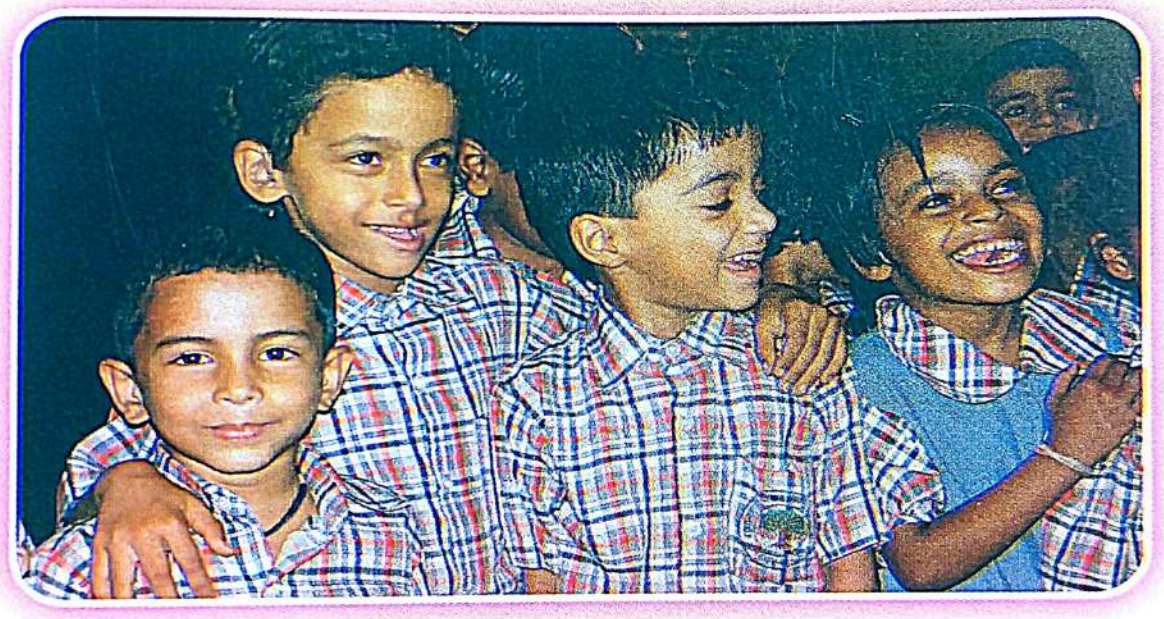
Education

TOWARDS INCLUSIVE EDUCATION OF CHILDREN WITH HEARING IMPAIRMENT

A GUIDE BOOK FOR SCHOOL TEACHERS



ALI YAVAR JUNG NATIONAL INSTITUTE FOR THE HEARING HANDICAPPED
K.C.MARG, BANDRA (W) RECLAMATION
MUMBAI-50

e-mail: ayjnihh@vsnl.com
Website: www.ayjnihh.nic.in, www.jobsfordeaf.com
Tel: 26400215/228, 26404984 (dir) Fax: 26404170

Foreword

This book has been prepared in a very simple language with illustrations, so that teachers in elementary schools can learn to manage children with hearing impairment and /or speech disorders.

Approximately, 6 percent of children in school going age suffer with either speech and/or hearing disorders.

The authors have taken great efforts to comprehensively unfold and clarify several points on educating children with hearing impairment, use of hearing aids, managing speech defects of children in elementary schools, among other topics of interest.

This book makes an excellent general reading too.

R. Rangasayee
DIRECTOR
AYJNIHH,MUMBAI-50.

Preface

"Children who learn together, live together"

- Margaret Mead

Living in harmony is the greatest challenge before the society. All efforts are hence geared towards achieving inclusion through education.

Inclusive education refers to schools, centers of learning and educational systems that are open to all children and which ensure that all children learn and participate. For this to happen, teachers, schools and systems may need to change so that they can accommodate the diversity of educational needs and educate children with disability.

Amongst the group of children with disabilities, children with hearing impairment face differential barriers of language, communication, speech and literacy. This affects their learning and participation in the school. The present guidebook for teachers is one step towards facilitating inclusive education for children with hearing impairment.

Varsha Gathoo
Reader & Head
Dept. of Education
AYJNIHH, Mumbai-50

Index

UNIT-1

HEARING IMPAIRMENT IN EARLY CHILDHOOD

Objectives of this unit :

- To know the meaning of hearing impairment
- To understand the effect of early childhood hearing impairment in children
- To appreciate the need to identify the hearing loss early

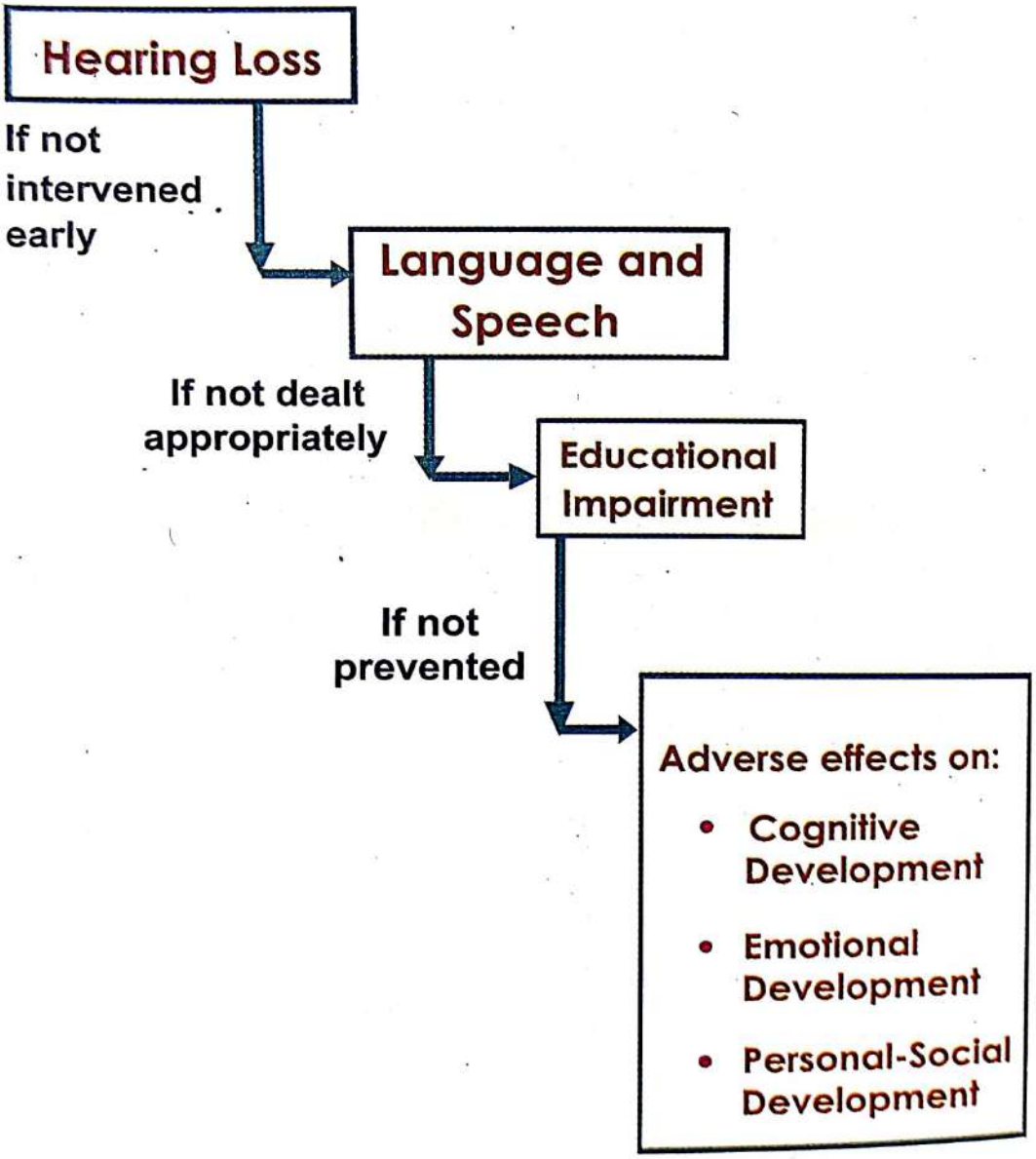
'Deafness' is now referred to as 'hearing impairment'. It is an invisible handicap, which reduces the sensitivity of hearing. Those who acquire hearing impairment later in life, perhaps may only experience diminished hearing sensitivity, but children born with hearing impairment (congenital) or those who acquire hearing impairment in the first few years of life (0-5 years) experience serious language, communication and educational problems.

Language and speech are acquired by children from the surroundings mostly by 'hearing' the people talking around them. But if the sensory channel of hearing in children is nonfunctional /damaged, these young ones fail to acquire even their mother tongue. They cannot understand the language and hence cannot speak in that language. Therefore, at times, they are referred to as 'Deaf and Dumb'. However, **deaf are not dumb**. If appropriate intervention is given at the right time, **they too can speak.** It is hence rightly said by Meadows, "b*asic deprivation of hearing impaired is not deprivation of sound, it is the deprivation of language".*

The language barriers further separate a child socially because it results into communication difficulties.

Being unable to understand a language, further restricts cognitive and emotional develop-ment. This may also affect the reading and writing skills. The following illustration shows the impact of hearing loss in children if identification and intervention are delayed.

Fig1.1: Effect of early childhood hearing impairment



For the purpose of reducing the impact of hearing loss, technological development has become a boon for children with hearing impairment. Early detection of hearing loss within the first few months and early intervention (therapy by a team of special educator, audiologist, speech therapist and parents) could bring significant changes in the lives of children with hearing impairment and bring them at par with their hearing counterparts.

****

UNIT-2

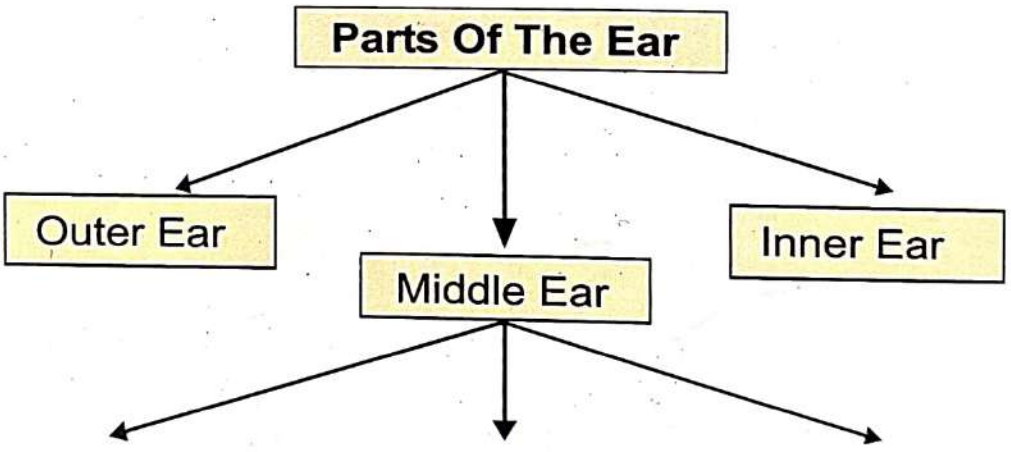
UNDERSTANDING THE PROCESS OF HEARING

Objectives of this unit :

- To know the parts of the ear
- To understand the process of hearing
- To acquaint with the different classifications of hearing loss
- To know the unit of measurement of frequency And intensity of sound

In order to have a better understanding of hearing loss in children, it is essential to know the parts and functions of the ear and how one hears.

Fig 2.1: Parts of the ear

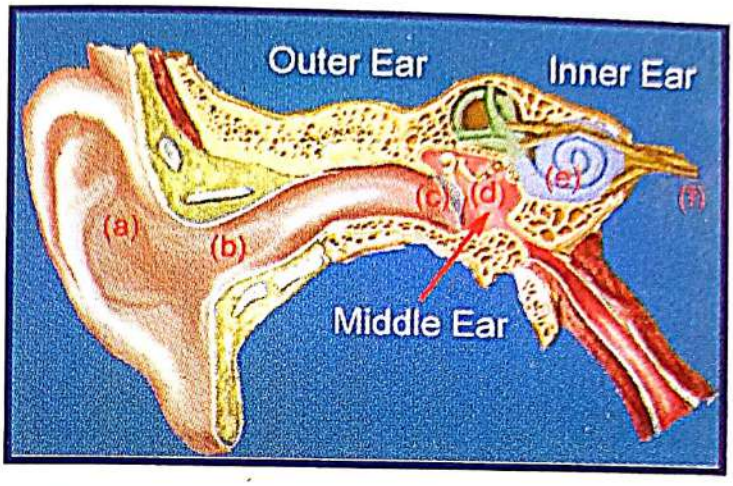


a) pinna
b) ear canal

c) ear drum
d) cavity with 3 tiny bones

e) cochlea
f) auditory nerve

2.1. How do we hear?



Sound waves travel from the environment through the outer ear to the eardrum of the middle ear

↓

These waves cause the eardrum and the three tiny bones in the middle ear to vibrate.

↓

- Vibration of the oval window disturbs the fluid in cochlea
- The moving fluid causes the thousands of microscopic hair cells in the cochlea to Vibrate
- The hair cells change the mechanical vibrations into electrical energy which stimulates the hearing nerve
- The hearing nerve sends electrical impulses to the brain
- The brain interprets the signals as sound

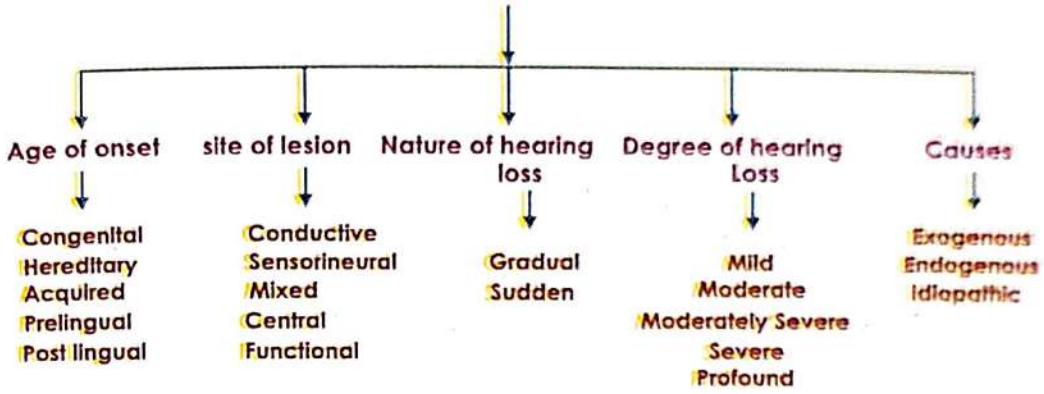
2.2. Hearing loss & its classification

Hearing loss varies from individual to individual. It can occur at any point of time. The knowledge of hearing and the nature of hearing loss are crucial for its management. The intensity of hearing loss is measured in decibels (dB) and frequency of sound is measured in Hertz (Hz)

- Normally human beings can hear frequencies between 20 Hertz (Hz) to 20,000 Hz
- Hearing loss means any reduction in the sensitivity of hearing sounds above 25 decibels (dB) at an average frequency of 500 Hz,1Kilo Hz & 2KiloHz
- Hearing loss is always looked in terms of the ability of an individual to hear everyday speech in quiet and noisy environment. Any difficulty in this may be due to hearing loss.
- According to Persons with Disabilities Act (1995),'A person shall be deemed to be hearing disabled, if she/he has hearing loss of 60 dB or more in the better ear in the conversational range of frequencies'.

2.2.1 Classification of hearing loss :

Fig 2.2: Basis of Classification of hearing loss



2.2.1.1 Age of Onset:

Congenital : Hearing loss occurring prior to birth or at the time of birth

Hereditary : Hearing loss due to factors present in the genetic make up of the fertilized ovum

Acquired : Hearing loss developed at a later stage due to some reasons like severe illness, accidents etc.

Prelingual: Hearing loss developed prior to the language development or language acquisition. Generally, hearing loss in the first two years of life is considered as pre-lingual hearing loss

Peri lingual: Hearing loss developed between 2 years to 6 years of age. It may be sudden or progressive in nature

Post lingual : Hearing loss developed after the language development is complete. Usually adult form of language is developed by 6 years of age. It may be sudden or progressive in nature.

2.2.1.2 Site of lesion (physical origin of impairment):

Conductive hearing loss: Any dysfunction of the outer or middle ear in the presence of a normal inner ear. It is reversible i.e. Correctable with medicine or surgery.

Sensorineural hearing loss: Hearing loss due to defect or athology in the inner ear or along the auditory nerve pathway from the inner ear to the brainstem. This loss is irreversible or permanent.

Mixed hearing loss: Hearing loss due to damage or defect in both outer and middle ear as well as in inner ear. This loss may be reversible or irreversible depending on the pathology.

Fig 2.3 : Type of hearing loss based on the site of defect

Site of defect	Type of hearing loss
Outer ear	Conductive
Middle ear	Conductive
Inner ear	Sensorineural
Auditory nerve	Sensorineural
A combination of any two or more	Mixed

2.2.1.3 Nature of hearing loss:

Gradual hearing loss: Gradual deterioration of hearing sensitivity with time

Sudden hearing loss: Hearing sensitivity lost suddenly due to damage of auditory system because of fall/ trauma / accident like bomb blast, severe illnesses like meningitis, ototoxity etc.

2.2.1.4 Degree of hearing loss:

Mild hearing loss :
26 dB HL to 40 dB HL

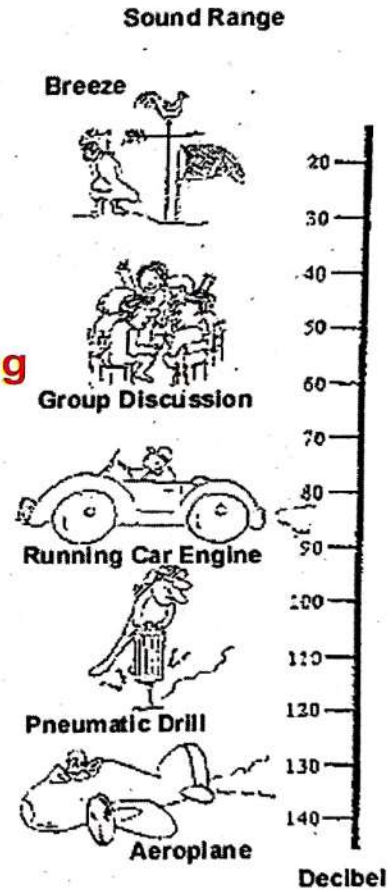
Moderate hearing loss :
41 dB HL to 55 dB HL

Moderately Severe hearing loss : 56 dB HL to 70 dB HL

Severe hearing loss :
71 dB HL to 90 dB HL

Profound hearing loss:
91 dB HL and above

Hearing sensitivity in the range of -10dB HL to 25dBHL is considered as hearing within normal limits.



2.2.1.5 Cause of hearing loss:

Exogenous hearing loss: Hearing loss caused by all factors other than heredity

Endogenous hearing loss : Hearing loss caused only due to hereditary factors

Idiopathic hearing loss : Hearing loss of unknown causes. In other words, these are persons with hearing loss where no known cause could be established.

****

UNIT-3

CAUSES AND PREVENTION OF HEARING LOSS

Objectives of this unit :

- To identify the causes of hearing loss
- To know the ways of preventing hearing loss

It is said that **'prevention is better than cure'**. In order to prevent the hearing loss, one needs to know what causes hearing loss.

3.1. Causes of hearing Loss

3.1.1 Prenatal

- Rubella infection or other infections during first 3 months of pregnancy
- Family history of childhood deafness
- Consanguineous marriages
- Rh incompatibility
- Very poor nutritional condition of the expectant mother
- Excessive alcohol or nicotine intake
- Intake of antibiotics or any other ototoxic drugs
- Excessive exposure to X-rays

3.1.2 Perinatal

- Premature or instrumental delivery
- Delayed or feeble birth cry
- Birth weight less than 1500 gms

3.1.3 Postnatal

- Deformities of ear, nose, face and throat
- Jaundice, high fever or convulsions after birth
- Infectious diseases (e.g. whooping cough, mumps, measles, syphilis meningitis viral fever, T.B.)
- Injury to the ear
- Exposure to loud sounds
- High blood pressure, Diabetes
- Ageing
- Tumors of the nerve supplying the ear
- Neglected chronic/long term ear discharge

3.2. Prevention of hearing loss

- Immunize the adolescent girls and women in child bearing age against rubella
- Get the blood group and Rh factor tested before 3 months of pregnancy, because if found Rh ve, then treatment will start from 5th month of pregnancy
- Avoid marriages amongst close relatives
- Ensure good health of the expectant mother\
- Expectant mother should avoid contact with infectious diseases
- Make sure that the delivery is performed by trained person in healthy environment, preferably in hospital

- Maintain good ear hygiene
- Avoid exposure to loud sounds such as crackers
- Avoid taking medicines without doctor's advice
- Do not use sharp objects to clean the ear

3.3 Is Deafness Curable?

- Not all types
- Conductive loss curable by medicine or surgery
- Ear discharge or infections blocking the hearing could be curable with medicines
- Other hearing losses have to be handled with hearing aids

****

UNIT-4

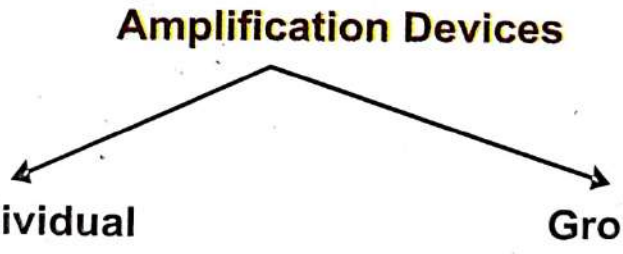
AMPLIFICATION DEVICES

Objectives of this unit :

- **To understand the importance of amplification devices for children with hearing impairment**
- **To know the various types of amplification devices : both individual and classroom and their features**

Amplification devices amplify the sound. It functions like a miniature 'public addressing system'. Due to the technological advancement, a variety of amplification devices are available. Hearing aids are fitted according to the audiological evaluation. Children with hearing impairment are given auditory training to listen through the hearing aids and understand the language.

4.1 Types of amplification devices



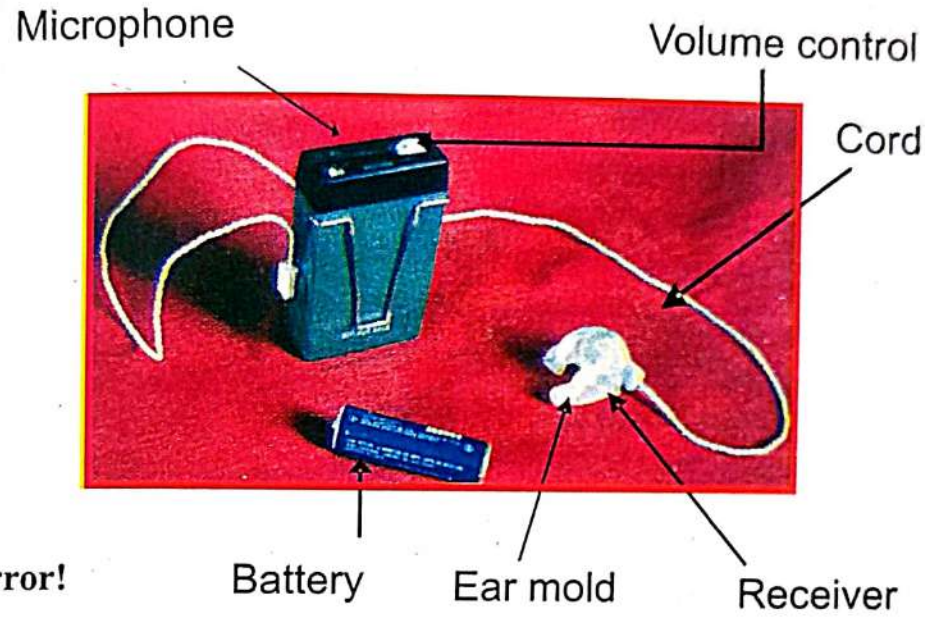
Body-worn hearing aids
Behind The Ear hearing aids
In The Ear hearing aids
- Spectacle or Eyeglass hearing aids

Hard-wire system
Induction Loop System
Infrared Systems
-Frequency Modulated system

4.1.1 Individual Amplification Devices

4.1.1.1 Body-worn hearing aids: components and their functions

Fig 4.2 : Components of the body-worn **(pocket model)** hearing aid



Error!

Component	Function
microphone	collects the sound waves & converts them into electrical signal
amplifier	amplifies the electrical signal
receiver	receives the amplified electrical signal & converts them back into sound waves/auditory signal
battery	supplies power
cord or tubing	carries the electrical signal from the amplifier to the receiver. Shorter versions are available for kids.

volume control	increases or decreases the loudness of signal.
on-off switch	for switching the aid on and off.
battery compartment	used to place the battery
Ear mould	conducts the amplified sound from the hearing aid receiver into the ear canal.
tone control	provides emphasis on specific frequency ranges.
tele(T)-coil	picks up the electro magnetic waves from the telephone or from Loop induction system in a classroom or auditorium.

Harness :

Harness helps to keep the body level hearing aid in its place. It is a tailor made pocket, specially stitched according to the size of the hearing aid. It is worn on the chest of the child. It ensures that the hearing aids do not fall off and thus maintains the safety of hearing aid and its delicate parts. The cords of the hearing aids are routed and placed in the harness in a way that will not interfere with the activities of the child.

Ear mold:

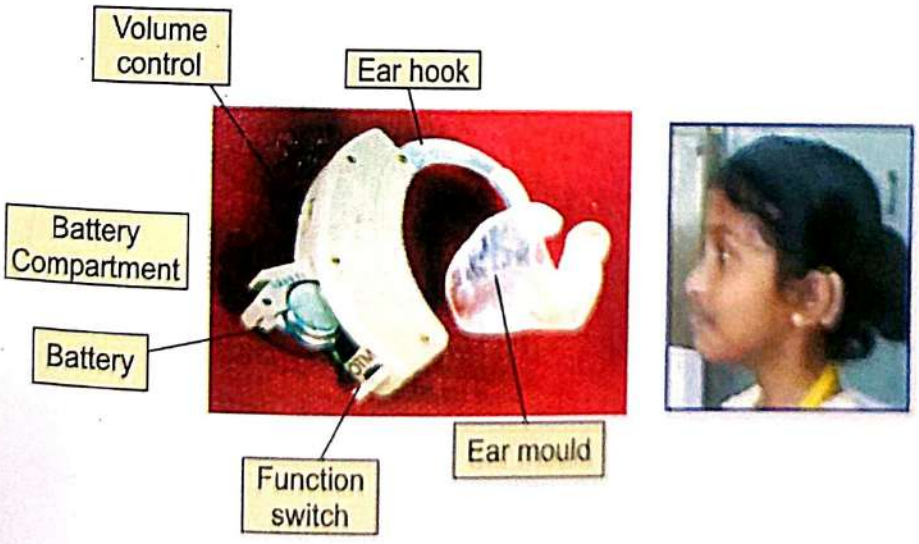
A Ear mold is an important part of the hearing aid. It helps the receiver of the hearing aid to fit tightly into the ear. The

ear mold conducts the amplified sound from the hearing aid receiver to the ear canal. In children, it is essential to change the ear mold for proper fitting. It is also essential to keep the ear mold clean and wax free. There are different types of ear molds, which can be custom made based on the type of hearing aid.

4.2.1.2 Behind-the-ear hearing aids (BTE): Components

This type of hearing aid is worn behind the ear. A thin plastic tube (ear hook) connects the hearing aid to the ear mold. Various types of BTE hearing aids like digital and analog hearing aids are available .

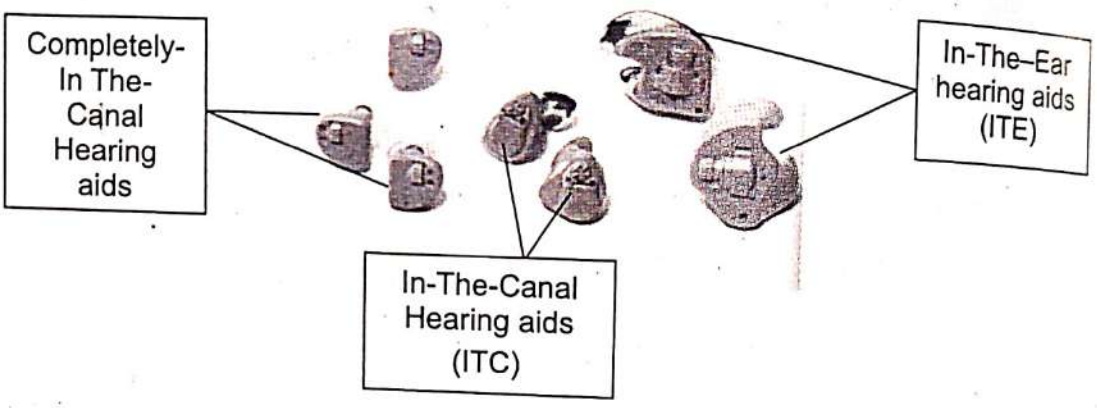
Fig 4.3 : Components of a BTE



4.2.1.3 In-The-Ear (ITE) hearing aids / In The Canal hearing aids

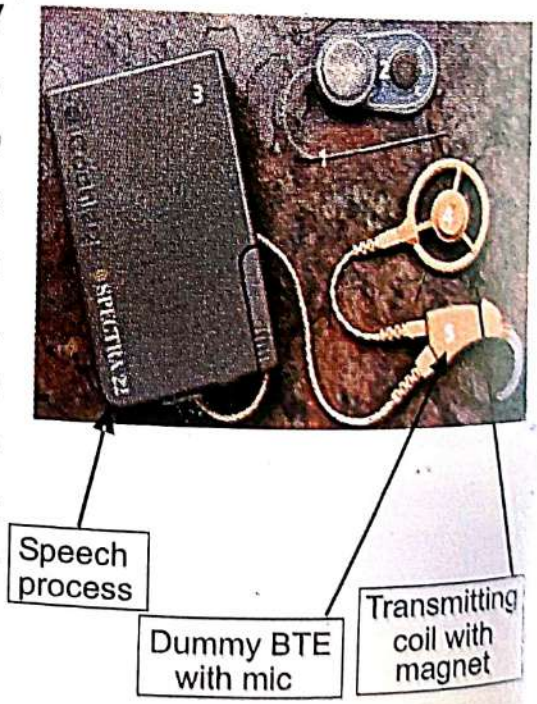
In the Ear hearing aids are fitted in the ear canal. Generally, These hearing aids are used by adults.

Fig 4.4: Models of ITE hearing aids

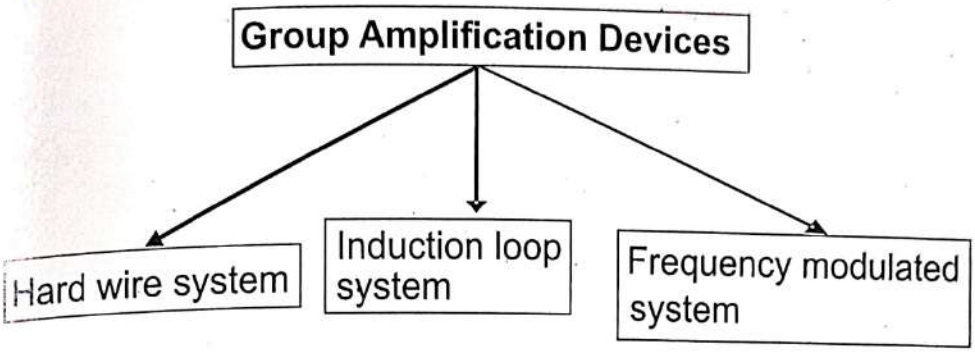


4.2.1.4 Cochlear Implants

It is a surgically implanted device, designed to stimulate the hearing nerve with electrical impulses. The children who are undergone cochlear implant though may hear clearer, would still require auditory training to attach meaning to the language heard.



4.2.2 Types of group amplification devices

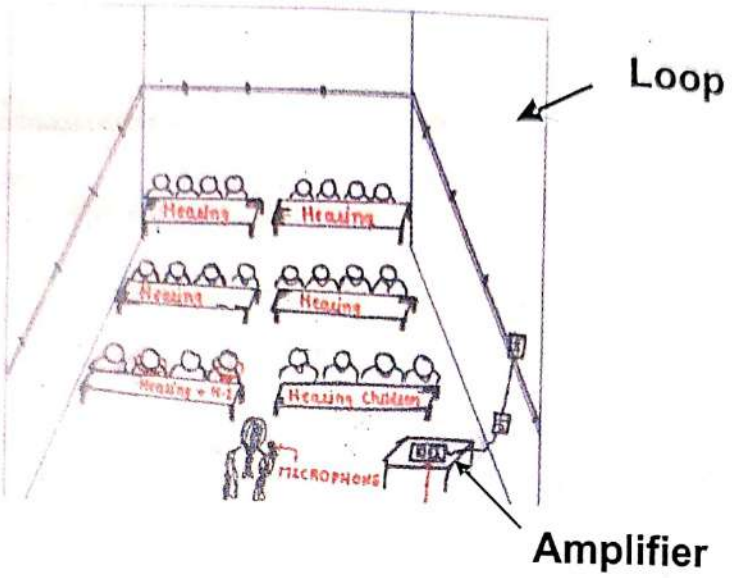


4.2.2.1 Hard Wire System (group hearing aids)

In this amplification system, the teacher uses a mic to speak. This gets amplified and is heard by the students through the headphones. This system was earlier used in special schools. It may be useful in the resource room for instructions in a group.

4.2.2.2 Induction Loop System

This system could be installed in the regular classrooms. An induction loop is installed along the walls of the classroom. The teacher's voice from the mic is amplified and transmitted through the coil to the child's hearing aid. It provides better flexibility to the students.



4.2.2.3 Frequency Modulated system:

Frequency modulated system i.e. FM system is the one in which the speaker's i.e. teacher's oice is picked up via a FM wireless microphone and is transmitted to the children's receivers. This also has a matching frequency chip. The background noise is considerably reduced. So the child clearly hears the teachers speech. As it is a wireless system it allows freedom in movement to both teachers and pupils and hence is ideal for inclusive classroom.

****

UNIT-5

CARE AND MAINTENANCE OF HEARING AID & TROUBLESHOOTING

Objectives of this unit :

- To know how to care and maintain a hearing aid and ear mold
- To understand the simple trouble shooting of hearing aids

As hearing aids are electronic devices, appropriate care and maintenance is necessary for a long life of the aids. Basic knowledge about minor trouble shooting of hearing aids can help in repairing the hearing aids quickly without loosing time and money.

5.1. Usage of Hearing aids

- Hearing aids should be worn all the time.
- They should be **handled gently** and protected from moisture and dust.
- Hearing aids must be removed if it is raining or if the child is swimming.
- Hearing aids must be removed if the child is engaged in a rough outdoor sport. However they may not be removed while carrying out experiments in the laboratory or other school activities.
- Body worn hearing aids have to be protected at the time from food/drinking water.
- If for any reason the hearing aids are not used for a long time, the battery must be removed from the battery compartment.

5.2. Cleanliness of Molds

- Molds need to be cleaned regularly to avoid blockage of sound due to wax.
- **Detach the molds from hearing aids** and then clean them with luke warm water, brush and soap preferably during night time when the child is sleeping and doesn't require the hearing aid .
- Dry them completely before attaching them to the hearing aid.

5.3 Checking of Hearing Aids

- Turn the child to his back at a distance of about three feet, wearing the aid or cover your mouth (so that he should not lip read)
- Individually present each of the following six sounds: /a/, /i/ , /u/, /sh/, /s/,/m/ (These sounds represent the variety of the frequencies present in speech. ie. low ,mid and high frequencies)
- Instruct the child to raise hand or place a block into a container when he hears these sounds or repeat them.

5.4 Trouble shooting of Hearing Aids

Problems	What to do about it
No sound	- Try a new battery - Make sure the battery is properly placed. ie.Match the positive (+) on the battery to the(+) in the battery compartment. -The battery compartment may be corroded. Clean it gently with the pencil

	eraser, and then try a new battery. -Make sure the hearing aid is set at ON, not at the T switch -Look for wax or dirt in the ear mold. Clean the mold with a pipe cleaner, and then with luke warm soapy water. Dry it completely before reattaching it to the aid. Do not use alcohol/any pointed objects like hair pin, pencil etc. For cleaning . -Look for twist in the tubing.
Squealing/ feedback	-Check to see if the ear mold fits properly. If it looks too small, inform the student's parent or audiologist. -Check the volume /control switch and turn it down to the minimum /appropriate setting. -Check for loose tubing, or for the cracks in the tubing attached to the aid or mold.
Weak , distorted or Scratchy Signal	-Change the battery, even if it is new. -With body aid try another receiver. -Turn the volume control up and down and listen for scratchiness or dead spot. - if there is tone control, make sure the tone control is set properly.
Any other	Contact hearing aid technician immediately

****

UNIT-6

METHODS OF COMMUNICATING WITH CHILDREN WITH HEARING IMPAIRMENT

Objectives of this unit :

- **To know the various methods of communication used by children with hearing impairment**
- **To know the features of each method of communication**

The different methods of communicating with children with hearing impairment are Oralism, Total communication and Manualism. The selection of any one of these depends upon the child's individual capacity, interest of parents and philosophy of the special schools where the child has been intervened.

6.1 Oralism :

In this method, the emphasis is on developing listening skills and learning to **'understand'** and **'use'** spoken language Through Auditory Training, the special teachers would have assisted the children to develop good Aural/oral skills. Such children would understand the spoken language well and would also speak while communicating.

6.2 Manualism :

In this method, the children will be signing. They may or may not be using the hearing aids. Teachers may have to use signand the children in turn may also sign

For communication. Though speakingmay not be the method of communication, such children too develop good command over manual language. *Interpreter services may be required for these children in regular schools. The interpreters will interpret the classroom instructions to the child and also interpret the child's queries and communicate to the regular teacher. Apart from signing, the child with manual method may use finger spelling (refer to page 26) or signed language. (Signing each word of a spoken language, refer to page 27)

(* An interpreter is a person who acts as a mediator between the child with hearing impairment and other speaking people.)

6.3 Total communication :

Children using total communication\ may have skills in both oral and manual. These children will understand the spoken language through lip reading

the teachers. Children using total communication may speak to communicate or may also make use of sign language/signed language /finger spelling. Interpreter services may not be generally required for children with total communication. However, the need of interpreter's services would depend upon the individual child's capacity.

Fig 6.1 : Single Handed Finger Spelling

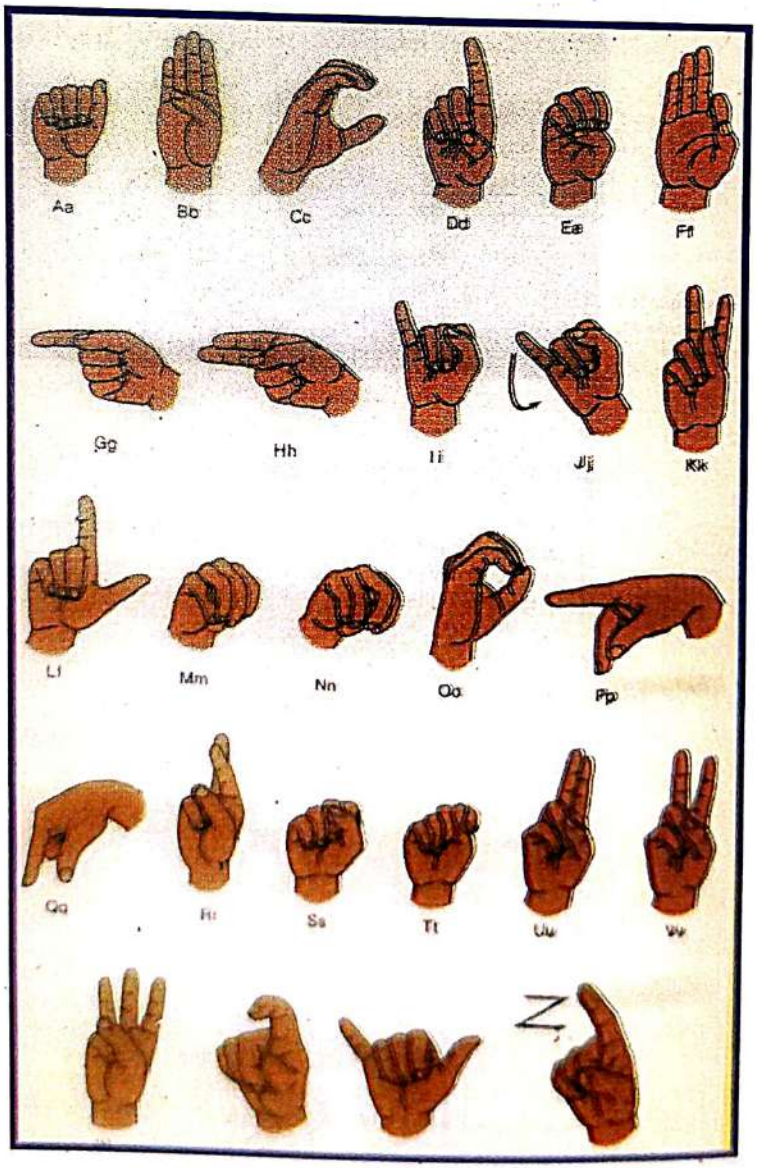


Fig 6.2 : Signed language (signed English)

I

have

a

brother

UNIT-7

INCLUSIVE EDUCATION

Objectives of this unit :

- **To understand the difference between integrated and inclusive education.**
- **To understand the importance and requirements of a resource unit.**

7.1 Integration VS Inclusion

While both integration and inclusion imply education of special children in regular schools, there is a philosophical difference in their approach. Integrated education means preparing the special child by specialists for the challenges in regular schools. It further includes making the special child suitable for the regular school system. Inclusive education on the other hand promotes the idea of including the special child like any other child. It stresses the need to modify and tune the system to adapt itself to the needs of special children. It includes sensitizing the regular school teachers and removal of architectural and attitudinal barriers. The special schools are seen more as **service giving centers** rather than a place to educate a special child.

7.2 Resource Unit

Resource unit is a center in a regular school for supporting the special needs of children with disabilities. The services offered in a resource unit

for children with hearing impairment includes :

- Assessment of hearing loss
- Maintenance of amplification And other assistive devices
- Educational support
- Ancillary services like speech teaching and auditory training
- Educational guidance for parents

7.2.1 Requirements for a resource unit

Infrastructure

- A well-lit and ventilated room in a noise free place
- Suitable furniture with bushes
- Vinyl flooring
- Blackboards and Soft boards

- Booth for audiological assessment
- Induction loop system/ FM amplification system

For Assessment of hearing loss

- Audiometers, portable audiometers
- Screeners
- Toys and pegboard for conditioning

For Maintenance of amplification and other assistive devices

- Hearing aid analyzer
- Spare Hearing aids
- Spare parts of hearing aids like cord, batteries, receiver, tubes, battery charger
- Multimeter

For Educational support

- Standardized and teacher made tests for educational assessment
- Computer with educational softwares
- Resource books
- Two and three dimensional teaching learning materials
- Supportive teaching learning materials like adapted textbooks
- Individualized instructional materials

Ancillary services like speech teaching and auditory training

- Speech trainer
- Big mirror
- Speech teaching kit
- Noise makers, flash cards, word and sentence strips

Educational guidance for parents

- Copy of Acts and other legislation like PWD Act (1995), NPPD (2006)
- Government orders for various concessions and facilities for children with disabilities and their parents
- List of service providers

7.3 Individualized Education plan

Children with disabilities and hearing impaired in particular, are a heterogeneous group. Their educational needs are highly individualized. These needs are assessed, targets are set and suggestive measures to achieve the targets are documented in the Individualized Education Plan.

Contents of IEP

- Current/ Present level of functioning
- Annual goals and short term objectives
- Services required and providers

Team for IEP

- Special educator
- Speech and hearing professionals
- Parents
- Regular school teachers
- School counselors

7.4 Parent Professional partnership for inclusive education

Support services of parents are very important for the success of inclusive education

- Intimate parents in advance about the topic to be taught
- Encourage them to take follow up at home
- Inform parents about the progress of their child

****

UNIT-8

BARRIER FREE CLASSROOMS FOR CHILDREN WITH HEARING IMPAIRMENT

Objectives of this unit :

- **To identify the various barriers in the learning**
- **To know the tips for removal of barriers in classroom learning of children with hearing impairment**

Children with hearing impairment face barriers of attitude, environment and instructions.

8.1. Tips for removal of attitudinal barriers

- Be optimistic. Develop a positive attitude by gaining adequate information about disability and its management
- Recognize the strengths of disabled children and consider them as differently abled
- Give adequate information to regular school students and peers , parents and allied professionals about the differently abled child prior to his/her arrival in class
- Give ample opportunities for peer interaction, curricular and co curricular activities in and outside the classrooms.
- Encourage peer tutoring and buddy system. It will help both-regular school children and the special child.
- Assign some class assignments to the special child like distributing notebooks etc. This will inculcate belongingness and also help the child to familiarize with the names of class children

8.2. Tips for removal of environmental barriers

- An Induction Loop System or a Frequency modulated system should be installed in the classroom.
- The special child's seat should be away from noise and close to the teacher
- Classroom and background noise should be as minimized.
- Light should fall on the teacher's face. Avoid standing with a direct light behind.
- Seating should be preferably at the centre and in front of the teacher so that the child can speech read and listen well.
- Furniture should have rubber bushes.

To facilitate speech reading:

- Teachers should restrict their movements while teaching
- Teachers and other students should speak naturally using natural gestures and maintain face to face contact. It is suggested to avoid chewing and talking together as the special child will face difficulty in speech reading.
- Teachers should not turn their back to students while speaking/writing and avoid talking while writing on the board.
- Looking down in books or notes and or holding them, in front of the face should also be avoided to remove barriers in speech reading.

8.3. Tips for removal of instructional barriers

- Use of more visual aids will help to reduce the learning barriers.
- Initially the prior preparation may assist better understanding in class. So inform the parents about the new topic in each subject before teaching in class.
- Give a brief introduction to the topic being taught. Indication by ways of pointing in between in the book of the special child will ensure that he /she also reads the same thing which is being read by others.
- A Schematic representation on the board in the beginning (like the e.g. given below) will give the child with hearing impairment child an idea as to how the teacher's instructions will proceed Eg:

1. Where is air?
2. Constituents of air
3. properties of different constituents of air
4. uses of air
5. steps to prevent air pollution

- While switching over from the text book reading to explanation or showing teaching aid, a gentle tap on the desk of the child will make the hearing impaired child alert about the change in stimulus variation.

- Giving more examples while teaching, so also relating to the child's experiences will help in comprehension of the lessons. Asking the child to use new words in sentence of his/her own will help to develop the concepts being taught.
- Demonstration method and activity method are more beneficial for teaching a child with hearing impairment than the lecture method.
- Text book adaptation if available or undertaken can supplement the teaching (refer to page -38).
- Questions can be asked in between to check whether the special children are understanding the instructions .However avoid ambiguous and double barreled questions.
- The subject matter could be explained in simple, sequential and in complete sentences.
- While discussion in the class, encourage only one child at a time to speak so that, the child with hearing impairment knows where to focus.
- Slow the pace of instructions where ever necessary.
- Add prompts wherever required which will build up the special child's confidence
- It is suggested not to make the child conscious of the speech errors by criticizing. Instead, provide a good model and ask him/her to imitate.

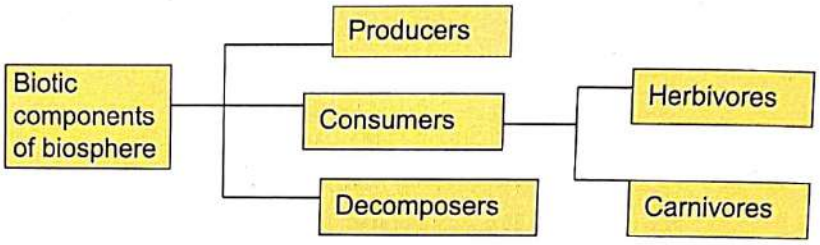
- Watch for student's fatigue as they have to speech read and attend the auditory stimuli simultaneously.
- The greatest challenge which is faced while teaching a child with hearing impairment is of language comprehension. This could be tackled by taking the help of resource teachers either prior or after the lesson. In the absence of such a facility, devoting 10-15 minutes in a day for clarifying the special child's doubts will be a much welcome move.

8.4. Tips for removal barriers in examination

- Use simple language while framing questions.
- Questions should be specific.
- Reduce difficult vocabulary and structure of questions.
- Break up the questions wherever necessary.
- Explain key words or give visual/ manual cues.
- Use objective questions where ever possible.
- Give different variety of objective questions. Essay questions could be replaced to objective /short answer questions.
- In essay questions, use 'response restricted' essay questions.
- Instructions for answering the questions should be clear and specific.

8.5. Strategies for remedial reading

- **Graphic organizers** (as given below) could be useful where ever required.

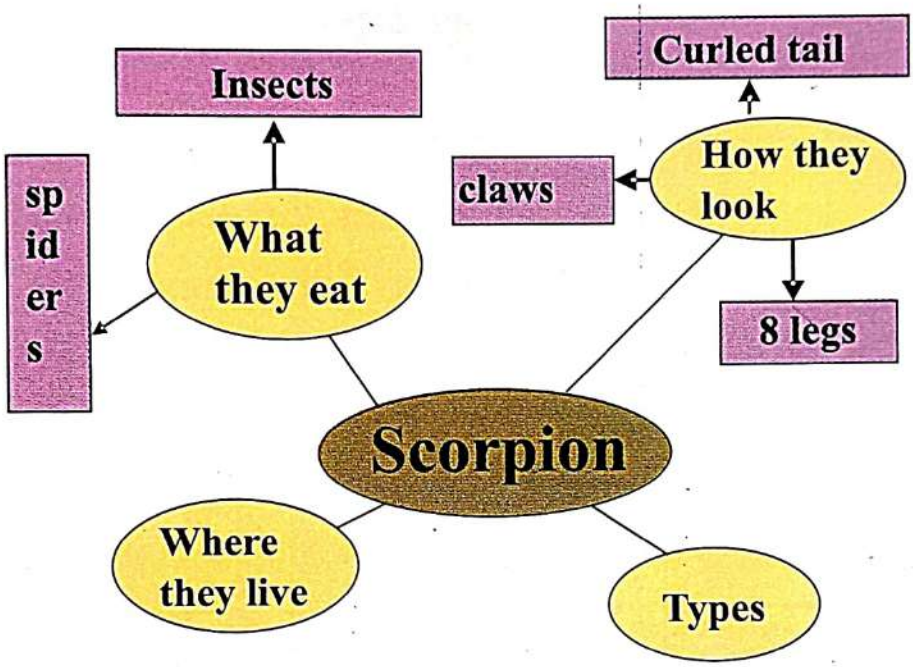


- Pre teaching the new vocabulary before actual reading.
- Highlighting the important points.
- Setting the objective by saying, 'let us see what happens next'.
- Encouraging silent reading.

8.6. Strategies for improving Writing Skills

- Encourage use of dictionary and computers as an aid
- Pre teach the spellings as required. Identify the words, which are already mastered. Focus on the words they need to learn
- Review the rules for punctuation, capitalization etc. before they start writing. Pin the rule chart on the bulletin board
- Give practice for written expression, Ask students to compose a small story or a note and correct it in front of the child .
- Develop organization Map wherever required.

E.g.: For writing an essay on scorpion, the organization map could be:



8.7. Strategies for improving Arithmetic Skills

- Use visual prompts to solve computation problems .Eg.Multiply 31X5

Eg. 31 31 31

X 5 x5 x5

- Give only a few problems at a time
- Use manipulative objects while teaching basic concepts and relationships
- Provide verbal prompts
- Use real situations for word problems
- Make sure that the language used in word problems is clear

- Help students to analyze the problems and to identify and comprehend the key words.
- Give adequate exposure to the clue words. For eg.

  Addition: sum, altogether, plus etc.

  Subtraction: remains, lost, left, spent etc.

  Multiplication: how many times etc.

  Division: share each, cost of one, distribute each etc.
- Use compare and contrast matrix where ever required Eg:

Shape	No. of Sides	Length of the sides	Area
Rectangle	4	Opposite sides are equal in length	A=lxb
Square	4	All sides are equal in length	A=lxl
Equilateral Triangle	3	All sides are equal	½ bh

****

UNIT-9

ADAPTATION OF TEXTBOOKS

Objectives of this unit :

- **To know the importance of adaptation of text books**
- **To understand how an original text is different from an adapted text**
- **To identify the areas of adaptation and their strategies**

Textbooks play a major role in the teaching- learning process. How ever, majority of children with hearing impairment face difficulties in following the text. This is because of the following reasons:

The language of the textbooks is attuned to that of the hearing children

- The language of the text differs from that of communication in everyday life.
- The vocabulary load, sentence structure (complexity, length, rhetorical language), idea density (concrete, abstract words), figures of speech, idiomatic language, use of substitutes, characters, length of text make understanding difficult.
- Some of the text items are not sequenced properly.
- Textbooks are less Illustrated and illustrations are restricted to the nouns.

In such instances, adapted textbooks are very useful for teachers, children with hearing impairment and their parents. The adapted text , the areas of adaptation and strategies to be followed for adaptation are mentioned below

9.1 Example of an adapted text

Original text :

"We live on the earth. There are trees and plants, birds and animals and human beings on the earth. Trees and plants, birds and animals and human beings are called living things. Long ago, there were no living things on the earth. Gradually, over thousands of years, living things appeared one by one. All the living things did not appear at the same time. The first living things were born in water. They were so tiny that they could not be seen by the eye. They did not have hands, feet, eyes and other organs. Many years' later, froglike creatures were born. They could live in water as well as on land. Later on, many other kinds of animals, birds and plants appeared. Some of the animals were huge. They were much bigger than even elephants. Gradually, they became extinct, that is they all died out. Their skeletons have been found in rocks deep under the ground. Although the huge animals became extinct, many other kinds of birds and animals survived. Later on, an apelike creature appeared. His head was bigger than that of an ape. He had no tail. He walked on two legs, but could not stand or walk erect. His arms were long, reaching up to his knees. He had lots of hair on his body. His eyebrows were thick. His nose was flat. His jaw was broad. This creature was the early man of thousands of years ago".

Adapted text :

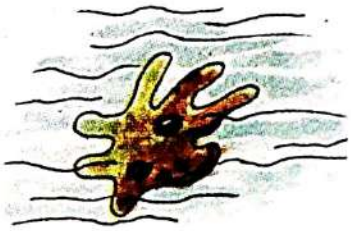
We live on the earth. Many living things live on the earth. It means, plants, trees, birds, animals and human beings live on the earth.

When was the first living thing born?

Long ago, there were no living things on the earth. There was only rocks and water on the earth. Gradually, over thousands of years, living things appeared one by one. All living things did not appear at the same time.

Description of living things appeai

- **Very tiny creatures appeared:** They lived in water. They were so small that they could not be seen by the eye. They did not have hands, feet, eyes and other organs.

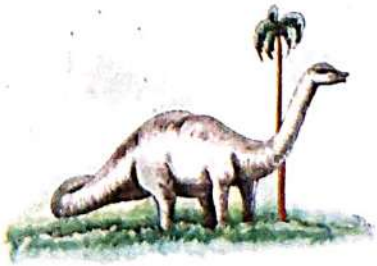


Later on

- **Frog like creatures appeared :** They could live on land as well as in water.

Later on

- **Birds, animals and plants appeared :** They were of different types. Some animals were huge. They were much bigger than even elephants.



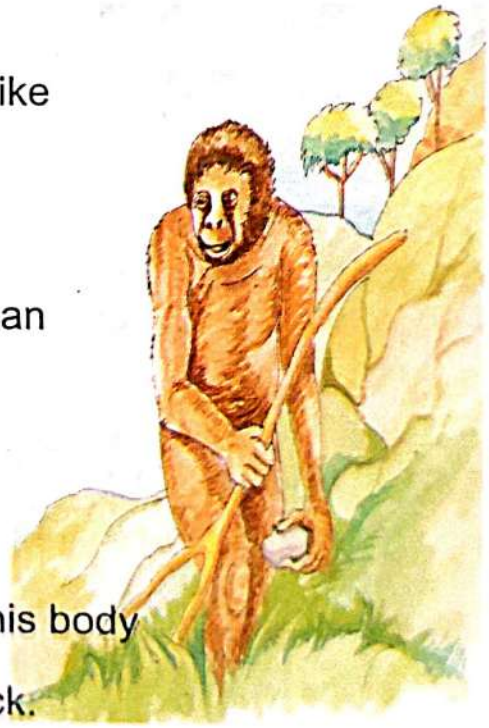
Gradually, they became extinct, that is they all died out. Their skeletons have been found in rocks deep under the ground.

Although the huge animals became extinct, many other kinds of birds and animals survived.

Later on

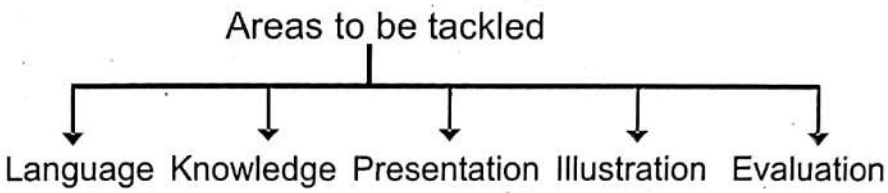
Ape like creature appeared : This creature was the early man of thousands of years ago.

How did the early man look?



- The early man looked like an ape
- He had no tail
- His head was bigger than that of an ape
- His nose was flat.
- His jaw was broad.
- He had lots of hair on his body
- His eyebrows were thick.
- He walked on two legs, but could not stand or walk erect.
- His arms were long, reaching up to his knees.

9.2. Strategies for textbooks adaptation



9.2.1. Adaptation in language :

- Breakup long sentences:
  - Rewrite as two or more short sentences
  - Use simple conjunctions
- Reduce difficult vocabulary load
  - Retain essential technical vocabulary
  - Use simple synonyms
- Use guiding questions (about facts, application of prior experience, linking next aspect)
- Present cause and result expressions in a simple form
- Aspects like passive sentences, positive and negative sentences, colloquial and idiomatic expressions should be made clear
- Use of rhetorical language should be limited

9.2.2. Adaptation in knowledge:

- Reduce the density of concepts in a chapter
  - Break concepts into various units
- Present knowledge step by step
- Give direct information first, indirect next and general last
- Do not cut down the content

9.2.3. Adaptation of illustrations :

- Include illustrations such as pictures, sketches, graphs etc
- Use simple and clear Illustrations
- Place Illustrations near the text to be referred
- Pictures should be expressive
- Pictures should not be referring only to nouns but to the overall meaning of the text

9.2.4. Adaptation of presentation :

- Include flowcharts, tables etc.
- Present matter in bullet form instead of paragraphs
- Include footnotes or marginal explanation
- Put boxes or use different print for important words, definitions etc.
- Present a list of main ideas in the text
- Include word bank giving meanings of different words in a box at the end and underline or highlight all these words in the text.

9.2.5. Adaptation of Evaluation

- Add simple questions within the text.
- Add inferential questions to recall from previous knowledge.
- Include attractive/ innovative assessments like crosswords puzzles etc.
- See that assessments cover both language and knowledge.

****

UNIT-10

SPEECH DISORDERS

Objectives of this unit :

- **To know about articulation, voice and fluency disorders in children**
- **To understand the management of children with articulation, voice and fluency disorders**

Speech is the vocal means of communication. The production of sounds requires the coordination of oral neuromuscular movements to physically produce sound waves, the physical transmission of sound and meaning. In other words, speech refers to the sounds that come out of our mouth and take shape in the form of words and sentences.

Speech is considered abnormal or distorted when it is conspicuous, unintelligible, unpleasant, interferes with communi-cation, or causes the speaker to be maladjusted. In other words, the listener is confused with "how" the message is conveyed.

Problems that are labeled as abnormal speech are typically placed in one or more of the following categories:

- **Articulation disorders (speech sound disorder)**
- **Voice disorders**
- **Fluency Disorders**

10.1 Articulation disorders :

Most of us have heard a young child making errors in speech sound production. The child may have pronounced a **'rose'** a **'roth'** or a **'rabbit'** a

'wabbit'. In the first instance, a **/th/** sound was substituted for an **/z/** sound, and in the second instance a **/w/** sound was substituted for an **/r/** Sound. Difficulty in producing speech sounds is called as articulation disorder.

10.1.1 Types of articulation disorders

- Distortion: A speech sound is said to be distorted when it sounds more like the intended sound than any other speech sound yet is noticeably wrong. Example : **/s/** produced by releasing the air stream laterally rather than frontally such that it sounds slushy.
- Substitution: A substitution occurs when one speech sound is substituted for another. Example: **/th/** is substituted for **/s/** when a child says **'thun'** for **'sun'**
- Omission: An omission occurs when a speech sound is simply left out. Example: The **/r/** is omitted when a child counts and says **'fo'** instead of **'four'**.
- Addition: An addition occurs when a speech sound is added to a word. Example: A child may insert an unstressed vowel **'u'** into the word **'blue'** between the **'b'** and **'l'**, thus saying **'bulue'**.

10.1.2 Guidelines to handle children with articulation disorders

Do's

- Correct the child's misarticulation when ever possible. Insist on correct production of speech sounds
- Work closely with the speech-language pathologist when working with a child with a speech sound problem.
- Attempt to reinforce in the classroom what a child has mastered in the therapy sessions.
- Cooperate fully with a speech-language pathologist when he or she wishes to recheck a child who has been in therapy.
- Encourage the child to speak .

Don'ts

- Don't permit ridicule of a child with a speech sound problem.
- Do not punish the child for his/her misarticulation

10.2 Voice Disorders

Voice is produced by the voice box or larynx. Each person has a characteristic voice due his unique vocal apparatus. That is why we can sometime identity a person on the phone as soon as he says "hello". The voice also imparts other

information about us. It mirrors our emotions. It may reflect our physical health or medical conditions.

Voice problems may be a symptom of a more serious medical condition. It is necessary to have an ENT doctor examine a child with a voice problem. Depending on the problem, medical, surgical or voice therapy may be recommended.

10.2.1 Types of voice disorders :

A voice disorder exists when a speaker's voice significantly differs from 'normal' in relationship to his/her age, sex, size and cultural background. Such a voice draws attention away from the content of the message to the manner in which the message is being delivered.

Inappropriate pitch

There are different types of voice disorders. A child's voice may sound too high or too low; a female can sound like a male because her pitch was too low, or a male may have a high and feminine sounding voice.

Inappropriate Loudness

Another type of voice disorder is where voice is too loud or too soft. The voice that is too loud may be that of a child who is in the habit of shouting, screaming or cheering loudly in the playground.

Inappropriate Quality

In some children voice quality may be poor and described as hoarse, rough, breathy or nasalized.

10.2.2 Causes of voice disorders :

Voice disorders can result from vocal abuse and misuse. These involve improper use of the vocal mechanism. Examples include screaming, yelling, shrieking, loud talking, excessive use of voice, grunting, loud laughter, effortful singing, use of voice to make animal or machine like sounds, coughing, throat clearing and smoking. Such behaviors may contribute to a voice disorder. Children who have allergies, asthma or frequent respiratory infections may be prone to vocal abuse.

A child's voice may sound hoarse or strained due to medical conditions such as vocal nodules and vocal polyps, which can be a result of the child using the vocal cords incorrectly. There are other medical problems, which can cause hoarse voice. These require medical attention.

10.2.2.1 Stuttering

Speech begins with the first cry at birth. It then develops rapidly during the first two years as the child learns to make meaningful sounds and words. Sometimes , between the ages of two and six, a child may begin to have noticeable

difficulties in speaking smoothly and freely especially when starting to use sentences. These may be the sign of a stuttering child. At the time of acquiring fluent speech, all children repeat words and phrases, hesitate often and have occasional difficulty with the smooth flow of words, but some have more trouble than others and for longer periods of time.

Stuttering occurs when the forward flow of speech is interrupted abnormally by repetition or prolongation of a sound, syllable or articulatory posture or by avoidance and struggle behaviors.

10.2.2.2 Characteristics of stuttering :

Stuttering usually begins gradually by the time the child is 5 years. Some warning signs are:

- **Repetitions:** Sometimes the child may repeat the initial sound in a word (e.g. "Sh sh-she") or repeat parts of words (e.g. "Mis Mis Mister").
- **Prolongations:** Sometimes, instead of repeating initial sounds, the child may prolong the first sound of a word, so that "Mummy" becomes "Mummmumomy".
- **Struggle and tension:** Child may struggle to get words out or have an unusual amount of tension in his lips, tongue, throat or chest when he tries to say certain words.

The presence of these signs indicates that the child may develop into a stutterer unless something is done. A visit to a Speech Pathologist is a must.

10.2.2.3 Causes of stuttering :

Neurophysiological, psychological, social and linguistic factors all probably contribute to its onset and development. It is a developmental disorder. Its first appearance is in a toddler and as time progress the symptoms may become worse due to family stresses, listener reaction. Good treatment of mild and moderate stutterers in their preschool and early elementary years may leave a child with little trace of stuttering. Most severe stutterers or those treated after puberty will make partial recovery.

10.2.2.4 Tips for teachers

- Accept the child who stutters just as you would any other child.
- Try to build the self-confidence of the child.
- Provide ample opportunity for the child having stuttering problem to participate successfully in oral activities.
- Maintain eye contact when a stuttering child speaks. Be a good listener, even though it may take longer.
- Develop an accepting attitude in other classmates towards the child

- Provide opportunity for the child to say what he/she wants to say.
- When the child has disruption in speech, allow him time to work through his mistakes :
  a) Without listeners hurrying him.
  b) Without listeners finishing words or ideas for him.
- If required, refer him/her to a speech language pathologist.
- Get acquainted about the nature of his/her problem from the speech and language pathologist
- Reinforce the work of the speech-language pathologist.

****

UNIT-11

CONCESSIONS FOR PERSONS WITH DISABILITIES

Objectives of this unit :

- To know the various concessions and facilities available for persons with disabilities
- To know the educational concessions for PWDs mentioned in PWD Act, (1995)

11.1 Financial and other concessions

ITEM	SCHEME	DETAILS*
Financial	Children's Educational Allowance (for income slab below Rs. 2000 p.m.)	Reimbursement of Rs. 40/-p.m from class I-X & Rs. 85 from class XI-XII for day scholars and Rs. 140 for hostellers
Financial		**Hosteller Day scholar**
	Class IX-XII	Rs.140/- Rs.85/-
	BA/B.Com/Bsc	Rs.180/- Rs.125/-
	National Scholarships for : B.A./ B.Com. / B.Sc.	Rs.180/- Rs.125/
	Professional courses B.E./B.Tech.	Rs. 240/- Rs. 170/-

	P.Hd/ M.Phil/ P.G. In Engineering/ Medicine/ Agriculture/ Vetenary/ Educational Management Diploma / Certficate level courses	Rs.1000/- Rs.700/- Rs.700/- Rs.400/-
Financial	UPSC/SSC Exams	exempted from payment of application and examination fee
	Scheme of Integrated Education for the Disabled children	Books and stationary allowance of Rs. 400/- per annum and b) Uniform allowance of Rs. 200 per annum Transport allowance Rs.50 p.m. Reader Allowance Rs. 50 p.m. for blind children For hostellers, boarding and lodging charges max. of Rs.200/-per month Maintenance Rs. 75 p.m.

Financial	Scheme of assistance to disabled persons for purchase / Fittings of aids/ appliances	Diagnosis and fitting of Aids and appliance at free of cost up to income slab Rs.6,500 50% up to Rs.10,000 full cost above Rs.10,000 Travel allowance of max. Rs.250 (ordinary class) Rs. 30 for lodging, boarding per day up to 15 days
Financial	Birth Right Insurance Scheme	New India Insurance Co
Financial	On purchase of hearing aids for the disabled child	Reimbursement of the cost of aids
Travel	Road /rail/Air	50% concession for travel in bus
		50% concession for disabled and his escort in rail
Tele Commu-nication	STD/ PCO booths	Preference is given to the disabled
Income tax con-cession	For disabled employees under 80 U	Exemption of Rs. 50,000/-

	Section 80 DDB for Parents having a disabled minor	Exemption of Rs.75,000/- for severly handicapped and 50,000/- for dependant having disability less than 50%
Profess-ional tax	Disabled employees/ spouse/ parents of Disabled	Exempted from professional tax
Employ-ment	Reservation of jobs	3% for all disabled (1% each for OH,VH & HI) in Group A,B, C & D posts
Age Relaxa-tion For Employ-ment		Relaxation in upper age limit up to 10 years for appoint-ment to any post
Self em-ployment loans	National Handi-capped Finance Development Corporation Ltd. Loans	Loan for Self-Employment from Rs. 1,00,000/- to Rs. 5 lakh
Reser-vation in Self employ-ment loans	PMRY & SJSY of ministry of rural development and poverty alleviation schemes	3 % of the allocation are ear marked for PWDs

Reser-vation in admiss-ions	Government technical institutes / Tech. Institutes aided by Government	3 % reservation

* Condition Apply & subject to change.

11.2 Other Educational facilities for children with hearing impairment

According to Persons with Disabilities (Equal opportunities, Protection of rights, Full Participation) Act, 1995 the appropriate Government shall by notification prepare a comprehensive education scheme which shall make provisions for:

- free education in an appropriate environment till he attain the age of 18 years
- the removal of architectural barriers from schools colleges or other institutions imparting vocational and professional training
- restructuring the curriculum for benefit of students with hearing impairment to facilitate them to take only one language as part of their curriculum

****

Acknowledgements

Sarasvady Sunder,
Dept. of Education,
&
R. Bhattacharya,
HOD/ SERD
AYJNIHH, Mumbai 50

INSTITUTIONS

Mahadevi Poddar Prathamik Vidyalay
Mumbai- 400 054.

Rochiram Thadani School for the Hearing Handicapped
Mumbai- 400 074.

Central Society for Education of the Deaf
Mumbai 400 008.