

T.1 Phonetics.

Phonetics as a science and its branches.

The main features of pronunciation.

Phoneme. Allophone.

Organs of speech.

The articulatory classification of the English sounds.

- **Speech** is a continuous stream of sounds, without clear-cut borderlines between them, and the different aspects of connected speech help to explain why written English is so different from spoken English.

From phonetics to phonology

- **Speech is one of human activities used for conveying meaning**
- **Speech is a continuous process, so the vocal organs do not move from one sound segment to the next in a series of separate steps. Rather, sounds continually show the influence of their neighbors.**
- *map, lamb*

Phonetics deals with the description of sound either by analyzing their acoustical properties or by studying the precise of production

Phonology, in contrast, is concerned not with the physical properties of sounds, but rather with how they function in a particular language.

PHONETICS AND PHONOLOGY

- **Phonetics** studies physical properties, how the sounds are produced by the articulator organs (lips, tongue, jaw- tongue complex and vocal tract).
- **Phonology** studies how sounds alternate to form meaning. Phonology has two main branches:
 - **Segmental:** Vowels and Consonants.
 - **Suprasegmental:** especially Stress, Intonation and Rhythm.

Phonology:

- The branch of linguistics concerned with the study of speech sounds with reference to their distribution and patterning.
- **Phonetics** is the study of speech sounds; whereas **Phonology** is the study of sound patterns.
- In other words, phonetics is concerned with describing the speech sounds (the physical and articulatory aspects) that occur in a language; phonology focuses on the study of rules and organization of sound units in a language.

Phonology

Phonology is the study of the *sound system of a particular* language, it is concerned with the *function* of speech sounds of the language.

Phonetics and Phonology

- ▶ **Phonetics:** The physical manifestation of language in sound waves.
 - How sounds are articulated (articulatory phonetics)
 - How sounds are perceived (auditory phonetics)
- ▶ **Phonology:** The mental representation of sounds.

Phonetics studies speech sounds from the articulatory and acoustic point of view.

Phonology studies their communicative purposes.

The unit of **phonetics** is a speech sound, the unit of **phonology** is a phoneme.

- **1. Articulatory phonetics**

- Study of the vocal organs and how they produce speech sounds

- **2. Acoustic phonetics**

- A study of the physical properties of speech sounds as sound waves.

- **3. Auditory Phonetics**

- Study of how speech sounds in the form of sound waves are perceived and processed by ears , nervous system, and brain.

1.1. Phonetics as a Science and its Branches

Phonetics is the science which studies the characteristics of human sound-making, especially those sounds used in speech, and provides methods for their description, classification and transcription.

Three traditional branches of the subject are generally recognized:

- *articulatory phonetics* is the study of the way speech sounds are made by the vocal organs;
- *acoustic phonetics* studies the physical properties of speech sound, as transmitted between mouth and ear;
- *auditory phonetics* studies the perceptual response to speech sounds, as mediated by ear, auditory nerve and brain.

The fourth branch – *functional phonetics* is concerned with the range and function of sounds in specific languages. It is typically referred to as *phonology*.

Phonetics is the study of how speech sounds are made, transmitted, and received, phonetics is the study of all possible speech sounds. The human vocal apparatus can produce a wide range of sounds; but only a small number of them are used in a language to construct all of its words and utterances.

Phonology is the study of *segmental* (speech sound types) and *prosodic* (intonation) features. It studies the way in which speakers systematically use a selection of units – *phonemes* or *intonemes* – in order to express meaning. It investigates the phonetic phenomena from the point of view of their use.

Within phonology, two branches of study are usually recognized: SEGMENTAL and SUPRA-SEGMENTAL. *Segmental phonology* analyses speech into *discrete segments*, such as *phonemes*; *supra-segmental phonology* analyses those features which extend over more than one segment, such as intonation contours.

People engaged in the study of phonetics are known as *phoneticians*. People engaged in the study of phonology are known as *phonologists*.

Phonology was oriented in the 30s of the 20th century by a group of linguists belonging to the Prague school of linguistics. Nikolai Trubetskoy claimed that phonology should be separated from phonetics as it studies the functional aspect of phonic components of language. Phonetics is a biological science which investigates the sound-production aspect. Contemporary phoneticians hold the view that form and function cannot be separated and treat phonology as a linguistic branch of phonetics.

Nowadays a big amount of phonetic research is experimental, aimed at the development and scientific testing of hypotheses. This sub-field of phonetics which uses controlled experiments is known as *experimental phonetics*. Experimental research is carried out in all areas of phonetics. If controlled phonetic experiments employ the use of measuring devices and instrumental techniques, this sub-field of phonetics is called *instrumental phonetics*. Its primary objective is the analysis of speech by means of instruments.

Many different instruments have been devised for the study of speech sounds. The technique for acoustic analysis is known as *spectrography*, in which a computer produces “pictures” of speech sounds. Articulatory activity is analyzed with the help of such instrumental techniques as *radiography* – examining activity inside the vocal tract, *laryngoscopy* – inspecting the inside of the larynx, *palatography* – recording patterns of contact between the tongue and the palate, *glottography* – studying the vibrations of the vocal cords.

Review questions

1. What does phonetics study?
2. What traditional branches of phonetics are generally recognized?
3. What does *articulatory phonetics* study? *Acoustic phonetics*?
4. What does *auditory phonetics* study? *Functional phonetics*?
5. What is the main distinction between phonetics and phonology?
6. What branches of study are usually recognized within phonology?
7. What problems does each of them solve?

Discussion points and activities

Exercise 1. Answer the following questions using word/phrase answers.

	<i>Question</i>	<i>Answer</i>
1.	People engaged in the study of phonetics are known as ...	
2.	The technique for acoustic analysis is known as ...	
3.	Examining activity inside the vocal tract is known as ...	
4.	Inspecting the inside of the larynx is known as ...	
5.	Recording patterns of contact between the tongue and the palate is known as ...	
6.	Studying the vibrations of the vocal cords is known as ...	

Phoneme definition

The **phoneme** is a minimal abstract linguistic unit realized in speech in the form of speech sounds opposable to other phonemes of the same language to distinguish the meaning of morphemes and words.

Three aspects of phoneme:

Functional

Material

Abstract

Phoneme

- *Firstly, the phoneme is a functional unit (distinctive function).*

*e.g.: bath-path, light-like; He was heard badly -
He was hurt badly*

- *Secondly, the phoneme is material, real and objective (constitutive function).*

*e.g.: door — darn — down; deal — day — did;
bedtime — god dog; dry — dream; breadth;
dweller*

- *Thirdly, the phoneme is abstract and generalizing, one linguistic unit (recognitive function).*

3. FUNCTIONAL ASPECT OF THE PHONEME.

It performs three principal functions in speech:

- **Constitutive** – phonemes form the sound-shape of morphemes and words.
- **Recognitive / Identificatory** – phonemes help identify words.
- **Distinctive** – phonemes help differentiate the meaning of words and grammatical forms.

Modifications of sound

- Phonemes and allophones
- Speech production stages:
 - (1) the on-glide, or the initial stage,
 - (2) the retention-stage, or the medial stage, and
 - (3) the off-glide (release), or the final stage.
- Economy of effort
- Co-articulation

Consonants

- ▶ How are phonemes produced?
- ▶ Consonants are produced by obstructing the flow of air as it passes from the lungs through the vocal tract.
- ▶ When we describe a consonant, one of the features we use is its **place of articulation**.
- ▶ The other feature is the **manner of articulation**.

1.2. The Main Features of Pronunciation

Phonic shaping of the oral form of language is called *pronunciation*.

Features of pronunciation

Speech sounds are grouped into language units called *phonemes*. The phoneme is realized in speech in the material form of speech sounds of different type. Various speech realizations of the phoneme are called its *allophones*.

Grouping sounds according to their major articulatory features is called an *articulatory classification*.

According to the specific character of the work of speech organs, sounds are subdivided into two major subtypes: vowels (V) and consonants (C).

There are articulatory, acoustic and functional differences between V and C. *Articulatory* difference between vowels and consonants is that in the articulation of V the air passes freely through mouth cavity, while in making C an obstruction is formed in the mouth cavity and the airflow exhaled from the lungs meets a narrowing or a complete obstruction formed by the speech organs. From the *acoustic* point of view, vowels are called the sounds of voice, they have high acoustic energy, consonants are the sounds of noise which have low acoustic energy. *Functional* differences between Vs and Cs are defined by their role in syllable formation: Vs are syllable forming elements, Cs are units which function at the margins of syllables, either singly or in clusters.

Vowels are voiced sounds produced without any obstruction in the supra-glottal cavities and consequently have no noise component. They may be *single*, or a combination, involving a movement from one vowel sound to another; such combinations are known *diphthongs*. Single vowel sounds may be *short* or *long*. The symbol [ː] denotes a long sound.

The English monophthongs are: /i:/, /u:/, /a:/, /ɔ:/, /ɜ:/, /e/, /ə/, /æ/, /ʊ/, /ɒ/, /ʌ/. The English diphthongs are: /aɪ/, /eɪ/, /ɔɪ/, /aʊ/, /əʊ/, /eə/, /ɪə/, /ʊə/

Consonants. In the articulation of consonants a kind of noise producing obstruction is formed in the supra-glottal cavities.

Voiced consonants /b/, /d/, /g/, /v/, /ð/, /z/, /ʒ/, /dʒ/ when the vocal cords are brought together and vibrate, we hear voice.

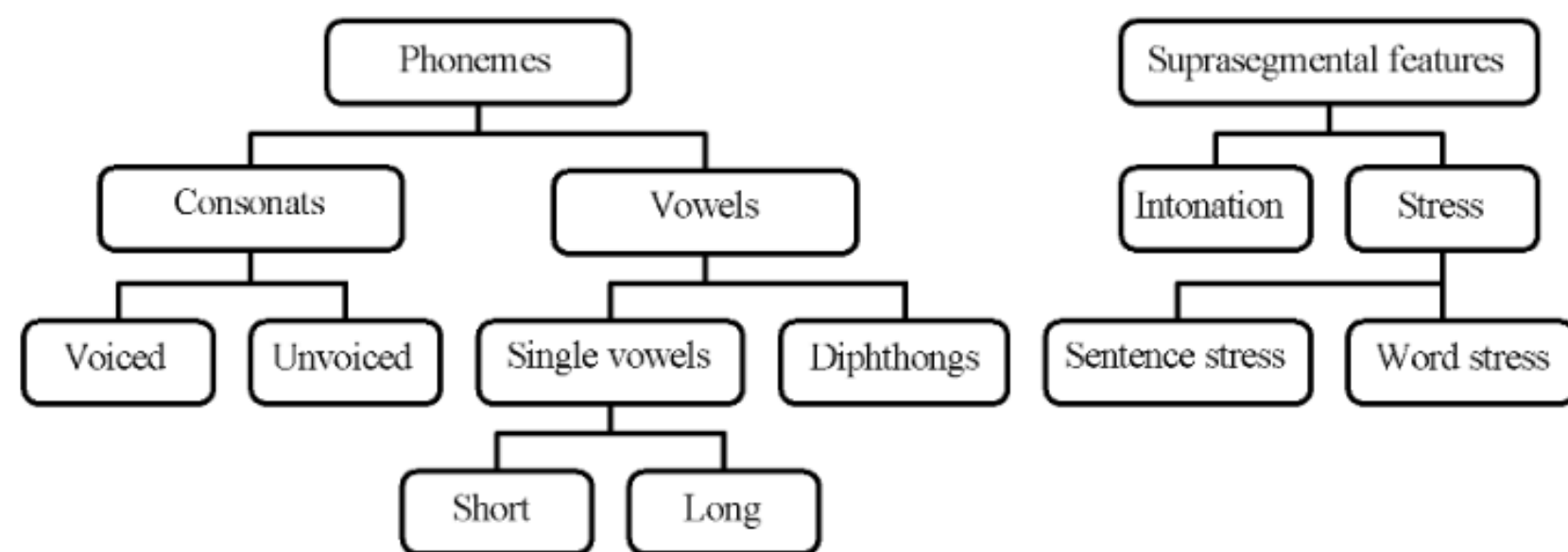
Unvoiced consonants are /p/, /t/, /k/, /f/, /θ/, /s/, /ʃ/, /tʃ/, /h/. If the vocal cords are apart and do not vibrate, we hear only noise and the consonants are voiceless. *Sonorants* are made with tone prevailing over noise because of a rather wide air passage /m/, /n/, /ŋ/, /r/, /l/, /w/, /j/.

Suprasegmental features, as the name implies, are features of speech which generally apply to groups of segments or phonemes.

With regard to individual words, we can identify *word stress*. Usually one syllable in a word will sound more prominent than the others. *Sentence stress* gives rhythm to speech. One or more words within each utterance are selected by the speaker as worthy of stressing, and thus made prominent to the listener.

Intonation – is the way in which the pitch of the voice goes up and down in the course of an utterance.

Phonetic symbols are a great help when it comes to learning to pronounce English words correctly. Any time you open a dictionary, you can find the correct pronunciation of words you don't know by looking at the phonetic pronunciation that follows the word.



Organs of speech

All the sounds we make when we speak are the result of muscles contracting. The muscles in the chest that we use for breathing produce the flow of air that is needed for almost all speech sounds; muscles in the **larynx** produce many different modifications in the flow of air from the chest to the mouth. After passing through the larynx, the air goes through what we call the **vocal tract**, which ends at the mouth and nostrils; we call the part comprising the mouth the **oral cavity** and the part that leads to the nostrils the **nasal cavity**. Here the air from the lungs escapes into the atmosphere. We have a large and complex set of muscles that can produce changes in the shape of the vocal tract, and in order to learn how the sounds of speech are produced it is necessary to become familiar with the different parts of the vocal tract. These different parts are called **articulators**, and the study of them is called **articulatory phonetics**.

Fig. 1 is a diagram that is used frequently in the study of phonetics. It represents the human head, seen from the side, displayed as though it had been cut in half. You will need to look at it carefully as the articulators are described, and you will find it useful to have a mirror and a good light placed so that you can look at the inside of your mouth.

- i) The **pharynx** is a tube which begins just above the larynx. It is about 5 cm long in women and about 4 cm in men, and at its top end it is divided into two, one

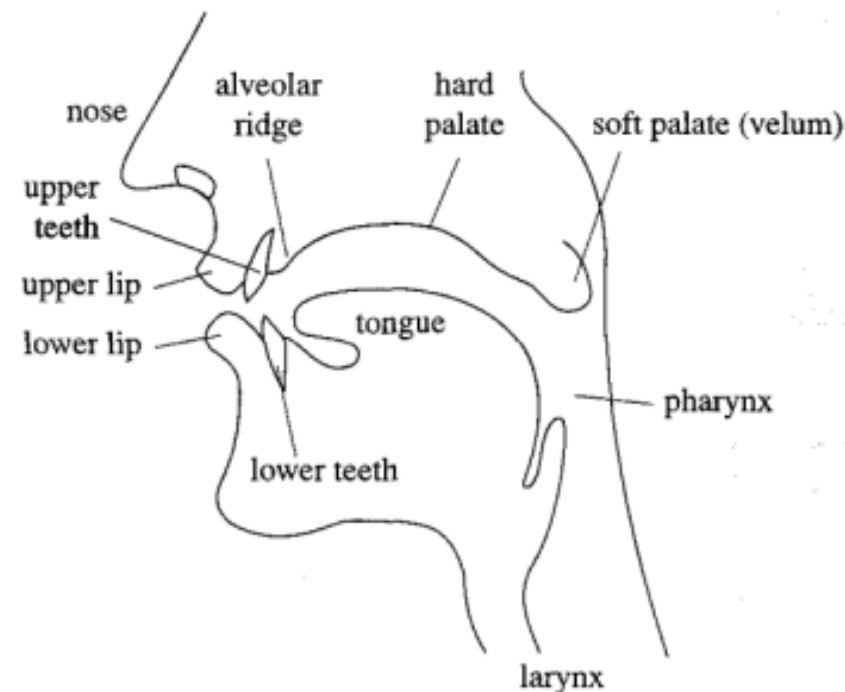


Fig. 1 The articulators

part being the back of the oral cavity and the other being the beginning of the way through the nasal cavity. If you look in your mirror with your mouth open, you can see the back of the pharynx.

- ii) The **soft palate** or **velum** is seen in the diagram in a position that allows air to pass through the nose and through the mouth. Yours is probably in that position now, but often in speech it is raised so that air cannot escape through the nose. The other important thing about the soft palate is that it is one of the articulators that can be touched by the tongue. When we make the sounds k, g the tongue is in contact with the lower side of the soft palate, and we call these **velar** consonants.
- iii) The **hard palate** is often called the "roof of the mouth". You can feel its smooth curved surface with your tongue. A consonant made with the tongue close to the hard palate is called **palatal**. The sound j in 'yes' is palatal.
- iv) The **alveolar ridge** is between the top front teeth and the hard palate. You can feel its shape with your tongue. Its surface is really much rougher than it feels, and is covered with little ridges. You can only see these if you have a mirror small enough to go inside your mouth, such as those used by dentists. Sounds made with the tongue touching here (such as t, d, n) are called **alveolar**.
- v) The **tongue** is a very important articulator and it can be moved into many different places and different shapes. It is usual to divide the tongue into different parts, though there are no clear dividing lines within its structure. Fig. 2 shows the tongue on a larger scale with these parts shown: **tip, blade, front, back** and **root**. (This use of the word "front" often seems rather strange at first.)
- vi) The **teeth** (upper and lower) are usually shown in diagrams like Fig. 2 only at the front of the mouth, immediately behind the lips. This is for the sake of a simple diagram, and you should remember that most speakers have teeth to the sides of their mouths, back almost to the soft palate. The tongue is in contact with the upper side teeth for most speech sounds. Sounds made with the tongue touching the front teeth, such as English T, D, are called **dental**.

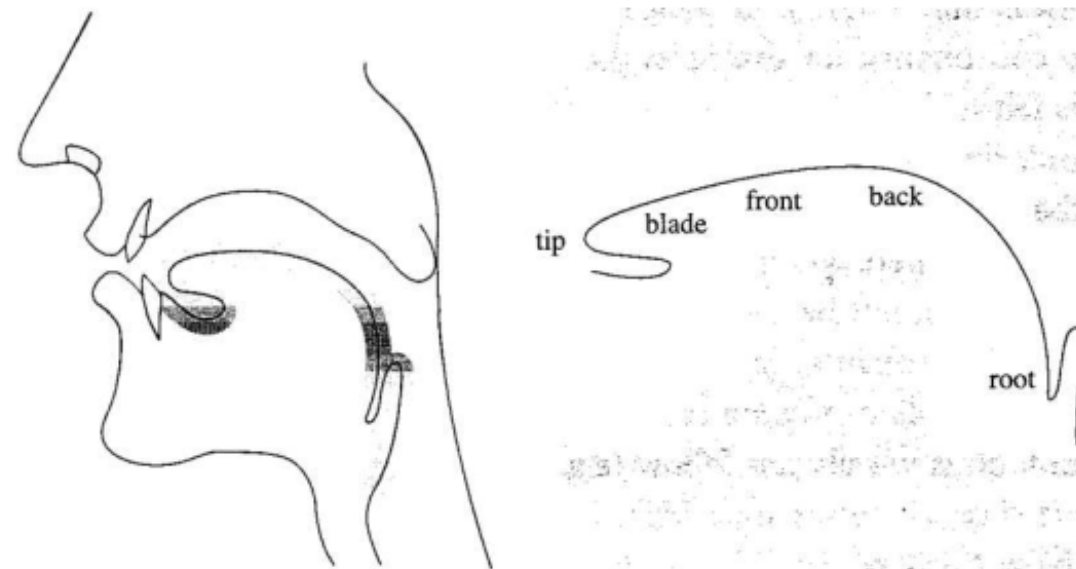


Fig. 2 Subdivisions of the tongue

vii) The **lips** are important in speech. They can be pressed together (when we produce the sounds p, b), brought into contact with the teeth (as in f, v), or rounded to produce the lip-shape for vowels like u:. Sounds in which the lips are in contact with each other are called **bilabial**, while those with lip-to-teeth contact are called **labiodental**.

The seven articulators described above are the main ones used in speech, but there are a few other things to remember. Firstly, the larynx (which will be studied in Chapter 4) could also be described as an articulator - a very complex and independent one. Secondly, the **jaws** are sometimes called articulators; certainly we move the lower jaw a lot in speaking. But the jaws are not articulators in the same way as the others, because they cannot themselves make contact with other articulators. Finally, although there is practically nothing active that we can do with the **nose** and the nasal cavity when speaking, they are a very important part of our equipment for making sounds (which is sometimes called our **vocal apparatus**), particularly nasal consonants such as m, n. Again, we cannot really describe the nose and the nasal cavity as articulators in the same sense as (i) to (vii) above.

Фонетична таблиця звуків англійської мови

	Голосні		Приголосні
i:	tree, he, teacher, read	p	pen, pencil, pin, pine, pig
ɪ	pin, sit	b	bed, bag, box, book
e	pen, lesson	t	table, take, tree
æ	bag, stand, cat, black	d	dog, desk
a:	garden, are, classroom	k	kite, come, cat, school
ɒ	dog, on, box	g	go, give, garden, green
ɔ:	wall, morning, or	l	lamp, little, live, long
u	good, book	m	map, morning, my
u:	spoon, school, too, who	z	is, has, boys, pens, girls, dogs, chairs, schoolbags
ʌ	bus, up, under, come	ŋ	sing, song, English, thank
ə:	first, girl, third	ð	this, the, then, they
ɔ	a pen, under, teacher	v	stove, give, five
eɪ	take, table, plate, cake	θ	three, third, thank, fourth, fifth
oʊ	open, stove, rose, sofa, no	s	sit, spoon, second, lesson, books, desks, yes
ɔɪ	boy	f	flag, first, four, fourth, fifth
au	down, how, now	n	no, not
aɪ	pine, kite, I, my, rhyme	r	rat, red, rose, read, tree, Russian, street, green
ɪə	hear, pioneer	ʃ	she, English, Russian
ɛə	chair, where	h	he, hen, has, here, who
aɪə	pioneer	tʃ	children, chair, teacher
auə	our	dʒ	Jane, John
		w	wall, what, where, we, one
		j	yes, you, your

Classification of Phonemes

1. Consonants

- formed by complete or partial obstruction or modification of breath channel by organs of articulation

2. Vowels

- Produced by articulatory organs moving without obstruction or interference of the vibrating breathstream through breath channel

**Test 1. THE ARTICULATORY CLASSIFICATION
OF THE ENGLISH VOWELS**

#	Question	Answer
1	How many vowels are there in English?	
2	How is a pure vowel sound called?	
3	How many monophthongs and diphthongs are there in English?	
4	What are the elements of a diphthong?	
5	What English sounds are considered to be diphthongoids?	
6	What is the division of vowels according to the degree of muscular tension?	
7	What is the division of vowels according to the character of their end?	
8	What English vowel is considered to be half-long?	
9	What English vowel is long, tense, rounded, fully back, high of narrow variation?	
10	What English vowel is short, lax, rounded, back, low of broad variation?	
	The number of correct points is	
	My grade is	