



# Phonetics and phonology - a brief introduction -



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## *Essential definitions*

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*Phonetics* is the study of human sounds in general without reference to their systemic role in a specific language (contrast *phonology* below). Phonetics is divided into three types according to the production (*articulatory*), transmission (*acoustic*) and perception (*auditive*) of sounds.

Sounds can be divided into consonants and vowels. The former can be characterised according to 1) *place*, 2) *manner of articulation* and 3) *voice* (voiceless or voiced). For vowels one uses a coordinate system called a *vowel quadrangle* within which actual vowel values are located.

*Phonology* This is the functional classification of the sounds of a particular language. It is the system of sounds by means of which meanings are differentiated in a language and which serve as the building blocks for the higher linguistic levels, e.g. morphology.

*Phoneme* This is the smallest unit of language which distinguishes meaning, it is the organisational unit of phonology. Phonemes are written in slashes: / /. Examples of phonemes are /k/ and /g/ in English or German. Their status is shown by finding minimal pairs in which the only difference is between the two sounds in question, e.g. *cot* and *got* in English or *Kunst* and *Gunst* in German.

*Allophone* This term has two basic meanings. a) the realisation of a phoneme; b) non-distinctive variants of a phoneme. Allophones are written in square brackets: [ ]. Examples of allophones are provided by different sounds in a language which do not change the meaning of a word, e.g. the uvular and alveolar /r/ of German as in *Brot* [bro:t] or [bro:t]. An English example would be provided by the alveolar and the velarised /l/ of English as in *leap* [li:p] and *deal* [di:l].

*Phonotactics* This is the area which is concerned with the possible sequences of sounds in a language. For instance, there is a word *fact* in English with a syllable-final /-kt/ but there is no word *ctaf* as /kt-/ cannot occur at the beginning of a syllable. Another example of a phonotactic restriction can be seen with the vowel /ʌ/ which occurs in closed syllables but not in open ones, e.g. *dove* /dʌv/ is a permissible word in English but /dʌ/ is not because the syllable is not closed by a consonant at the end.

*Prosody* is concerned with features of words and sentences above the level of individual sounds, e.g. stress, pitch, intonation. Stress is frequently contrastive in English as in <sup>1</sup>*convert* (noun) and *con*<sup>1</sup>*vert* (verb). Note that the stressed syllable of a word is indicated by a superscript vertical stroke placed before the syllable in question, e.g. *hostel* /<sup>h</sup>hɒstəl/ and *hotel* /həʊ<sup>t</sup>tel/.

It is essential to distinguish between *writing* and *sound*. There are various terms to characterise the relationship between the written and the spoken word depending on what the *match* between the two is like: *homophony* ‘sameness of sound’, e.g. *meat* and *meet*, *homography* ‘sameness of writing’, e.g. *lead* and *lead*, *homonymy* ‘sameness of sound and writing’, e.g. *bear* and *bear*.

## Transcribing English

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*Received Pronunciation* This is the standard pronunciation of British English. It stems originally from the speech of the middle and upper classes in London. In the course of the 19th century it developed into a sociolect, particularly when adopted by the *public schools*, and attained a wide distribution in Wales and Scotland as well. The term was coined by the English phonetician Daniel Jones. It is often abbreviated to RP.

Received Pronunciation is the form of English which is generally taught to European students. It differs from American English in some key respects, chiefly in the realisation of vowels and in the lack of /r/ in syllable-final position, e.g. a word like *dark* is pronounced without an /r/ in RP and with an /r/ in American English and many other varieties of English as well.

*International Phonetic Alphabet* A system of transcribing the sounds of languages which consists of some Latin and Greek letters and a variety of additional symbols and diacritics. The goal is to represent each recognisable sound in a unique fashion. The alphabet was developed at the end of the 19th century. The name is usually abbreviated to IPA.

Many of the symbols found in the IPA are the same as those of the Latin alphabet as largely used for English and German, e.g. *kept* is transcribed as /kept/. In order to transcribe other English words, however, certain special symbols are required. These are listed below.

## *Broad and narrow transcription*

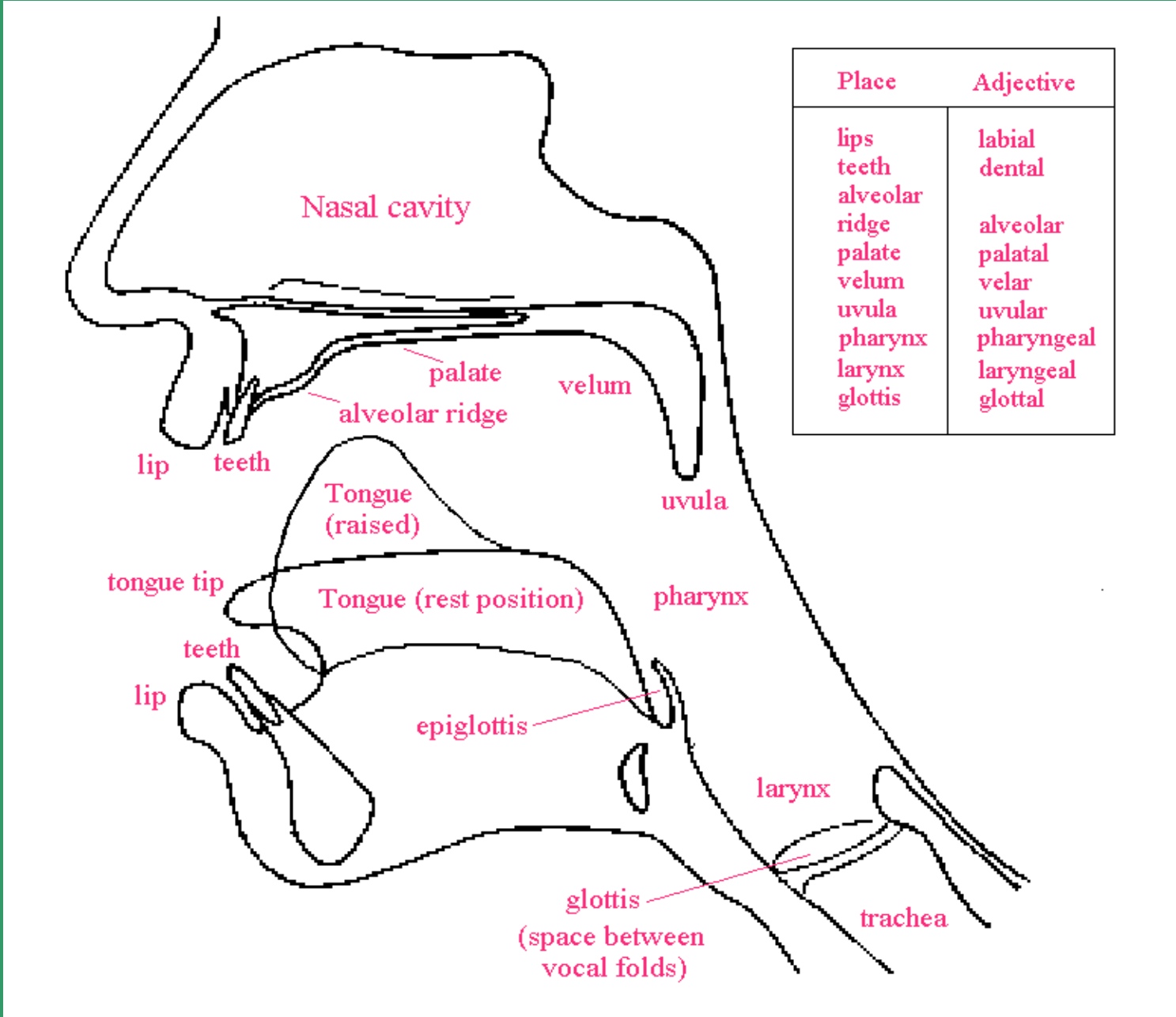
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The amount of phonetic detail you indicate in a transcription is often a matter of choice. For instance, the lateral /l/ is velarised in syllable-final position in RP, thus *pull* is narrowly transcribed as [pʊɫ̠]. The /r/ in English is not rolled so that a narrow transcription would demand [ɹ] rather than [r] as in [ɹeɪn] (which is a trilled /r/ as in Italian in narrow transcription). However, for practical purposes, a broader transcription is used so as not to have too much detail which makes the recognition of a word difficult. Here one would transcribe the words just given as [pʊl] and [reɪn] respectively.

## **Points of articulation**

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The following table illustrates the main points of articulation in the mouth. The most important of these is the alveolar ridge as the most common sounds are produced here, e.g. /t,d,s,z,n,l/. The nasal cavity is used to produce nasals, e.g. /m, n, ŋ/. In German the /r/ is articulated by raising the back of the tongue towards the uvula. The glottis is the space between the vocal folds. When air escapes here and the folds are brought together the latter vibrate. This accounts for the characteristically ‘soft’ sound of /z/ as opposed to /s/.



## CONSONANT CHART FOR ENGLISH

	labial	dental	alveolar	post-alveolar	palatal	velar	glottal
stops	p b	t d				k g	
fricatives	f v	θ ð	s z	ʃ ʒ			h
affricates				tʃ dʒ			
nasals	m		n			ŋ	
liquids		l, r					
glides	w (labio-velar)				j (palatal)		

The left symbol of each pair is voiceless, the right one voiced.

Examples: *pit* /pɪt/, *bit* /bɪt/, *fit* /fɪt/, *vet* /vet/, *met* /met/, *wet* /wet/, *too* /tu:/ *do* /du:/, *thin* /θɪn/, *this* /ðɪs/, *low* /ləʊ/, *row* /rəʊ/, *sue* /su:/, *zoo* /zu:/, *new* /nju:/, *shoe* /ʃu:/, *vision* /vɪʒən/, *cheap* /tʃi:p/ *jeep* /dʒi:p/, *yes* /jes/, *kit* /kɪt/, *get* /get/, *sing* /sɪŋ/, *hit* /hɪt/

*Special consonant symbols required for English*

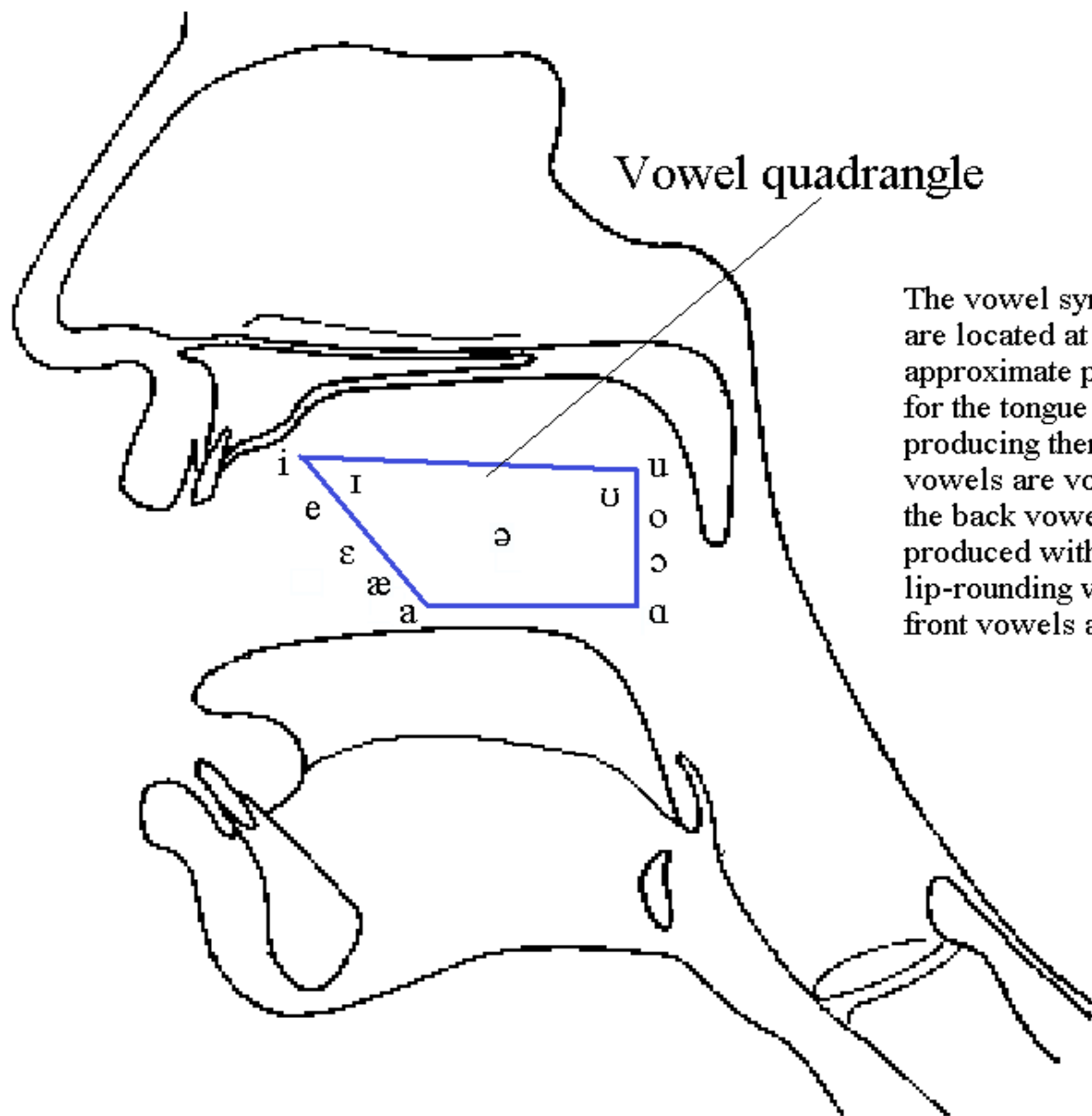
	labial	dental	alveolar	palatal-alveolar	palatal	velar	glottal
1)	(p b)	(t d)			(k g)		
2)	(f v)	θ ð	(s z)	ʃ ʒ		(h)	
3)				tʃ dʒ			
4)	(m)		(n)			ŋ	
5)			(l, r)				
6)	(w)						(j)

## The system of cardinal vowels

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The system of cardinal vowels was developed early in the 20th century by the English phonetician Daniel Jones. The idea was to use an abstract rectangle roughly representing a sagittal section of the mouth and to take the extreme points of this rectangle as reference points when describing actual vowels of real languages. The cardinal vowels are thus vowel values at the extreme edges of the vowel quadrangle and represent the furthest the tongue can travel towards the edge of the quadrangle without the vowel quality of the articulation being lost. For instance, the cardinal vowel /i/ is articulated by pushing the tongue as far forward and upwards as possible while still pronouncing a vowel. Any further and the sound would be the palatal fricative /j/.

The four extremes of the vowel quadrangle are covered by /i/ (front, high), /u/ (back, high), /a/ (front, low) and /ɔ/ (back, low). Apart from these points one can also recognise two further levels of height between high and low. These are mid-open and mid-closed and are necessary when describing many of the world's languages. The mid-open front vowel is /ɛ/ and the mid-closed front vowel is /e/ while the mid-open back vowel is /ɔ/ and the mid-closed back vowel is /o/. You will note that this gives eight vowels, but there are in fact 16 cardinal vowels. The explanation here is that vowels can be rounded or unrounded. Across the world's languages one can notice a significant statistic, namely that front vowels tend to be unrounded and back vowels to be rounded. There are some exceptions to this, for instance French, German, Finnish, Hungarian, etc. have the front rounded vowels /y/ and /ø/. Unrounded back vowels are comparatively rare cross-linguistically.

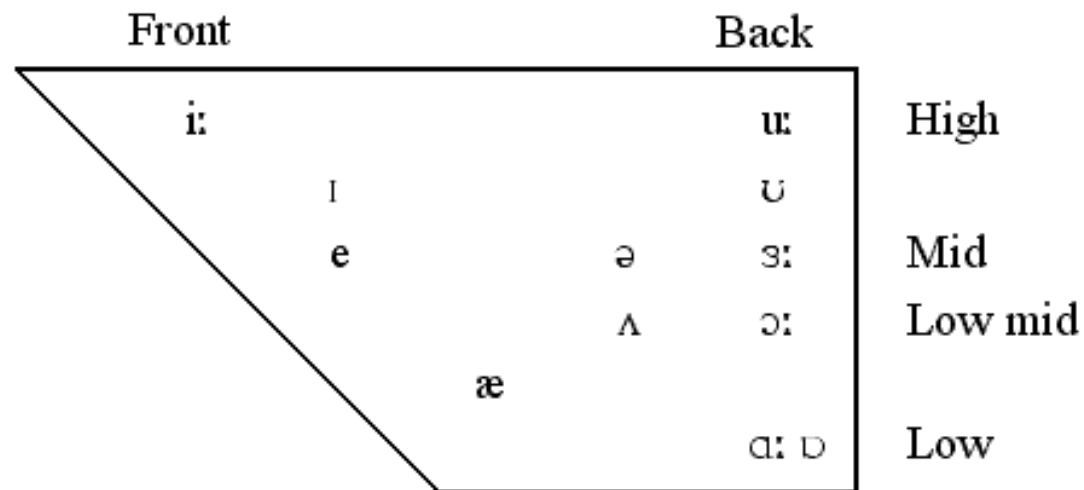


### Vowel quadrangle

The vowel symbols are located at the approximate position for the tongue when producing them. All vowels are voiced and the back vowels are produced with lip-rounding while the front vowels are not.

## VOWEL CHART AND SYMBOLS FOR ENGLISH

### *Monophthongs*

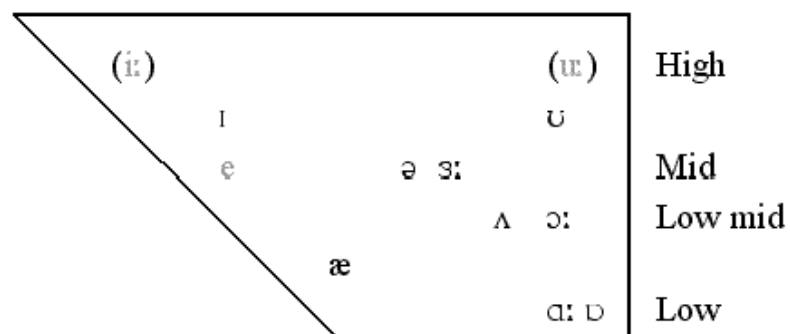


**Examples:** *beat* /bi:t/, *bit* /bɪt/; *bet* /bet/; *bat* /bæt/, *bard* /bɑ:d/, *bo(ttom)* /bɒtəm/; *bull* /bʊl/, *but* /bʌt/; *bought* /bɔ:t/, *boot* /bu:t/; *(butt)er* /bʌtəl/, *bird* /bɜ:d/.

<i>Diphthongs</i>	rising:	ai, au, ɔi	<i>bile</i> /bail/	<i>bow</i> /bau/	<i>boil</i> /boil/
		ei, əʊ	<i>bait</i> /beit/	<i>boat</i> /bəʊt/	
	centring:	ɪə, əə, ʊə	<i>pie</i> /piə/	<i>pear</i> /pɛə/	<i>poor</i> /pʊə/

## *Special vowel symbols*

Nearly all the vowel symbols needed for English (Received Pronunciation) are different from the Latin alphabet symbols. Only the long vowels in *beet*, *boot* and the short vowel in *bet* are the same. A length mark — : — is used to indicate that a vowel is long.



<i>Symbol</i>	<i>Description</i>	<i>English word</i>
[ i ]	centralised high front unrounded vowel	bid
[ æ ]	low front unrounded vowel	bat
[ ɑ ]	low back unrounded vowel	class (RP)
[ ɒ ]	low back rounded vowel	stop
[ ɔ ]	mid back rounded vowel	thought
[ ʌ ]	low mid back unrounded vowel	cup
[ ʊ ]	centralised high back rounded vowel	push
[ ə ]	unstressed central vowel (schwa)	about
[ ɜ ]	stressed central vowel (schwa)	bird (RP)
[ ɝ ]	r-coloured schwa	bird (AmerEng)

## Standard lexical sets

(RP vowel values with some variants, after Wells 1982)

### *Short vowels*

KIT	/ɪ/
DRESS	/e/
TRAP	/æ/
LOT	/ɒ/
CLOTH	/ɒ, ɔ:/
STRUT	/ʌ/
FOOT	/ʊ/

### *Long vowels*

FLEECE	/i:/
PALM	/ɑ:/
BATH	/ɑ:/
THOUGHT	/ɔ:/
GOOSE	/u:/

### *Rising diphthongs*

PRICE	/aɪ/
MOUTH	/aʊ/
CHOICE	/ɔɪ/
GOAT	/əʊ/
FACE	/eɪ/

### *Centring diphthongs / rhotacised vowels; Unstressed vowels*

NEAR	/ɪə/	/iə̃/		
SQUARE	/ɛə/	/eə̃/		
CURE	/ʊə/	/uə̃/		
START	/ɑ:/	/ɑ:r/	COMMA	/-ə/
NORTH	/ɔ:/	/ɔ:r/	LETTER	/-ə/ /-ə̃/
FORCE	/ɔ:/	/o:r/	HAPPY	/-ɪ/
NURSE	/ɜ:/	/ə̃:/		

## Transcription samples

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*teeth* [ti:θ]

*beat* [bi:t]

*man* [mæn]

*jaw* [dʒɔ:]

*Latin* ['læti:n]

*butter* ['bʌtə]

*occur* [ə'kɜ:]

*executive* [eg'zekjʊti:v]

*Berlin* [bɜ:'li:n]

*linguistics* [li:n'gwɪstɪks]

*homogenize* [hə'mɒdʒənaɪz]

*teethe* [ti:ð]

*bit* [bɪt]

*men* [men]

*both* [bəʊθ]

*Danish* [deɪmɪʃ]

*verse* [vɜ:s]

*below* [bi'ləʊ]

*luxury* ['lʌgʒəri]

*Kanada* ['kænədə]

*synchrony* ['sɪkrəni]

*paralysis* [pə'ræli:si:s]

*cease* [si:s]

*pull* [pʊl]

*occur* [ə'kɜ:]

*thought* [θɔ:t]

*chap* [tʃæp]

*because* [bi'kɔ:z]

*consider* [kən'sɪdə]

*manager* ['mænədʒə]

*hypothesis* [hai'pɒθɪsɪs]

*diachrony* [dai'ækroni]

*variable* ['veəriəbl]

*seize* [si:z]

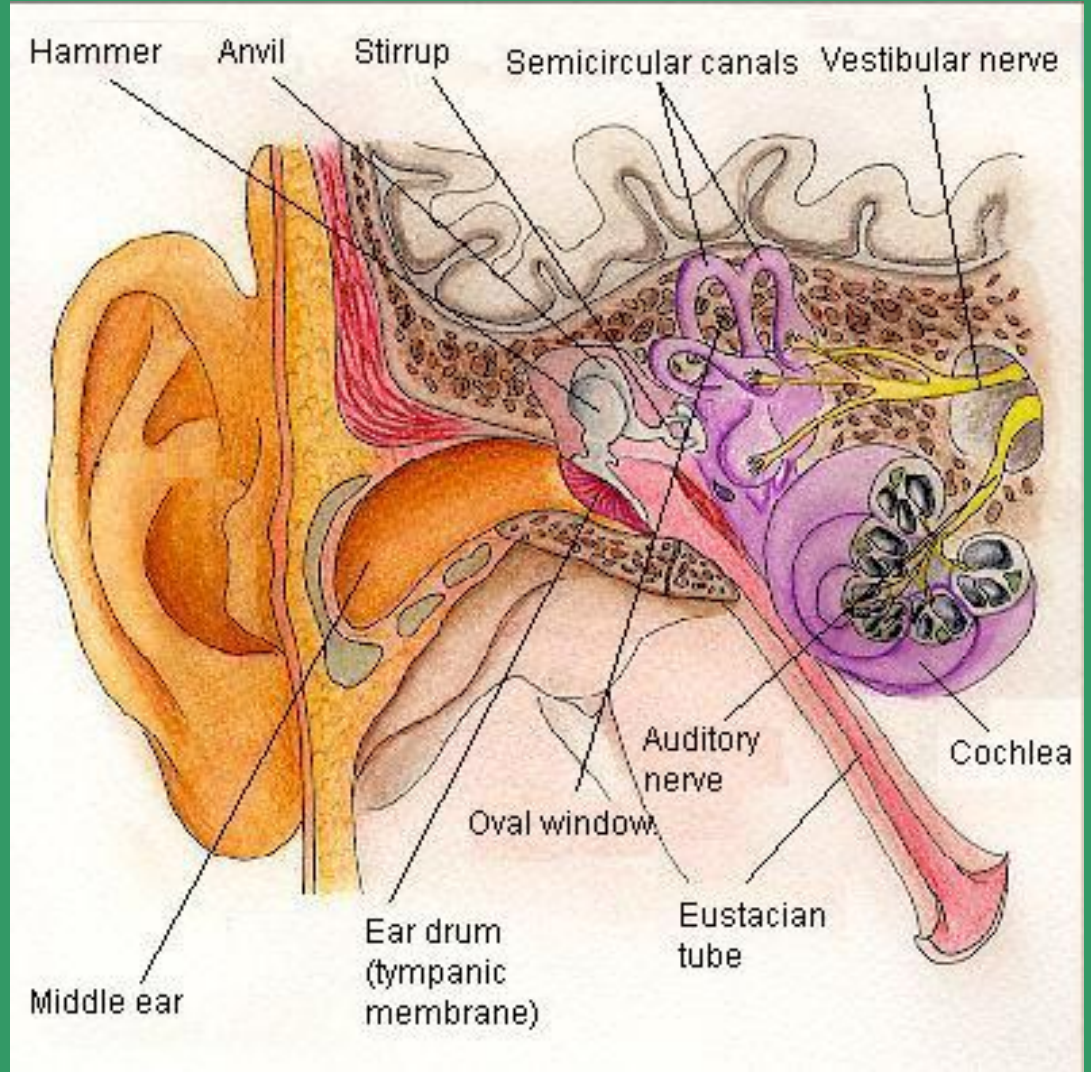
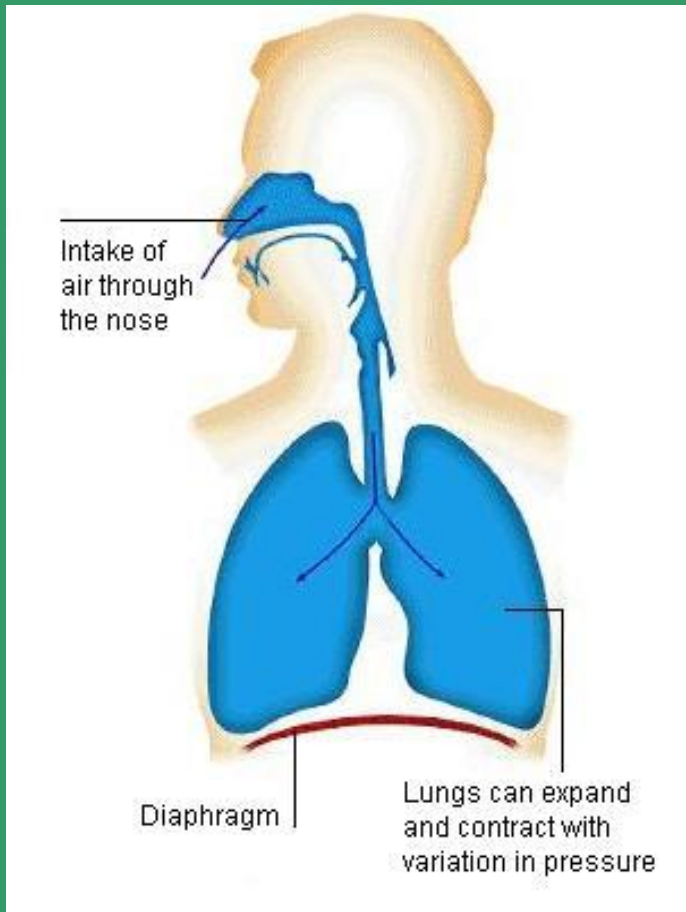
*pool* [pu:l]

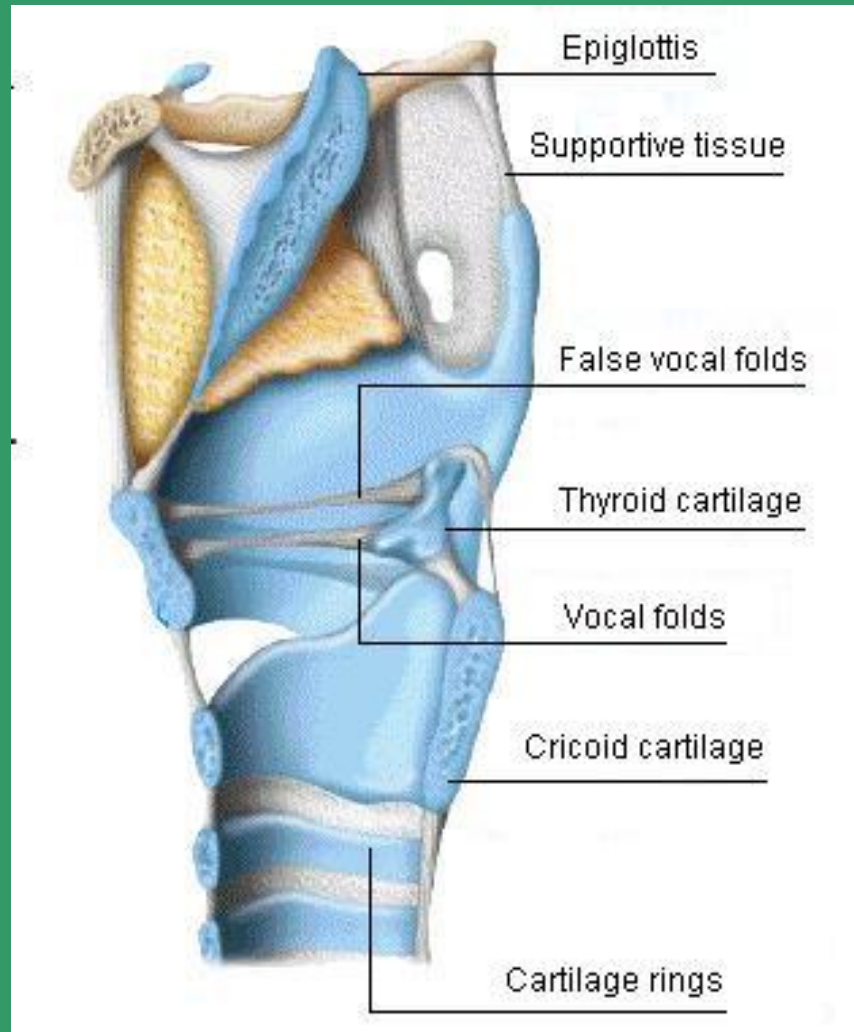
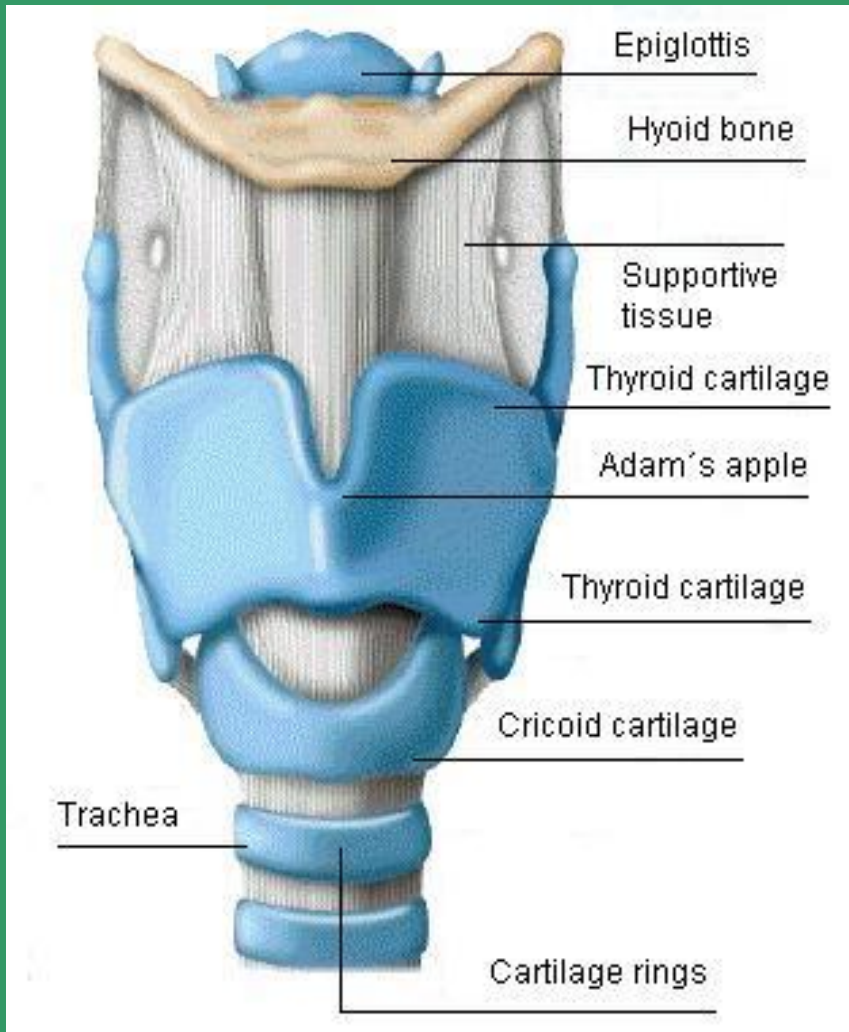
*display* [di'spleɪ]

*blockage* ['blɒkədʒ]

*cancel* ['kɑ:nsəl]

*patient* ['peɪʃənt]





## THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

### CONSONANTS (PULMONIC)

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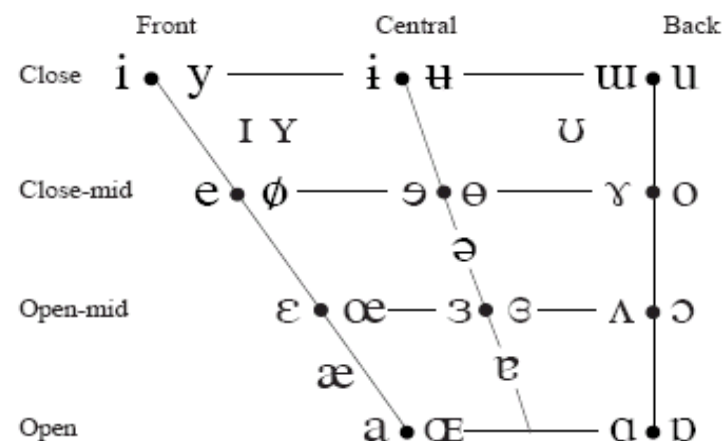
	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			ʀ					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

### CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
◌◌ Bilabial	ɓ Bilabial	ʼ Examples:
Dental	ɗ Dental/alveolar	pʼ Bilabial
! (Post)alveolar	ɟ Palatal	tʼ Dental/alveolar
≠ Palatoalveolar	ɡ Velar	kʼ Velar
Alveolar lateral	ɠ Uvular	sʼ Alveolar fricative

### VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.



# American phonetic transcription

<i>Symbol</i>	<i>Description</i>	<i>English equivalent</i>
[š]	palato-alveolar voiceless fricative	[ʃ]
[ž]	palato-alveolar voiced fricative	[ʒ]
[č]	palato-alveolar voiceless affricate	[tʃ]
[tš]	alternative rendering	
[j]	palato-alveolar voiced affricate	[dʒ]
[dž]	alternative rendering	

# American phonetic transcription

		<i>American</i>	<i>British</i>
1)	palatal approximant yes	[y] [yes]	[j] [jes]
2)	front end-element of rising diphthong try	[y] [tray]	[i] [traɪ]
3)	back end-element of rising diphthong bow	[w] [baw]	[u] [bau]
4)	high front rounded vowel Fr. <i>vu</i>	[y̥] [v̥y̥]	[y] [vy]
5)	high front rounded vowel Fr. <i>peu</i>	[ø̥] [pø̥]	[ø] [pø]



## Recommended literature on Phonetics

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