

World Bank Group: Education Global Practice
Toolkit for **MASTER TRAINERS** in
Preparing Teachers for **INCLUSIVE
EDUCATION FOR CHILDREN**
with Special Needs

Making Inclusion Work



Master Trainers Material

Module 5: Including Children with Hearing Impairment



सत्यमेव जयते

Ministry of Human Resource Development
Government of India



WORLD BANK GROUP

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FOREWORD

The Right of Children to Free and Compulsory Education Act (2009) mandates free and compulsory elementary education to all children in the age group of 6-14 years. Sarva Shiksha Abhiyan (SSA) is the key vehicle for implementation of RTE Act. One of the important components of SSA is Inclusive Education of Children with Special Needs (CWSN). The thrust of SSA is on providing quality inclusive education to all children with special needs. However, inclusion implies equal opportunities and full participation of **All** children with special needs in school activities. For this, the environment has to be disabled-friendly and barrier free (77.37 percent of schools under SSA are now barrier-free). Necessary support services are needed; over 20 thousand resource persons have been appointed and close to 800 non-governmental organizations are involved in this area. More and more children are being provided with much needed assistive devices and technologies, large print and Braille books to facilitate their inclusion in regular classrooms. Over 2.3 million children with special needs are now enrolled in schools in SSA.

The critical link to making inclusion of CWSN happen in schools and classrooms is the teacher. Hence, capacities of the teachers need to be built up on those pedagogical practices that would address the needs of all children with special needs, especially those with high level support needs in a mainstream classroom. One of SSA's goals is to ensure that there are enough trained teachers to respond to and address the challenge of inclusion.

This series of five training modules on *Making Inclusion work* is a tremendous contribution to SSA's ongoing efforts to prepare teachers to work with children of all abilities. Geared towards master trainers, the modules provide practical information on effective inclusion of CWSN, especially of children with autism spectrum disorder, cerebral palsy, deafblindness and hearing impairment in mainstream inclusive environments. They aim to build awareness of the challenges faced by children with these disabilities and share tested approaches in addressing these challenges. The modules are full of practical advice on how to create a classroom culture based on the principles of diversity, belonging and respect for individual differences.

I am very pleased to dedicate this to the teachers of the country who have an immense role in making school a welcoming place for all children, including these with special needs.


(PRAKASH JAVADEKAR)

Foreword

In 2000, the Government of India embarked on a massive endeavor to universalize elementary education. The *Sarva Shiksha Abhiyan*—the Government’s Education for All programme—has supported efforts to ensure that *all* children ages 6-14 have access to free and compulsory education throughout the country—in villages, towns, cities and mega cities. All children regardless of social economic background, gender, and abilities have the fundamental right to schooling. SSA has a zero exclusion policy. The scale of the challenge was immense; in 2001 there were 205 million children of elementary schooling age.

Fifteen years down the road, and in close partnership with State governments and communities across India much has been achieved. Access to schools has been nearly universalised and almost 98 percent of habitations have access to a school within a kilometre. SSA today covers more than 1.5 million schools and 4.5 million teachers have been added. One of the strongest pillars of the SSA programme continues to be the focus on equity, and progress has been significant. An equal number of girls and boys now attend school. The proportion of children from schedule castes and scheduled tribes enrolled in elementary schools now mirrors the SC and ST proportion in the general population. At this juncture it is critically important to work together to secure these tremendous gains for future generations, while continuing to make more progress on access, equity and quality of education.

Since the adoption of the RTE in 2009, SSA has been increasingly focused on ensuring access to quality education for Children with Special Needs (CWSN). Despite concerted efforts and progress, far more needs to be done to ensure that children with disabilities are effectively included in the education system. Data also indicate that identification processes need to be strengthened as only 1.22 percent of all children have been identified as CWSN.

SSA supports a multi-pronged strategy for the inclusion of CWSN. Some children are enrolled in Special Schools, others with severe disabilities are home schooled, and yet others go through a school readiness programme to prepare them for transition into a mainstream classroom—the ultimate goal of SSA. However, preparing children to fully participate in an inclusive education environment is only one part of the challenge. The school’s physical environment has to be disabled-friendly and barrier-free (82 percent of schools in India are now barrier-free). Necessary support services are needed; over 20 thousand resource persons have been appointed and close to 800 non-governmental organization are involved in this area. More and more children are provided with much needed assistive devices, large print and braille books

and other technologies that allow children with special needs to be fully included in regular classrooms across India.

The critical link to making inclusion of CWSN truly a reality in schools across India is the teacher. One of SSA's goals in 2015 was to ensure that there are enough teachers to respond to the challenge of inclusion and that they have training, teaching-learning materials and academic support structure at the cluster, block and district levels.

This series of five training modules on *Making Inclusion Work* is a tremendous contribution to SSA's ongoing efforts to prepare teachers to work with children of all abilities. Geared toward master trainers, the modules provide practical information on effectively including CWSN, especially children with autism spectrum disorder, cerebral palsy, deafblindness and hearing impairment, in mainstream inclusive environments. They aim to build awareness of the challenges faced by students with these disabilities and more important, share tested approaches—tips and advice from experts in the field—to addressing these challenges. The modules are full of practical advice on how to create classrooms where all children participate and are given opportunities to thrive and learn from each other.

I am very pleased to dedicate this to the teachers of the country who can make schools a welcome place of joy and learning for children with special needs.

Acknowledgments

The World Bank is pleased to support Government of India efforts to include children with disabilities into regular classrooms. As part of broader, long-standing support to *Sarva Shiksha Abhiyan (SSA)*, the World Bank helped produce the *Toolkit for Master Trainers in Preparing Teachers for Inclusive Education for Children with Special Needs: Making Inclusion Work*. The series of teacher training resource material comprises five modules addressing the inclusion of children with disabilities, particularly focusing on children with autism, cerebral palsy, deaf-blindness, and hearing impairment. The work was possible with funding from the United Kingdom's Department for International Development.

The toolkit was developed through a highly collaborative process, drawing on the extensive knowledge of domestic and international experts in pedagogy. A Writers' Workshop in December 2014 brought together 13 experts from various institutes, including EdCil, Rehabilitation Council of India, National Council of Educational Research and Training, as well as Non-Governmental Organizations (NGO) to conceptualize and prepare early drafts of the resource material. We would like to acknowledge the immense contributions of all the participants: Prof. Sudesh Mukhopadhyay, Prof. Anupam Ahuja, Ruma Banerjee, Merry Barua, Bharti Baweja, Anupriya Chaddha, Dr. Indu Chaswal, Dr. Varsha Gathoo, Prof. Judith Hollenweger Haskell, Uttam Kumar, Bhushan Punani, Dr. Vandana Saxena, Anamika Singh, and Vinay Singh. Despite busy schedules, they all found time to contribute to this important initiative.

The work also benefited from the sharing of knowledge from international experience. We would like to thank Amada Watkins of the European Agency for the Development of Special Needs and Inclusive Education, Filomena Pereira, Ministry of Education, Portugal, Aleksandra Posorac, Country Sector Coordinator, World Bank-Philippines, Michael Rosanoff, Autism Speaks, and Charlotte McClain-Nhlapo, Disability Advisor to the World Bank Group.

The modules would not have been possible without the technical leadership of Dr. Renu Singh, who was instrumental in making this collaborative process a success. Dr. Singh worked closely with experts to develop, write and edit all five modules. We would also like to acknowledge the contributions of Ms. Navleen Kohli, who with her colourful illustrations helped enhance each module. Ms. Mamata Baruah also provided excellent support to help organize workshops.

This module aims to help teachers identify and successfully remove barriers to learning, development, and participation faced by many children with hearing impairment. However, our main focus has been to offer comprehensive information about hearing impairment,

as well as how all key stakeholders, particularly the teacher, can respond effectively to the needs of each child. We acknowledge that including children with hearing impairment in the mainstream school requires certain preparation and capacity building of the teacher. Since this module is aimed at master trainers, many of whom will be specialists in working with children with hearing impairment, each unit has activities that the master trainers can utilise to foster reflection and support the teacher. Given that children with hearing impairment are not a homogeneous group, where “one solution fits all,” this module encourages the teacher to try different strategies to discover the ones that work optimally for the child in their classroom. By providing resource support to the master trainer to assist teachers in fostering inclusion of children with hearing impairment. We hope this resource material will facilitate the development of inclusive barrier-free environments with a comprehensive support system in every school.

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OVERVIEW

OBJECTIVES

To enhance teacher knowledge about the social and learning needs of student with hearing impairment

To develop an understanding about the different challenges faced by children with hearing impairment in the classrooms and beyond

To develop an understanding of creating enabling environments for learning in the classroom and beyond

To develop skills for curriculum transaction.

TABLE 1: OVERVIEW OF THE MODULE

| CONTENT | METHODOLOGY | EXPECTED OUTCOMES |
|--|---|--|
| Unit I: Understanding Students with Hearing Impairment | | |
| <ol style="list-style-type: none">1. Definition and understanding hearing impairment2. Classification of hearing loss, characteristics and implications3. Myths about hearing impairment | Presentation, group work, case study approach and discussions | Teachers will be able to: <ul style="list-style-type: none">• Identify variations that exist amongst children classified as hearing impaired• Explain different implications of hearing impairment on various life domains• Differentiate myths from reality |
| Unit II: Challenges Faced by Students with Hearing Impairment in the Classroom and Beyond | | |
| <ol style="list-style-type: none">1. Communication barriers2. Physical environment, including the listening and visual environment and classroom seating arrangements | Group activity, demonstration | Teachers will be able to describe the ideal situations and barriers in: <ul style="list-style-type: none">• Communications• Physical environment and infrastructural requirements |

| CONTENT | METHODOLOGY | EXPECTED OUTCOMES |
|--|---|--|
| 3. Interactions and activities in the classroom and beyond 4. Instructional processes and materials | | <ul style="list-style-type: none"> • Interactions, activities • Instructional processes and assessment |
| Unit III: Creating Enabling Environments | | |
| 1. Strategies for addressing communication barriers including Alternative and Augmentative Communication (AAC) 2. Socialization and friendships 3. Concessions and facilities for children with hearing impairment 4. Facilitating collaboration between different stakeholders | Lecture cum demonstration, videos, case studies | The teachers will be able to: <ul style="list-style-type: none"> • Understand effective modes of communication, including AAC • Identify facilitators for socialisation • Learn about available concessions • Describe the role and responsibilities of different stakeholders |
| Unit IV: Curricular transactions and pedagogic strategies | | |
| 1. Curriculum adaptations: adapting content, instruction, assessment practices, and teaching and learning material. 2. Teaching literacy skills 3. Developing writing skills 4. Teaching mathematics | Presentation and group activities | Teachers will learn to make accommodations and adaptations required for a child with hearing impairment |

Unit I: UNDERSTANDING STUDENTS with HEARING IMPAIRMENT

TABLE 2: OVERVIEW OF UNIT I

| CONTENT | METHODOLOGY | EXPECTED OUTCOMES |
|--|---|--|
| Unit I: Understanding Students with Hearing Impairment | | |
| 1. Definition and understanding hearing impairment 2. Classification of hearing loss, characteristics and implications 3. Myths about hearing impairment | Presentation, group work, case study approach and discussions | Teachers will be able to: <ul style="list-style-type: none"> • Identify variations that exist amongst children classified as hearing impaired • Explain different implications of hearing impairment on various life domains • Differentiate myths from reality |

Hearing is the ability to detect the mechanical vibrations referred to as sound. Hearing impairment is commonly known as 'deafness'. It is a hidden disability; it is difficult to identify a child with hearing impairment until interacting with him/her or noticing hearing aids. Aids may not be conspicuous as some hearing aids are very tiny and placed in or behind the ear or have surgically implanted cochlear implants. And, not all individuals with hearing impairments wear hearing aids.

The most prominent feature of this impairment is the difficulty in hearing, understanding and using spoken language. Those who are born with this impairment or acquire it at a very young age may not have heard any language at all, even their mother tongue! Hence they do not learn and use spoken language automatically. Those who have acquired this impairment later in life may have a better understanding of language, but may still experience difficulties in using spoken language to communicate. Helen Keller quotes, "Blindness separates people from things; while deafness separates people from people".

It is vital to note that hearing impairment does not create insurmountable barriers. Due to technological developments the impact of impairment on the child can be reduced dramatically. The philosophy of and policies promoting inclusive education lead to improved access and participation in schools. If teachers and parents work together cohesively and systematically,

children with hearing impairment can acquire language and achieve their academic goals. A lack of awareness often perpetuates prejudice and disregard of the rights and capabilities of people with hearing impairment. The fundamental issue of 'communication barriers' is not realized and therefore many, even in this era of communication technology, may label children with hearing impairment as 'dumb'!

PAUSE AND THINK

If you visit France or Japan and you do not understand or cannot communicate in French or Japanese or if you go to a state in India where you do not understand the local language and others do not understand your language, is it fair to label you 'dumb'? Certainly not! Same is the case with deaf children; they simply use a use different language so they should not be labeled 'dumb.'

1. DEFINITION AND UNDERSTANDING HEARING IMPAIRMENT

To address the needs of children with hearing impairment in an inclusive class, it is crucial to understand the importance of hearing, process of hearing, and definition of hearing impairment.

1.1 Importance of Hearing

Hearing is a primary sense, which is closely integrated with our daily existence. It helps us in being safe, in communicating, socializing and enjoying life. Consider all the sounds that surround you every single day: a child laughing, a bird singing, a friend chatting, or a great song on the radio. It also helps us to stay connected to the outside world and it keeps us safe by warning us of potential danger. A telephone ringing, a crying baby or the blare of a car horn are just a few examples of important signals that we need to be able to hear. Children start learning to communicate from the moment they are born. They are constantly listening, and quickly they are able to recognize the voices of their mother and father. They learn to talk by imitating the sounds they hear.

ACTIVITY

Understanding the importance of hearing

- ❖ Ask the teachers to think of all situations where hearing is required for a child.
- ❖ Give them a few minutes then ask them to share their thoughts
- ❖ After a discussion, emphasize the following: The child has to hear the horn of the school bus so that he/she doesn't miss it. In the bus the child has to hear friends calling him to sit next to them, they have to hear the friends giggling and sharing jokes. They also have to hear the school bell indicating time to go to class. Further hearing is essential to them for learning in school, for singing to the rhythm of others, for enjoying the music, for matching to the drum beats for parade or physical education drills and so on. Hearing is also important for responding to the door bell and phone calls at home. It helps them enjoy TV shows and movies and above all talking to their friends and siblings. Thus, hearing is essential in literally every part of life.

ACTIVITY

CASE STUDY

Sumit is a young child who is very quiet in class. He does not have friends and even during recess does not go out to play. He prefers to stay in class. When the teacher asks questions, Sumit does not raise his hand voluntarily. He is often absent whenever there is an oral test. Sumit wears a hearing aid and responds when called out.

Question for discussion:

- ❖ Why does Sumit remain quiet?
- ❖ Why does Sumit refrain from playing with other children?
- ❖ Why do you think he is often absent during an oral test?

Sumit obviously has a hearing impairment; he wears a hearing aid. Sumit's behavior could be a result of his lack of understanding of others' speech, low self-esteem, fear of failure or fear that others may not understand his speech and laugh at him, or a lack of accommodations by the teacher. Or, Sumit hears with his hearing aid but may not be listening!

Questions for discussion:

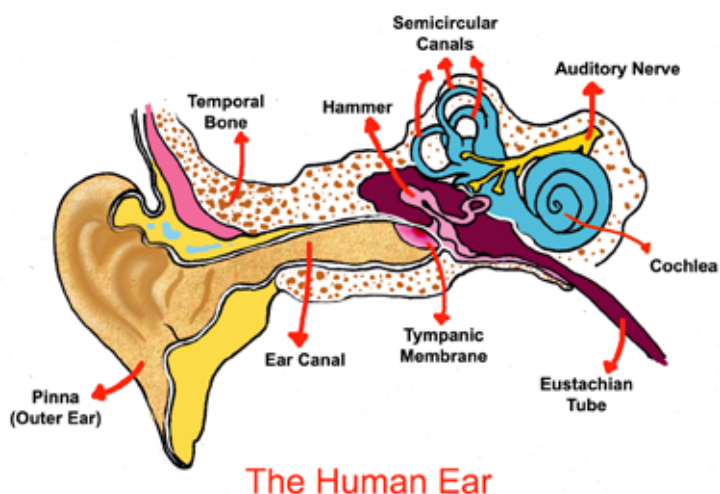
- ❖ Is there a difference between listening and hearing?
- ❖ Which of these—listening or hearing—is more essential for communication?

Hearing and listening are different. 'Hearing' is an involuntary act, while 'listening' is voluntary. When we listen, we try to make sense out of the sounds that we hear. Sumit is probably hearing, but is not able to attach meaning to it and hence is not listening. Because he is not listening he may find it difficult to understand others and hence is non-communicative. This in turn may adversely affect socialization, academics and other aspects of a child's life.

1.2 The Process of Hearing

The ear is the sense organ that helps us hear and communicate with others. It is quite often described as "a master piece of bio-medical engineering". The human auditory system is broadly divided into two main parts: the ear and the auditory or neural pathway.

FIGURE 1: THE ANATOMY OF THE HUMAN EAR



As shown in Figure 1, the human ear has three main parts: outer ear, middle ear and inner ear.

Outer ear: The external or outer ear is the outer most portion of the ear that consists of two parts:

Pinna, which is visible from outside, is a conical shaped structure attached to the head, on either side. Pinna collects the sound waves coming from different directions and funnels them into the external auditory canal.

Auditory canal is the tube that connects the pinna and the eardrum. The canal conducts the sound waves into the middle ear.

Middle ear: The middle ear is a small air filled cavity located between the outer and inner ear. The tympanic membrane commonly known as the eardrum separates the external ear from the middle ear. The middle ear plays a vital role in “bio medical engineering” activities of the human ear. When sound waves coming through the ear canal fall on the eardrum, it starts vibrating. The eardrum converts the sound energy into mechanical energy. The eardrum is connected to the ossicular chain, which is made up of three of the smallest bones in the human body—the stapes, incus, and malleus. These bones amplify the sound vibrations and send them to the inner ear of the cochlea.

Inner ear: The inner or the internal ear—the size of a pea—is also referred to as Bony Labyrinth as it consists of a set of complicated tubes. It is also called a vestibule as it is a passage to other parts of the auditory system and brain. Both the organs of hearing as well as the organ of the balance are in the inner ear. It also contains the cochlea, an organ of hearing that is filled with a fluid called perilymph.

The cochlea in the inner ear also contains the organ of corti or the body’s microphone. The corti contains for rows of hair cells, which protrude from its surface. The hair cells are the most important sensory structures as they convert the sounds into electrical impulses. The electrical impulses are then transmitted to the brainstem through the auditory nerve. These impulses carry all the necessary information regarding the frequency, intensity and time of the sound very systematically till they reach the auditory cortex. Sound is perceived and heard once the impulses reach the various parts of the auditory cortex.

1.3 What is Hearing Impairment?

The Persons with Disabilities Act (1995) states that **“Hearing Impairment means loss of 60 decibels or more in the better ear in the conversational range of frequencies”**.

Three aspects emerge from this definition:

1. **Hearing loss in the better ear:** Like the differences in eye sight in both eyes, hearing levels differ in both ears. The definition directs us to consider hearing loss in the better ear.
2. **More than 60 decibels (dB):** The level of hearing is measured in decibels, the unit of sound. The definition directs assigning a disability certificate to those who have a hearing loss in the better ear of more than 60 dB. This means their hearing thresholds lie above 60 dB.
3. **Conversational range of frequencies:** If we measure our normal speech it seems to fall under three frequencies: 500, 1000 and 2000 Hertz (Hz). The definition directs us to consider hearing thresholds at these frequencies.

ACTIVITY

Hearing loss is never the same in any two individuals

Instructions:

1. Ask teachers to read and discuss the case study about Shaila and Amit
2. Ask them to assess why some children like Shaila may get language exemptions while others like Amit are not eligible?
3. In the discussion emphasize to the group that hearing loss is never same in any two individuals, hence different exemptions. Children with a certain degree of hearing loss get language exemptions. Amit may have hearing loss in only one ear (i.e. unilateral hearing loss), so he was not eligible for concessions.
4. Ask teachers to share the norms for language exemptions in their state.

CASE STUDY

Shaila and Amit are children with hearing impairment studying in 10th grade. Shaila wears hearing aids in both ears, while Amit wears one in only in one ear. As preparations of board exams are nearing, Shaila's parents informs Amit's parents about the concession their daughter is getting due to her disability certificate. Amit's parents also approached the school authorities for language exemptions, however, the school counsellor found out from the authorities that Amit was not eligible for the same concession.

1.4 Relevant Terms

Deaf refers to hearing impairments that preclude successful processing of linguistic information through audition, with or without a hearing aid. A person who is termed as 'deaf' usually has a profound hearing loss (beyond 90 dB) and is pre-lingual.

Hard of hearing refers to impairment in hearing that does not entirely prevent practical communication by speech. Thus, the person who is hard of hearing generally communicates by using speech. Using a hearing aid and/or by residual hearing, he/she is enabled to process linguistic information successfully through audition.

Residual hearing refers to the hearing that remains after a person has experienced a hearing loss. It is suggested that the greater the hearing loss, the lesser the residual hearing.

Audiogram is a graphical representation of what the person is able—and unable—to hear. It is a graphical display of a hearing test. As seen in figures 2 and 3 below, two components are graphed: frequency or the pitch as measured in Hertz (Hz) is on the X axis and intensity or loudness measured in decibels (dB) is on the Y axis. The red line represents hearing in the right ear and the blue represents hearing in the left ear.

FIGURE 2: NORMAL HEARING

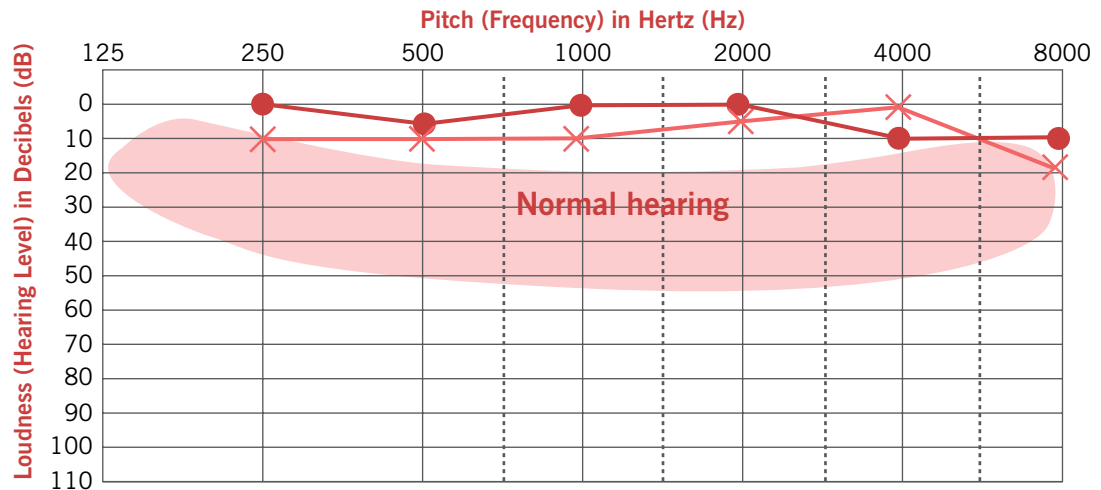
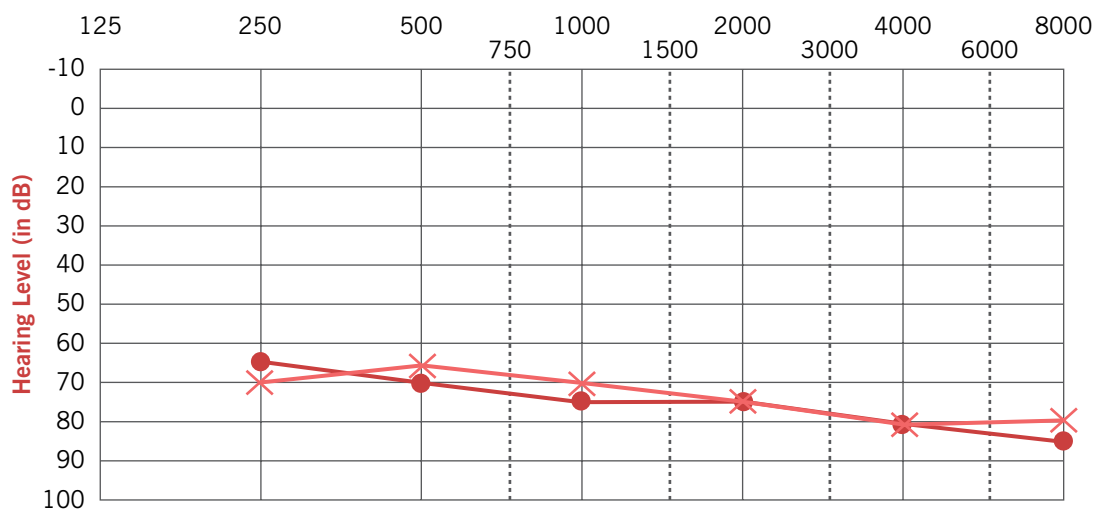


FIGURE 3: HEARING LOSS IN BOTH EARS



2. CLASSIFICATION OF HEARING LOSS, CHARACTERISTICS AND IMPLICATIONS

ACTIVITY

Differentiation in the type of hearing loss

LET'S MEET RUPA AND ROHIT

Eight year old Rupa and Rohit study in different sections of 3rd grade in the same school. Both wear hearing aids behind their ears. While teachers are happy to have them in their class, Rohit's class teacher has many concerns. Rohit's speech is not 'understood' by other children. Rohit struggles to communicate even in his mother tongue and uses lots of signs and gestures. His reading and writing skills are not age and grade appropriate. Rupa on the other hand has no problems in communicating with others. She speaks fluently in English, Hindi and in her mother tongue, and reads and writes well.

1. After reading about Rupa and Rohit, ask participants in small groups discuss the following questions:

- ❖ Why do Rupa and Rohit differ in communication skills?
- ❖ Why is Rohit struggling even in his mother tongue?
- ❖ Why are reading/writing differences of Rupa and Rohit so obvious?
- ❖ Why does Rupa ask for repetitions and prefers watching speakers?
- ❖ Rupa and Rohit are not friends. Why do you think that is?

In the larger group discussion stress the following: The answer to all the above questions lies in the fact that there are differentiations in the type of hearing loss. Rupa and Rohit do not seem to have similar type of hearing loss. Rupa seems to be using 2 or 3 languages for communicating, which suggests that she may have acquired a hearing loss at a later stage in life, perhaps after 5 or 6 years of age. Rohit could have been born with a hearing loss as he struggles even with his mother tongue. Rohit's hearing loss could also be more severe in degrees than Rupa's because of the fact that his speech is unclear and he does not have age appropriate reading and writing skills.

Classification terms

Hearing loss is created by obstacles in the auditory pathways. Certain terms associated with different types of hearing loss may be mentioned in reports or in the children's individual education plans. Understanding these terms and the differences in the types of hearing loss will be helpful for planning instructional strategies. As shown in Table 5, five factors are considered in the classification of hearing impairment: degree, site of lesion/injury, age of onset, causal factors and nature. (See Annexure 2 for further details).

TABLE 3: FIVE FACTORS OF CLASSIFICATION OF HEARING IMPAIRMENT

| FACTORS | EXPLANATION | CLASSIFICATION |
|------------------------------|---|--|
| Degree | Hearing loss is never the same; it may be different even in both ears. | Depending upon the levels of dB audible to a child, hearing loss is classified as: <ul style="list-style-type: none"> • Mild • Moderate • Moderately severe • Severe • Profound |
| Site of lesion/injury | Hearing loss could be caused due to injury or harm to various parts of the ear. | Depending upon the site of injury i.e. the lesion, hearing loss is classified as: <ul style="list-style-type: none"> • Conductive • Sensori-neural • Mixed • Central Auditory Dysfunctioning |

| FACTORS | EXPLANATION | CLASSIFICATION |
|-----------------------|--|---|
| Age of onset | Hearing loss could be developed at any time during the lifespan. | Depending upon the age of onset, hearing loss is further classified as: <ul style="list-style-type: none"> • Congenital • Acquired • Pre-lingual • Post-lingual |
| Causal factors | Hearing loss can be caused due to various reasons. | Some of the specific causes leading to hearing loss are classified as: <ul style="list-style-type: none"> • Pre-natal • Post-natal • Noise |
| Nature | Hearing loss never happens in a similar manner. | Depending upon the nature, hearing loss is classified as: <ul style="list-style-type: none"> • Sudden • Gradual |

It is important to remember that hearing loss can occur in various combinations. A child may have pre-lingual congenital hearing loss of a severe to profound degree. Another child may have a mixed profound loss. While interpreting the audiological information, care must be taken to consider the background of the child such as age of identification, parental participation, and early intervention, so that one could anticipate and set expectations.

Impairments related to hearing loss do not necessarily result in activity limitations in life situations. When assessing persons with hearing loss, special emphasis should be put on potential abilities rather than impairments alone. The WHO International Classification of Functioning, Disability and Health (ICF) provides a useful framework for such assessments in a person-centred manner in the given context. The ICF views health, disability and functioning in an integrated and interrelated way. Individual functioning is not considered the consequence of disease but the result of the interaction between a health condition such as hearing loss, personal attributes and environmental influences. Personal attributes and environmental factors ultimately act as facilitators or barriers to functioning which may have been affected by impairments. The aim is to eliminate or minimize participation restrictions in any given situation.

3. MYTHS ABOUT HEARING IMPAIRMENT

ACTIVITY

Myths about hearing impairment

1. Ask teachers to share their views of children with hearing impairment, especially in the context of education.
2. Note whatever teachers say on a flipchart/board.
3. Give them a handout on the Ten Common Myths on Hearing Impairment (Annexure 1) and summarized in Table 4 on the next page.

TABLE 4: MYTHS AND REALITY

| TEN COMMON MYTHS ON HEARING IMPAIRMENT | |
|--|--|
| MYTH | REALITY |
| 1. A child's hearing loss cannot be identified unless the child is three years old. | Hearing loss can be identified even in newborn babies. |
| 2. The child will outgrow hearing loss. | Most children who have damage in the inner ear have permanent hearing loss; it cannot be outgrown. |
| 3. Hearing aids should be fitted when the child grows old enough to handle it. | There should be no gap between identification of hearing loss, fitting of hearing aids, and language intervention. |
| 4. A child with hearing loss should attend special school. | Many children with hearing impairment are successfully studying in mainstream schools. |
| 5. Children with hearing loss are a homogenous group; all of them exhibit similarities in terms of educational challenges. | No two children are alike and hence no two children with hearing loss can be alike. |
| 6. Hearing impairment can be 'cured' by using a hearing aid. | Hearing impairment is not a 'disease' to be cured. |
| 7. Teachers should speak loudly while talking to a child with hearing impairment. | Speaking loudly to a child using an amplification device such as a hearing aid or a cochlear implant can cause pain to the child's ears, distort the sounds and also damage the speaker's voice. |
| 8. Children with hearing impairment have 'lower' cognitive abilities. | Many children with hearing impairment perform very well in school. |
| 9. Many people think everyone who is hearing impaired or deaf uses only sign language to communicate. | Not all people who have hearing impairment use Sign language to communicate. |
| 10. Children with hearing impairment cannot go to college. | Many children with hearing impairment succeed academically. |

Also see Seven Common Myths on Disability in Unit I of Module 1: Inclusive Education.

Unit II: Challenges FACED by STUDENTS with HEARING IMPAIRMENT in the CLASSROOM and BEYOND

TABLE 5: OVERVIEW OF UNIT II

| CONTENT | METHODOLOGY | EXPECTED OUTCOMES |
|---|--------------------------------------|--|
| Unit II: Challenges Faced by Students with Hearing Impairment in the Classroom and Beyond | | |
| <ol style="list-style-type: none"> 1. Communication barriers 2. Physical environment, including the listening and visual environment and classroom seating arrangements 3. Interactions and activities in the classroom and beyond 4. Instructional processes and materials | <p>Group activity, demonstration</p> | <p>Teachers will be able to describe the ideal situations and barriers in:</p> <ul style="list-style-type: none"> • Communications • Physical environment and infrastructural requirements • Interactions, activities • Instructional processes and assessment |

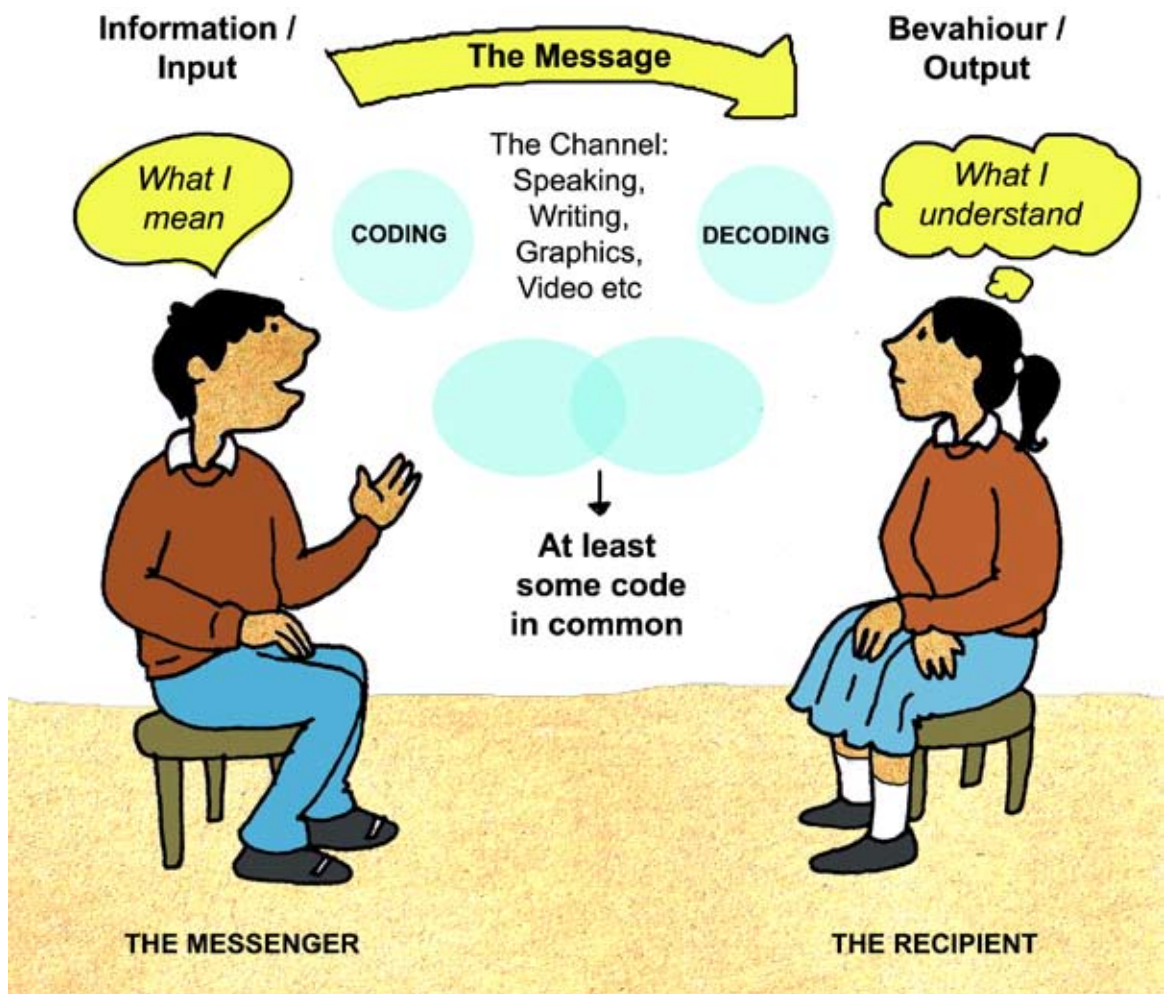
Barriers to inclusion may exist at several levels and therefore must be addressed at several levels.² For example, when schools do not provide a rewarding, quality education to meet the needs of a child and his or her family, the child may drop out. Physical barriers may further cause difficulty in accessing schools; a wheelchair user, for example, may not be able to access a school on the top of a hill or cross a river or difficult terrain. Last but not the least, the most difficult barrier may be the prevailing negative attitude within educational institutions, which could lead to discrimination and a toxic environment for the child with disability. Inclusive classrooms need to be barrier-free.

1. COMMUNICATION BARRIERS

Students with hearing impairment are likely to face many communication barriers in the classroom. As Figure 2 shows, communication is a two-way process between a speaker and listener.

² See Module 1: Inclusive education for more detailed discussion of barriers to inclusive education.

FIGURE 2: THE COMMUNICATION PROCESS



Teaching and learning in classrooms requires communication between teachers and students, and is required even before the actual teaching begins (i.e. checking previous knowledge or introducing a topic), while teaching and assessing how much students have learned.

CHECKING PREVIOUS KNOWLEDGE AND INTRODUCING A TOPIC

A teacher discusses various natural and manmade sources of water. She explains where water comes from i.e. the taps in houses. The teacher may also ask questions to know if the children remembered the 'reservoir' and the 'well' they saw while the class went for a field trip in a rural area. Rohan raises his hand and reminds the class that they also saw a pond and a handpump during the field trip. On hearing this, Reema wants to know if canal water is manmade or natural source of water

In this example, communication was happening in the class and facilitated students' learning. The teacher elicited answers from students based on their previous experience and knowledge. Both the teacher and students communicated with each other.

Students tend to be very active during story telling sessions or history class. They converse with the teacher while predicting incidences in a story. They provide interesting options when the teacher asks 'what do you think might have happened next? Besides predicting, children often speak spontaneously while a teacher is explaining a topic and this brings in new knowledge and awareness in a class.

Apart from the communication about daily routines, assignments, homework, and information about the school bus, communication between the teacher and students is essential for learning. When communication happens, information transfer becomes complete, making learning easier, joyful, more meaningful and long-lasting. Better communication in classrooms also enhances interpersonal relations, which in turn, help to create a positive environment in the class, and the school. Conversely, if communication is ineffective or incomplete, it impedes learning, and both the teacher and students may find this frustrating.

2. PHYSICAL ENVIRONMENT

Children with hearing impairment often face barriers in the physical environment as well as barriers to interactions and activities within the classroom and beyond. Noise and seating arrangements in mainstream classrooms create significant barriers for inclusive learning of children with hearing impairment.

ACTIVITY

Visualizing a typical mainstream school

- ❖ Ask participants to visualize a mainstream school and typical interactions in the classroom. Where is the school located? What sounds can be heard inside and outside of the classroom?
- ❖ In all probability, the first thing that one would notice is the large class size! Children may be sitting cramped on benches or perhaps sitting the floor. The teacher is probably standing near the blackboard. What participants will probably be unable to visualize is the noise level in the classroom, which is collectively generated from the classroom as well as from adjoining classrooms. It is a common sight in some public schools to conduct a couple classes in one single hall without any walls! Schools are often located near busy streets with road traffic, and nearby markets.
- ❖ To help participants understand the possible noise levels in a typical classroom that comes from external sources, play this video: (<https://www.youtube.com/watch?v=s3BzHO0mT5s>)



Now imagine Nitin, a child with bilateral hearing loss, sitting on a bench in your visualized classroom:

- ❖ Is this classrooms conducive for this child?
- ❖ Will learning happen in such a classroom for this child with hearing impairment?
- ❖ Why is this not an ideal learning environment for Nitin?
- ❖ What modifications/alterations may be required for a child with hearing impairment, like Nitin, to improve the learning environment?

ACTIVITY

Why seating arrangements matter

Ask participants:

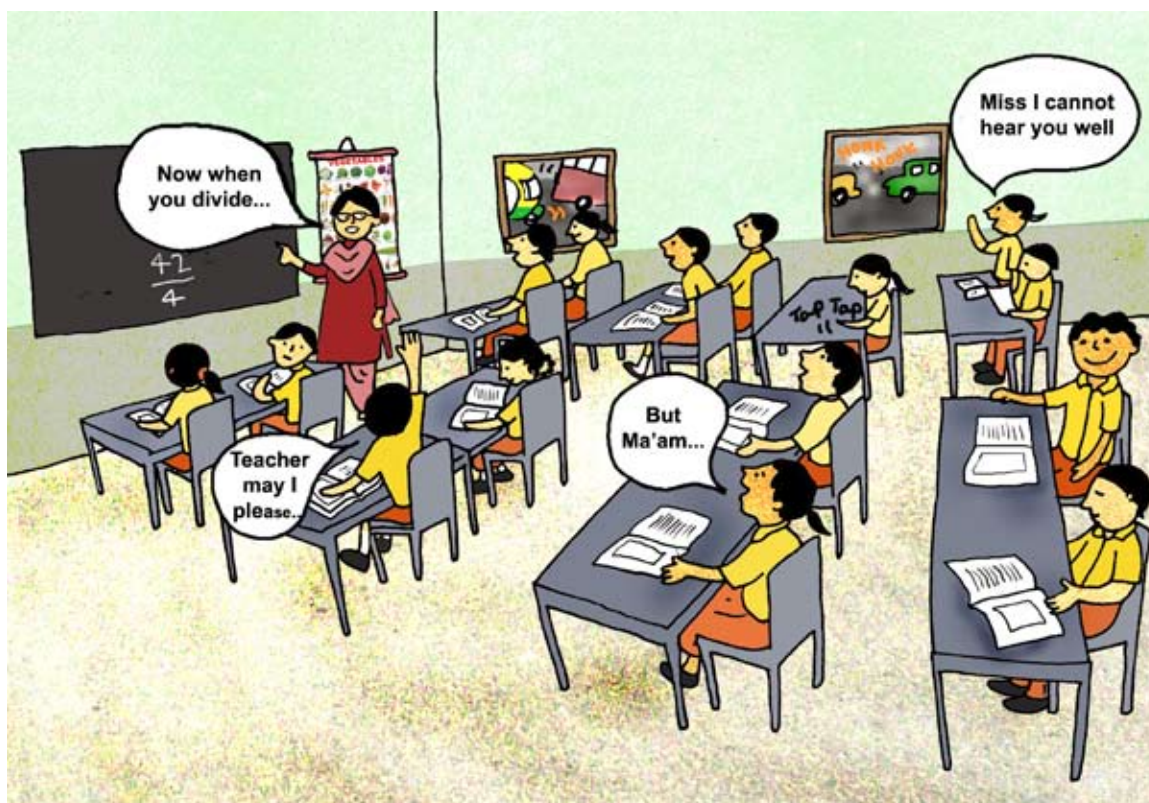
- ❖ Why are movie halls ideal for watching movie shows?
- ❖ What makes a movie hall noise-free?
- ❖ Why are seats in theatres arranged in ascending order from front to back?
- ❖ Unlike theatres, why is are seating arrangement in discussion rooms' often semi-circular or oval?

The obvious answer is that these arrangements make listening and viewing a movie more enjoyable. While seated in a movie hall or theatre, one does not hear the outside noise. The audio of the movie is crystal clear and even the person seated in the last row or a corner can see and hear things clearly. The seating arrangement in a theatre is different than that of a boardroom/meeting room, because it serves a different purpose. In boardrooms people have to communicate with each other and participate in a discussion, so they need to see each other. In a theatre one has to be a silent spectator so that others enjoy the show! One can draw parallels to classroom environment and seating arrangements from these illustrations.

2.1 Listening Environment

Room acoustics is a science that creates a good listening environment. Three terms are essential to differentiate a good classroom from a bad one in terms of room acoustics: noise, reverberation and signal-to-noise ratio.

Noise creates disturbances in paying attention to what one wants to hear. Unwanted sounds interfere with listening, paying attention and carrying out conversations in noisy environments. One would wonder how noise bothers children who have hearing loss! The fact is that many children with hearing loss are auditory learners. Many wear hearing aids or may use a classroom amplification device, which amplifies all sounds. Amplified noises may cause pain, disturbance and in worst situations, further damage hearing. Some sophisticated hearing aids filter out noise, but not all hearing aids are tuned to do so. Appropriate measures have to be taken to control the noise in classrooms. Noise levels in the classrooms vary throughout the day, depending on such factors as hall traffic, street noise coming through open windows, blowing fans, and general noise caused by a group of children. It is recommended that the noise level in an average unoccupied classroom should not exceed 30 dB (Nixon, 2002). In most schools however, the average unoccupied classroom noise level ranges from 45 to 60 dB. When classrooms are occupied by students and teachers, these noise levels are even greater.

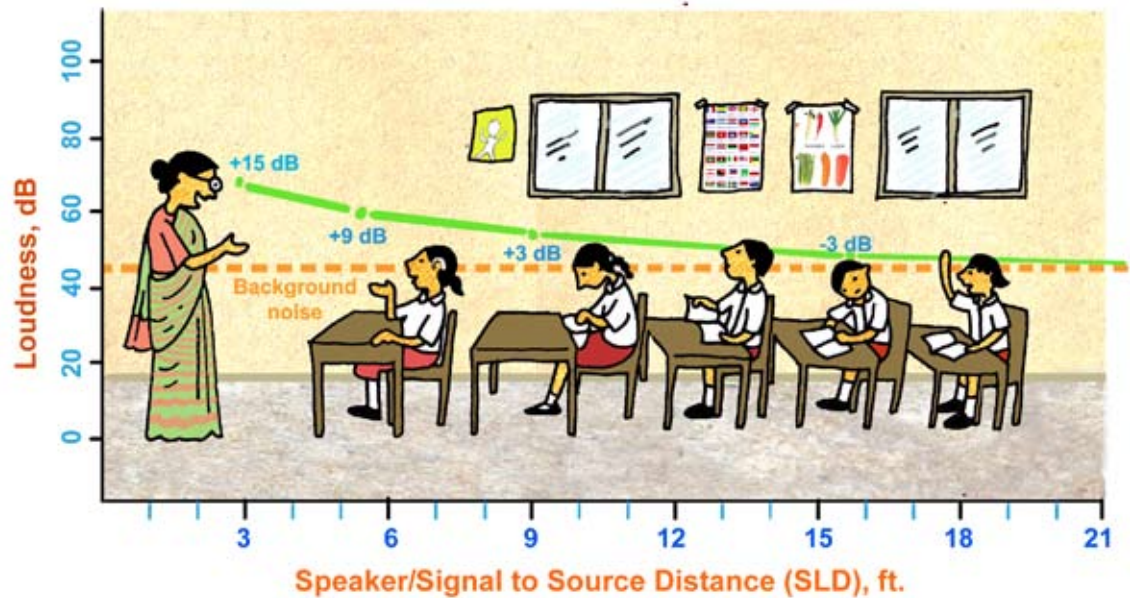


Reverberations are the sum total of original sound and reflected sound in a classroom. Most classroom surfaces do not have sound absorbing material on the walls, ceiling and floor. So sounds created during teaching and other classroom activities travel towards walls, floors and ceilings and revert or reflect back, mixing together to cause a greater amount of mixed sound waves—noise. These are called reverberations. According to ASA (2000), reverberations are the arch enemy of speech clarity for two reasons:

- ❖ Reverberations raise the noise level; and cause a buildup of sound, which includes the original sound plus the reflected sounds.
- ❖ Since reflected sounds arrive at our ears after the original sound, they distort everything in their wake. Our brain can filter out a lot of noise, but it has much more difficulty with distorted words since they more closely resemble the original sounds.

A simple way of checking reverberations in classrooms is the clapping test. Clap your hands loudly one time at different points in the room. If you hear a ringing sound or if the clap takes more than 1/2 second to die down, you may have excessive reverberation.

Signal-to-Noise Ratio (SNR) is a simple comparison that is useful for estimating how understandable speech is in a room. In the classroom, the SNR basically indicates how much louder the teacher's voice is above other noises in the room. For example, if the teacher's voice is at 65 dB and the background noises (students, computers, etc.) are at 55 dB, the SNR is 10 dB. SNR is a critical measure as it impacts speech intelligibility i.e. the ability to understand what you hear. Children with no hearing loss, require an SNR of +15 dB; the teacher must speak at least 15 dB louder than the background noise in the room for a child to fully understand what she/he hears. A simple way for checking sound in classrooms is to read aloud a list of words and syllables and ask another person to write down what they hear. The percentage of correctly-heard words is an indication of SOUND in a given room.



2.2 Visual Environment

Several studies have demonstrated that deafness in early years results in specific, compensatory changes in visual processing. In particular, deaf individuals' exhibit enhanced performance for tasks performed in the visual periphery (Dye et al, 2009). Thus, vision enhances learning of children with hearing impairment as it informs the cognitive system about the knowledge being imparted. Visual aids enhance learning of all children, not only those with hearing impairment. Unfortunately, not all classrooms in a typical school have soft boards on the walls. Some may have a couple of charts hanging on the walls, but these are often not updated to reflect the current topic being taught. Creative teachers draw on boards or make charts while teaching. Some use overheads or computers. Some teachers make visual representations of concepts to be taught. Using visual aids supports universal learning designs.³

TIPS FOR ENHANCING CLASSROOM ACOUSTICS AND VISUAL LEARNING

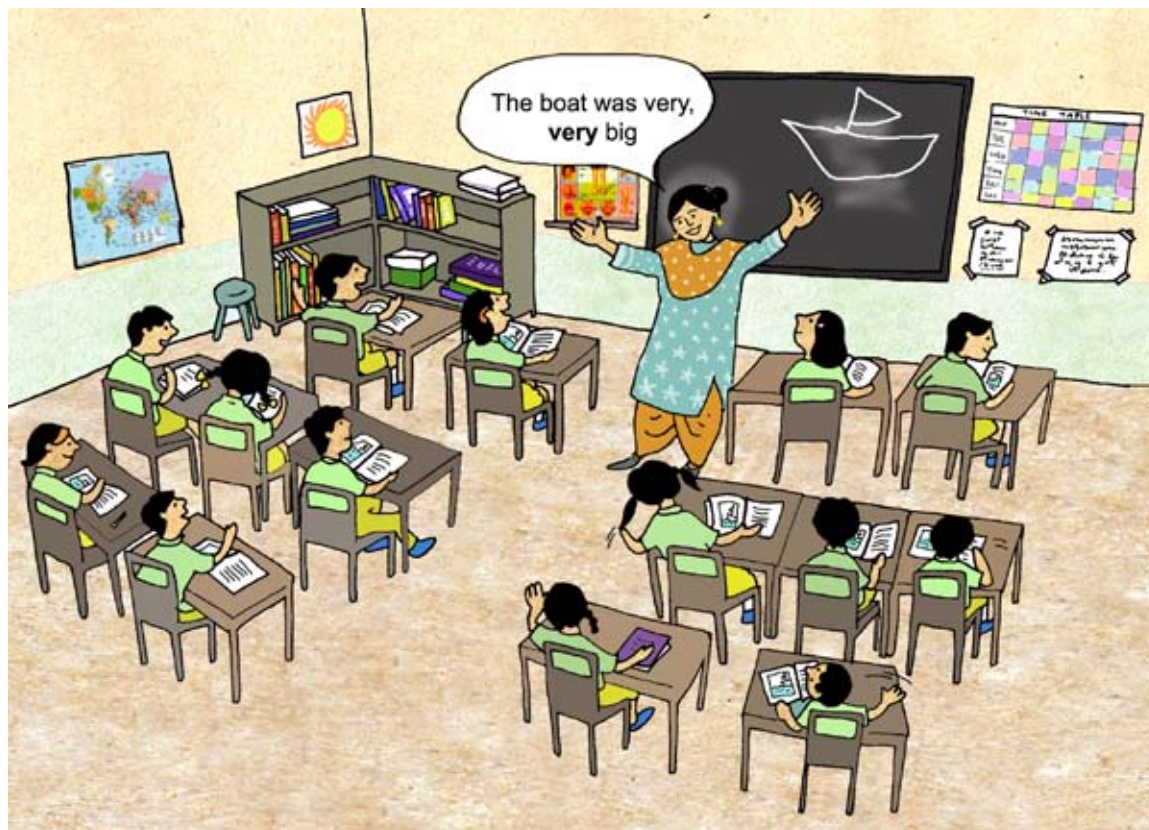
- Furniture should have strong rubber fittings so that it does not move and cause noise.
- It is best not to pair up doors to adjacent rooms.
- Walls in classrooms, corridors and other activity rooms need to be covered by soft boards to absorb noise and could also be used to put up charts, and reading material.
- Where possible, classrooms need to be fitted with a public address system so that all students hear well and teachers do not have to raise their voice. This is mutually-beneficial to teachers and students, alike. The teacher's voice is not damaged!
- Gaps between walls, floor and ceiling should be sealed with an acoustical sealant.
- Classroom noise level indicators should be installed.

2.3 Classroom Seating Arrangements

In most mainstream classrooms, children are seated one behind the other in rows and columns, most probably according to height, with the shortest child sitting in the front. Many schools do not allocate fixed seating and the seats are rotated or changed every week.

³ See Module 1: Inclusive Education to learn more about Universal Design for Learning.

Teachers need to remember that proper seating arrangements facilitate speech reading, communications and learning. Speech reading or the ability to recognize different sounds of speech by observing movements of lips, tongues, and jaw. It includes understanding a person by watching the facial and body movements and using the information provided by the situation and the language.



ACTIVITY

Classroom seating arrangements matter

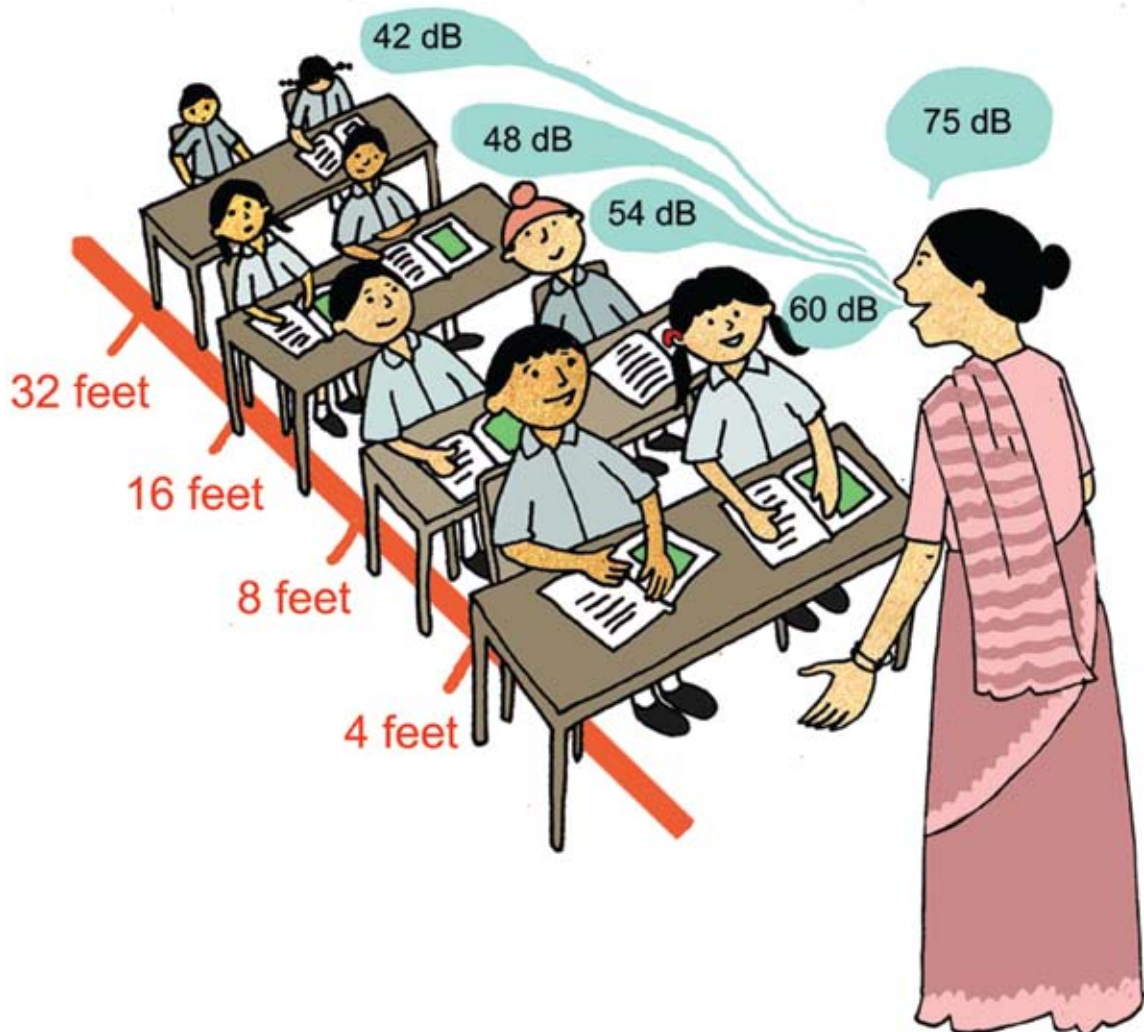
1. Ask teachers:

- ❖ What, in their opinion, is the best seating arrangement to enhance learning?
- ❖ Would seating arrangements where children sit one behind the other in rows and columns bother children with hearing impairment?
- ❖ How would a teacher's movement bother children with hearing impairment?

2. During the discussion, stress that when seated in rows or columns, many children with hearing impairment lose out on opportunities to lip read their classmates. They miss out on how fellow classmates respond to a teacher's question, apart from enjoying any jokes shared by a classmate! Often a teacher moves up and down the classroom so that children remain attentive. The teacher may talk while writing on the blackboard, and may stand near a window facing the children to get some fresh air. This may pose problems for children with hearing impairment.

Remember that the intensity is inversely proportional to the distance, so the closer the child is seated to the teacher the better will the teacher's voice be heard.

Lose **6 dB** of direct sound for each doubling of distance.



3. INTERACTIONS AND ACTIVITIES IN THE CLASSROOM AND SCHOOL

ACTIVITY

- ❖ Ask teachers to visualize a typical day in a mainstream school.
- ❖ Ask teachers to identify common day-to-day activities and human interactions in a classroom and beyond.
- ❖ Ask them to identify barriers children with hearing impairment are likely to face.
- ❖ Share Table 6 next page on the likely barriers children with hearing impairment face at school.
- ❖ Share Annexure 3, which includes a list of strategies for addressing these barriers. (Addressing barriers will be covered greater detail in Unit III of this module).

TABLE 6: SCHOOL INTERACTIONS, ACTIVITIES AND LIKELY BARRIERS

| INTERACTIONS AND ACTIVITIES | LIKELY BARRIERS |
|--|---|
| Permission for entering class or Principal's room | Teacher may not understand the child's speech when he/she is seeking permission to enter the class. The child may also miss out on the teacher instructing him/her to enter the classroom. |
| Attendance/roll call | Students with hearing impairment may miss out his/her name while teachers call out numbers. This is because many names have phonemes which are inaudible (e.g./sh/ in Shishir), some sound the same (e.g. Mohan and Rohan), while others sound the same due to a similar starting phoneme: /p/b/m/. |
| Announcements | Students with hearing impairment may not only miss out on the content of an announcement, but may also not realize that there are common announcements from the principal's office—announcements about change in timings or visitors in school or dress code for a special day. |
| Prayers time | Students with hearing impairment may not be able to sing the national anthem or school prayers at the same pace as others. |
| Assembly | School assemblies have speeches and lectures, which students with hearing impairment may find difficult to hear and comprehend. |
| Subject classes | Subject teachers are different for each subject. Each teacher has a different teaching style. Adjusting to speech reading of different teachers becomes difficult for a student with hearing impairment, if teachers change too frequently. |
| Art and craft classes | Students with hearing impairment are very creative; they work with concentration and perfection and hence are less distracted. However, they may lose out if an activity is time bound. Many art and craft teachers give oral instructions, which may not be 'understood' by the student. |
| Physical education and sports | Students with hearing impairment enjoy and excel in physical activities; however, oral instructions are often a barrier. Many sports teachers blow a whistle to signal the start/end of a game or an activity. A whistle has a very high frequency and are not audible to students with hearing impairment. |
| Tiffin time/Recess time | Students with disabilities encounter barriers in understanding jokes and take time to understand rules of games of other students during Tiffin or recess times. This may lead to social isolation. |
| Library time | A library has rules around book issue and return. They are noise free and require silence. Whispering is a difficult skill for students with hearing impairment. |

| INTERACTIONS AND ACTIVITIES | LIKELY BARRIERS |
|---|---|
| Laboratory work | Laboratory technicians sometimes give only oral instructions for use of equipment or carrying out an experiment. A student with hearing impairment not fully understand oral instructions. Laboratory technicians might also speak and manipulate objects or perform a task simultaneously. Students with hearing impairment may not completely understand the process due to split attention. |
| Functions and festivals in school | As part of co-curricular activities, schools organize competitions, festivals and other functions that include performing arts such as dance and dramas. Due to communication barriers, students with disabilities are often not given a role—or at best, given a very insignificant one such as becoming a tree in a stage act or a servant who does not have to speak. |
| Outreach and extension activities | Community activities, such as awareness about cleanliness or water and energy conservation are fun for all children and also broaden their social horizon and commitment. Outreach activities are also some times undertaken by schools for fund raising. These may require communication with the general public, which may create embarrassments due to misinterpretations for the student with hearing impairment. |
| School administration including paying fees, filling scholarship forms | Communication barriers of students with hearing impairment may lead to misinterpretations and cause delays in payments of fees. For higher class students or those who are parents with hearing impairments, reading comprehension may also cause a barrier in filling up forms. |

4. INSTRUCTIONAL PROCESSES

Inclusive classrooms are diverse and include students with different interests, needs, learning styles, and cultural backgrounds. Apart from addressing these differences among students with hearing impairment, teachers have to also bear in mind the impact that deafness has on both receptive and expressive language.⁴ Because of their deafness, and the fact that they do not hear the language, children’s reading and comprehension may be impacted, which in turn impacts their academics in social studies, science, and math.

Certain teaching methods adopted by teachers may also create barriers for children with hearing impairment. These include:

Using reading of text as the only method of teaching: Often teachers simply read from textbooks. They do not discuss, explain or demonstrate. This can be very frustrating for students with hearing loss, as holding a book in front of the face while reading may impede their speech/lip reading of the teacher. They may also find it difficult to concentrate on listening, speech reading and following the textbook along with the teacher.

⁴ Receptive language means the ability to understand or comprehend language heard or read. Expressive language means being able to put thoughts into words and sentences, in a way that makes sense and is grammatically accurate.

Too many instructions: Teachers often give multiple instructions in one go. For example, “Open your history text book, read silently the second to last paragraph on page 30, while I prepare a video for all of you to watch. After you are done do not talk amongst yourself but raise your hand to tell me quickly ‘Who was Afzal Khan and why did Shivaji Maharaj kill him?’” Teachers need to remember that students take time to absorb each instruction or a question, process the information and respond to it accordingly. Too many “cluttered” instructions might confuse the children, especially those with hearing impairment. When such long multiple instructions are given the child may miss out on some and not raise his/her hand at all even if he/she has read the paragraph and has the correct answer.

Not knowing the learner: Teachers often assume that their teaching is very effective. They explain the content and proceed further, assuming that all the students understood the content. It is best to avoid such assumptions, and accept that each student has unique learning needs and that one teaching method may not work for all students. All too often teachers do not adapt instructions for diverse learners and do not check comprehension.

Animation, expression and eye contact: Children lose interest if teachers do not use multiple means of communication. An animated face, eye contact, body language and facial expressions help children understand a teacher. For instance, making eye contact is a very basic skill while communicating. However, many teachers forget to make eye contact with all learners while teaching and often look at only one group of students from whom they expect answers and active participation. This limits the range of a teacher’s communication. Other students lose interest in the teaching and may not pay attention. And then, when suddenly they are asked a question, they do not have the correct answer.

Language of the learners matters: A common language between the teacher and student is essential for communication. Even if they share the same language, the level and complexity of language that teachers use also matters. Both aspects need to be taken into consideration to effectively impart knowledge to students. The language aspect of communication is especially significant for children with hearing impairment. While many may understand and use sign language, others may prefer oral communication. If teachers and other students do not have an understanding of sign language, it could result in a communications breakdown. Children with hearing impairment may have telegraphic speech i.e. they may speak in single words and in a distorted voice. There are often omissions and substitutions of speech sounds, resulting in speech that may sound unclear to teachers and peers.

See “Understanding Different Learning Styles and Approaches in Developing Inclusive Pedagogy” (Unit III) of Module 1: Inclusive Education.

ACTIVITY

Understanding how children with and without hearing loss communicate

Instructions:

- ❖ Ask teachers to discuss how children with and without hearing loss communicate.
- ❖ Ask them to identify the differences in how they communicate and give reasons for these differences.
- ❖ Share the Table 7 to generate more discussion.

TABLE 7: COMMUNICATION

| STUDENTS WITHOUT HEARING LOSS | STUDENTS WITH HEARING IMPAIRMENT |
|---|--|
| Knowledge of language | |
| <ul style="list-style-type: none"> • Hearing students acquire adult-like vocabulary and an adequate language base naturally, mainly through listening, daily routines, and listening to parents and others talk to them continuously. • Even before starting school, children use adult-like language to communicate. • In school, they learn to read and write the language already known to them. Hearing children first acquire language, and later learn to read it at school. They learn one skill at a time. | <ul style="list-style-type: none"> • Hearing impairment is a hidden disability, and is often not immediately detected in a child. Delay in identification often means that critical time for language acquisition is lost. • When children are placed in mainstream schools, they may not have age appropriate language skills. • Many children with hearing impairments may learn language simultaneously through reading in school. They learn two skills at one time: learning a language and reading that language. • Their communication skills and academic progress may be delayed as a result. |
| Use of communication mode | |
| <p>Hearing children use a uniform single mode of communication—listening and speaking which is called aural-oral mode.</p> | <p>Children with hearing loss are a heterogeneous group and may use different communication modes such as aural-oral or manual (i.e. using a sign system or sign language). Some may use a combination of both, also called “total communication.”</p> |

UNIT III: Creating ENABLING ENVIRONMENTS

TABLE 7: OVERVIEW OF UNIT III

| CONTENT | METHODOLOGY | EXPECTED OUTCOMES |
|---|---|---|
| Unit III: Creating Enabling Environments | | |
| <ol style="list-style-type: none"> 1. Strategies for addressing communication barriers including Alternative and Augmentative Communication (AAC). 2. Socialization and friendships 3. Concessions and facilities for children with hearing impairment 4. Facilitating collaboration between different stakeholders | Lecture cum demonstration, videos, case studies | <p>The teachers will be able to:</p> <ul style="list-style-type: none"> • Understand effective modes of communication, including AAC • Identify facilitators for socialisation • Learn about available concessions • Describe the role and responsibilities of different stakeholders |

Schools are institutional spaces for communities of learners. As public spaces within a web of social relationships, schools must create enabling learning environments where children feel secure and where there is an absence of fear (National Curricular Framework, 2005). The white paper on 21st century learning skills also emphasizes that learning must take place in contexts that promote interaction and a sense of community. Hence, teachers shoulder a huge responsibility of creating a supportive classroom environment to facilitate learning in schools. Teachers should nurture their classroom spaces as places where children can ask questions freely and engage in a dialogue with the teacher and peers (NCF, 2005). To engage fully in the learning process, *all* students need to communicate by sharing their experiences, clarifying their doubts and asking questions to teachers and peers.

1. STRATEGIES FOR ADDRESSING COMMUNICATION BARRIERS

Putting in place strategies that address the many communication barriers faced by children with hearing impairment is critical to creating an environment that allows *all* children to participate and learn. For the teacher, the starting point is to understand the three main

communication options—all based on distinct philosophies—available for children with hearing loss. As detailed in Annexure 4, the three communication options are oralism, total communication and educational bilingualism, each requiring different types of support in the classroom. Specialists and parents tend to follow a particular philosophy, and work together to enhance the language of a deaf child and help him/her develop that particular communications modes.

STRATEGIES TO SUPPORT CHILDREN FOLLOWING DIFFERENT COMMUNICATION OPTIONS

Oralism

- Audiological support for maintaining hearing aids, cochlear implants and other amplification devices
- Hearing aid trouble shooting and spare parts kit
- Installing assistive listening devices like a hard wire system or a loop induction system in the classroom
- Auditory verbal therapist and/or special educators for facilitating smooth communication between the student with hearing impairment and hearing peers.

Total communication (TC)

- Specialist or parents can help train fellow students, teacher and other concerned school authorities in sign systems to enhance communication with the student using TC.
- Installing simple charts of fingerspellings, signs of sign system in the classrooms, canteen, and playground.
- Signed English dictionary of almost 3,000 words, where each word is illustrated with corresponding image and its description. (Refer to the resources for details)
- Install **Sign 4 Me**, a signed English translator, in computers for student use in schools. (Refer to the “other resources” section in this module for details.)

Educational bilingualism

- Certified Indian sign language teacher and Indian sign language interpreter.
- Installing simple charts of signs of the Indian Sign Language (ISL) in the classrooms, canteen, and playground.
- Availability of supported E-text—digital texts which involve a variety of supports like video of ISL translation; display grids with combinations of words and ISL graphics; and include embedded questions that prompt comprehension strategies. These e-texts make instructional materials more accessible to students with hearing impairment.
- Signing avatars are digital animated characters that provide sign language interpretation. The user can customize the avatars with different “skins” personifying different characters and with adjustments of signing speed and viewing perspective. They can be embedded in a multimedia product to provide ISL translation. They are best alternatives for mainstream schools, where it is difficult to get the services sign language interpreters.
- Sign to text, speech to text options in the computer system enable the translation of signs used in sign language or of spoken words into text. If installed in the computers of mainstream classrooms, such options will definitely prove to be a boon for students with hearing impairment.

Some other **common strategies** to address communication barriers for all children with hearing loss in mainstream schools are as follows:

- ❖ Sensitizing teachers and peers about the strengths of a child with hearing impairment, including the “do’s and don’ts” associated with the child’s augmentative and assistive devices
- ❖ Noise-free classrooms

- ❖ Preferential seating in classrooms
- ❖ Opportunity for speech reading teacher's face
- ❖ Sufficient light in the classrooms, especially on the speaker's face
- ❖ Assistive devices, such as smart boards, and alarms, such as glowing bells
- ❖ Multimedia and other graphic/visual aids
- ❖ Need-based adapted textbooks and other audio video support material
- ❖ Captioning in computer-assisted instructions
- ❖ Overheads, visuals, handouts and outlines of topics
- ❖ Use of note takers or other forms of recorders
- ❖ Resource teachers



See Annexure 5 in this Module on different software and online resources available to teach speech and enhance communication skills of children with hearing impairment.

1.1 Alternative and Augmentative Communication

Augmentative and Alternative Communication (AAC) is a term used to describe items that are used to help or 'augment' a child's ability to communicate. More precisely, **alternative communication** is an approach that is a substitute for (or alternative to) natural speech and/or handwriting. **Augmentative communication** is an approach which is an addition to speech or writing. AAC is used by people who some or all of the time cannot rely on their

speech. AAC is used when children with severe speech or language problems arising from hearing loss or any other disability need a form of communication to replace or supplement speech that is not functional to express thoughts, needs, wants, and ideas. AAC devices help an individual to interact with others and participate. Allows a person who does not have speech or language to ask questions and share feelings and views and provides independence and opportunities for spontaneity.

There are two broad types of augmentative and alternative communication systems: unaided and aided:

- ❖ **Unaided communication systems** rely on the child's body to convey messages, including gestures, body and sign language.
- ❖ **Aided communication systems** require the use of tools or equipment in addition to the child's body. Aided communication systems can range from a pencil and paper, books and boards to devices that produce voice (i.e. speech generating devices) or written outputs. Electronic communication aids allow the child to use picture symbols, letters, and words and phrases to create messages. In the last ten years there have been great advances in the world of electronic communication, making communication for individuals who need help much more effective.

For a fuller discussion on AAC see "Use of Assistive Devices, ICT and Other Resource Support to Meet the Specific Needs of CWSN" in Module 1: Inclusive Education and "Augmentative and Alternative Communication" in Unit III in Module 3: Including Children with Cerebral Palsy.

Understanding the different communication systems is especially important when a child with impairment also has additional disabilities. Let us meet Sameer, a 3rd grader with hearing impairment and cerebral palsy.

Sameer is a child with multiple disabilities. He has both hearing impairment and cerebral palsy. He is a 3rd grader and is known in the school for throwing fits of anger. The intensity of anger is highest when the teacher is undertaking recapitulation of a lesson, i.e. asking children what they have learnt. Sameer is also seen frequently disrupting the class, while other children are narrating a story in the class.

Sameer wears a hearing aid. His teacher notes that she and other children find it difficult to understand Sameer's speech. Sameer finds it difficult to hold and use a pen or even communicate in signs as his hand movements are uncoordinated due to cerebral palsy.

ACTIVITY

Communication challenges for a child with multiple disabilities

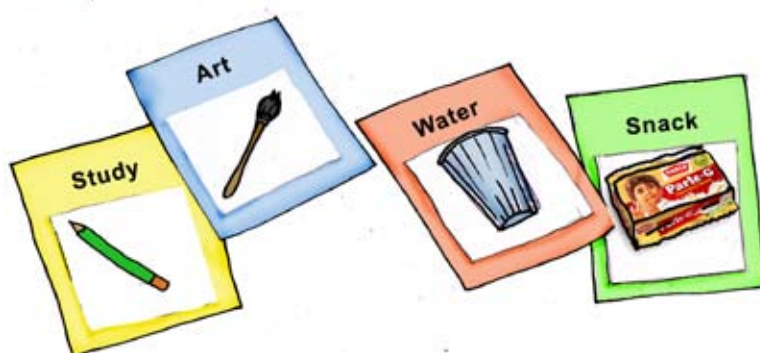
- ❖ Why does Sameer throw temper tantrums?
- ❖ What can the teacher do to help Sameer?
- ❖ What types of AAC aids could be used to help Sameer communicate better?
- ❖ During the discussion, stress that Sameer's temper and fits of anger are likely due to his inability to participate in the class. The inability to communicate may have a significant impact on daily living skills, educational access and may lead to behavioural challenges. Sameer probably wants to add his ideas/thoughts or reasoning to the story or wants to let the teacher know that he knows the right answer! However, Sameer's attempts to communicate are not understood by his teachers. This must be truly a frustrating situation for Sameer!

Examples of alternate communication options

Communication board may comprise symbols and words and can be in the form of a booklet, flat display or chart. Listeners should be aware of the symbols that the child uses. The child points out the symbol to express him/herself. If the child points to a water bottle, that may mean he/she is thirsty.



Object symbols represent an activity, object or person. Different types of object symbols include: miniature versions of the real objects (e.g. a plastic cup or biscuits to represent snack time), parts of real objects (e.g. piece of a jigsaw to represent a puzzle), or an object that is associated with an activity (e.g. pencil to represent writing activity).



Picture Communication System are another AAC widely used with non-verbal children.



Transcense, a speech translator available as a smartphone application, is widely used by deaf individuals across the globe to help with communication. It is a useful tool even for deaf students who excel at lip reading who need some help when in the classroom or in group conversations. Transcense can translate speech into written words and transcribe it on screen in near real time. It can help a teacher in a mainstream class communicate with children with hearing impairment.

TIPS FOR CREATING AND USING AAC IN THE CLASSROOM

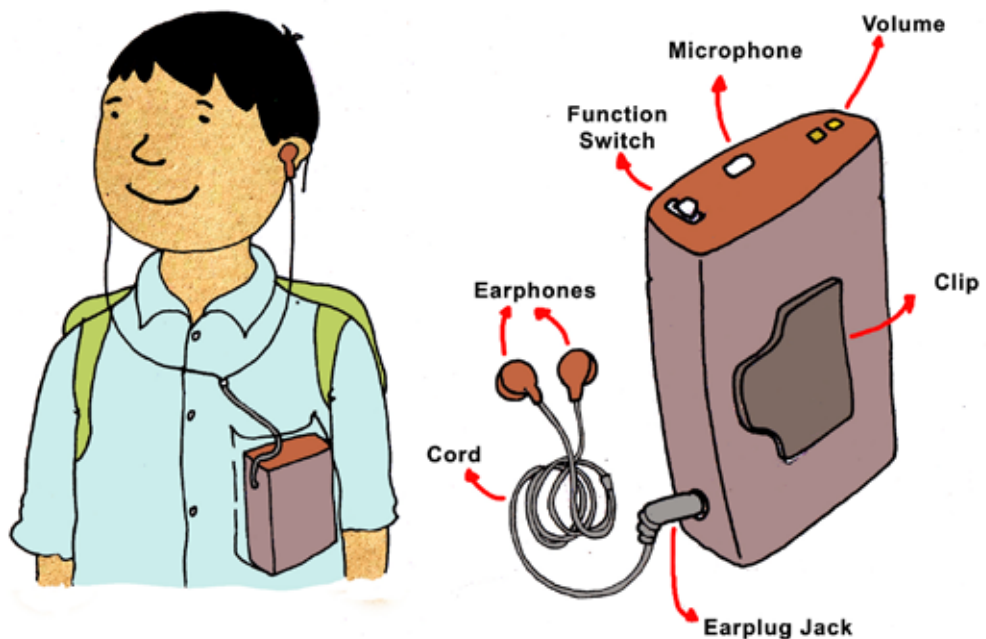
It is very easy for teachers to design and prepare their own AAC systems. AAC systems need to be designed in a way that address the communication needs of each individual student. A communication board of simple day-to-day commands/questions and corresponding pictures (e.g. 'May I drink water? May I go to toilet? May I wash hands? Don't talk. Pay attention, May I come in the class?') can be made and installed in the class. The use of such communication boards allows students with communication difficulties to more easily express their needs in the class.



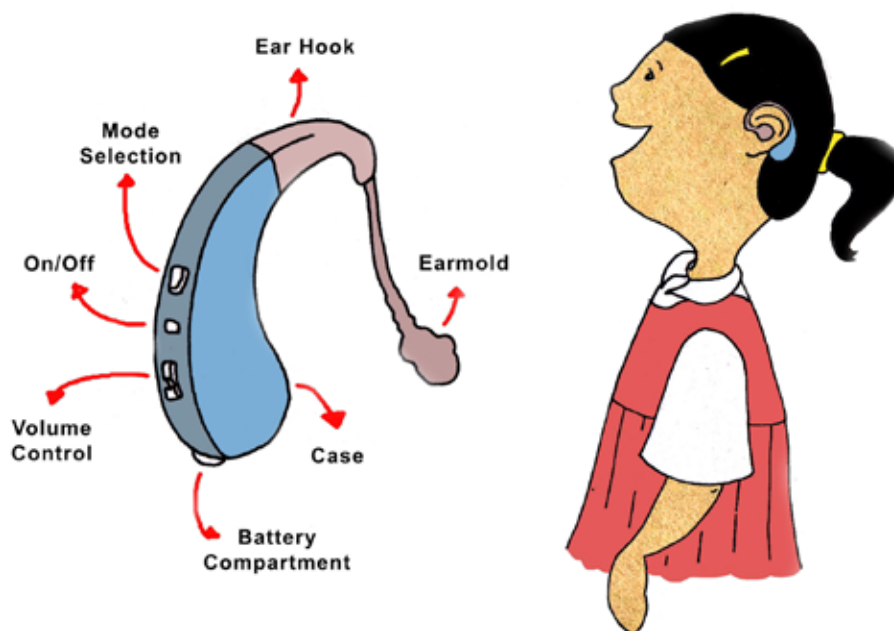
1.2 Conventional Hearing Aids

There is a range of conventional hearing aids, and chances are that a teacher may have students using different types of hearing aids. Due to technological advancement, a variety of amplification devices are available. Hearing aids are fitted based on an audiological evaluation, and children with hearing impairment are given auditory training to learn how to use them. Examples of hearing aids include:

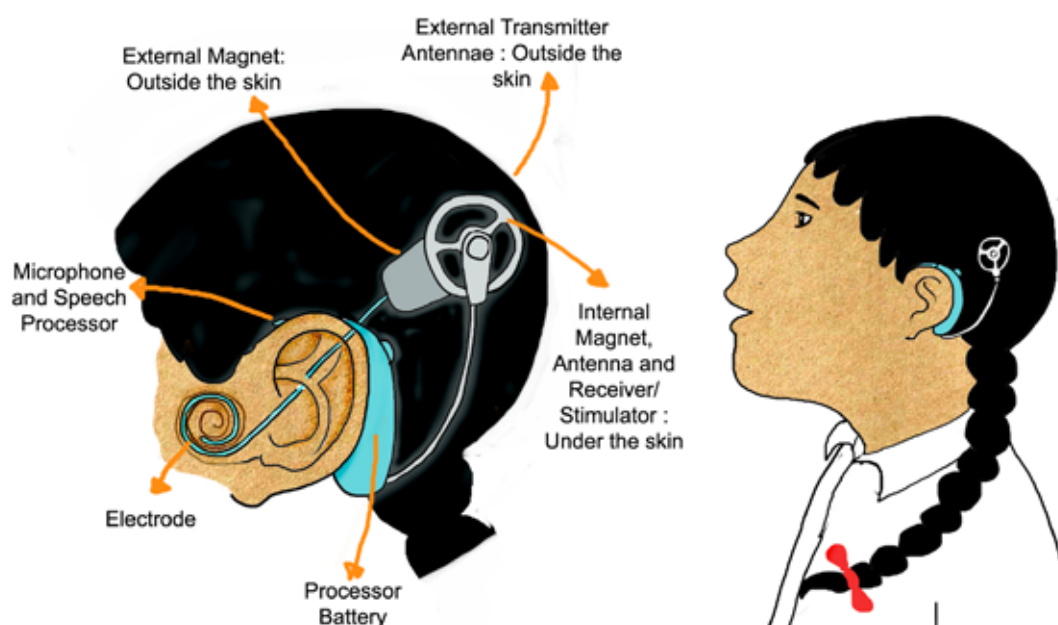
Body-worn hearing aids are commonly used by students with hearing impairment. However, these are bulky and outdated. Today, there is a variety of modern hearing aids that are much smaller and less noticeable.



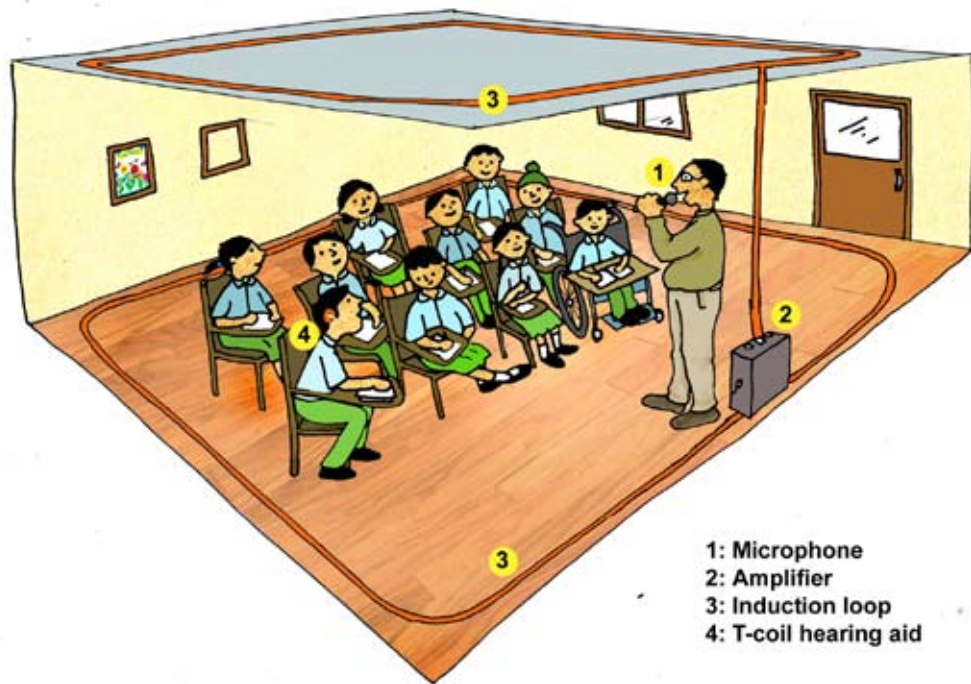
Behind the ear (BTE) hearing aids are worn behind the ear. Various types of digital and analog BTE aids are now available.



Cochlear implant is a device that is surgically implanted. It is designed to stimulate the hearing nerve with electrical impulses. Children who have cochlear implants may hear clearer, but still require auditory training to attach meaning to the language heard.

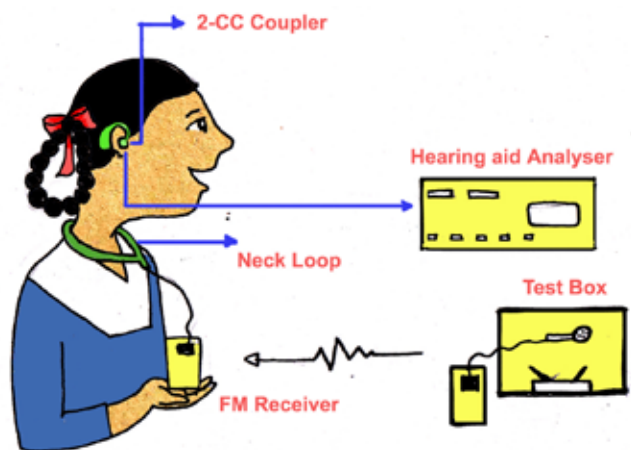


Induction loop system could be installed in a mainstream classroom, if resources are available. The system is installed along the walls of the classroom. The teacher's voice from the microphone is amplified and transmitted through the coil to the child's hearing aid. It provides better flexibility to the student with hearing impairment.



Frequency Modulated (FM) System:

Some private schools also use a frequency modulated system that picks up the voice of the speaker—in this case the teacher—via a FM wireless microphone and transmits it to the student’s hearing aid. The system also has a matching frequency chip, and helps to reduce background noise considerably, allowing the student to clearly hear the teacher’s speech. As it is a wireless system, it allows freedom in movement to both teachers and students and is ideal for inclusive classroom.



TIPS FOR TEACHERS: USAGE OF HEARING AIDS

Hearing aids should be:

- Worn At All Times.
- Handled gently and protected from moisture and dust.
- Removed if it is raining or if the child is swimming.
- Removed if the child is engaged in a rough outdoor sport.

Hearing aids should not be:

- Removed while carrying out experiments in the laboratory or other school activities.

Body worn hearing aids have to be protected when eating or drinking. If for any reason the hearing aids are not used for a long time, the battery must be removed from the battery compartment.

ACTIVITY

Familiarizing teachers to handle hearing aids

- ❖ Allow teachers to explore different models of hearing aids
- ❖ Ask teachers to put them on and off
- ❖ Ask them to check whether they are working
- ❖ Ask teachers to change the volume
- ❖ Ask teachers to change batteries

2. SOCIALIZATION AND FRIENDSHIPS

Beyond their immediate family, children with hearing impairment may find it difficult to communicate with others, which is necessary for socialization. As a result, the child may have difficulties developing relationships, making friends, and participating in social activities.

If you have a child with hearing loss in your class, it is helpful to ask yourself the following questions:

- ❖ Will this child have friends?
- ❖ Will he/she be teased?
- ❖ Will he/she play sports?
- ❖ Will he/she understand what is taught in the class?

ACTIVITY

“What is that in your ears?” and “What type of hand language is this?”

Instructions:

- ❖ Ask teachers to read the three case studies about Pooja and Sheetal, which highlight the barriers faced by children with hearing loss in mainstream schools.

CASE STUDY

Case Study 1: After completing four years of special pre-schooling, Pooja was enrolled in the 1st grade of Navoday, a mainstream school. On the very first day, Pooja’s parents dropped her at the school. Nitish, another 1st grader, like most other children, had completed preschool from Navoday. He seemed confident and was busy talking to other classmates. While Nitish passed by Pooja he looked at Pooja’s hearing aids and asked his father “What are those things in her ears?” Nitish’s father looked embarrassed and apologised to Pooja’s mother. Pooja understood this and insisted that her mother remove the hearing aids. Pooja’s mother smiled at the boy and replied, “Those are Pooja’s hearing aids. They help Pooja hear well, just as glasses help to see well.” Will you take care and introduce Pooja to others?” asked Pooja’s mother. Nitish felt elated as he walked with Pooja to the class and was seen introducing Pooja to other classmates!

Case Study 2: Sheetal was a girl with hearing impairment enrolled in 4th grade of a mainstream class and was using sign language to communicate. Initially, good in her studies, Sheetal's performances started to worsen. She seemed very lonely and had no friends. Sheetal started expressing that she did not want to continue school any further. She communicated to the school counsellor that her classmates teased her for using hands and facial expressions. The school counsellor spoke to the school Principal and introduced Sign Language as an optional language in school. Sheetal helped other children learn the language. The teacher took help of Sheetal to model the signs. This was fun! Children not only learned a new language as specified in NCF (2005), they also now could understand Sheetal well. Sheetal was happy to be a Sign Language teacher of the school!

Case Study 3: Deepak was a boy with hearing impairment studying in 5th standard of a mainstream school named Vivekanand Vidyalaya. Once, the class teacher Mrs. Anita announced a 'talent hunt', an inter school competition. Since, it was a group event, the organizers needed group entries only. Mrs. Anita asked all the students to think about an innovative performance. Students mostly suggested group song, group dance and some other wanted to present a drama. Mrs. Anita had once noticed Deepak's miming and acting skills during the free hour time. She suggested that Deepak teach miming to others. Then Mrs. Anita encouraged one of the class students Rohan to write a script based on the history textbook titled *Evolution of Mankind*. Satish was encouraged to compose play back music. Since the storyline had lots of sequences, almost the whole class got to participate. The students practised a lot for almost 3 weeks. The hard work and team approach was quite visible and hence no wonder that they won the 1st prize.

Questions for discussion:

- ❖ What would have happened had Pooja's mother not talked to Nitish?
- ❖ What helped Pooja get a buddy?
- ❖ What strategy did the school counsellor use to help Sheetal? How did it benefit other children?
- ❖ Are there other simple tips to overcome big hurdles like those Sheetal faced?
- ❖ What was the real innovation in Deepak's case? Miming or the teamwork? How did the students use multiple intelligence to foster teamwork?

2.1 Strategies for Overcoming Social Barriers

One effective approach to facilitate socialization of deaf students in mainstream classrooms is to orient the fellow hearing students, teachers and non-teaching staff about the nature of hearing loss, amplification devices, sign language and other core issues. Once children know that hearing aids are devices used to amplify sound, they are likely not to tease a child with hearing loss. Mainstream students need to be introduced to Indian sign language. It is the mother tongue or first language of many children with hearing loss. In fact, hearing students and teachers enjoy learning sign language for the simple reason of keeping secrets of communicating.

Often teachers have a very sympathetic approach towards children with hearing loss in their mainstream class. They may even overlook poor behavior and treat them preferentially. It is very important for a teacher to be unbiased and treat all children equally. Avoid being over-protective to children with hearing impairment.

It is good to encourage peer interaction. A recommended approach is the **rotation buddy system** in which each child in the mainstream class gets the opportunity to sit and interact with the child with hearing impairments. In this way the student communicates with all the other fellow students in the class. This system tends to avoid group-ism in the class.



Cooperative learning is also known as small group learning. Students are divided into small groups and task is assigned to each group. The student with hearing loss is also a part of a small group. The task is such that each member of the group has to participate actively. Thus, the student with hearing impairments is included in classroom activities and participates.

3. CONCESSIONS AND FACILITIES FOR CHILDREN WITH HEARING IMPAIRMENT

Concessions offered by Government for students with hearing loss in a mainstream school include extra time for SSC examinations and language exemption, meaning that students can opt for only one language and instead opt for vocational subjects at SSC exam. Concessions are granted based on producing a disability certificate as per the Persons with Disabilities Act (PWD Act, 1995). A full list of accommodations/concessions available for children with hearing impairment is provided in the Annexure 6.

4. FACILITATING COLLABORATION BETWEEN DIFFERENT STAKEHOLDERS

Collaboration with different professionals and parents will help teachers understand and better support children with hearing impairment. Parents can help teachers understand a child's communication, while an audiologist and speech specialist can help the teachers understand the nature and implication of the child's hearing impairment.

Also see "Collaboration, Convergence and Teamwork" in Unit IV of Module 1: Inclusive Education for on the importance of collaboration for inclusion.

Unit IV: Curricular TRANSACTIONS and PEDAGOGIC STRATEGIES

TABLE 8: OVERVIEW OF UNIT IV

| CONTENT | METHODOLOGY | EXPECTED OUTCOMES |
|---|-----------------------------------|---|
| Unit IV: Curricular transactions and pedagogic strategies | | |
| 1. Curriculum adaptations: adapting content, instruction, assessment practices, and teaching and learning material. 2. Teaching literacy skills 3. Developing writing skills 4. Teaching mathematics | Presentation and group activities | Teachers will learn to make accommodations and adaptations required for a child with hearing impairment |

1. CURRICULUM ADAPTATIONS

This section focuses on the accommodations and adaptations necessary to create enabling learning environments for students with hearing loss in your class.

Is curricular adaptation and accommodation one and the same?

Different terms are associated with the term curricular adaptation, such as accommodation, alteration, differentiation, change, revision, enhancement, compacting, integration, and scaffolding. Comfort (1990) defines curriculum modification as “the adapting or interpreting of a school’s formal curriculum by teachers into learning objectives and units of learning activities judged most reasonable for an individual learner or particular group of learners”.

Why is there a need for curricular adaptation for students with hearing loss?

Two standpoints are applicable in the context of adapting teaching learning material. ***The first stresses the importance of early identification and intervention of disability to help prevent impairment of hearing from escalating into disabling conditions in children.*** The critical period for language acquisition is 0 to 3 years. And it is within these years, that it is important for children with hearing loss to build language and communication skills.

Systematized efforts can help children acquire age-appropriate literacy skills and eliminate the need for remediation efforts later in life. Children who have access to early intervention may be on par with their hearing peers and may not require curricular adaptations. However, many children with hearing loss are identified much later in life and their language and literacy skills may lag behind those of their peers. These children are likely to require curricular adaptations to match their developmental age and stage.

It is important to remember that regardless of when a hearing loss is identified—early or later in life—each child is unique requiring unique interventions. Each child will have different instructional needs and as such may require different degrees of curricular adaptation and accommodation.

According to NCF (2005) the unique characteristics, interests and attitudes of children and diversity in learning styles demand differential teaching methods to be used by a teacher in the classroom to facilitate learning. To ensure diversity, an inclusive curriculum is needed. NCF (2005) also emphasizes the need of inclusive curriculum keeping in view the diversity of learners. This calls for curricular adaptations. An inclusive adapted curriculum aims to provide quality education that will enable all children to learn effectively and participate equally in class. It also affords children the dignity and confidence to learn. As per the NCF (2005), it is essential to retain all children in school, for which assessment of functional ability of learners is essential. This calls for broad-based curriculum to accommodate diversity of teaching approaches and use of teaching and learning materials in a given classroom.

The following NCF (2005) based guidelines will help guide the teacher while developing an inclusive curriculum for *all* children. The curriculum must:

- ❖ Include child-centered pedagogy, keeping in mind the child's psychological development, interests and specific learning needs;
- ❖ Ensure equal access in every possible manner (physical, attitudinal, academic and social) to maximize learning;
- ❖ Facilitate learning in an inclusive learning environment with accessible material, positive attitude and relevant/adaptive teaching strategies;
- ❖ Incorporate required adaptation in curriculum (learning content, learning approach, learning aids and evaluation) to address and accommodate individualized learning styles;
- ❖ Prescribe for use of all available educational/assistive technologies to ensure equal participation of and effective learning in all children specifically for children with special needs;
- ❖ Include all children with and without special needs by providing differential opportunities to demonstrate learnt skills according to their learning abilities;
- ❖ Include components of life skills through transitional stages working towards independent living;
- ❖ Include locally available conditions/opportunities/situations to develop prevocational and vocational competencies;
- ❖ Integrate work pedagogy in education and include broad-based work experiences taking care of the needs of children with special needs;
- ❖ Ensure participation of children with special needs in play, games, social and cultural activities to improve the physical and mental health by developing appropriate adaptations;

- ❖ Provide flexibility in school and class time tables to address individual needs of children;
- ❖ Create opportunities for facilitated social interaction; and,
- ❖ Construct knowledge by connecting new ideas to existing ideas on the basis of materials/activities.

When adapting curriculum for children with hearing loss begin by asking yourself three questions:

- ❖ What to teach? Adapting the curricular content and teaching learning materials.
- ❖ How to teach? Adapting the instructional strategies.
- ❖ When to teach? Adapting the assessment procedures in the classroom.

There is no single recipe for adapting general education curriculum to meet each special student's needs. Each teacher, each student, each classroom is unique and adaptations are specific to each situation. The curriculum does not always need to be modified; by providing multi-level instruction you will find that adapting a lesson may not always be necessary.

Differentiating instruction and providing multiple ways to assess allows more flexibility for students to meet the standards and requirements of the class. At other times, the curriculum can be made more accessible through accommodations. Supports for one student may not necessarily be the same in all situations. For example, a student who needs full time support from a paraprofessional for math may only need natural supports from peers for language and no support for art. Supports should not be determined by the disability label, instead supports should be used when the instructional or social activity warrants the need for assistance.

For further details see "Creating an Inclusive Learning Environment for Children with Special Needs; Unit III of Module 1: Inclusive Education.

1.1 Adapting Curricular Content

Issues regarding content for the child with hearing impairment may include difficulty with language structure which can affect the development of reading and critical thinking skills. Due to lack of higher order language comprehension skills, structures such as "why", past tense verbs, complex sentences, etc. may be difficult. The child may also need additional practice in using language to explain and make predictions such as, "Why couldn't the stork drink the soup?" or "What will happen if you don't wash your hands?" Adapting curricular content might involve applications as straightforward as: reducing the number of vocabulary words assigned in a content; having a learner complete less number of problems on a mathematics assignment; reducing number of chapters in a particular subject, holding less expectations than the task demands etc. Individualized adaptations of content can, also, be achieved by restructured concept-based teaching.

1.2 Adapting Instruction

Most teaching strategies used to instruct children without disability are also appropriate for children with hearing impairment. Basic strategies for addressing receptive and expressive language are as follows:

- ❖ Minimize distractions and background noise.
- ❖ Use repetitions, routines and multi modal teaching to enhance the memory.

- ❖ Teach and reteach the concept in variety of context for accuracy.
- ❖ Rehearse and practice in the context of daily living routine activities.
- ❖ Make sure to catch student's attention before speaking. While teaching, it is very important to make eye contact with all children, so that everyone feels that they are being looked at. Besides talking, it is also good to use nonverbal communications such as gestures and animations to make teaching effective for all children and more so for children with hearing loss.
- ❖ Use short, concise, simple sentences and avoid idiomatic language. Classroom instructions must be given crisply and step by step. After every step, it is good to check whether students understood the instructions/concept; they may require more practice or explanation to avoid communication breakdown.
- ❖ Use visual or tactile cues wherever possible. For example, for a child with hearing impairment, the teacher could use graphics, images and other visual learning aids to supplement an oral explanation.
- ❖ Use student's name while giving instructions.
- ❖ Use positive rather than negative language.
- ❖ If possible, provide transcripts of audio information.
- ❖ Be flexible in allowing longer duration for handling teaching aids like flash cards
- ❖ Allow students to indicate answers by drawing, sketching, writing, signing or enacting. Use real objects, pictures, photographs so that children could point to answers.
- ❖ After explaining content gently check if the child understood what is being taught. This can be done by asking a clear question and asking the child to point to the correct answer. This will facilitate communication in class.

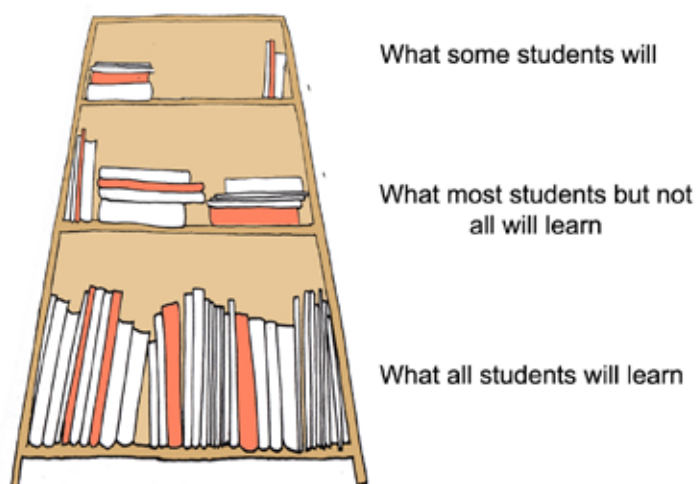
Planning classroom teaching

At the beginning of the school year, teachers are advised to study the assessment reports of children with hearing loss, and discuss with the resource teachers and parents the children's learning goals. (For more on auditory assessment see Annexure 7.) An observation and interaction with the student will help the teacher establish further rapport and clearly understand the needs of the student in the classroom. Teachers in inclusive classrooms are not expected to provide totally different programs to students with hearing impairment; rather, the differences can be managed using a variety of approaches such as a Learning Pyramid and/or differentiated instructions.

Learning Pyramid helps the teacher plan the content of his/her lessons. The teacher first identifies the key concepts or skills in the topic or content and then categorizes the content in terms of three degrees of learning:

- ❖ What **some** students will learn – top of the Pyramid
- ❖ What **most**, but not all, students will learn – middle of the Pyramid
- ❖ What **all** students will learn – base of the Pyramid

In an inclusive classroom, the teacher will have to first identify the essentials of desirable content and then plan his/her strategy accordingly.



Differentiated instruction addresses diversity and helps teachers in accommodating students with a wide range of abilities, interests, and learning styles. Teachers can differentiate curriculum in three broad areas: content (matter to be taught), process (the way it is taught), and product (expected learning outcomes). Because students with hearing impairment experience difficulty with receptive and expressive language, with remembering, and with understanding abstract ideas, techniques of teaching need to be chosen with care.

Classroom organisation

An inclusive classroom should provide a good acoustic environment. A classroom away from noise or one that is acoustically treated will create a good listening environment. According to Graham and Faser (1993) good acoustic listening conditions are vital for students with hearing loss and other students to enable them to make the maximum use of their aided residual hearing. This helps children with hearing loss to understand classroom instructions.

See Module 1: Inclusive Education; Unit III on creating an inclusive environment for more suggestions on classroom organization.

Children with hearing loss could also be provided with a preferential seat, which will help them speech read the teacher (i.e. read the teacher's lips). Paying attention to lighting arrangements is also important; sufficient light should fall on the teacher's face to help the child with hearing loss to read the teacher's lips. Many children with hearing loss are visual learners, so reducing visual distractions such as chewing or moving while talking is also helpful. Additionally, a teacher may need to signal a speaker in case a child with hearing loss fails to localize who is speaking.

Other instructional strategies


Some instructional strategies that you can undertake in an inclusive class.

- ❖ Advance notice of topics to be taught in class allows parents to prepare their children with some background information.
- ❖ An outline or sketch of the topic that reflects the general flow of content is also useful, as are glossaries and summaries.
- ❖ Taped lectures are particularly useful for a child with hearing loss, who has difficulty understand a lecture and needs to hear it more than once.

- ❖ Tailored materials and use of assistive technology such as computer assisted instructions, and Powerpoint presentation are other ways to adapt instructions.
- ❖ Grouping for instructions, role playing and cooperative learning are good techniques that benefit the entire inclusive class.
- ❖ Use of variations in teaching styles or stimulus variations creates interest and enhances learning. For example, students can walk along a route of colored tape on the floor to learn the path of blood flow to/from the heart.
- ❖ Activity-based instruction are particularly useful in an inclusive classroom environment and benefits all children—with and without disabilities. Students who are hearing impaired often prefer activities that involve concrete learning through visual, tactile or kinaesthetic teaching styles.

Graphic organizers (also known as mind maps, webs, clusters, and think sheets) are visual diagrams that represent abstract ideas and concepts in a concrete form.

An Example: sorting organizer for solid and liquids from a given list

| Sr. no |  Things we eat |  Things we drink |
|--------|---|--|
| 1. | | |
| 2. | | |

Lesson frames are used to present an overview of a lesson or concept to help students organize their thoughts around a lesson. They are presented in writing but may also include pictures or graphics, and are usually placed on overheads, photocopies, chalkboards, or posters. Lesson frames typically indicate the course, topic, date, lesson outline, lesson outcomes, assignment, and notes. The example below shows a lesson on sources of water.



1.3 Adapting Assessment Practices

Assessment is a vital component of instruction, undertaken by a teacher at various stages of classroom instruction. When judging a student’s prior knowledge of a specific topic, assessment can be done quickly at the beginning of the instruction. Mid-course assessment is done periodically to check whether or not the children are following the instruction, and unit end assessment is undertaken after a lesson/unit is completed. Assessment can be mostly done orally or by way of pointing or writing.

The scheme of Continuous Comprehensive Evaluation (CCE) is being followed in mainstream schools, since no detention policy has been adopted till grade 8 under the Right of Children to Free and Compulsory Education Act, 2009 (RTE Act, 2009). The primary purpose of assessment and evaluation is to improve children's learning to help them progress leading to their overall development. Assessment during teaching-learning process (i.e., continuous assessment) gives clues about children, which the teacher can act upon to enhance holistic learning, especially where children are facing difficulties and special help is needed. The same CCE is applicable to the students with hearing loss too.

Effective assessment of children with hearing impairment is challenging as many have significant language and communication difficulties. Adapting the style of assessment to meet a child's specific needs is therefore critical. While assessing the child with hearing loss, the assessor/teacher should face the child as he/she speaks and should speak slowly and clearly. Instructions should be simple and repeated, if required by the child. To the extent possible, the assessor/teacher should first demonstrate the expected response, and then ask the child to perform.

Oral and written tests are typical evaluation tools. However, oral recitations or answers and written assessment material such as a question paper may present barriers of language and communication, especially for children with disabilities. A child may indeed know the answer, but may not be able to respond correctly. Oral tests such as evaluating through reciting a poem, narrating a story, elocution, and viva are challenging for children with hearing impairment as they face difficulties in comprehending the oral questions, framing answers in correct grammatical structures, speaking intelligibility and answering within the given time span. Hence, the manner and content of assessment needs careful planning. Oral tests could be modified using parallel techniques such as action songs, role playing or enacting stories, and distributing written text of the speech to the child with hearing loss. Designed to evaluate performance/knowledge in subjects like science, language, and maths, written tests generally consists of an objective, and short answer and essay type questions. Achievement is measured in terms of students' abilities in expressing the knowledge gained through correct written language.

Helpful tips

- ❖ Performance tests rather than paper-pencil tests help to overcome the innate language and communication barrier experienced by majority of children with hearing impairment.
- ❖ Individual rather than group tests are beneficial.
- ❖ Extra allocation of time and assistance through instructions is also helpful.
- ❖ Sometimes teachers feel that writing essay type questions are difficult, so they give students short or objective type questions with multiple choices. However, even these might have some aspects of language twists, making the questions difficult to understand and answer correctly. (see example in box next page)
- ❖ While students write reports, classroom assessments for children with hearing impairment could be supplemented by teacher observation.
- ❖ Modern assessment techniques such as the portfolio, open book exams and presentations could also be used as a part of summative evaluations.
- ❖ For formative evaluations various Classroom Assessment Techniques (CAT) such as Course Knowledge and Skills (see below) could be undertaken, and benefit all students:

SAMPLE WRITTEN TEST QUESTION

Double-negatives are unnecessarily confusing to a test-taker with hearing impairment.

*Which one of the following choices **is not** a correct option and **is not used** as an astronomical tool?*

- Bow and arrow
- Seat and needle
- Type of compass
- Scissors

The question could be reframed more clearly as:

*Many devices were used to make astronomical calculations in ancient India. Select one choice below that was **not** an astronomical device:*

- Bow and arrow
- Seat and needle
- Type of compass
- Scissors

The use of idiomatic expressions such as “who was baking up the wrong tree?” in test questions may confuse children as they may understand the literal meaning only.

Sometimes the structure of the question itself is not understood due to the incorrect word order. *The Vedanga Jyotisha was an example of which kind of calendars?* The more appropriate frame could be: *What type of calendar was Vedanga Jyotisha?*

The teacher should also be cautious about using words with multiple meanings and embedded clauses with the same meaning or with a stem question.

- *One-Minute Paper:* Asking the students to write the most important thing they learned today and what they understood least on a paper.
- *Chain Notes:* A key question on the content is pasted on a large envelope and passed around the class. Each student writes or tick marks and puts it in the envelope.
- *Group questions:* Students are divided into small groups and each group asks questions to the other group on the content that the teacher has taught.

Other strategies of formative assessment include:

Seminar: Working in groups of eight to ten students, comprising students with hearing loss, a given topic is researched/studied and ‘presented’ to all students. In this group activity, students with hearing loss may be given the responsibility of data entry, preparing the material, and/or presenting to the class using sign language. The areas of assessment are: ability to research a specific topic; acquisition of content knowledge; public speaking/signing with interpreter services; ICT skills and leadership quality.

Symposium: Students can be asked to ‘present’ papers on the topic of their choice. Students with hearing loss may be permitted to present in sign language with support of interpreter services. The areas of assessment are: depth of the content; presentation of the content; use of audio visual aids; expression and comprehension of the topic.

Group discussion: Groups of ten students can be given specific topics to discuss. Students choose a group leader, moderator and recorder. Roles have to be clarified before throwing the topic open for discussion. The group leader ensures that all students including those with hearing loss participate in the discussion. The moderator ensures that there is no cross talk, and no two students speak together and everyone listens to each other patiently. The moderator

also ensures that students with hearing loss are not teased, bullied, isolated, ignored, and/or ridiculed by other students. The recorder records all students' observations, including those of students with hearing loss. The areas of assessment are: courage to put forth one's view; teamwork; respect for peers; knowledge of content; appropriate body language; communication and listening skills.

Group activities: While planning group activities, teachers should ensure that students with hearing loss are not left out and instead are able to participate in each and every activity. This requires teachers to use alternative strategies for evaluating students with hearing loss and entrusting them with roles and responsibilities to be performed in the group activity. The teacher can plan a wide variety of group activities for facilitating the participation of students with hearing loss in the mainstream set up such as projects, action plans and surveys.

Rubrics: Rubrics is an assessment tool that clearly indicates marking criteria. It can be used for marking assignments, class participation, or overall grades. A rubric is a coherent set of criteria for students' work that includes descriptions of levels of performance quality on the criteria. The genius of rubrics is that they are descriptive and not evaluative. Of course, rubrics can be used to evaluate, but the operating principle is to match the performance to the description rather than "judge" it. Effective rubrics have appropriate criteria and well-written descriptions of performance.

Subject specific assessment strategies

Languages

For students with hearing loss, teachers may use performance-based assessment measures wherein the students are required to perform a range of activities starting from simple pointing, signing, writing, sketching for indicating their response. Some students with hearing loss may have issues with language and reading comprehension.

Performance-based assessment: As stated earlier performance-based measures can prove to be the best source for deducing true picture of a student's performance. Hence, it is also known as authentic or alternate assessment. Teachers may use a variety of alternate assessment techniques like using role play and dramatization while assessing languages of students with hearing loss.

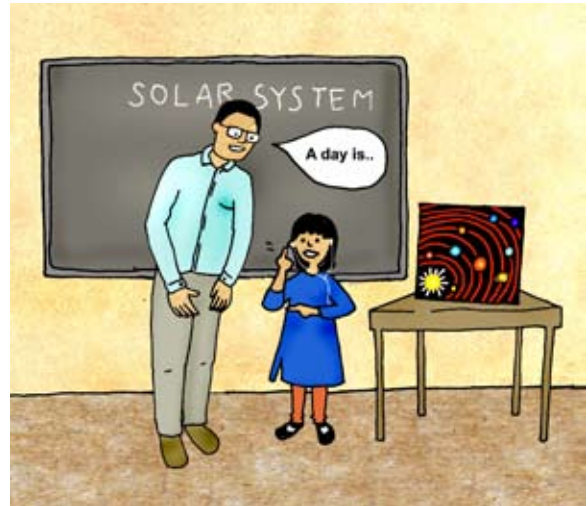
Communication boards: Communication boards usually have a picture corresponding to every word or sentence. A child with hearing impairment needs visual clues and simply points out the correct item on the communication board to indicate his/her response. (See Unit III of this module for more detailed discussion of AAC.)

Marking: Considering the reading difficulties students with hearing loss may face, teachers may mark the passage of the textbook for these students. Marking a specific passage can help overcome to a great extent the difficulties associated with taking dictation. They are constantly kept within the loop of classroom activities. Marking can also act as a visual clue to the students during assessment. It reduces the content or distracters and the students with hearing loss can arrive at the correct response more quickly.

Sign language: During oral quizzes, storytelling, story development, and presentations involving conversations with peers and teachers, the students with hearing loss may be allowed to communicate using sign language, provided that there is a sign language interpreter in the class. The interpreter will translate the student's response into speech and the teacher's oral question into sign language.

Open book tests: Students with hearing loss may find it difficult to answer questions that involve answering in brief, giving reasons, making short notes, and writing essays due to difficulty in framing sentences and under-developed grammar structures. Allowing them to keep the textbook open while writing descriptive answers for the exam could be especially beneficial.

Multiple choice questions: To overcome the challenge that the students with hearing loss face while writing descriptive answers, teachers may use multiple choice questions. The aim of such tests is to purely assess the knowledge of the students. They are asked to place a tick mark against one correct answer from among the given alternatives.



Computer-based assessment: Computer-Based Assessment (CBA) offers an alternative to local assessment. Students have to respond to questions on the computer, clicking the correct option from the given alternatives. Questions could be made attractive for students with hearing loss by inserting graphics, images, and signing avatars. A computer-based approach provides much needed flexibility to learners, as they can learn at their own pace. Computer provides instant feedback to the students with hearing loss in a visual way.

Mathematics

Mathematics involves many abstract concepts. Language issues faced by students with hearing loss make math a bit more complex for them. A possible approach is to divide the class into groups, allowing students with hearing loss to solve math problems in a collaborative way. While students use paper/pencil worksheets for solving math problems, students with hearing loss may be asked to solve the same math problems using visual teaching aids such as objects for arithmetic calculations, play act the role of buyer and seller for teaching concept of profit and loss, etc. Field activities, reporting, assignments (class work and homework) can remain the same for students with and without hearing loss.

Environmental activities

There are various instructional techniques that can be used to support teaching learning process for Environmental Science e.g. reading with a purpose(making notes), oral quizzes, presentation on current topics, group discussion, use of charts and models, map reading, field trips and reports.

1.4 Adapting Teaching and Learning Material

Students with hearing impairments are able to see and manipulate printed instructional material; thus, they are not commonly considered to have a print disability. Hence, both audio and video assisted materials are helpful:

- ❖ For students with moderate or moderately severe hearing loss the use of audio and/or digital text could improve access to curricular materials. These students may not hear all speech sounds (background noises could be particularly distracting to them, resulting not understanding, fatigue, and poor concentration). Technology with

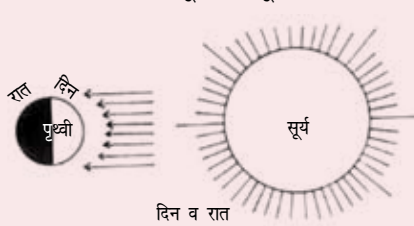



adjustable controls and noise-cancelling earphones could be used while listening to audio tapes.

- ❖ For those with higher degrees of hearing loss, use of videos with captioning is very helpful. For this the classrooms have to be digitised. If such digitised facilities are not available, the traditional approaches could be used such as charts, colour coding for key words and flashcards. Pictures should have labels and charts should have titles.

Adapting Instructional Materials

Instructional material (such as textbooks and reference books) in most classrooms are language heavy. They are primarily developed for children without disabilities, often making them difficult to understand by children with hearing loss and/or other disabilities. Adapting such instructional material is necessary to make it more accessible to *all* children.

Adapting teaching materials involves making changes to the text or curricular material to which a student has access during the course of instruction. This may involve changing the formats (both language and presentation) through which information is represented to better meet the needs of the learner. As seen in the example below, presenting material graphically or with a diagram could greatly enhance the accessibility of the material.⁵

| DIRECT INTRODUCTION OF ABSTRACT CONCEPTS | MAXIM OF CONCRETE TO ABSTRACT |
|---|---|
| <p style="text-align: center;">Original text</p> <p style="text-align: center;">२. कालमापन</p> <p>सूर्याचा प्रकाश पृथ्वीवर पडतो. पृथ्वी गोल असल्यामुळे सूर्यप्रकाश निम्म्या भागावर पडतो. त्यामुळे तो भाग उजेडात असतो व निम्म्या भागावर अंधार असतो.</p> <p><i>दिवस:</i> पृथ्वीच्या स्वतः भोवती फिरण्यामुळे तिचा अंधारातील भाग हळूहळू सूर्यासमोर येतो. पृथ्वीचा अंधारातील भाग पहिल्यांदा उजेडात येतो, त्या वेळी तेथे सूर्योदय होतो. पृथ्वीचा जो भाग उजेडातून पहिल्यांदा अंधारात जातो तेथे सूर्यास्त होतो. सूर्योदयापासून सूर्यास्तापर्यंतचा काल 'दिन' होय. सूर्यास्तापासून सूर्योदयापर्यंतचा काल 'रात्र' असते. दिन व रात्र मिळून एक 'पूर्ण दिवस' होतो.</p>  <p><i>महिना:</i> सर्वसाधारणपणे तीस दिवसांचा मिळून एक महिना होतो.</p> <p><i>सप्ताह:</i> रविवार, सोमवार, मंगळवार, बुधवार, गुरुवार, शुक्रवार आणि शनिवार या सात दिवसांचा एक 'सप्ताह' किंवा एक 'आठवडा' होतो.</p> <p><i>वर्ष:</i> पृथ्वीला सूर्याभोवती एक फेरी पूर्ण करण्यास जो काळ लागतो त्याला एक 'वर्ष' म्हणतात. बारा महिन्यांचे एक वर्ष असते. चैत्र, वैशाख, ज्येष्ठ, आषाढ, श्रावण, भाद्रपद, आश्विन, कार्तिक,</p> <p style="text-align: center;">३</p> <p>Source: Gathoo and More (1990)</p> | <p style="text-align: center;">Adapted text</p> <p style="text-align: center;">२. कालमापन</p>  <p>वेळ, काळ, भोजन्यासाठी, चित्रातील दस्तूचा उपयोग होतो. काळ म्हणजे दैव आणि मापन म्हणजे भोजने कॅलेंडरवर-आपण वर्ष, महिने, आठवडे, दिवस (तारस) बघतो. दिवस, आठवडे, महिने, वर्ष कसे ठरवजात?</p>  <p>तुम्ही भोवरा फिरताना पाहिल्या आहे ना?</p> <p>तो जोरात स्वतः भोवती गोळ गोळ फिरतो.</p> <p>करून पहा- एक छोसासा टेबलटेनिसचा बौल हाताने स्पिन करा (जागध्या जागी गोळ फिरवा). तो हळका असल्याने जोरात फिरेल. भोवण्याप्रमाणे वेडु सुद्धा स्वतः भोवती गरगर फिरतो.</p> <p>आपली पृथ्वी गोळ आहे. ती देसीळ अशीच स्वतःभोवती फिरते. पृथ्वी गोळ असल्यामुळे सूर्यप्रकाश पृथ्वीच्या निम्म्या भागावर पडतो. तिथे उजेड असतो. दुसऱ्या निम्म्या भागावर अंधार असतो.</p>  <p style="text-align: center;">३</p> |

5 http://mhrd.gov.in/sites/upload_files/mhrd/files/upload_document/specialneeds.pdf

Multiple modality materials can be designed that appeal to different learning styles; material for kinesthetic and tactile learners may be different than material for visual or auditory learners. This can be done by altering the presentation of the text through the use of bullets instead of big paragraphs, and use of flowcharts, tables and illustrations. Alternate instructional material such as speech to text and text to speech software programs or universally designed textbooks may also be useful.





For a discussion on diverse learning and teaching styles, see Making Inclusion Work: Module for Inclusive Education; Unit III on Creating an Inclusive Learning Environment for Children with Special Needs.

Strategies for adapting textbooks

As the diagram below indicates, there are five areas—language, knowledge, presentation, illustration and evaluation—that need to be considered when adapting textbooks to better meet the needs of children with hearing impairment.

Language

- ❖ Break up long sentences: rewrite as two or more short sentences and use simple conjunctions.
- ❖ Refrain from too much difficult vocabulary; retain essential technical vocabulary; and use simple synonyms.

| ORIGINAL TEXT | ADAPTED TEXT – STEP BY STEP |
|--|---|
| <p style="text-align: center;">९. चाकाचा शोध</p> <p>वेगवेगळी वाहने आपण पाहतो. चाकांमुळे वाहने जोरात धावू शकतात. फक्त वाहनांमध्येच चाक असते असे नाही. चरखा पहा. रहाट पहा. जत्रेतील फिरत्या पाळण्याचा खेळ पहा. या सर्वांमध्ये आपल्याला चाकांचा उपयोग केलेला दिसतो. वेगवेगळ्या यंत्रांमध्ये चाके असतात. घड्याळातसुद्धा एकमेकांना जोडलेली चाके असतात.</p> <p>चाकाचा शोध अश्वयुगाच्या शेवटी लागला. कुंभारकाम करणाऱ्या माणसाने चाकाचा प्रथम वापर केला असावा.</p> <p>ओल्या मातीच्या गोळ्याला हाताने आकार देऊन माणूस भांडी तयार करत असे. हे काम अधिक चांगल्या रीतीने करण्यासाठी माणसाने आडव्या फिरणाऱ्या चाकाचा वापर सुरु केला. चाकामुळे त्याला सुबक आकाराची मातीची भांडी तयार करणे शक्य झाले. तो अधिक भराभर भांडी बनवू लागला.</p> <p>चाकाचा शोध लागल्यावर गाड्यांना लाकडाची चाके जोडण्यास सुरुवात झाली. सुरुवातीची चाके भरीव होती. काही वेळा लाकडी फळ्या एकमेकांना जोडून चाके तयार केली जात असत.</p> <p>भरीव चाके फार जड होती. अशा चाकांची गाडी ओढणे त्रासाचे होते. म्हणून कमी वजनाची चाके तयार करणे आवश्यक झाले. त्यामुळे माणसाने आरे असलेले चाक तयार केले. भरीव चाकाऐवजी माणूस आन्यांची</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>भरीव चाक</p> </div> <div style="text-align: center;">  <p>आन्यांचे चाक</p> </div> </div> <p style="text-align: center;">३६</p> <p>Source: Gathoo & More, 1990</p> | <p style="text-align: center;">९. चाकाचा शोध</p> <p>रस्त्यावरून जाणारी, रुळावरून पळणारी किंवा आकाशात उडणारी अशी वेगवेगळी वाहने आपण पहातो. सगळ्या वाहनांना चाके असतात आणि चाकामुळे वाहने जोरात धावू शकतात. फक्त वाहनांमध्येच चाक असते असे नाही. चरखा, रहाट, जत्रेतील फिरता पाळणा या सर्वांमध्ये आपल्याला चाकाचा उपयोग केलेला दिसतो. वेगवेगळ्या यंत्रांमध्ये चाके असतात, घड्याळातसुद्धा एकमेकांना जोडलेली चाके असतात.</p> <div style="text-align: center;">  </div> <p>चाकाचा शोध: चाकाचा शोध अश्वयुगाच्या शेवटी लागला. कुंभारकाम करणाऱ्या माणसाने चाकाचा प्रथम वापर केला असावा.</p> <p>पूर्वी माणूस ओल्या मातीच्या गोळ्याला हाताने आकार देऊन भांडी तयार करत असे. नंतर आडव्या फिरणाऱ्या चाकाचा वापर सुरु केला. चाकामुळे त्याला सुबक आकाराची मातीची भांडी तयार करणे शक्य झाले. तो अधिक भराभर भांडी बनवू लागला.</p> <div style="text-align: center;">  </div> |

- ❖ 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.
- ❖ Limit the use of rhetorical language.

Knowledge

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

Presentation

- ❖ Include flowcharts and tables.
- ❖ Present information in bulleted form instead of paragraphs.
- ❖ Include footnotes or explanations in the margins.
- ❖ Highlight important words, definitions by putting them in boxes or using different print.
- ❖ Include a word bank that gives meanings of different words in a box at the end and underline or highlight all these words in the text.



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.

Source: Gathoo & More, 1990

Illustration

- ❖ Include illustrations such as pictures, sketches, and graphs.
- ❖ Use simple and clear illustrations.
- ❖ Place illustrations near the relevant text.
- ❖ Pictures should be expressive.
- ❖ Pictures should refer not only to nouns but to the overall meaning of the text.



Illustrations restricted to nouns



Illustration based on content

Evaluation

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

2. TEACHING LITERACY SKILLS

“What disables deaf people is not that they cannot hear, but that they cannot read and write.” (Enns, 2006)

Literacy is fundamental to a child’s educational progress. Students without well-developed literacy skills find it difficult to participate in the classroom learning. Besides the language reading textbooks, the content knowledge of school subjects such as science or social science is also acquired and expressed through reading and writing. Consequently, students who struggle to read and write are much more likely than their better performing peers to experience failures in school.

Why is reading difficult for some children? Reading is a language based activity that requires a good understanding of language. As discussed earlier in this module, hearing impairment at a young age severely affects language development; children with severe and profound hearing loss may find reading difficult. Luckner et. al. (2005) compares reading problems of hearing children to those with hearing impairments:

“Hearing children learn to map the spoken language they already know to the printed words, but this is difficult to those with hearing loss as they do not have an easy access to the phonological code.”

“Unlike their hearing peers, who learn to read and write in a language they already know, many students who are hearing impaired learn to read and write while simultaneously learning their first language”.

Additionally, if they are sign language users, the signs have their own vocabularies, morphologies, and syntax, which do not parallel those of spoken or printed English (Marschark and Harris, 1996). Thus, a vicious circle is created: impoverished vocabularies limit reading comprehension, and poor reading strategies and skills limit students’ ability to acquire adequate vocabulary knowledge from context (deVilliers and Pomerantz, 1992).

To be an effective reader, individuals need to be active, self-regulated, and need to be armed with a variety of strategies to help them understand what they are reading (Snow, 2002). Regrettably, many students who are deaf at a young age continue to struggle with lower-level skills, such as recognition of words, syntactic parsing, and understanding vocabulary.

Hence, students with hearing loss do not always develop the independent reading strategies such as, self-questioning, activating prior knowledge, summarizing the main idea, constructing representational images, predicting what text will follow, or drawing inferences (Andrews and Mason, 1991; Strassman, 1992).

Reading could be developed, and needs to be taught to the children who are hearing impaired.

“I would introduce into the very youngest classes the practice of reading regardless of the fact that children may not understand meaning of the words on the printed page before them... I would have a deaf child read books in order to learn language... I believe that in the acquisition of language by the deaf, reading will perform the function that hearing does for the ordinary child”

...Alexander Graham Bell

CLARIFICATIONS REGARDING READING INSTRUCTIONS IN A MAINSTREAM CLASS

Q: Should reading for children with hearing loss be conducted in a separate session?

A: Not required in most cases. In fact, reading strategies need to be embedded in all classroom instructions, but more so in language subjects. However, if a child has specific difficulty in any one area (e.g. fluency), then individual sessions with the help of resource teachers would be helpful.

Q: Would mainstream school teachers be in a position to teach or enhance the reading levels of children with hearing loss?

A: Yes. The basic strategies of reading remain the same. However, there are certain techniques like modelling imitation, acoustic highlighting, are necessary for teaching reading to a child with hearing impairment.


Q: Will the performance of other children be hampered if reading strategies for children with hearing loss are used?

A: No. In fact the techniques and strategies used to enhance reading of a deaf child would be helpful to all children. It would especially help other typical children who are poor readers.

2.1 Strategies and Techniques for Developing Reading and Writing

Reading is the process of constructing meaning from the text. It involves five basic core abilities: phonics, phonological awareness, fluency, vocabulary and comprehension.

TABLE 9: FIVE BASIC CORE ABILITIES

| COMPONENTS OF READING | ACTIVITIES | DESCRIPTION | ADD-ON TECHNIQUES |
|---|--|--|---|
| Phonics: The relationship between written and spoken letters and sounds. | Alphabet matching e.g. look and say sound symbol relation  | Activities for young children that help them to learn sounds and associate letters to sounds | Hand cuing AVK (Auditory, Visual, Kinesthetic) Modelling imitation |

| COMPONENTS OF READING | ACTIVITIES | DESCRIPTION | ADD-ON TECHNIQUES |
|--|---|---|---|
| Phonological awareness: The knowledge and manipulation of sounds in spoken words. | Blending and segmenting sounds  | Activities conducted to create awareness about consonant vowel/consonant combinations | Acoustic highlighting Auditory feedback |
| | Word games | Students match spoken words to written words while reading. | |
| | Rhyming games | Children group words by a common sounds | |
| | Syllable games | Students divide words into parts or chunks i.e. syllables | |
| Fluency: The ability to read with accuracy and with appropriate rate, expression and phrasing | Audio assisted reading | Children read along with the audio recording or audio tape by moving their finger along each line | Pausing and waiting |
| | Choral reading | Children undertake loud reading together in a group | |
| | Paired reading | Students read aloud to each other mostly in pairs | |
| | Shared reading | The teacher supports or guides students who share the reading of a book or other text | |
| Vocabulary: The knowledge of words, their definition and context | Labels and categorisation | Helps children group words according to some common characteristics (e.g. living, food habits, etc.) | Pre-teaching vocabulary Repeated exposure to words |
| | Word hunts | Students focus on spelling and hunt for other words. | |
| | Word maps | Helps develop definitions, synonyms, antonyms, word or concepts | |
| | Word walls | A collection of words displayed in large visible letters on a wall, bulletin board, or other display surface (e.g. soft boards) | |
| | Root analysis | Teaches essential word strategies that enable students to unlock the meaning of vocabulary words e.g. prefix and suffix | |

| COMPONENTS OF READING | ACTIVITIES | DESCRIPTION | ADD-ON TECHNIQUES |
|---|-------------------------|---|---|
| Comprehension: The overall understanding i.e. the meaning of the text | Predicting | Students use information from graphics, text and experiences to anticipate what will be read/viewed/heard and to actively adjust comprehension while reading/viewing/listening. | Keyword method Making connections Questioning |
| | Concept map | A visual/graphic organizer that enriches students' understanding of a new concept. Students think about the concept in several ways. | |
| | Story maps | Graphic organisers are provided to students which help them learn/identify story characters, central idea, setting etc. | |
| | Visual imagery | Students are encouraged to use prior knowledge and background experiences to create mental images as they read. | |
| | Listen-Read and Discuss | Students listen to the teacher then read a text. After reading, they discuss about the topic. During the discussion, students compare and contrast the information which they heard and read. | |
| | Summarising | Students identify and accumulate the most important ideas and restate them in their own words. | |

2.2 Add-on Techniques

Hand cues are mostly used by teachers to alert children with hearing loss to the fact that someone is talking to them, and that they need to pay attention and listen. Teachers use hand cues to slightly cover the mouth, but take care that acoustic information is not adversely affected by the hand cues. Hand cues are also used to prompt the child to respond, either through imitation or spontaneous speech.

Acoustic highlighting is the speech used when talking with young children with hearing loss to make the speech more audible. This helps them in learning language and contextually understand the language. Teachers highlight the sounds in a word or words in a sentence, and while doing so change the rhythm; stress certain components in a sentence i.e. the supra segmental aspects in a spoken language.

Modelling imitation is a technique that could be used for speech or language teaching to children with hearing loss. For those children who do not utter or sign a grammatically correct sentence, the teacher can model the sentence in whole or in parts. Peers could also participate.

Auditory feedback is used to encourage children to imitate or use spontaneous speech by matching their voice production with the speech patterns of others thus monitoring their own speech production. Besides this direct auditory feedback, children receive indirect feedback from the listener's reactions to their vocalisations and speech, which further reinforces the quality of their production.

Pausing and waiting: Children with hearing impairment may take longer to process auditory information, so the technique of pausing and waiting with anticipation encourages a child to listen and follow through with a task rather than waiting for the speaker to repeat. To emphasise listening, pause and then ask, "What did you hear?"

Auditory, Visual, Kinesthetic (AVK): Auditory path is considered to be best for learning to learn new words and phonics. So speech/language is first presented through hearing, then visually and finally, kinesthetically (in tactile mode). This sequence is called AVK.

ENHANCING READING SKILLS OF CHILDREN WITH HEARING IMPAIRMENT

Mr. Cross swats a fly!

Mr. Cross was always angry. He was always angry with his family and friends. He lost his temper now and then. He shouted at his wife and children. He shouted at his friends too. So they all stayed away from him, as far as possible. This made him angrier.

When teaching the above text, the teacher can begin by drawing the student's attention to the title by asking "who do you think is the story about?" Children may say "Mr. Cross or Fly." The teacher should next ask to guess the meaning of the word 'swat'. For children with hearing impairment, the teacher could use the hand cue to indicate that it is a new word. She may additionally write the word 'swat' on the board and draw one single line beneath the word to indicate that it has one syllable. The teacher could later inform the students that the word 'swat' is also an acronym, related to the army, **Special Weapons and Tactics (Swat)**. She could give examples of various acronyms.

Next, the teacher could reference the word swat and the name Mr Cross. Depending upon the level of the children, the teacher could undertake loud or silent reading. For children with hearing loss she could assist by reading aloud to him/her. She could further discuss the term 'stayed away' by using it in a known context. For example, "Rohan had got measles so all stayed away from him." Next the teacher could discuss why all stayed away from Mr. Cross. For a child with hearing loss it would be good to ask who 'all' are. Similar strategies could be used for teaching the phrase '**lost his temper**' '**every now and then**' '**and as far as possible**'.

See entire Story of Mr. Cross in Annexure 8.

Source: Balbharti English Textbook, 2013.

Auditory training

Voice inflection: The teacher can cover her lips and say a sentence and ask the child with hearing impairment to guess whether what she said was a statement, command, request or question.

Discrimination of environmental sounds: The teacher can play audio sound and ask the child to guess: Is the sound that of breaking a jar or crashing cups, saucers, plates, bowls? Is the sound a soft buzz of a fly or a loud buzz or even a louder buzz?

Speech teaching: Read with proper intonation i.e. pause, rhythm, stress and inflections. May require modelling imitation of high frequency sounds like /sh/ in shoe.

Creative writing: Write a letter to the Mayor or write an essay on 'If I was a fly'.

3. DEVELOPING WRITING SKILLS

The act of writing is a cognitive process that involves comprehension of ideas, expressive language, and mechanical skills (Dorn, Soffos, 2001). Writing incorporates both cognitive and motor capabilities occurring simultaneously. According to Gunning (2008), writing evolves from pre-speech gestures children make and from the language they hear and later use. According to Giddens (2009) using Gunning's idea that writing develops from language children hear and use, it would make sense that children who have incomplete access to a language would therefore have problems in the development of written language. Children who have hearing loss have differing access to sound, which depends on many different factors. Since the access to sound is some way impaired, then access to spoken language would also be affected to some degree. As access to spoken language is impeded so the development of written language is also impacted in some way. Most children with hearing impairment would have the basic mechanical skills of writing skills that include scribbling and drawing. Tracing and copying would also not be an issue; however activities such as dictation or creative and independent writing always poses a challenge to them.

Early writing skills include writing letters through listening or writing the beginning, middle or ending phoneme of words. Children in kindergarten are also required to spell words with or without writing prompts. The following tips would be helpful to teachers who have a young child with hearing loss in their classrooms:

- ❖ For ruling out any visio-perceptual issues, provide figures, colours, letters, words, phrases and short sentences for the child to copy.
- ❖ Check for the finger-thumb opposition.
- ❖ Check if the child is aware that writing is from left to right.
- ❖ Make sure that the student has strong letter recognition skills, knowledge of syllables and is able to construct "consonant vowel consonant" combinations.

For developing and assessing writing skills, the following could be used:

- ❖ Completing the word with prompts and gradually reducing prompts with pictures alongside.
- ❖ Creating a word wall with common sight words that children need to use in writing.
- ❖ Integrate writing activities with all other subjects including drawing or painting.
- ❖ Have students draw anything they want and write a sentence or words describing the picture. Do not focus on capitalization or punctuation or grammar until later in the year.
- ❖ Use guided writing strategies such as experienced based words, lines and paragraphs for e.g. after a birthday celebration in the class prepare worksheets based on it and ask the students to write missing letters, words, sentences for pictures based on the celebration.

Challenges and strategies for creative/independent writing

Generally, creative, independent writing processes include stages such as pre-writing or planning phase, composing, revising for clarity and organization, editing, and publishing.

Brokop and Persall (2009) have suggested the following strategies to address challenges faced by deaf children at various stages of writing: pre-writing, vocabulary for writing, composing, revising, and editing.

Pre-Writing

Challenges: Limited language proficiency and vocabulary to express length and breadth of ideas. Spelling is another challenge as it requires combination of phonemic awareness, morphemic awareness, and visual memory.

Brainstorming: By undertaking a group brainstorming in the form of recording all ideas generated by the group a teacher puts all that is expressed on a whiteboard or flip chart paper. It becomes effective as this not only helps to generate ideas, but also gives the child with hearing loss an opportunity to build on the vocabulary and labels connected in to the topic. It also gives an occasion for modelling and exposure to the grammatical structures and communicative language.

In another variation groups can be formed. One student of the group writes an idea, another reads it and adds feedback and his or her own idea, and then passes it on to another. If computer labs are available discussion boards could also be arranged by pairing a child with hearing impairment with a typical child.

Vocabulary for writing

Challenge: Significantly limited vocabulary knowledge; they learn new vocabulary at a slower rate than their peers.

Knowledge model: While teaching a new target word, the teacher may discuss additional meanings of the word. This strategy entails always connecting the “unknown” or “new” with existing knowledge.

Vocabulary web: It includes synonyms, antonyms, and derivations of the new word. The teacher can add categories, including phrases that incorporate the target word, idiomatic expressions, or related grammatical forms.

Composing

Challenge: Lack of understanding of difference between different types of texts like narrative, descriptive, direct, expository and argumentative.

Strategies: Use of Mnemonics for composing. For example:

- ❖ C-SPACE – Generating content for story writing (MacArthur and Graham, 1993)
C = characters, S = setting, P = problem or purpose, A = action, C = conclusion
E = emotion
- ❖ PLEASE Strategy – Paragraph writing (Vaughn, Bos, and Schumm, 2003)
P = Pick the topic, audience, and paragraph type. L = List information about the topic
E = Evaluate whether the list is complete and determine how to order the items in the list. A = Activate your writing by starting with a topic sentence. S = Supply supporting details in sentences, using items from list. E = End with strong concluding sentence and evaluate the paragraph by revising and editing.
- ❖ TREE Strategy – Essay writing (Vaughn, Bos, and Schumm, 2003)
T = Write a topic sentence. R = Think of reasons to support the topic.
E = Examine your reasons. E = Think of ending, or conclusion:

Revising

Challenge: Inner voice for detail or explanation or clarify their thoughts where students expand, combine, rework, or eliminate phrases and sentences to make the text clearer.

Strategy:

- ❖ Collaborative approaches where students with hearing impairment are grouped with hearing students.
- ❖ Specific feedback on a regular basis from teachers and peers.

Editing

Challenge:

- ❖ Difficulty with grammar as students with hearing impairment do sequential transmission of language.
- ❖ Grammar of spoken and sign language is different.

Strategies:

- ❖ Grammar practice workshop supplemented with concept explanation in writing.
- ❖ Practice with sentence structure strips like jumbling up words and asking students to put in correct word order.
- ❖ An editing checklist for error and rules (see Table 10) could be made on charts.

TABLE 10: SAMPLE EDITING CHECKLIST

| ERROR | RULE | EXAMPLE |
|------------------------|--|--------------------------|
| I played with ball red | Adjective comes before the noun | I played with a red ball |
| I wondering | Double-check words that end with “ing.” If they are acting as verbs (action) they need to include a helping word in front. I need to decide if the verb is present, past, or future, and then pick the right form of the verb “to be.” | I was wondering |

4. TEACHING MATHEMATICS

Mathematical concepts can be learned by children who are deaf or hard of hearing in the same sequence and manner as by their hearing peers (Meadow, 1980). However, various factors may prevent them from successfully constructing mathematical knowledge. Students may lack general vocabulary and the basic mathematical vocabulary needed to be able to understand math concepts/processes. Incidental learning, of mathematical concepts such as “in front of/behind” or “heavy/light” is sometimes missed out by them due to hearing loss and if not formally taught. If the child with hearing impairment and others in his or her environment do not communicate with each other effectively, they will not be able to engage in mathematical processes such as problem-solving, developing logic and reasoning, and communicating mathematical ideas. Cognitive development also gets delayed in case of children with hearing loss as they are not introduced to a diversity of mathematical experiences along with a rich language base (Ray, 2001).

Strategies for mathematical instructions

- ❖ Provide meaningful situations and enriched experiences with opportunities for exploration and problem-solving.
- ❖ Provide effective vocabulary, label objects and also pre-teach mathematical concepts and ideas.
- ❖ Consider parents as equal partners as home situations provide limitless opportunities to explore and discuss math concepts during daily routines.
- ❖ For teaching concepts such as fractions, etc. manipulative, verbal, pictorial, and symbolic modes so also integrating it with drawing and craft activities will be effective.
- ❖ Word problems could be introduced with informal stories or dramatization and then translating into the math problem.

ACTIVITY

Inclusive Teaching

Materials Required: Grade 3 and 4 NCERT Books in Social Science as well as Math; waste material for creating TLM (leaves, paper rolls, empty boxes, socks, buttons, wool, etc.) scissors, six paint boxes, medium paint brushes, whistle, glue, fevikol, colored paper, and chart paper.

Instructions

- ❖ Divide participants into four small groups
- ❖ Provide the teachers with the NCERT books (any preferred subject).
- ❖ Request them to plan an inclusive lesson plan for a class with a child with hearing impairment. Half the groups should plan with Rupa in mind and the other with Rohit—two eight year olds we met at the beginning of this module.

LET'S MEET RUPA AND ROHIT

Eight year old Rupa and Rohit study in different sections of 3rd grade in the same school. Both wear hearing aids behind their ears. While teachers are happy to have them in their class, Rohit's class teacher has many concerns. Rohit's speech is not 'understood' by other children. Rohit struggles to communicate even in his mother tongue and uses lots of signs and gestures. His reading and writing skills are not age and grade appropriate. Rupa on the other hand has no problems in communicating with others. She speaks fluently in English, Hindi and in her mother tongue, and reads and writes well.

- ❖ Ask the teachers to choose a topic of their choice and develop an inclusive lesson, keeping learning needs of Rupa or Rohit in mind. Each group will also develop Teaching Learning Materials (TLM) using waste material available
- ❖ Each group to transact the lesson in front of others in a mock classroom situation
- ❖ Collect feedback on each lesson from other teachers and discuss

Since every child with hearing loss has a different learning profile, it is the teacher's role to use a range of strategies to make the curriculum more engaging and meaningful, "personalising" learning for each and every student, and creating communities of learners who support and share in each other's learning. This includes methods of assessing what the child has learned, which in turn will inform future teaching strategies.

ANNEXURES

ANNEXURE 1: TEN COMMON MYTHS ON HEARING IMPAIRMENT

Myth 1: A child's hearing loss cannot be identified unless the child is three years old.

Fact: Hearing loss can be identified even in newborn babies.

India is yet to have a mandatory Universal New Born Screening. Hence, awareness about deafness needs to be created. Those with a family history of deafness, mothers with complications during pregnancy and babies who have complications like infantile jaundice, and/or high fever immediately after birth should be screened for hearing and other disabilities. Remember early identification can do a lot to avert disabling conditions.

Myth 2: The child will outgrow hearing loss.

Fact: Most children who have damage in the inner ear have permanent hearing loss; it cannot be outgrown.

If hearing loss is due to a physical obstruction such as wax, then hearing can be restored by removal the wax. If it is due to an infection in the middle ear it can be treated with antibiotics and hearing can be restored. However, many children have hearing loss due to damaged hair cells in the inner ear. These hair cells cannot be regenerated; hence, in these cases, hearing loss is permanent and cannot be restored. Using hearing aids will help the child to minimise the disabling effects of hearing loss.

Myth 3: Hearing aids/cochlear implants should be fitted when the child grows old enough to handle it.

Fact: There should be no gap between identification of hearing loss, fitting of hearing aids, and language intervention.

Early identification and support holds the key to successful development of spoken language and communication skills. Hearing aids can be fitted even in infants and they often begin to enjoy hearing from them. While cochlear implants can assist communication needs early-on, many deaf people have also raised ethical concerns about their surgical implantation in young children, for example in relation to fully informed consent and the use of sign-language as the first language.

Myth 4: A child with hearing loss should attend special school.

Fact: Many children with hearing impairment are successfully studying in mainstream schools.

RTE (2009) mandates neighbourhood schools and suggests making schools inclusive and responsive to the needs of all children. A child with hearing loss also has the right to education in a mainstream school for which the school has to make accommodations, modifications and adaptations. This allows the child with hearing impairment to participate in school like any other child in the class.

Myth 5: Children with hearing loss are a homogeneous group; all of them exhibit similarities in terms of educational challenges.

Fact: No two children are alike and hence no two children with hearing loss can be alike.

Children differ in their degree and type of hearing loss, cognitive abilities, socio cultural backgrounds, learning styles and their strengths and weaknesses. Children who receive support early after identification of their hearing loss will exhibit different levels of performance than children who may have not received such support.

Myth 6: Hearing impairment can be 'cured' by using a hearing aid.

Fact: Hearing impairment is not a 'disease' to be cured.

Hearing impairment is a result of difficulties in the auditory pathway of the ear, which can be restored or compensated to some extent by using a hearing aid or undergoing a cochlear implant surgery. These devices do not correct hearing loss in the way glasses correct vision. They amplify sound to varying degrees. However, hearing difficulties may still be experienced by the person with hearing aids or a cochlear implant.

Myth 7: Teachers should speak loudly while talking to a child with hearing impairment.

Fact: Speaking loudly to a child using an amplification device such as a hearing aid or a cochlear implant can cause pain to the child's ears, distort the sounds and also damage the speaker's voice.

Hearing aids amplify the speech, so speaking at a normal tone and level is beneficial to a child with hearing impairment. The rate of speech needs to be kept normal avoiding exaggerations such as jaw dropping or getting very close to the child. Talking in simple direct speech is always recommended.

Myth 8: Children with hearing impairment have 'lower' cognitive abilities.

Fact: Many children with hearing impairment perform very well in school.

Language—the gateway to knowledge—may be affected in deaf children. This may in turn create language difficulties which may impact reading and writing. However, with adequate support these difficulties could be overcome, and children could be guided to read and write.

Myth 9: Many people think everyone who is hearing impaired or deaf uses only sign language to communicate.

Fact: Not all people who have hearing impairment use Sign language to communicate.

Some may use sign language, some may prefer to be oral i.e. may speak, while some others may use a combination of speaking and signing called 'Total Communication'. People with hearing impairment use modes of communication that are different from those used by the majority population.

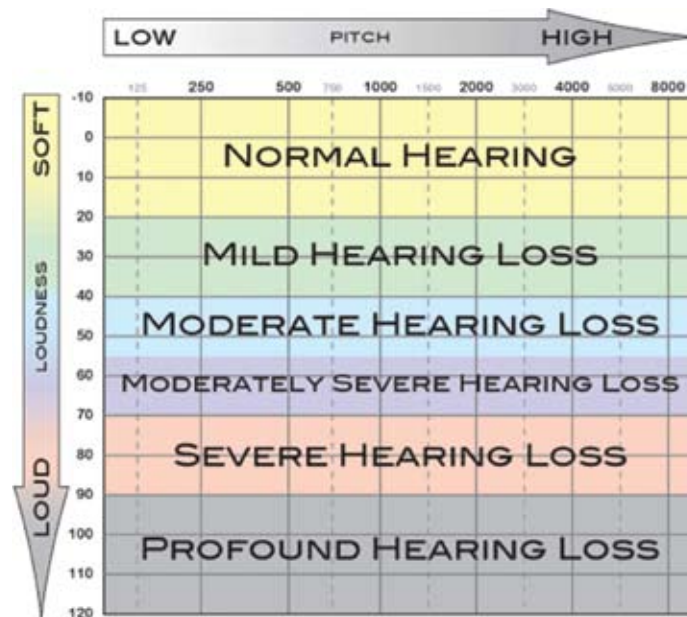
Myth 10: Children with hearing impairment cannot go to college.

Fact: Many children with hearing impairment succeed academically.

Students with hearing impairment have full potential to achieve great heights if the right supports are provided to them at the right time. The Government of India has also made provisions of 3% reservations and schemes such as HEPSEN has been initiated to promote higher education of persons with disabilities.

ANNEXURE 2: CLASSIFICATION OF HEARING LOSS

1. Degree of hearing loss



Source: Eisner (2012) University of Illinois at Urbana-Champaign

The figure above will help to understand how range of hearing measured by decibels (dB) determines the degree of hearing loss.

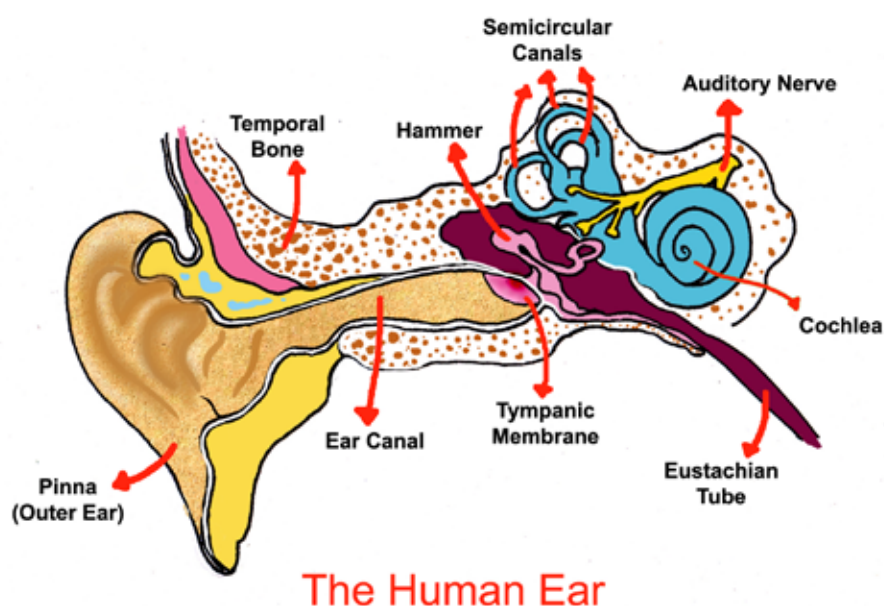
| DEGREE OF HEARING LOSS | RANGE OF HEARING (DB) | CHARACTERISTICS |
|--------------------------|-----------------------|--|
| Mild | 26- 40 | This degree of hearing loss may often go unnoticed. Children with mild hearing loss may be a bit un-attentive in class. Teachers may feel they are poor in academics. Some amount of language delays is expected. Missing of parts of words is also common. If left unattended, children may have speech errors like difficulty in articulating /a/ for /k/. Less severe loss is more harmful as it goes unnoticed; such children may unnecessarily be labelled a slow learners. |
| Moderate | 41-55 | Moderate hearing loss may also go unnoticed, especially for those at the lower end of the range of hearing. Apart from being un-attentive, children with this degree of hearing loss may have difficulty communicating. If the loss is undetected, and if children are not wearing aids, they could also have misarticulated speech and a limited vocabulary. Children will find it difficult to follow oral instructions and may make mistakes in class dictations. |
| Moderately severe | 56-70 | As the degrees of hearing loss increases, access to oral information decreases. Without the use of hearing aids, children will find it extremely difficult to understand others. Apart from speech and language difficulties, children may also have a different voice quality i.e. they may talk in high pitch or nasality. |

| DEGREE OF HEARING LOSS | RANGE OF HEARING (DB) | CHARACTERISTICS |
|------------------------|-----------------------|--|
| Severe | 71-90 | Children with severe hearing loss, who have received any support in early years of development may have no speech. If using hearing aids, it is likely that they make speech errors. Difficulty in understanding others may lead to avoidance of communication with others. Reading and writing difficulties frequently result in academic failures. |
| Profound | 90 and above | Speech and language delays are likely for children with profound hearing loss. Children may 'read lips', or use sign language. |

2. Site of lesion

a. Conductive hearing loss

Why does it happen? The outer ear and middle ear **conducts** sounds to the inner ear. Defect or dysfunctioning in the outer or middle ear hampers the conduction or transmission of sound and hence is called conductive hearing loss.

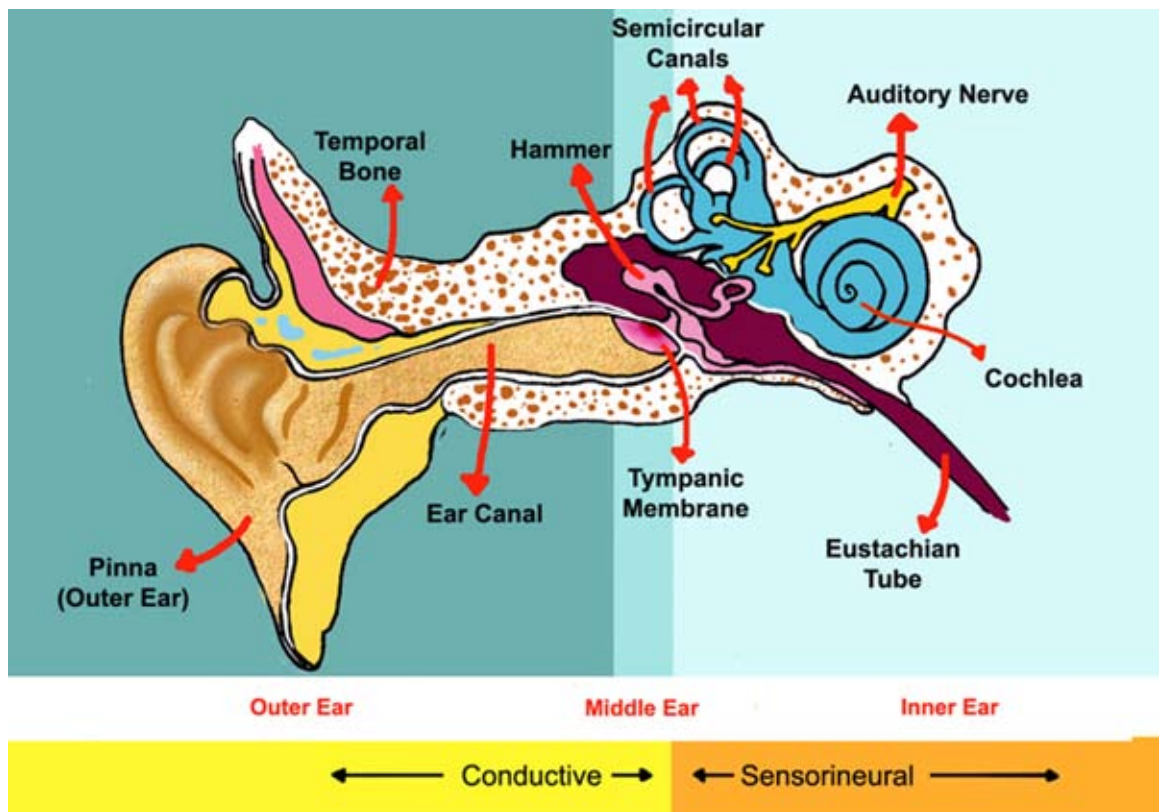


Sometimes small children may put cotton balls or chalk, paper bits or beads/beans etc. in the ear canal. This may also block or plug the hearing. Remember, wax is essential to protect ears so one should not unnecessarily remove it. In some children there may be infection resulting in inflammation or ear discharge also causing perforation of ear drums. These may cause blockage or obstacle in the path of sound propagation. The child should be referred to an Ears, Nose and Throat (ENT) doctor, who will properly guide in respect of wax and infection or perforation.

Implications, characteristics and management: Blockage due to obstruction as mentioned above could result in mild hearing loss. Such children may miss out in some classroom instructions and be temporarily inattentive. Once the obstacle-causing object is removed and attended, their hearing will be restored.

b. Sensori-neural hearing loss

Why does it happen: The inner ear is made up of a very tiny but important sensory organ called cochlea. The cochlea is snail shaped and is filled with fluid. It also has very tiny hair cells, which transmit information to the auditory nerve which in turn carries it to brain for interpretation. Defects or damage to the sensory organs or nerve causes sensori-neural hearing loss.



Implications, characteristics and management: Damage or defective inner ear results into severe or profound hearing loss. This is a permanent loss to the hearing and can only be managed by use of an appropriate hearing aid and intensive language intervention. Cochlear implant are a surgical insertion of electrodes into cochlea and is proving to be very effective in improving hearing reception. Children with sensori-neural hearing loss are commonly found to have profound hearing loss and hence require good support services in mainstream inclusive classrooms in terms of preferential seating, room acoustics, audio visual teaching aids, adaptation of curricula and teacher sensitivity for differentiated instructions. It is generally a good practice to face the child while speaking in order to optimize the speech reading.

c. Mixed hearing loss

Why does it happen? When both sensori-neural hearing loss and conductive hearing loss are present the result is a mixed hearing loss. This is also a kind of permanent hearing loss due to the inner ear damage.

Implications, characteristics and management: This will be the same as stated for sensori-neural hearing loss.

d. Central Auditory Dysfunctioning

Why does it happen? This type of impairment is not necessarily accompanied by a decrease in hearing sensitivity but children will have problems of auditory comprehension. It can simply

be explained as if the brain doesn't hear what the ears hear. That means both the ears and brain aren't fully coordinated with each other. It is frequently associated with learning disability. Hence, it has become common audiological practice to perform a central auditory test battery on children who have been diagnosed as having a learning disability.

The cause is not really known. However, head trauma, tumors, degenerative disorders, childhood viruses, recurring ear infections, oxygen deprivation, lead poisoning could cause this disorder.

Implications, characteristics and management: Children may have difficulty with noise, may ask frequent repetitions, make mistakes in spellings, and reading. Their language may not be age appropriate too. Understanding children communication mode, computer assisted learning and individualized attention are some of the strategies that help.

3. Age of Onset

a. Congenital Hearing Loss

Hearing loss occurring prior to birth of a baby is termed as congenital hearing loss.

Why does it happen? This loss could be due to hereditary factors or could have happened due to complications arising out of pregnancy of the mother or at the time of delivery.

Implications, characteristics and management: Babies born with hearing loss of any degree will surely miss out on the sound world. Babies learn to understand the language of the family due to small routine interactions and the mother's routine 'talk' during the activity of feeding, bathing etc. Slowly babies start using the language of the family meaningful i.e. they speak. Children with congenital hearing loss can hence be expected to have delayed language. When they come to schools they may not have age appropriate language and speech. Management will be intensive language training, use of appropriate communication options and emphasis on visual learning material.

b. Acquired Hearing Loss

Why does it happen? Acquired means hearing loss has occurred any time after birth of a child. This could be due to injuries or infections of the ear.

Implications, characteristics and management: The impact and management varies according to the degree or type of loss. The silver lining here is that the children would have had some time after the birth or childhood, where he/she may have got a chance to develop language and speech. These children would be mostly oral speaking kids. They may have developed speech already. However may rely on lip reading skills. Noise will be distracting to them as it is amplified by their hearing aids. Teachers may have to take care of their listening environments. Use speech to text and text to speech material

c. Pre-Lingual Hearing Loss

The term pre-lingual suggests that the hearing loss has occurred prior to the completion of the basic language acquisition process. The language acquisition age is 0 to 5 years of age. So any loss occurring between this age group is termed as Pre-Lingual hearing loss. The reasons, implications, characteristics and management will be the same as congenital hearing loss.

d. Post-Lingual Hearing Loss

The term post-lingual suggests that the hearing loss has occurred after the completion of the basic language acquisition process. So any hearing loss occurring after the age of 5 years is referred to as Post-lingual hearing loss. The reasons, implications, characteristics and management will be the same as acquired hearing loss.

4. Causal factors

a. Pre-natal hearing loss

Natal means birth and so pre-natal refers to before birth. So hearing loss happening in the womb of the mother is called pre-natal hearing loss.

Why does it happen? The vital organs of hearing and brain are formed of the embryo in the mothers' womb during the first trimester (first 3 months of pregnancy). Hence mothers contracting infection such as German measles (Rubella), tuberculosis, meningitis etc. or use of drugs or medicines which are ototoxic may lead to pre-natal hearing loss in the babies.

Implications, characteristics and management: Children having pre-natal hearing loss will be congenitally born deaf. They will not hear spoken language naturally, hence all those efforts taken for a congenital or pre-lingual hearing loss will be applicable to these children also.

b. Post-natal hearing loss

Post-natal means after birth, hence hearing loss occurring after birth is termed as post-natal hearing loss.

Why does it happen? The vital organs of hearing and brain if damaged or injured after the birth causes post-natal hearing loss. This may be caused due to infantile jaundice or fever etc. It is also caused sometimes due to fire crackers bursting aloud near the babies or may also result due to fall or accidents.

Implications, characteristics and management: Children having post-natal hearing loss are also termed as acquired hearing loss children. If they acquire a severe or profound degree of loss before language acquisition, it becomes detrimental to language development impacting academics. So depending upon the severity of degree and type of post-natal hearing loss appropriate measures mentioned above could be undertaken.

c. Noise induced hearing loss

Noise has become a part and parcel of our daily leaving. So much so that people living near airports or railway tracts do not even notice it.

Why is it caused? Very loud sound of 4000 Hertz or more from an explosion may cause temporary loss of hearing. However, constant exposure such noise could make it permanent. People living near airports, industries, looms where cloth is woven are known to cause hearing loss to children and adults. Excessive use of mobile phones, loud music for more than 85 to 90 dB is injurious to hearing health.

Implications, characteristics and management: Temporary hearing loss will be disappears after proper rest and avoiding excessive exposure noise, so that is the only thing that teachers could do. If loss is of a permanent nature, then depending upon the degree and site of lesion as specified above, appropriate measures as could be undertaken.

5. Nature

a. Sudden hearing loss

It is a type of hearing loss in which the child's hearing was normal and suddenly the child stops hearing or responding.

Why does it happen? Shock, falls of severe nature, accidents or war affected areas having loud explosions may cause a sudden hearing loss.

b. Gradual hearing loss

A child who had normal hearing but slowly losing it is termed as gradual hearing loss.

Why does it happen? Children with prolonged infections or constant exposure to noise will eventually develop a gradual hearing loss.

Implications, characteristics and management: Gradual hearing loss can be difficult to detect, but the first signs usually include difficulty following conversations amid background noise, trouble understanding higher-pitched voices and needing to turn up the volume on the TV. Academically teachers may notice such children facing isolation and children themselves avoiding conversations with others. Understanding oral communications and directions slowly starts affecting and they may start losing interest in participation. Referral to an audiologist will be helpful and other measures specified for seating arrangements, noise free atmosphere etc. will be will be beneficial.

ANNEXURE 3: STRATEGIES FOR OVERCOMING LIKELY BARRIERS

| CLASSROOM INTERACTIONS AND ACTIVITIES | LIKELY BARRIERS | OVERCOMING BARRIERS |
|---|--|---|
| Permission for entering class or Principals room | Teacher may not understand the child's speech seeking permission to enter the class. The child may also miss out on the teacher instructing him/her to enter the classroom. | A general classroom rule could be made to knock on the classroom door to catch the teacher's attention. Teachers can also signal/gesture for student to 'come in'. |
| Attendance/Roll call | Students with hearing impairment may miss out his/her name while teachers call out numbers. This is because many names have phonemes which are in audible (e.g./she/ in Shashi), some sound the same (e.g. Mohan and Rohan), and others sound the same due to a similar starting phoneme: /p/b/m/. | Don't change the order of names too often. If name order is kept the same, students with hearing impairment will find it easier to identify his/her name. |
| Announcements | Student with hearing impairment may not only miss out on the content of an announcement, but may also not realize that there are common announcements from the principal's office about change in timings or visitors in school or dress code of a special day. | Providing 'buddy' or peer assistance is a most effective strategy. Classroom instructions could be written on the board. A displaying panel showing the matter announced; a glowing lamp like an alarm located near the black board so that the child knows when announcements are being made. |
| Prayers time | Students with hearing impairment may not be able to sing the national anthem or school prayers at the same pace as others. | National Anthem and prayers could also be sung in Sign Language. Student with hearing impairment could be given a place facing the row monitor to make it easier to lip read and maintain the pace. Row monitors could be changed so that all children get a chance to be the 'buddy'! |
| Assembly | School assemblies have speeches and lectures, which students with hearing impairment may find difficult to hear and comprehend. | For Sign language users an interpreter would be useful. In the absence of an interpreter the content matter of the speech could be provided in printed form to the student. |
| Subject classes | Subject teachers are different for each subject. Each teacher has a different teaching style. Adjusting to speech reading of different teachers becomes difficult for a student with hearing impairment if teachers change too frequently. | Teachers could be trained to lower their rate of speech, face children while explaining and using more of audio visuals. Digitized classrooms benefit all children as teachers can make use of PPTs, videos, etc. to supplement oral explanations. |

| CLASSROOM INTERACTIONS AND ACTIVITIES | LIKELY BARRIERS | OVERCOMING BARRIERS |
|---------------------------------------|--|---|
| Art and craft classes | Students with hearing impairment are very creative; they work with concentration and perfection and hence are less distracted. However, they may lose out if an activity is time bound. Many art and craft teachers give oral instructions, which may not be 'understood' by the student. | A clock in the art room will be helpful. The art teacher could keep checking the work and reminding the child of the remaining time. Making a small demonstration of steps to be undertaken for a craft activity or showing a sample of the finished product will be beneficial to all students in the class. |
| Physical Education and sports | Students with hearing impairment enjoy and excel in physical activities; however, oral instructions are often a barrier. Many sports teachers blow a whistle to signal the start/end of a game or an activity. A whistle has a very high frequency and are not audible to students with hearing impairment. | Drums are audible due to low frequency and hence could be used instead of whistle. Physical instructors could be sensitized to use colored cards or hand signaling along with whistles. Score boards could be used for displays like stadiums which will benefit the whole school. Sensitization about care of person using hearing devices is especially important as the devices are very expensive. |
| Tiffin time/ Recess time | Students with disabilities encounter barriers in understanding jokes and take time to understand rules of games of other students during Tiffin or recess times. This may lead to social isolation. | Sensitization to peers about importance of inclusion and having 'best buddy award' may help to create incentives to involve students with disabilities. |
| Library time | A library has rules around book issue and return. They are noise free and require silence. Whispering is a difficult skill for students with hearing impairment. | Rules of book issue and return could be displayed on a board in the library. The librarian could make use of a simple calendar to indicate how many days a student can keep a book. Good light in the library will not only help readability but will also help speech reading persons. Posters of silence if displayed will help students with hearing impairment to understand that they need to be quiet. |
| Laboratory work | Laboratory technicians sometimes give only oral instructions for use of equipment or carrying out an experiment. A student with hearing impairment not fully understand oral instructions. Laboratory technicians might also speak and manipulate objects or perform a task simultaneously. Students with hearing impairment may not completely understand the process due to split attention. | Signage for use of laboratory apparatus and procedures written step by step if displayed will be beneficial to all students including students with hearing impairment. It is beneficial to all students if a small demonstration is given by the laboratory technician. Posters of dos and don'ts in a laboratory will also be of a general help to all students. Doing one step at a time, then speaking about it or vice a versa will help. |

| CLASSROOM INTERACTIONS AND ACTIVITIES | LIKELY BARRIERS | OVERCOMING BARRIERS |
|--|---|--|
| Functions and festivals in school | As part of co-curricular activities, schools organize competitions, festivals and other functions that include performing arts such as dance and dramas. Due to communication barriers, students with disabilities are often not given a role—or at best, given a very insignificant one such as becoming a tree in a stage act or a servant who does not have to speak. | Students with hearing impairment can be motivated to say dialogues through peer tutoring or by drilling and practices to say dialogues. |
| Outreach and extension activities | Community activities, such as awareness about cleanliness or water and energy conservation are fun for all children and also broaden their social horizon and commitment. Outreach activities are also some times undertaken by schools for fund raising. These may require communication with the general public, which may create embarrassments due to misinterpretations for the student with hearing impairment. | Pamphlets could be designed for such activities which the students will distribute and this would be supplementary or supportive to their communication. This will help to avoid communication issues. |
| School administration including paying fees, filling scholarship forms etc. | Communication barriers of students with hearing impairment may lead to misinterpretations and cause delays in payments of fees. Reading comprehension may also cause a barrier in filling up of forms etc. for higher class students or those who are children of deaf parents. | Social workers and school counselors may specially be assigned the work of assisting students with hearing impairment and their families. |

ANNEXURE 4: COMMUNICATION OPTIONS

Oralism

The philosophy which desires to develop verbal language in the deaf children through aural-oral mode is referred to as Oralism.

Emphasis on Speaking: Children who come from an Oralism background use auditory (listening) modalities. They are also called verbal or oral kids as they speak and some also speech/lip read. Hearing loss in such children would have been identified early and they would have been fitted with good quality hearing aids or cochlear implants at an early age. Their parents would have taken efforts to teach them to speak and read at a young age. There are two prominent methods under this approach:

Auditory/Oral method emphasises listening through the use of hearing aids, and use of techniques that support the development of audition and spoken language. Some auditory/oral education therapy programs also have a strong visual component. In other words, there is an emphasis on using visual techniques to teach speech. In some cases, speech (lip) reading skills are used as a supplement to hearing.

Auditory-Verbal method is similar to the auditory/oral approach in that there is a strong emphasis on maximizing a child's residual hearing and his/her ability to use it. The primary goal is to provide adequate support to the child's development and integration of listening and spoken language into everyday life. The Auditory-Verbal approach also supports a child's participation in regular classroom placements as soon as possible. Certified Auditory-Verbal Therapists (AVT) provide individual therapy sessions in their centers and also coach their parents or caregivers to teach their child how to communicate using spoken language.

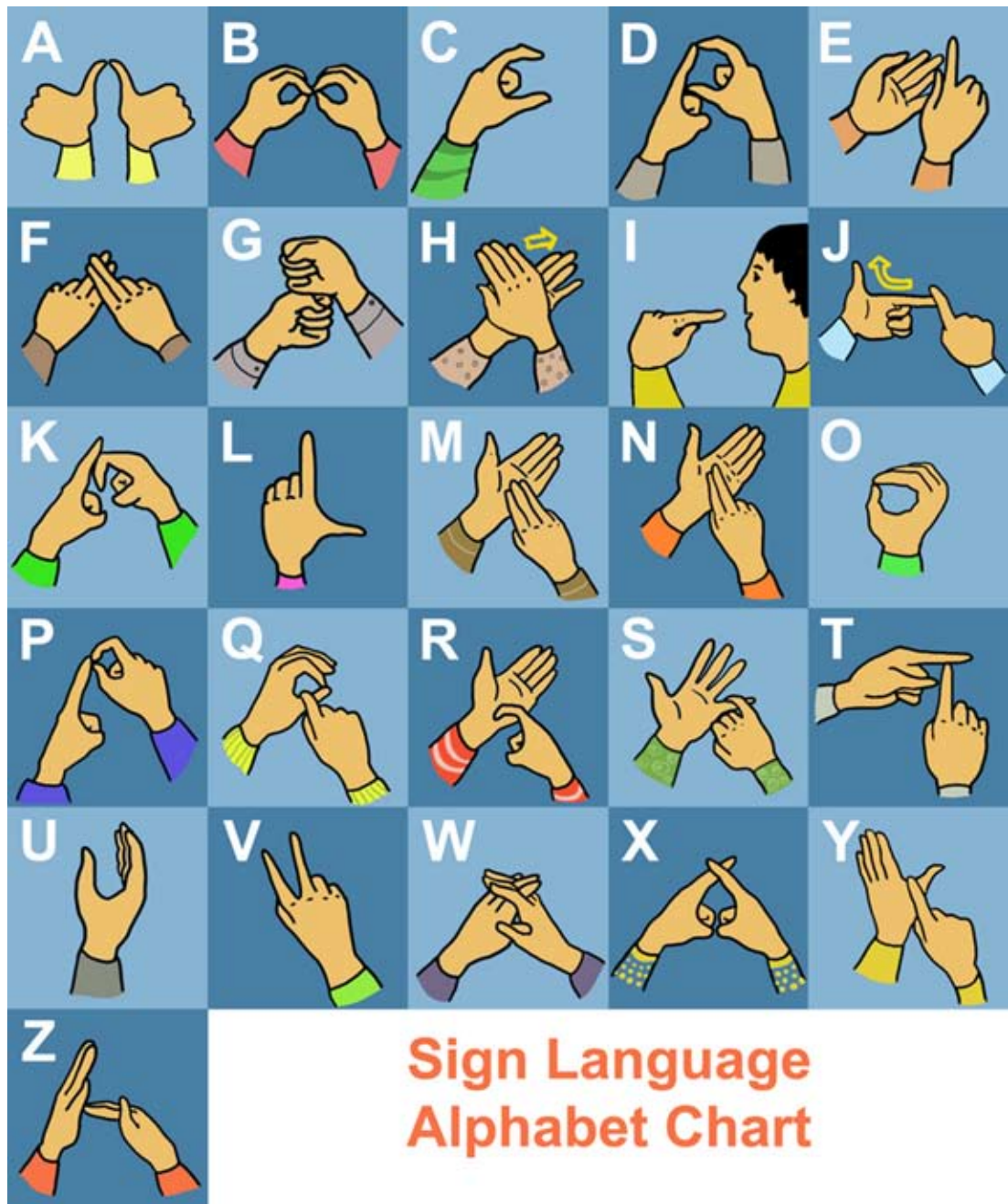
Total Communication

The philosophy which incorporates all means of communication including speaking, speech reading, signing, use of writing is referred to as Total Communication.

Emphasis on communication: Unlike Oralism, Total Communication (TC) follows an eclectic approach i.e. doing whatever works best for the child and emphasizes communication in *any* form. It supports the use of all modes of communication and language as needed in differing contexts. The intention of this philosophy is to provide a deaf child with *any and all* strategies necessary to support his/her development of communication and language. It does not intend to incorporate equally or used at the same time all the strategies.

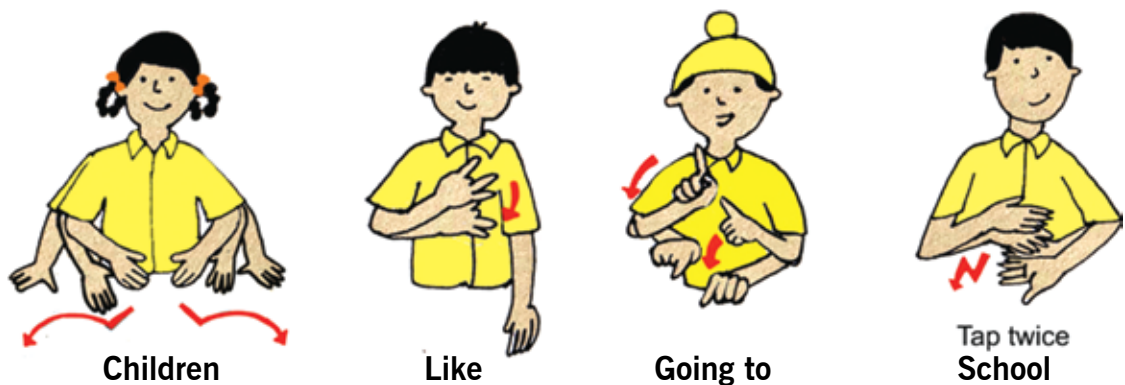
Fingerspelling is a method spelling each letter alphabet using hand and finger movements. Fingerspelling is used to spell out names of people and places for which there is no sign, for words for which signer does not know the sign for, and/or to clarify a sign that is not known by the person reading the signer. Given below are Fingerspellings as per Indian Sign Language (ISL).

Signed system is based on a verbal language wherein every word is signed separately. It is used along with speech. Hence, it is Also Called Simultaneous Communication (SIMCOM). One has to speak while signing. In signed system, each morpheme has a manual sign.



Sign Language Alphabet Chart

Example: “The boys played cricket.” In this sentence, there will be total 6 signs for (the, boy, s, play, ed, cricket). Here is another visual example.



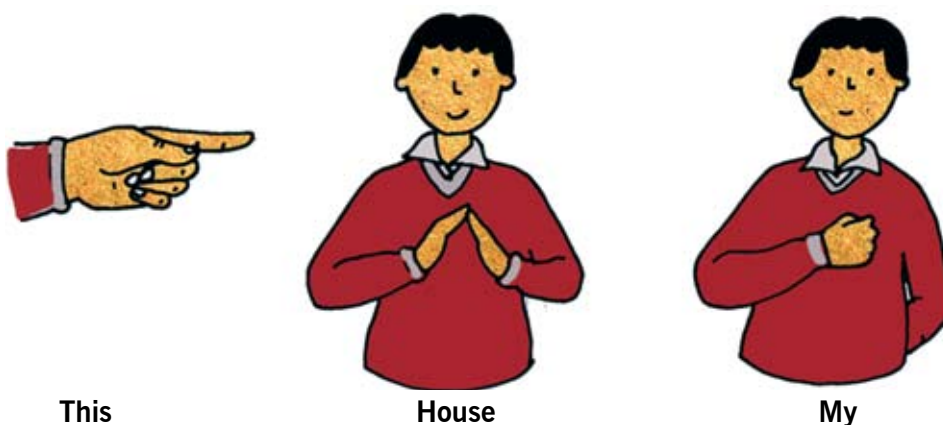
Educational Bilingualism

The philosophy which desires to develop both –a manual language i.e. Sign Language and one or more oral i.e. spoken language for e.g. Hindi, Marathi, English etc. in deaf children is referred to as Educational Bilingualism.

Bilingualism is similar to TC, in the sense that both involve the use of signs and sign language. However, bilingualism makes use of sign language to substitute speech. TC advocates sign system along with speech and Bilingualism advocates sign language instead of speech.

“Bi” meaning two, so bilingual education is a combination of proficiency in both a Sign Language (Indian Sign Language (ISL)/American Sign Language (ASL) and any other spoken language such as Hindi/English/Marathi/Gujrathi). These languages could be addressed through both print and spoken medium with the assistance of an interpreter. Advocates of Bilingual education believe that for deaf children sign language is only the first language. On the basis of sign language, they can learn any other verbal language as second language

Indian Sign Language (ISL) is used by Indian deaf individuals. There are some variations in vocabulary in different parts of the country. (Work Book- A Level, AYJNIHH).



Other sign languages: Like ISL in India, other countries of the world have their own independent sign languages e.g. United States has American Sign Language (ASL), and the United Kingdom has British Sign Language (BSL), etc. Sign languages do not encourage speech and is considered an independent language.

ANNEXURE 5: SOFTWARE FOR TEACHING SPEECH FOR CHILDREN WITH HEARING IMPAIRMENT

1. Speech Therapy

There is different software available for speech therapy. Software is used for evaluation of speech sounds and voice as well as fluency. During intervention, speech exercises are taken with the help of an animated programme. Details about some software are given below.

VAGMI professional, a window-version programme, helps in Voice, Articulation and Fluency therapy. It provides visual feedback of the voice production process. It includes very interesting games with visual clues, which stimulate the speaker to complete a given task. The performance is scored and a goal can be set to help the child to learn with interest. The software is quite effective and also time saving.

Dr. Speech is developed for speech/voice assessment and training purpose. For assessment, Dr. Speech clinicians can assess different aspects of speech such as *acoustic*, *electroglottographic (EGG)* and *perceptual measures*. And for speech therapy, Dr. Speech includes various colourful interactive games. With the help of these games, the child will learn different aspect of speech such as pitch, loudness, voiced and unvoiced phonation, voicing onset, phonation etc.

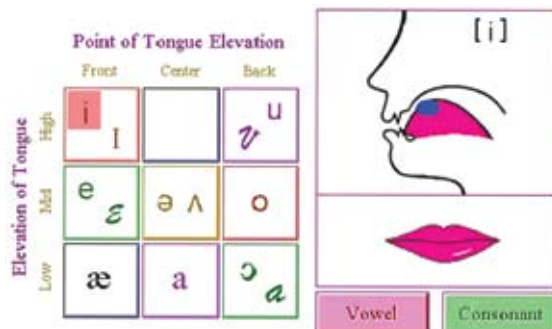
Screenshot Examples from Dr. Speech



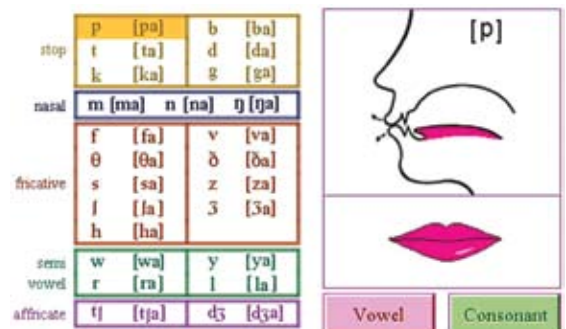
Sound Awareness:
A seesaw moves when there is sound over silence setting



Phonation Time Skill Building:
Keeping phonation moves the strawberry from left to right



Speech Articulation:
Vowel production (vowel/i/)



Speech Articulation:
Consonant production (vowel/p/)



Pitch Skill Builder:

Pitch controls how the boat moves around the rocks



Loudness Skill Builder:

Loudness controls how high the fireman climbs



Voicing Skill Building:

Voicing mode determines which mice will run



Voicing Onset Skill Building:

Voicing onset mode controls how the flower opens around the tree

My Word is very useful software for children with different communication difficulties. This software is used for speech and language therapy. Its key features include:

- ❖ Colourful animated videos and an IPA for each word are used for speech therapy
- ❖ It covers different aspects of language such as noun, verb, adjective, numerals etc.
- ❖ Speech production, auditory comprehension, auditory and visual attention memory can be done using this software.

Speech/voice therapy software is used for changes in pitch, loudness, voicing, voicing onset, maximum phonation time, sound, vowel tracking and phonetic exercise. Key features are:

- ❖ Colourful interactive video games for speech therapy
- ❖ Biofeedback
- ❖ Statistical report
- ❖ Clinical goal settings.

2. Communication

Tools such as internet, email, video calling, fax, text message, chat room, video conference can be useful for facilitating communication. With help of these tools children with hearing impairment can communicate with others using preferable communication options (Oralism, TC. and Educational Bilingualism). Some examples of software used for communication are:

- ❖ Skype
- ❖ iVisit
- ❖ ooVoo
- ❖ Eyeball Chat
- ❖ Ekiga

3. Emergent literacy

Various software is available for developing emergent literacy skills, such as phonetic, linguistic, and physical skills, etc. The software could be used for developing emergent literacy skills in children with hearing impairment. It is particularly helpful for drill work.

- ❖ **Azimpremji** foundation educational software (http://www.azimpremjifoundation.org/E-learning_Resources)
- ❖ **KIDWARE** (<http://www.kidware.com/mobius/17grops.htm>)

4. Sign language

Online sign language dictionaries are available on internet. Particularly useful, is the dictionary prepared by Ram Krishna Mission Vivekanad University, Coimbatore and can be accessed on <http://indiansignlanguage.org/dictionary/>The website includes a downloadable video of a huge number of signs. Users simply click on word and the video of the sign plays automatically.

5. Subject based software

Content-based subject material is available in the form of e-books. These cover almost all topics of all subjects up to 12th standard and are available for state board, CBSE board and ICSE board curriculum. Educational software publishers include:

- ❖ Navneet publication's digital classroom
- ❖ Morya Marketing
- ❖ Topper PVT LTD

ANNEXURE 6: 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 and Rs 85 from class XI-XII for day scholars and Rs 140 for hostellers |
| Financial | Class IX-XII B.A./B.Com./B.Sc. National scholarships for B.A./B.Com./B.Sc. Professional courses B.E./B.Tech/Ph.D/M.Phil/ Engineering/Agriculture/ Veterinary/Management. | Hosteller Day scholar Rs 140/- Rs 85/- Rs 180/- Rs 125/- Rs 240/- Rs 170/- Rs 1000/- Rs 700/- Rs 700/- Rs 400/- |
| Financial | UPSC/SSC Exams | Exempted from payment of application and exam fee |
| | Scheme of integrated education for the disabled children | Books and stationary allowance of Rs 400/- per annum 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/fitting of aids/appliances | Diagnosis and fitting of aids and appliance at free of cost up to income slab Rs 6,5000/- Pls refer to AYJNIHH website |
| 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 |
| Telecommuni- cation | STD/PCO booths | Preference is given to the disabled |
| Income tax concession | For disabled employees under 80 U | Exemption of Rs 50,000/- |
| Professional tax | Disabled employees/spouse/parents of disabled | Exempted from professional tax |
| Employment | Reservation of jobs | 3% for all disabled (1% each for OH, VH, HI) in group A,B,C and D posts |
| Age relaxation for employment | | Relaxation in upper age limit up to 10 years for appointment to any post |
| Reservation in self- employment loans | PMRY and SJSY of ministry of rural development and poverty alleviation schemes | 3% of the allocation are ear marked for PWDs |
| Reservation in admission | | 3% reservation |

ANNEXURE 7: AUDITORY ASSESSMENT

Auditory assessment is the main area of assessment of listening levels of students with hearing loss, who use hearing devices and who follow an oral communications approach. Students are assessed at four stages:

1. **Detection:** At this stage, the teacher checks to see if student is able to distinguish between presence and absence of sound in his/her environment. Ability to detect phonemes, words, phrases or sentences through listening alone is assessed.
2. **Discrimination:** The second stage assesses the student's ability to discriminate between different sounds. Again the student needs to be assessed at level of phonological awareness, word, phrases and sentences.
3. **Identification:** This means checking if the student is able to identify the particular sound, phoneme, word, phrase or sentence.
4. **Comprehension:** This is the highest stage of achievement. Once the child is able to identify, the child's ability to understand the meaning of the message heard needs to be assessed.

Record the details of the students with hearing loss in the Auditory Assessment chart given below:

| Stages of Assessment | Phonological awareness | Word level | Phrase level | Sentence level |
|----------------------|------------------------|------------|--------------|----------------|
| Detection | | | | |
| Discrimination | | | | |
| Identification | | | | |
| Comprehension | | | | |

PRESENT SPEECH STATUS

Instruction: Spoken language or speech is assessed for improving the speech intelligibility. Record the vowel/syllable and put a tick mark in the corresponding columns as per quality of the student's production. This may be indicated as present, absent or emerging. The teacher is expected to work on the areas where the pronunciation is absent or emerging.

| VOWELS/SYLLABLES | PRESENT | ABSENT | EMERGING |
|------------------|---------|--------|----------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

ANNEXURE 8: STORY OF MR. CROSS

3. Mr Cross swats a fly!



Mr Cross was always angry. He was always angry with his family and friends. He lost his temper every now and then. He shouted at his wife and children. He shouted at his friends too. So they all stayed away from him, as far as possible. This made him angrier.

One day, Mr Cross was busy writing a letter. He wanted to complain to the Mayor about all the other people in the town.

Just then, through the open window, a fly buzzed in. Oh, bother! At once, Mr Cross got up and began to shoo away the fly.



“Shoo! Out! Out you go!”



But the fly didn't go away. It began to buzz around the ink-pot on the table. Mr Cross grabbed a ruler and hit at the fly.

But oh! What's this? The ink-pot fell and all the ink splashed over his letter. Now Mr Cross was very very cross with the fly.

“Hey, you, fly! You dirty thing! Wait till I swat you.” He rushed after the fly.

The fly flew into the kitchen. It settled on a pot of honey. Down went Mr Cross's ruler. It toppled the pot of honey. The honey spilled on the table.



Buzz... buzz... buzz went the fly. Snap, snap, snap went Mr Cross's ruler, trying to get the fly. But, no ! He couldn't swat the fly. It buzzed merrily from place to place.



The fly then flew to a shelf of jars. Mr Cross was now trembling with anger. "Wait, you wicked creature ! I'll get you still !"

He picked up a rod and brought it down heavily on the fly. But the fly was too quick for Mr Cross. The rod landed on the jar and ... crash ! The jar broke into a hundred pieces.





Buzzzzzz went the fly louder than ever. Wherever the fly went, Mr Cross followed with his rod. Buzzzz... buzzzz... buzzzz... ! Jars, cups, saucers, plates, bowls, glasses, pots, ... everything went crashing to the floor. What a mess the kitchen was !



But Mr Cross could not stop now. He threw away the rod and began to look for something bigger to swat the fly.

He found a large and heavy frying pan. Holding it in both his hands, he got ready to strike. Just then, the fly came towards Mr Cross and settled on his nose.

“Got you !” cried Mr Cross and, oh dear ! He struck his own nose with the pan !

The fly flew out of the window.



Source: Balbharti English Textbook-Standard Two (2013). Chapter 3- Mr. Cross Swats a fly!. Maharashtra State Bureau of Textbook production & curriculum research: Pune.

Suggested lessons using the Story of Mr. Cross

The story can be used to teach:

Language/Grammar

Degree of comparison: Angry, angrier, and angriest

Type of sentences: Exclamatory, assertive, imperative, interrogative

Contextual use of the word: 'cross' (Mr. Cross, cross with the fly)

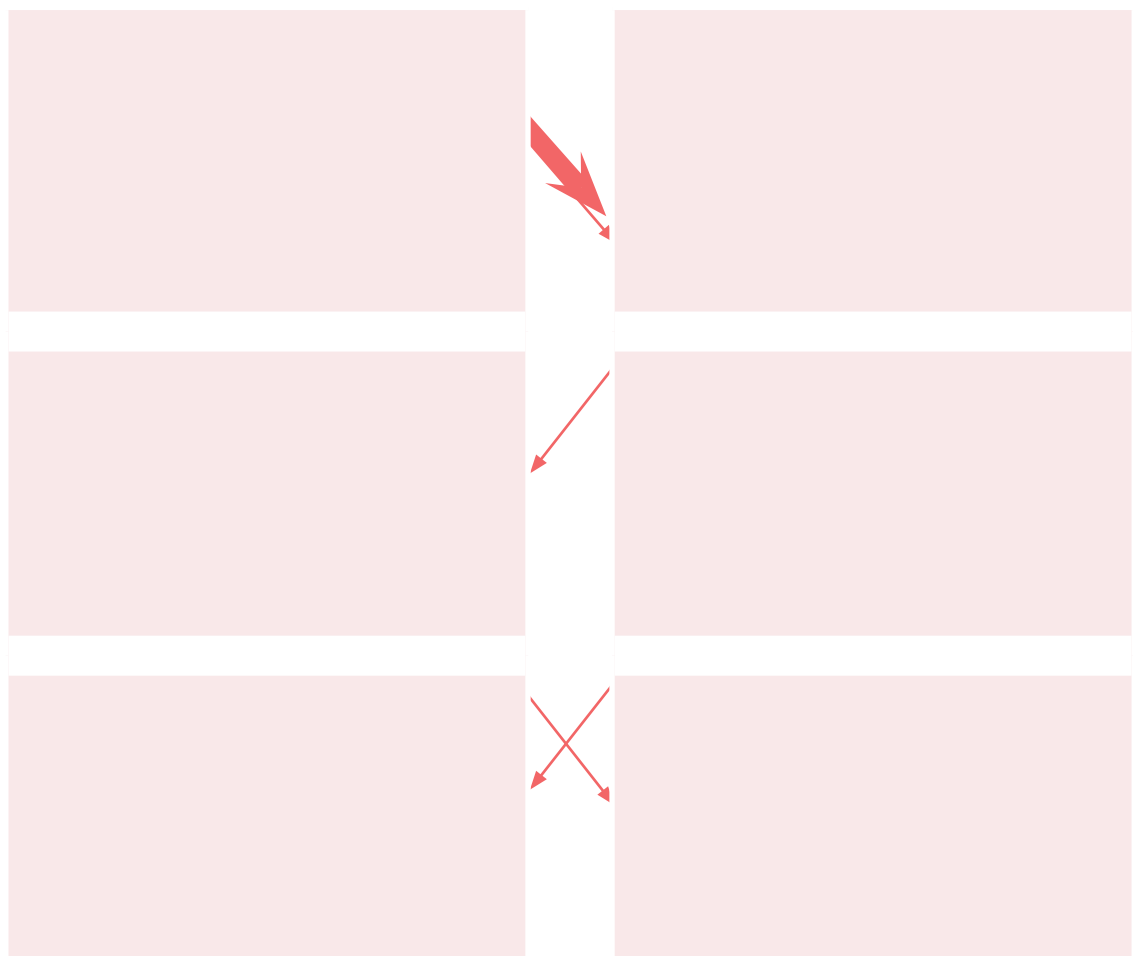
Questioning: Frame questions for the sentences: *He found a large and heavy frying pan* (Who? What?)

Cause and effect: Why did it happen? What happened?

TABLE FOR STUDENTS TO COMPLETE

| CAUSE | EFFECT |
|---|--|
| Why did it happen? | What happened? |
| Mr. Cross hit the ruler at the fly. There was an inkpot on the table. | The inkpot fell and all the splashed. Over the letter. |

Storyboard/chain of events graphic organizer: This organizer can be used for helping students understand how events are sequenced in a story. Students can also describe some of the details that are associated with each event.



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Online RESOURCES

<http://www.classroomhearing.org/acoustics.html>

Signed English dictionary

<http://sign.com.au/>

This website includes a Signed English dictionary of almost 3,000 words. Each word is illustrated and has a description.

Sign 4 Me

This is a Signed English Translator that can readily be installed on school computers. More details can be found on <https://itunes.apple.com/in/app/sign-4-me-for-ipad-signed/id383462870?mt=8>

Indian Sign Language (ISL)

If interested in learning ISL, Ali Yavar Jung National Institute for the Hearing Handicapped (AYJNIHH) in Mumbai has a basic level course. For details see: <http://ayjnihh.nic.in/advertisement.asp>

Study material of the basic level course (A level in ISL) in video- CDs can be purchased from Material Development Department (MDD), AYJNIHH, Reclamation, Bandra (W), Mumbai 50.



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