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## EASY WAY OF TEACHING MATHEMATICS TO THE CHILDREN WITH HEARING IMPAIRMENT

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### Introduction

*"Children with Special Needs  
Inspire a Special love."*

Government insists inclusion of special children in normal schools. Special children are physically handicapped, blind, deaf, epileptic and crippled; some differ mentally to a significant degree, being either seriously retarded in intellectual development or exceptionally gifted some are emotionally disturbed or unable to make a proper social adjustment in school and community. In this paper we have deal with hearing impairment children.

### Hearing impaired

*"A person who is deficient in hearing power"*

A person is considered to be deaf if they cannot hear the same range of sounds as a person with normal hearing ability. People that cannot hear any sounds are also hearing impaired.

### Types of Hearing impaired

#### Conductive deafness is the most common type

- It means that sounds cannot pass efficiently through the outer and middle ear to the cochlea and auditory nerve.
- This is most often caused by fluid building up in the middle ear. It is called Otitis Media with Effusion (OME) and can be referred to as 'glue ear' in some countries.

#### Sensor Neural Deafness

- It is caused by a fault in the inner ear or auditory nerve.
- This is sometimes called 'nerve deafness' accurate. Most sensorineural deafness is caused by a problem in the cochlea.
- Commonly, this is because the hair cells of the cochlea are not working properly and it is permanent.

#### Mixed Deafness

- It is a combination of both conductive and sensorineural deafness.
- For example a child may have glue ear and at the same time have a problem in their cochlea.

## Causes

There are different causes of deafness:

- **Age:** Many people will lose their hearing as they get older.
- **Exposure to noise:** Being in a noisy environment for a long time may damage ears and cause hearing loss.
- **Genetic conditions:** There may be a history of deafness in the family. If the mother and father are deaf, their child will have a strong chance of being deaf.
- **Diseases:** Certain diseases may cause deafness.
- **Drugs:** Certain drugs may cause changes to hearing, including deafness.
- **Chemicals:** | Certain chemicals can damage the ear.
- **Natural:** People are occasionally born deaf. Sometimes there is no explanation why they are deaf.

## Way of Communication

Hearing impaired members of this community have a strong sense of identity as a Deaf person. They feel 'at home' with being deaf and find a commonality with other Deaf people in their use of the sign language. Deaf exist everywhere in the world. Deaf people have evolved into strong communities and have developed **sign languages** throughout history. Lip readings are also taught to the auditory handicapped children to participate in communication with others.

## Sign Language

The most effective way to communicate with a deaf person is to use sign language. Sign language is composed of a system of conventional gestures, music, hand sign and finger spelling, plus the use of hand position to represent the letter of the alphabet. Signs can also represent complete ideas or phrases not only individual words.

- American Sign Language is a language that incorporates mime, and picture-like images to express and convey abstract ideas and concepts. Also, ASL uses space and movement to convey meaning.
- Finger- spelling is mainly used to give names of people, places, and identify brands or movie titles.

## Challenges Faced by Hearing Impaired Children

### Classroom Acoustics

Acoustics are often a problem in the classroom, but luckily there are several ways to solve this challenge. Deaf or hard-of-hearing students need full visual access, so the best seating arrangement for full participation, engagement and access by these students is to arrange desks

in a “U” shape. This will allow the students to see who is speaking, and participate fully in the conversation.

### **Language Deficiencies**

Keep in mind that some hearing impaired students first (or second) language may not be English. Be sure to provide an appropriate interpretation service that will effectively communicate the lesson in their primary language.

### **Curriculum and Instruction**

Some teachers require all students to take lecture notes during class. A suggestion to assist the hearing impaired children with this requirement would be provide to them with a written or digital copy of the lecture information beforehand. If it is preferred that the student engages more actively in class, teachers can provide a printed copy listing key points, so that the majority of the student’s attention remains on the lesson. We also encourage teachers to use interactive whiteboards if available.

### **Inadequate Knowledge and Awareness**

Every child learns differently. Even if teachers are given instruction on how to be assisted best of their students with hearing difficulty, it is too difficult to understand the capacity of them.

### **Lack of Resources**

Schools are not capable of supplying proper materials for the hearing impaired children with the proper technology that could significantly increase the learning development process. This could be any form of assistive technology- interactive whiteboards, VRI, chat rooms, strobe lights, digital pen technology, closed captioning on all movies and videos, infra-red systems – hearing aid compatible, computer-assisted note taking, ASL videos for testing materials, alert system.

### **Education**

The Indian constitution says “Right to education for all”. The word “All” denotes all types of children in the country including the hearing impaired one. So these children should also be considered and provided with special education. Education of hearing impairment is traditionally defined as the education of students who have some degree of hearing disability. Ideally, this education should be designed to meet the needs of individual hearing impaired people, and not the group as a whole. This is especially true for individuals who suffer from a disability or physical limitation, such as those who are visually challenged and hearing impaired.

### Easy Way of Teaching Mathematics to the Hearing Impaired Children

The paper discusses the easy way of teaching mathematics to the hearing impaired children. The concept of multiplication in the mathematics is taken using the *line-drawing* method.

For the two digits number  $12 \times 12$

In the term twelve, consider the first digit (one) by drawing a single line in a horizontal direction.

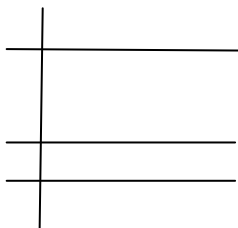
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Then draw two lines for the next number (two) in the same horizontal direction.

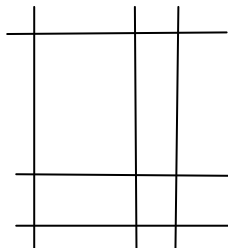
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For the next term twelve, digit one represented by drawing a single vertical line in the same figure.

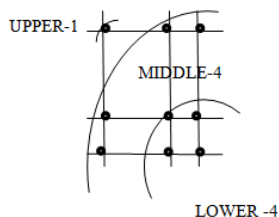


For the digit two, draw two vertical lines on the same figure.



Then separate the portion by drawing arcs.

Arcs are drawn in three positions like upper, middle and lower.



The answer is 144

In the lower arc, mark the joints of vertical and horizontal lines as four points, middle arc as four points and upper arc as one point. Calculate the points from lower to upper. Finally, the

answer to the problem is one hundred and forty four. This method is also applicable for the any-digit numbers.

### **Conclusion**

The subject mathematics is usually considered as difficult one for the normal children. It is all the more difficult for the disabled children, especially for the hearing impaired. There are several innovative methods, but this is easy to teach. Hearing disability is not a deficiency but these children have much skill than normal children. So, they should not be neglected and to provide an equal education for all the deaf children. Teaching them should be effective because it makes them understand easily. As per the norms of government, the inclusion of special children in normal schools based on that hearing impaired also included in normal schools. With the availability of special teachers they can also learn in normal schools.

### **References**

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