Lesson Four :

Phonetics and Phonology

Course: Introduction to Linguistics for Speech and Language Therapy

Duration: 2 Hours

Learning Outcomes

By the end of this lesson, students will be able to:

- Define phonetics and phonology.
- Explain the difference between phonetics and phonology.
- Identify English speech sounds.
- Describe how speech sounds are produced.
- Use the International Phonetic Alphabet (IPA).
- Distinguish phonemes from allophones.
- Recognize common phonological processes.
- Explain the importance of phonetics and phonology in Speech and Language Therapy.

1. Introduction

Human communication depends on speech. Speech is produced through the coordinated movement of the lungs, vocal folds, tongue, lips, jaw, teeth, and palate. Understanding how speech sounds are produced and organized is essential for Speech and Language Therapists because many communication disorders involve difficulties in producing or organizing speech sounds.

Two scientific disciplines study speech sounds:

- **Phonetics** – studies how speech sounds are physically produced, transmitted, and perceived.
- **Phonology** – studies how speech sounds function within a language.

Both fields are fundamental for speech assessment, diagnosis, and intervention.

2. What is Phonetics?

Phonetics is the scientific study of speech sounds.

It examines:

- How sounds are produced
- How sounds travel through the air
- How listeners hear speech

Phonetics focuses on the physical properties of speech rather than meaning.

Example:

The sounds /p/ and /b/ are produced similarly, but /b/ uses vocal fold vibration while /p/ does not.

Branches of Phonetics

A. Articulatory Phonetics

Studies how speech organs produce sounds.

Main speech organs include:

- Lips
- Teeth
- Tongue
- Hard palate
- Soft palate (velum)
- Uvula
- Vocal folds
- Lungs

B. Acoustic Phonetics

Studies sound waves.

It examines:

- Frequency
- Intensity
- Duration
- Pitch

C. Auditory Phonetics

Studies how the ear and brain perceive speech.

3. Speech Production

Speech production begins in the lungs.

The process includes:

1. Air is pushed from the lungs.
2. Air passes through the larynx.
3. The vocal folds vibrate or remain open.
4. Air reaches the oral or nasal cavity.
5. The tongue, lips, jaw, and palate shape the sound.

The Speech Mechanism

Speech production involves four systems:

Respiratory System

Provides airflow.

Organs:

- Lungs
- Diaphragm
- Trachea

Phonatory System

Produces voice.

Main organ:

- Larynx

If vocal folds vibrate:

→ Voiced sound

If they do not vibrate:

→ Voiceless sound

Examples:

Voiced:

- /b/
- /d/
- /g/
- /z/

Voiceless:

- /p/
- /t/
- /k/
- /s/

Resonatory System

Shapes sound using:

- Oral cavity
- Nasal cavity
- Pharynx

Articulatory System

Includes:

- Tongue
- Lips
- Teeth
- Hard palate
- Soft palate

These organs create different speech sounds.

4. The International Phonetic Alphabet (IPA)

The International Phonetic Alphabet (IPA) is a standardized system of symbols used to represent speech sounds.

Unlike English spelling, each IPA symbol represents one speech sound.

Example:

The IPA allows speech-language therapists to describe pronunciation accurately across languages.

Word	Spelling	IPA
cat	cat	/kæt/
ship	ship	/ʃɪp/
book	book	/bʊk/
think	think	/θɪŋk/

5. Consonants

Consonants are produced with some obstruction of airflow.

They are classified according to:

- Place of articulation
- Manner of articulation
- Voicing

Place of Articulation

Examples include:

Place	Example
Bilabial	/p/, /b/, /m/
Labiodental	/f/, /v/
Dental	/θ/, /ð/
Alveolar	/t/, /d/, /s/, /z/, /n/
Postalveolar	/ʃ/, /ʒ/, /tʃ/, /dʒ/
Palatal	/j/
Velar	/k/, /g/, /ŋ/
Glottal	/h/

Manner of Articulation

Type	Examples
Stops	/p b t d k g/
Fricatives	/f v s z ʃ ʒ θ ð h/
Affricates	/tʃ dʒ/
Nasals	/m n ŋ/
Liquids	/l r/

6. Vowels

Vowels are produced without blocking airflow.

They are classified according to:

- Tongue height
- Tongue position
- Lip rounding

Examples:

Front vowels

/i/
/ɪ/
/e/
/æ/

Back vowels

/u/
/ʊ/

/ɔ/
/ɑ/

Central vowels

/ə/
/ʌ/

7. Phonology

Phonology studies how sounds function in a language.

It examines:

- Sound patterns
- Rules
- Organization of sounds

Example:

English speakers know that:

"blick"

could be an English word.

"bnick"

cannot.

This knowledge comes from phonological rules.

8. Phonemes

A phoneme is the smallest unit of sound that changes meaning.

Example:

pat

bat

Only one sound changes:

/p/

↓

/b/

The meaning changes.

Therefore:

/p/ and /b/ are different phonemes.

Minimal Pairs

Minimal pairs differ by only one phoneme.

Examples:

Minimal pairs help speech-language therapists identify speech sound disorders.

Word 1	Word 2
pin	bin
cat	cut
fan	van
sip	zip
ten	den

9. Allophones

Allophones are different pronunciations of the same phoneme.

Example:

The /p/ in

pin

is aspirated.

The /p/ in

spin

is not.

Both are recognized as the same phoneme by English speakers.

10. Phonological Processes

Young children simplify speech while learning language.

Common phonological processes include:

Final Consonant Deletion

cat

→ ca

Fronting

car

→ tar

Stopping

sun

→ tun

Cluster Reduction

stop

→ top

Gliding

rabbit

→ wabbit

Speech-language therapists determine whether these processes are age-appropriate or indicate a speech disorder.

11. Why Phonetics and Phonology Matter in Speech and Language Therapy

Knowledge of phonetics and phonology helps clinicians:

- Assess speech sound disorders
- Diagnose articulation disorders
- Evaluate phonological disorders
- Teach correct pronunciation
- Use IPA transcription
- Monitor treatment progress
- Differentiate developmental errors from disorders

Summary

In this lesson, we learned that:

- Phonetics studies speech sounds.
- Phonology studies sound systems.
- Speech production involves respiration, phonation, resonance, and articulation.
- The IPA provides a universal system for representing speech sounds.
- Consonants and vowels are classified according to articulatory features.
- Phonemes distinguish meaning.
- Allophones are variations of the same phoneme.
- Phonological processes are common in children's speech development.

Interactive Activities

1. Label the speech organs on a diagram.
2. Practice IPA transcription of ten English words.
3. Identify the place and manner of articulation of selected consonants.
4. Match minimal pairs.
5. Listen to audio recordings and identify voiced and voiceless sounds.
6. Identify phonological processes in children's speech samples.

Assessment

Part A: Multiple Choice

1. What does phonetics study?

A. The meaning of words

B. The structure of sentences

C. The production, transmission, and perception of speech sounds

D. The history of language

2. What is the International Phonetic Alphabet (IPA) used for?

A. To teach grammar rules

B. To represent speech sounds accurately using standardized symbols

C. To classify parts of speech

D. To translate between languages

3. Which articulators produce bilabial sounds?

A. The tongue and the hard palate

B. The lower lip and the upper teeth

C. Both lips

D. The tongue and the alveolar ridge

4. What is a phoneme?

A. A written letter of the alphabet

B. The smallest unit of sound that distinguishes meaning in a language

C. A group of words with similar meanings

D. A sentence spoken with correct grammar

5. Which of the following pairs contains only voiced sounds?

A. /p/ and /t/

B. /k/ and /s/

C. /b/ and /z/

D. /f/ and /θ/

Part B: Short Answer

1. Explain the difference between phonetics and phonology.
2. Describe the four systems involved in speech production.
3. Define minimal pair with an example.
4. Explain the difference between a phoneme and an allophone.
5. Describe two phonological processes observed in children's speech.

Answer Key

Question	Correct Answer
1	C
2	B
3	C
4	B
5	C

References

Ashby, P. (2005). *Speech sounds* (2nd ed.). Routledge.

Ball, M. J., & Rahilly, J. (2014). *Phonetics: The science of speech*. Routledge.

International Phonetic Association. (1999). *Handbook of the International Phonetic Association: A guide to the use of the International Phonetic Alphabet*. Cambridge University Press.

Ladefoged, P., & Johnson, K. (2015). *A course in phonetics* (7th ed.). Cengage Learning.

Roach, P. (2022). *English phonetics and phonology: A practical course* (6th ed.). Cambridge University Press.

Yule, G. (2022). *The study of language* (8th ed.). Cambridge University Press.