characteristic. It is related to the frequency of the vibration of the vocal folds: The faster the vocal folds vibrate, the higher the pitch is. It is a component of stress, and it shapes the intonation of connected speech. Stress and pitch movement tell us, for example, whether a sentence like *She speaks English* is meant to be a statement or a question.

1. **Tone of voice**

Tone of voice, also called voice quality, tonal quality, or timbre, refers to the difference in "colour" that we hear between two voices when they produce a sound with the same phonetic features. The different tones of voice are produced by different patterns of vibration of the vocal folds, Tone of voice, like loudness and pitch, is a feature of spoken language as well as of the pronunciation of individual sounds.

1. **Duration and length**

Duration and length both refer to the span (period) of time during which a sound is sustained. The term duration is usually restricted to phonetics, and is used for the actual time taken in the articulation of a sound.

1. **Air-stream mechanism**

All speech sounds are made with some movement of air. The majority of sounds used are produced with air that is pushed up from the lungs and leaves the body through the mouth and sometimes through the nose.. This movement of air is called an egressive pulmonic airstream.

1. **Voicedness and voicelessness: The state of the glottis**

All sounds that are produced by an egressive pulmonic air-stream mechanism, and therefore all English sounds, pass through the glottis, if the vocal folds are together, the air-stream forces its way through and causes the vocal folds to vibrate. Sounds produced in this way are called voiced. If the glottis is open, i.e. if the vocal folds are apart, the air passes through without causing the vocal folds to vibrate. Sounds produced in this way are called voiceless. A third possibility is that the glottis is closed, i.e. the vocal folds are firmly pressed together, and the air-stream is stopped completely. Some linguists consider the voiced/voiceless contrast a distinctive feature in English since it distinguishes meaning.

**Phonologically Relevant Features: Distinctive Features**

1. **Intensity of articulation 1: Lenis and fortis**

The voiced/voiceless contrast is usually accompanied by a difference in the force with which the air-stream is pushed up. Voiced sounds are usually made with a relatively weak breath force, or little muscular tension. This is called a lenis articulation Voiceless sounds, on the other hand, are made with more force, or higher tension. This is called a fortis articulation.

1. **Place of articulation**

An important feature for the description of consonants is the exact place where the air-stream is obstructed. The place of articulationnames the speech organs that are primarily involved in the production of a particular sound. To produce a consonant, there is usually one active, mobile, lower speech organ that moves and makes contact with a passive, immobile, upper speech organ.

1. **Manner of articulation**

Another important feature for the description of speech sounds is the type or degree of closure of the speech organs involved. Thus the manner of articulation refers mainly to the degree to which the air-stream is obstructed at the place of articulation of consonants.

**Description and classification**

**of english consonants**

Two types of sounds are identified in English language, consonants and vowels. These sounds are described and classified according to different criteria namely place and manner of articulation. These sounds vary according to different features: The position of the tongue, position of the vocal cords (vibration or not), position of the soft palate (raised or not), position of the lips.

**1- PLACE of ARTICULATION**

**Bilabial sounds:** are produced with upper and lower lips. There is only one fortis bilabial in English, namely /**p**/ as in *peach,* whereas there are two lenis bilabials, /**b**/ as in *bat* and */****m****l* as in *mango,* /**w**/ as in *way.*

**1. Labiodental sounds:** are produced by a movement of the lower lip against the upper teeth. There is one fortis labiodental in English, */***f*/***as in *film,* and one lenis labiodental, /**v**/ as in *video.*

The bilabials and labiodentals form one larger group, the **labials,** because they all make use of the lips.

**2. Dental** / **Interdental sounds**: are made with the tongue tip and edges between the upper and lower teeth or against the upper teeth. The two dentals in English are the fortis /**θ/** as in *thin* and the lenis *1* **ð** *1* as in *this.*

**3. Alveolar sounds:** are made with the tongue tip coming near or touching the bony ridge behind the upper teeth, called the alveolar ridge*.* The two fortis alveolars are /**t**/ as in *tiger* and /**s**/ as in *snake.* The four lenis alveolars are /**d/** as in *dolphin*, /**z**/as in *zebra*, /**n/**as in *night,* and **/l/**as in *leopard.*

**4. Postalveolar sounds:** are made with the tongue tip approaching or touching the rear of the alveolar ridge or the area just behind it. There is only one postalveolar in English, namely the lenis **/r/**as in *red.*

**5. Retroflex sounds:** [from Latin *retroflexus,* 'bent backwards'] are produced when the tip of the tongue is curled back to approach or make contact with the front part of the roof of the mouth, called the hard palate just behind the alveolar ridge. /r/.

**6. AlveoPalatal sounds:** are made with the tongue tip touching the alveolar ridge, and with a simultaneous raising of the blade of the tongue towards the hard palate. The two fortis palatoalveolars in English are /**tƒ**/ as in *cheese* and */****ƒ****/* as in *shout.* The two lenis palatoalveolars are /**d3**/ as in *gin* and /**3/** as in *measure.*

**7. Palatal sounds:** are produced when the body of the tongue comes near or touches the (hard) palate. The lenis /**j**/as in *yes* is the only palatal in English.

**8. Velar sounds:** are made by placing the back of the tongue against or near the velum, or soft palate. There is one fortis velar in English, namely /**k**/ as in *Canada,* whereas there are three lenis velars, /**g**/ as in *Greenland,* In /**ŋ**/as in *England,* and /**w**/ as in *Wales.*

1. **Glottal sounds:** are produced in the larynx when air passes through the glottis. The only English phoneme that is articulated in this way is the Fortis /h/ as in *hat.*

**2- MANNER of ARTICULATION**

**Stops /Plosives:** are sounds produced by stopping the air (briefly) somewhere in the mouth or vocal passage and then releasing it (abruptly). The term stop refers to the stopping of the air; the word plosive refers to the release of air. English stops are: voiceless /**p**/, /**t**/, /**k**/ and voiced /**b**/, /**d**/, /**g**/.

**Fricatives / Sibilants:** are sounds produced by having the air rub against some surface in the mouth or vocal passage causing friction. English fricatives are: voiceless /**f**/,/**θ**/, /ʃ/, /**s**/, and voiced /**v**/, /**ð**/, /**3**/, /**z**/, /**h**/ as in ‘fish’, ‘those’.

**Affricates:** are sounds which are made up of two parts: a stop and a fricative. The two English affricates are voiceless /**t**ʃ/ and voiced /**d**ʒ/

**Nasal**s: are sounds produced with the air going through the nose or nasal cavity. English nasals are /**m**/, /**n**/, /**ŋ**/.

**Laterals:** are sounds produced by having the air go out of the mouth from both sides of the tongue. The only English lateral is /**l**/.

**Vibrants:** are sounds produced by having the tongue vibrate in the mouth. The only English vibrant is /r/

**Semi-vowels**: are sounds which are considered half consonants half vowels. They are like consonants in their structural behaviour and like vowels in their qualities. English semi-vowels are /w/, /j/.

**Retroflex sounds:** [from Latin *retroflexus,* 'bent backwards'] are produced when the tip of the tongue is curled back to approach or make contact with the front part of the roof of the mouth, called the hard palate just behind the alveolar ridge. /r/.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Type of articulation | Bila-bial | Labio-dental | Interdental | Alveolar | retroflex | Alveopalatal | palatal | velar | glottal |
| Stops vl vd | Pb |  |  | td |  |  |  | kg |  |
| Affricates vl vd |  |  |  |  |  | tʃdʒ |  |  |  |
| Fricatives vl vd |  | fv | θð | sz |  | ʃʒ |  |  | h |
| Nasals vd | m |  |  | n |  |  |  | ŋ |  |
| Laterals vd |  |  |  | l |  |  |  |  |  |
| Vibrant vd |  |  |  |  | r |  |  |  |  |
| Semi-vowel vd | w |  |  |  |  |  | j |  |  |