Creating Deaf Friendly Settings

(Secondary and Primary)

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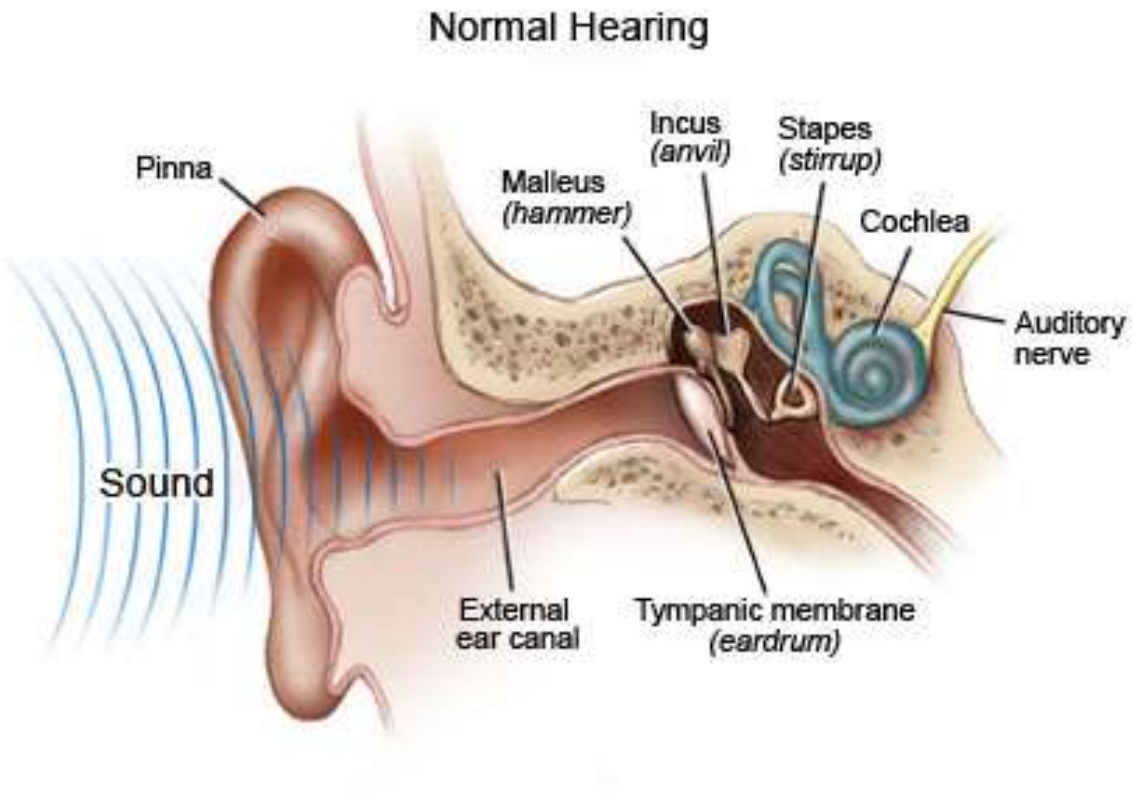
How Normal Hearing Works

Sound waves enter the outer ear and travel through the ear canal to the ear drum, causing it to vibrate.

Vibration of the eardrum sets into motion the three small bones of the middle ear, which in turn, transfer the vibration from the eardrum to the inner ear.

The inner ear, also known as the cochlea, senses the vibration and converts it into electrical signals.

The hearing nerve transmits electrical signals from the cochlea to the brain, where they are interpreted as sound.



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Types of Hearing Loss

Conductive Hearing Loss:

- Hearing loss in the middle ear - usually temporary (glue ear, perforated eardrum)

Sensorineural Hearing Loss:

- Permanent hearing loss of the inner ear (Connexin 26, genetic, unknown cause)

Mixed Hearing Loss:

- A Sensorineural hearing loss with a conductive overlay

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Levels of Hearing Loss

Mild*:*

- following speech is difficult, especially in noisy situations

Moderate:

- hearing aids required in order to access speech/conversation

Severe:

- difficulty accessing speech even with hearing aids

Profound:

- no useful hearing even with hearing aids

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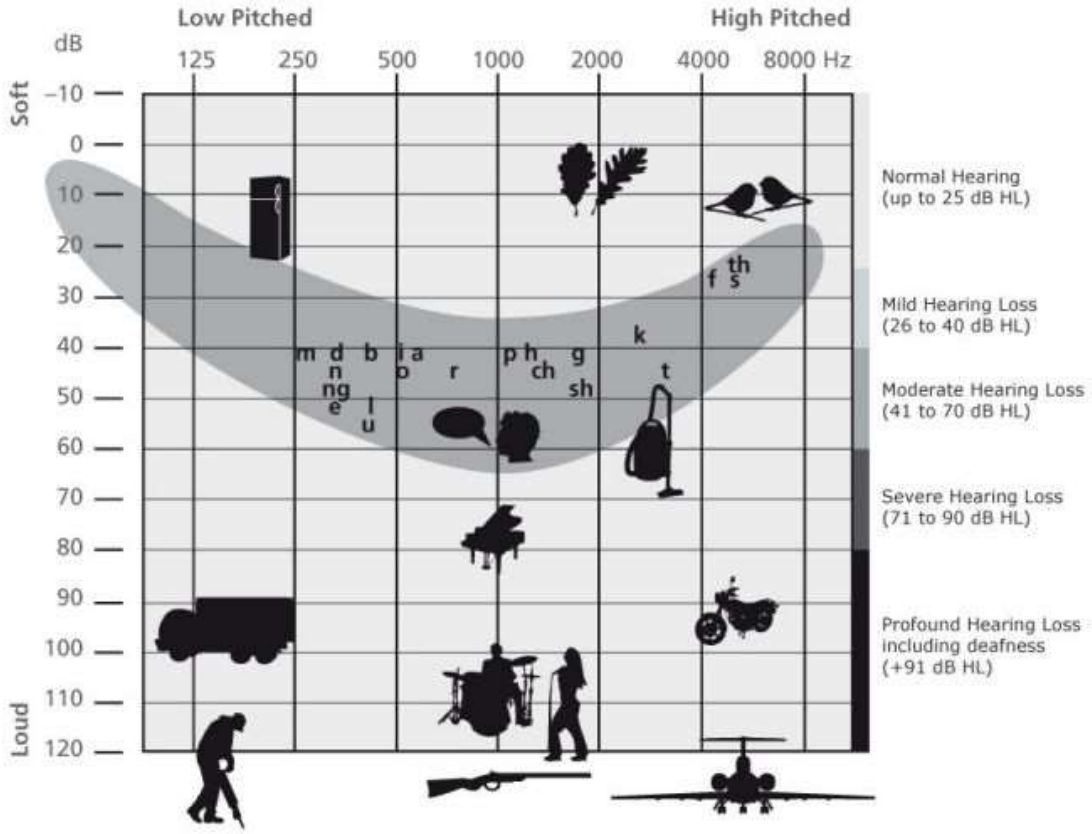
Degrees of Hearing Loss

- Normal conversational speech is about 45 dB.
- The term, ‘Speech Banana’, describes the area where the sounds of human speech appear on an audiogram.



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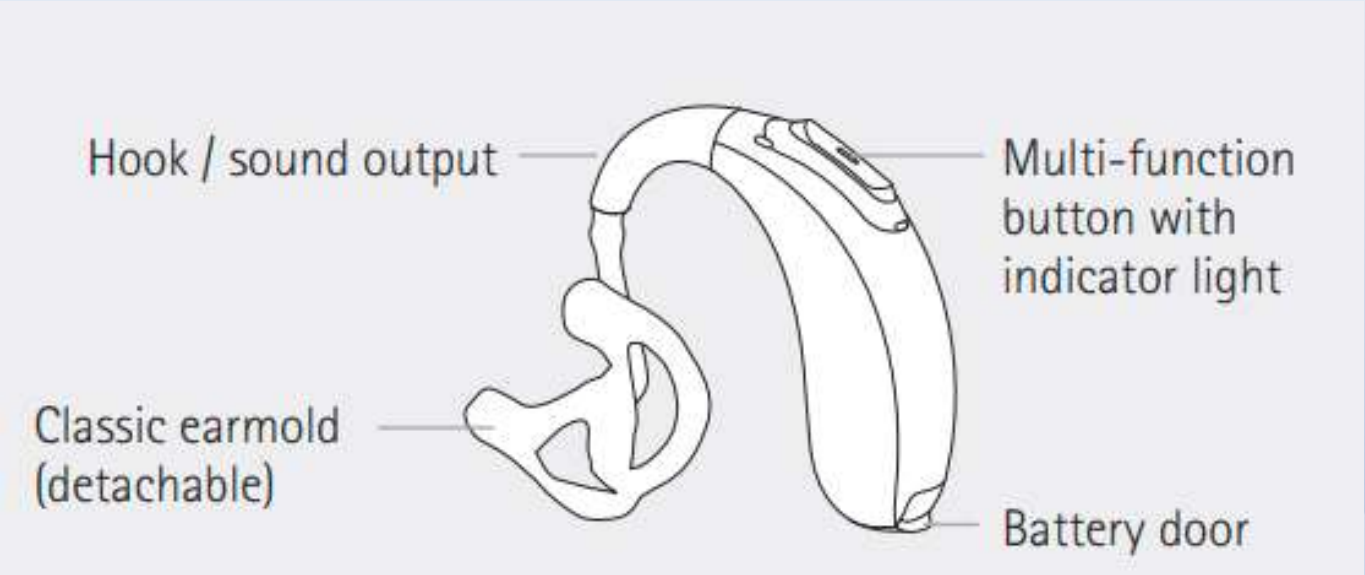
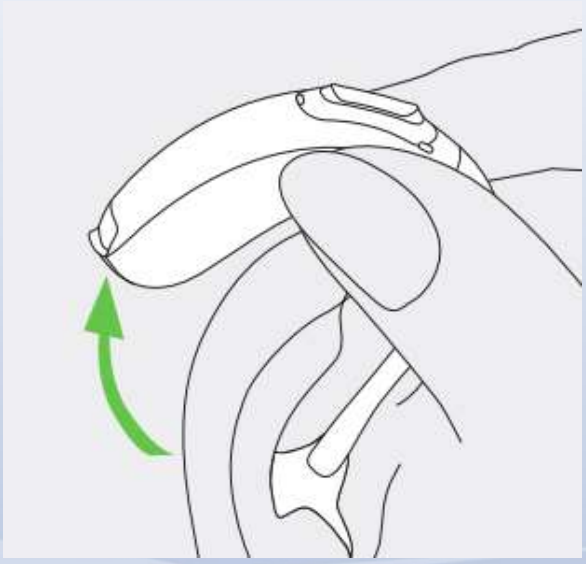
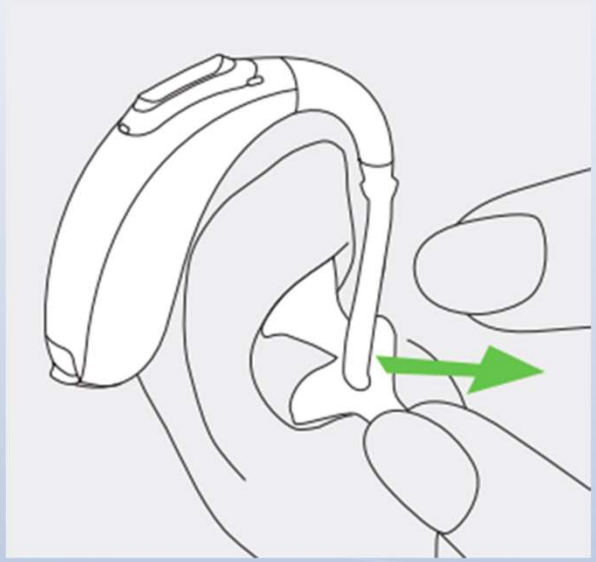
Hearing Aids



Removing the Hearing Aid



Lift the hearing aid above the ear



Remove the hearing aid by the mould.

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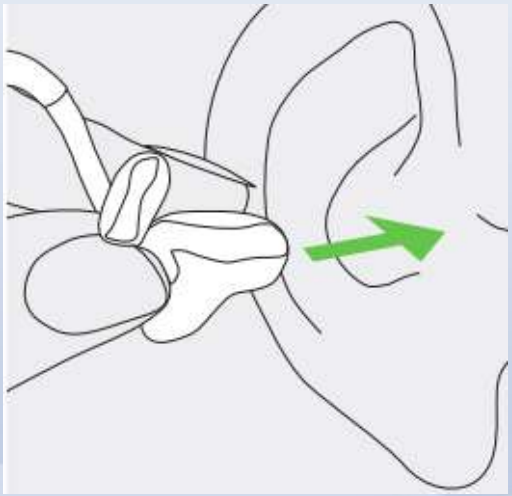
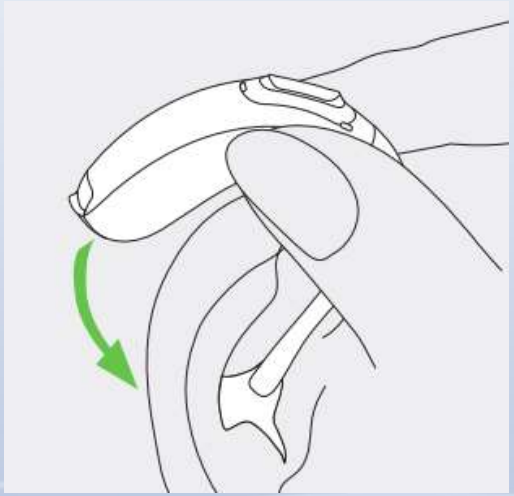
ENSURE THE HEARING AID IS ALWAYS REMOVED BY THE MOULD - PULLING IT BY THE AID ITSELF CAN CAUSE THE TUBING TO BECOME LOOSE!

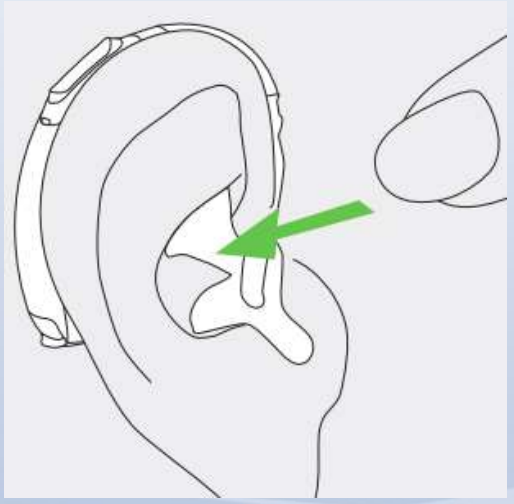
Inserting the Hearing Aid



Push the ear canal part into the ear canal



Place the hearing aid behind the ear



Insert the upper part of the earmould into the fold of skin

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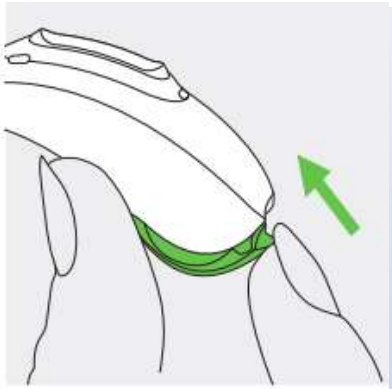
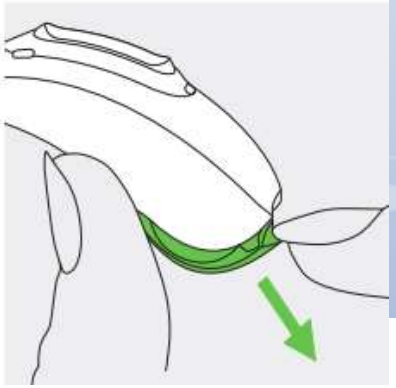
Turning the Hearing Aid on and off

1. Closed battery door = hearing aid is **on**



2. Open battery door = hearing aid is **off**



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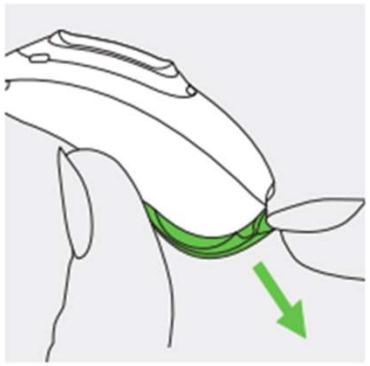
Changing the Hearing Aid Battery

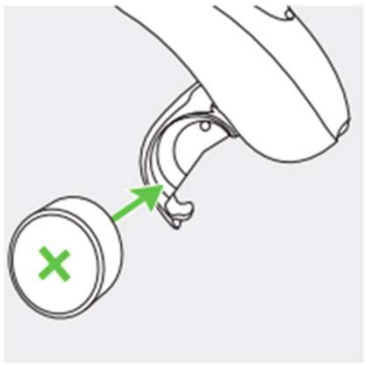
1.

Remove the sticker from the new battery and wait two minutes.



2.

Open the battery door.



3.

Place battery in the battery door with the "+" symbol facing upwards.

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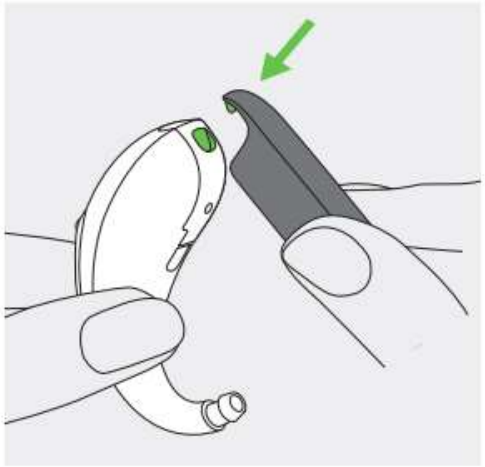
Opening the battery door (safety catch - Phonak)



1.
Place the tip of the tool in the small hole at the bottom of the hearing aid.

2.
Use the tool as a leverage to open the battery door with force in the direction of the green arrow.

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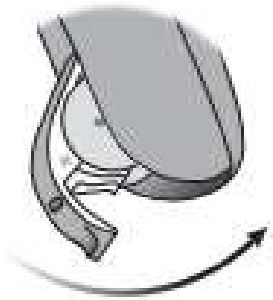
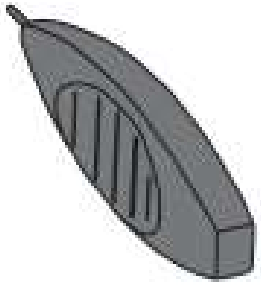
Opening the battery door (safety catch – Oticon)

To lock the battery drawer



Close the battery door completely and make sure it is locked.

Tool to unlock the battery drawer



Use the tool (you can also use a hairclip / needle)

Unlock the battery drawer

Insert the tip of the tool into the small hole at the back of the battery drawer.

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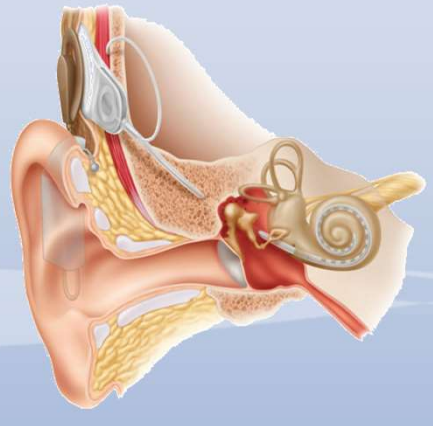
Cochlear Implants

A cochlear implant is a sophisticated hearing aid, part of which is surgically implanted in the child's ear.

The implant tries to do the job of the damaged hair cells in the cochlea. It converts sound into electrical signals which can then be sent up the auditory nerve to the brain.

https://www.youtube.com/watch?v=Vm0nZH9RahE



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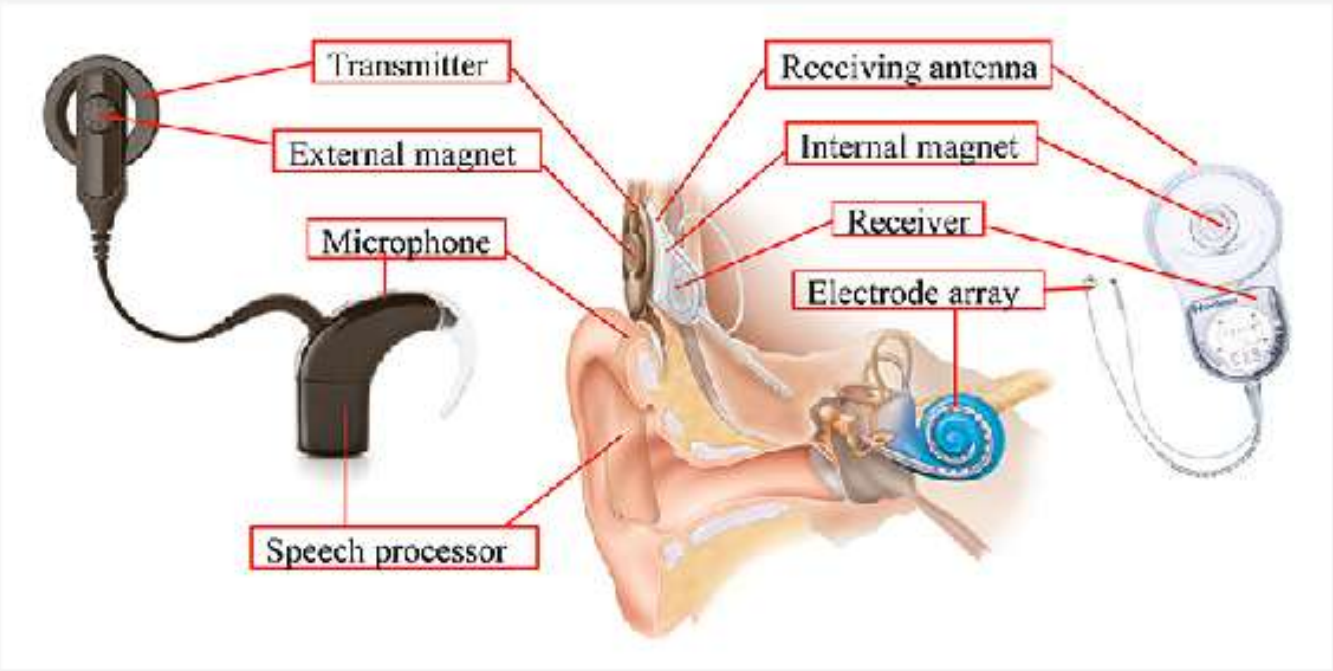
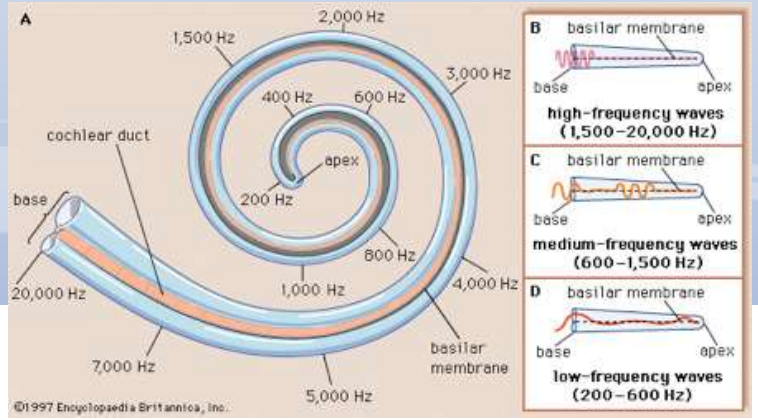

Transmitter
External magnet
Microphone
Speech processor
Receiving antenna
Internal magnet
Receiver
Electrode array

Figure 1



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Cochlear Implants

The earlier the child is implanted, the better the outcome.

Significant increase in the number of deaf children in mainstream education.

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Cochlear Implants – things to be aware of……

- Swimming and bathing (unless a waterproof kit is used)
- Security scanners such as at museums and airports (They must be switched off and must not go through the scanner)
- Vigorous/ contact sports: in case of impact/blow to head
- Magnets should not be used too close to the head
- Unable to have MRI normally

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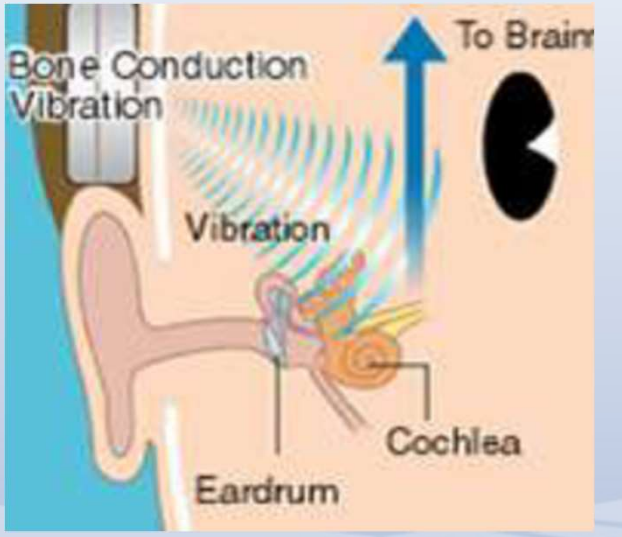
Bone Anchored Hearing Aid (BAHA)

- Held in place by a soft material band.
- Transmits the sound through the bone of the skull directly to the cochlea, bypassing the outer and middle ear.
- When the child is older they may have an operation to surgically attach an abutment or magnet to their skull so that they can be fitted with a Bone Anchored Hearing Aid (BAHA).



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BAHA – the device

- is for those with a conductive hearing loss -
- amplifies and transmits sounds – especially speech sounds BUT also ALL unwanted background noise
- does NOT restore normal hearing
- Is most effective at less than one metre

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Parts of a BAHA

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On / Off and Changing the Battery

Close the battery door to turn the BAHA on, open the door until you hear the first click to turn the BAHA off

Gently open the battery door until it is completely open, remove the old battery, peel the sticker from the new battery, insert the battery into the battery compartment with the + side facing up, close the battery door gently.

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Bone Conduction Hearing Implants

- Surgically implanted just under the skin
- External part, shaped like a disc, attached via an implanted magnet
- Does not require surgery to the cochlear
- Used for permanent conductive hearing loss / a mixed hearing loss / malformation of the external auditory canal
- Can be used for children over the age of 5
- Batteries are changed in the same way as a BAHA

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A Radio Aid / Mini Mic / EduMic

- A radio aid is a personal FM system that supports hearing aid / cochlear implant users to hear a speaker in a noisy situation or at distance from the speaker.
- The student wears a receiver attached to their hearing instrument and the speaker wears a transmitter.
- The system transmits the speaker's voice directly to the hearing instrument via the receiver therefore helping to overcome problems of listening in noise and at distance from the speaker.

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Radio Aid Equipment (receivers attached)

Lanyard – please remove all other lanyards when wearing the radio aid

The microphones must not be covered or disturbed

Switching it ON/OFF – please check the radio aid has been turned on

The receivers that should be attached to processors / hearing aids or he/she won't hear you

Connect the receiver to the transmitter

Slide the receivers on each morning and remove them at the end of the day.

The mute/unmute button. It will flash red when muted so you can't miss it

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Radio Aid Equipment (Bluetooth)

Lanyard – please remove all other lanyards when wearing the radio aid

The hearing aids / cochlear implant connect directly to the radio aid via Bluetooth

The microphones must not be covered or disturbed

Switching it ON/OFF – please check the radio aid has been turned on

Connect the receiver to the transmitter

The mute/unmute button. It will flash red when muted so you can't miss it

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Radio Aids – Good Practice

- The microphone should be about 15-20cm from the speaker's mouth
- The strap is adjustable
- The mic must be worn centrally
- The mic MUST be free of beads, scarves and other lanyards
- Turn off/ mute the transmitter when the student does not need to listen!

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A Conference Mic!

The radio aid / mini mic is also a conference mic and good for group work. It can be laid on the table and pick-up up to eight voices around a table clearly. Still be mindful of background noise and poor acoustics as that will affect the quality of listening.

During group work, lay it on the table the student is working at and then pick it back up again when you resume the lesson.

Just lay it flat on the table where the child is working

Remember to pick it back up again and wear it round your neck after any group activity!

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EduMic

LED lights.
Green – on.
Flashing green - mute

The microphone must not be covered or disturbed and should be placed approx. 20cm from the speaker's mouth

On / off button (press and hold)
Press the button briefly to switch between on / mute / off.

The EduMic has a clip that can be clipped to the speaker's clothing, alternatively there is a lanyard

Can also be connected to an audio device such as a laptop using the jack cable supplied

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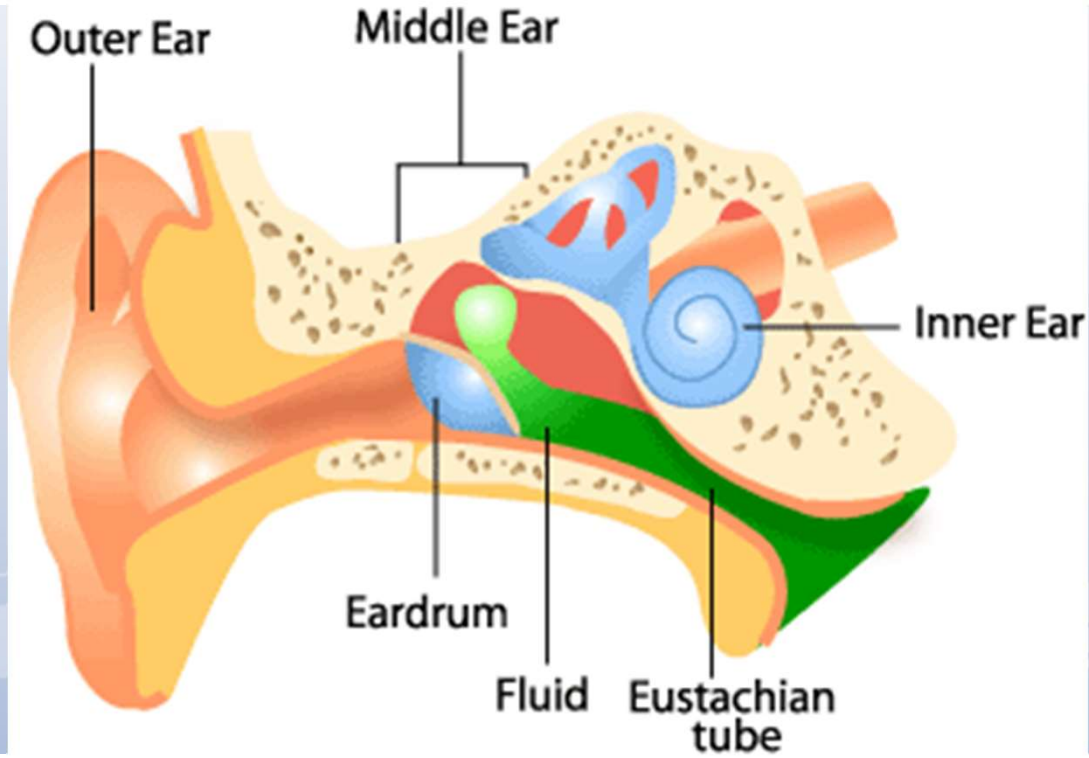
Glue Ear

- 1 in 5 children will have experienced glue ear by the age of 10
- Occurs when fluid collects in the child's middle ear
- Main symptom is temporary hearing loss
- Often occurs after infection, but can also occur when a blockage affects the child's eustachian tube



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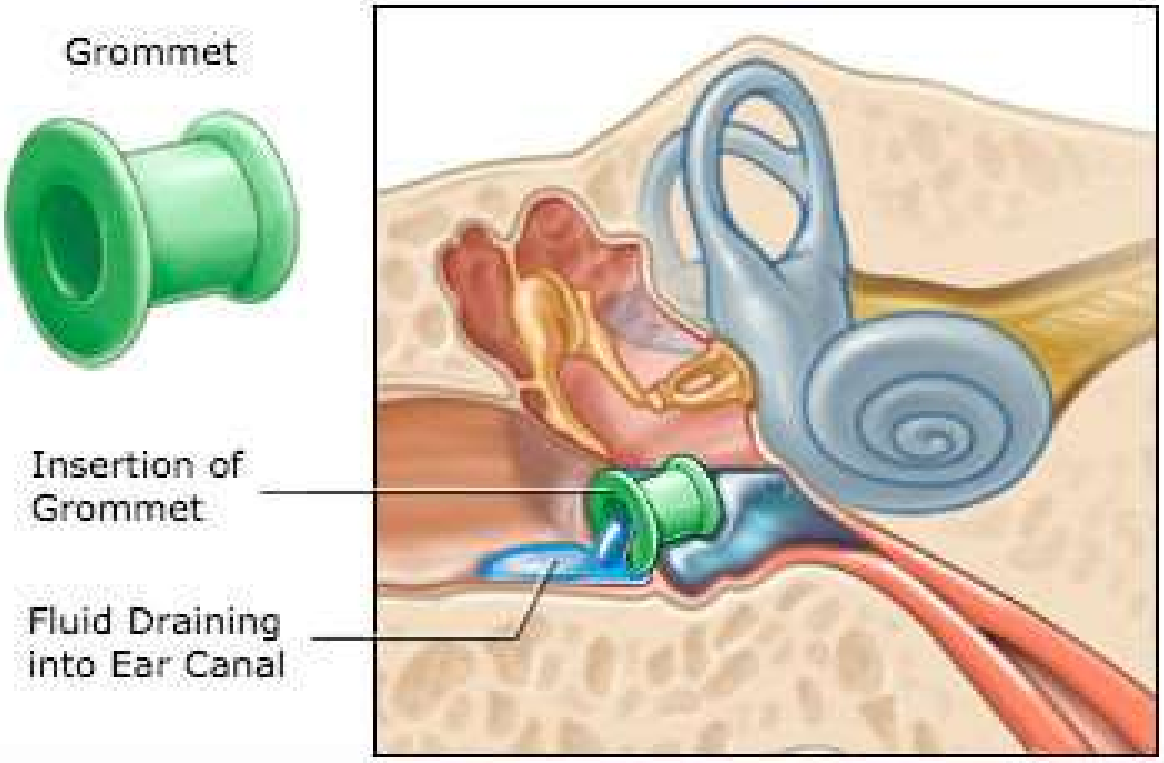
Grommets

- A grommet is a small tube that is placed inside the child's ear during surgery.
- It drains fluid away and keeps the eardrum open.
- The grommet usually falls out naturally after 6-12 months



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Single-sided hearing loss (unilateral hearing loss)

Because one ear still has normal hearing, a child will hear well in most situations, but may experience problems with the following:

- Hearing sounds directed toward the poorer ear
- Locating the source of sounds (this is called localization)
- Understanding speech in a noisy background

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Strategies for Unilateral Deafness

- The most important thing to remember is PREFERENTIAL SEATING i.e near the key speaker or sound source with the good ear towards the sound.
- Allow the child to change seat locations to direct the normal hearing ear toward the primary speaker and to sit near the speaker. This may mean that the child will need to change seats from one activity to the next.
- Use the child's name first when speaking to them – it will be difficult for them to localize direction of sound/speech.
- Face the child when talking. Do not speak while walking around the room.

What can Hearing Devices do?

- help pupils to hear speech sounds and acquire language
- help the wearer to hear conversation more clearly
- help to reduce feelings of isolation

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What do Hearing Devices *not* do?

- restore hearing to normal
- restore good hearing in the way that glasses restore good sight
- completely separate the sounds you want to hear from the ones you do not want to hear

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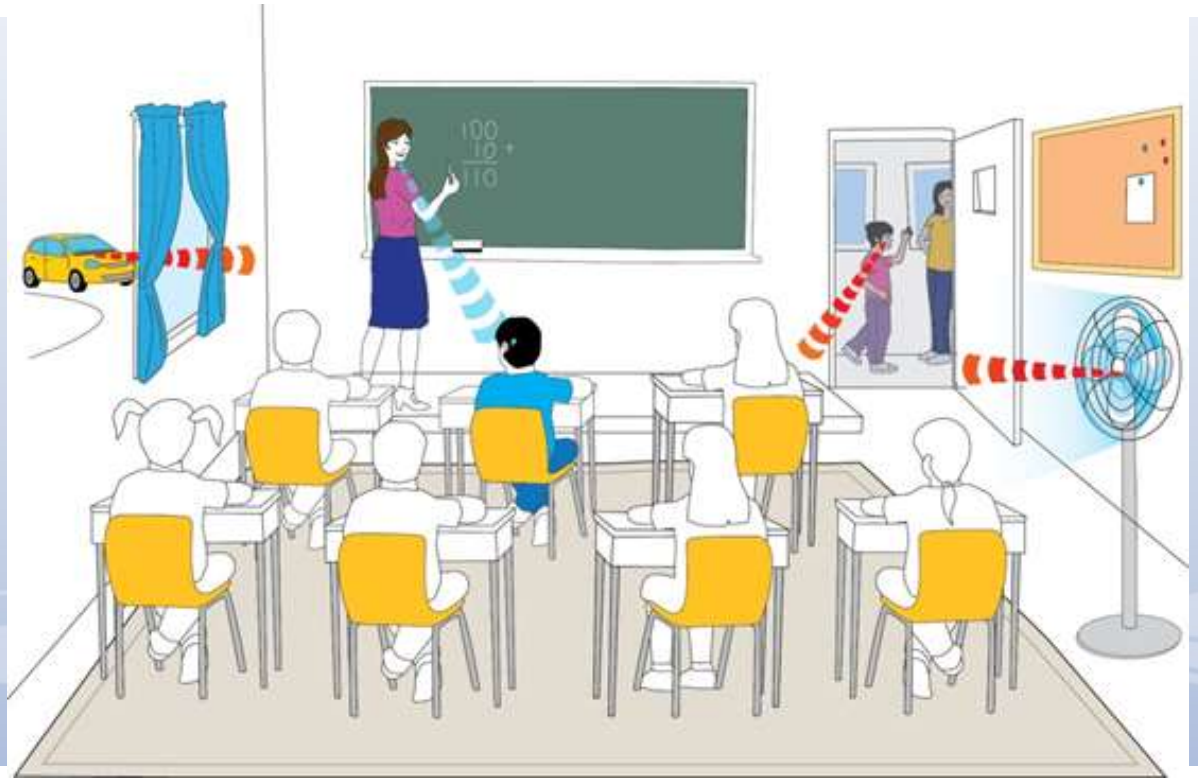
Please remember…

hearing with background noise and at a distance from the speaker remain challenging, even with hearing devices for all deaf learners.



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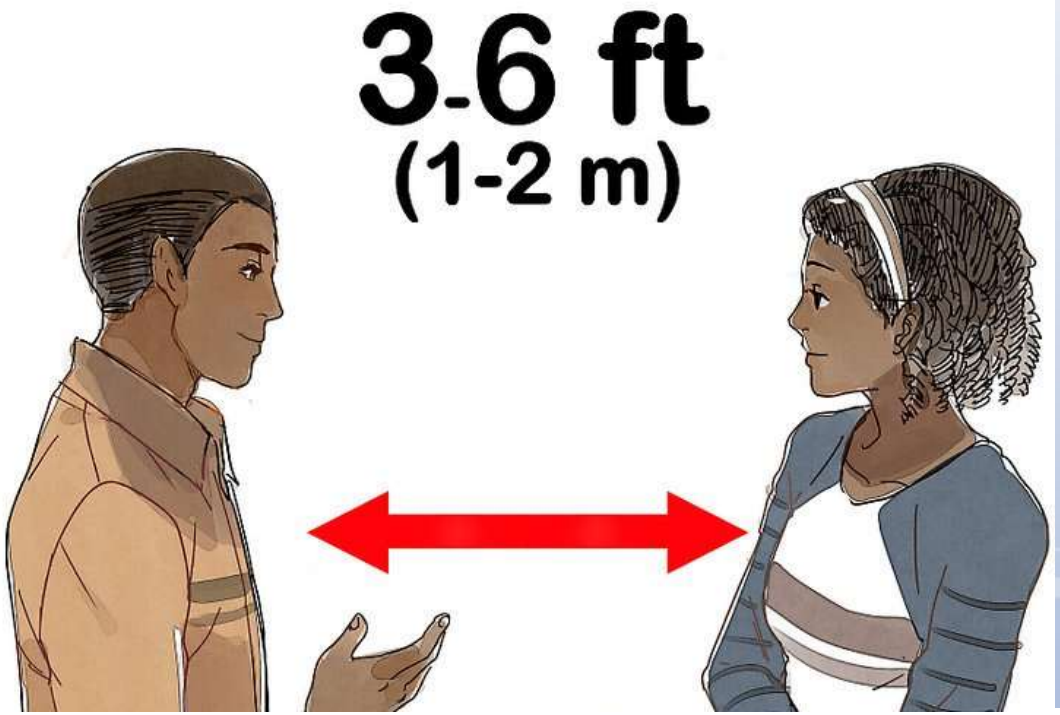
Comfortable Listening Distance



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Lipreading

- Even from a very young age children begin to recognise the lip patterns of familiar words. Deaf children tend naturally to try to lip-read when they are communicating, and to some extent we all do – especially in noisy conditions.
- It is estimated that only 30% to 40% of speech sounds can be lip-read even under the best conditions and extra information is usually required to understand what is being said.

The Impact of hearing loss on learning :

- causes delay in the development of receptive and expressive communication skills.
- Can cause learning problems that result in reduced academic achievement.
- Can lead to social isolation and low self -esteem.
- may have an impact on vocational choices.

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The social impact of hearing loss

Social interaction is largely dependent on language.

Children with a hearing loss miss:

overhearing conversations

entire conversations

parts of conversations

punch-lines to jokes…

This can lead to feelings of isolation, frustration, anger and withdrawal.

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Strategies to support good acoustics

Think what sources of noise are there in your classroom?

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Auditory Support - Acoustics

Ideal room (reduces reverberation)

- carpets
- low ceilings
- double glazed windows
- curtains or blinds

Simple Improvements to reduce reverberation

- soften hard areas with soft furnishings
- covers on tables
- rubber tips on chair legs
- fabric covered display boards
- mobiles

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Auditory Support – Noise Awareness

Internal noise

- Encouraging good behaviour
- Fan heaters
- Computers
- Projectors

External noise

- Close doors
- Close windows

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Auditory Support – Listening Effort

- Be aware of ‘listening effort’ which takes away from other cognitive functions such as reasoning and remembering.
- It can be tiring to listen, especially in a noisy situation. A child may ‘switch off’ at an inappropriate time.

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Visual Support - Positioning

Seating Position

- The student should be seated at the front of the class (front centre if possible)

Support for Lip-reading

- Face the student and get his/her attention before speaking

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Visual Support

- Reduce visual distractions
- Avoid exaggerated lip patterns
- Try to stand still
- Avoid covering your face or lips
- Ensure appropriate lighting

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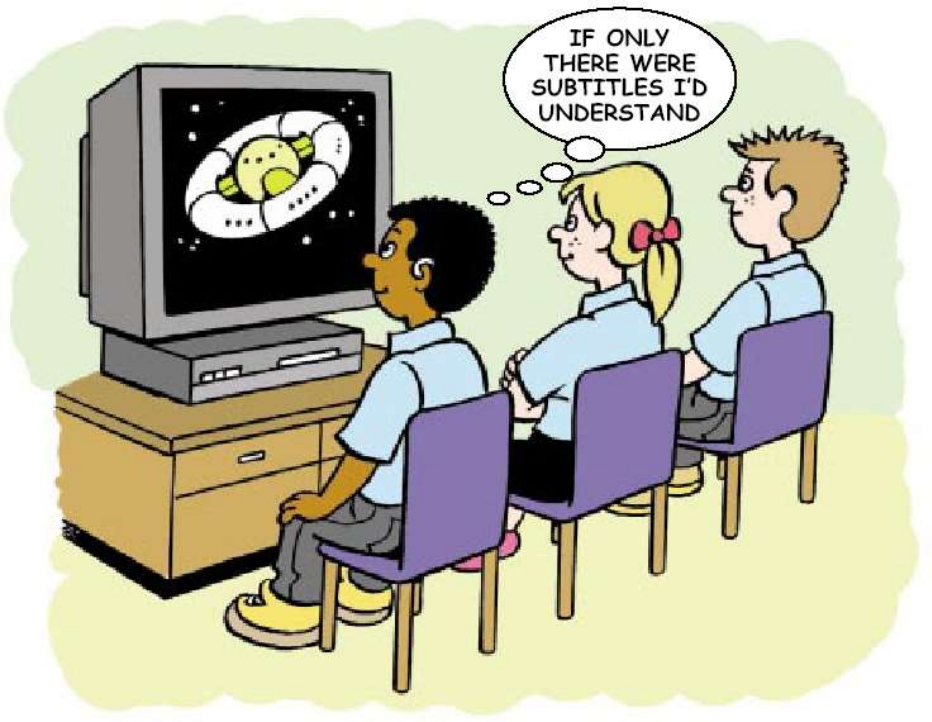
Visual Support



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Support for Understanding

- Write key words on board
- Write up lesson outline
- Use visual aids as much as possible
- Think of visual ways to clarify meanings of words

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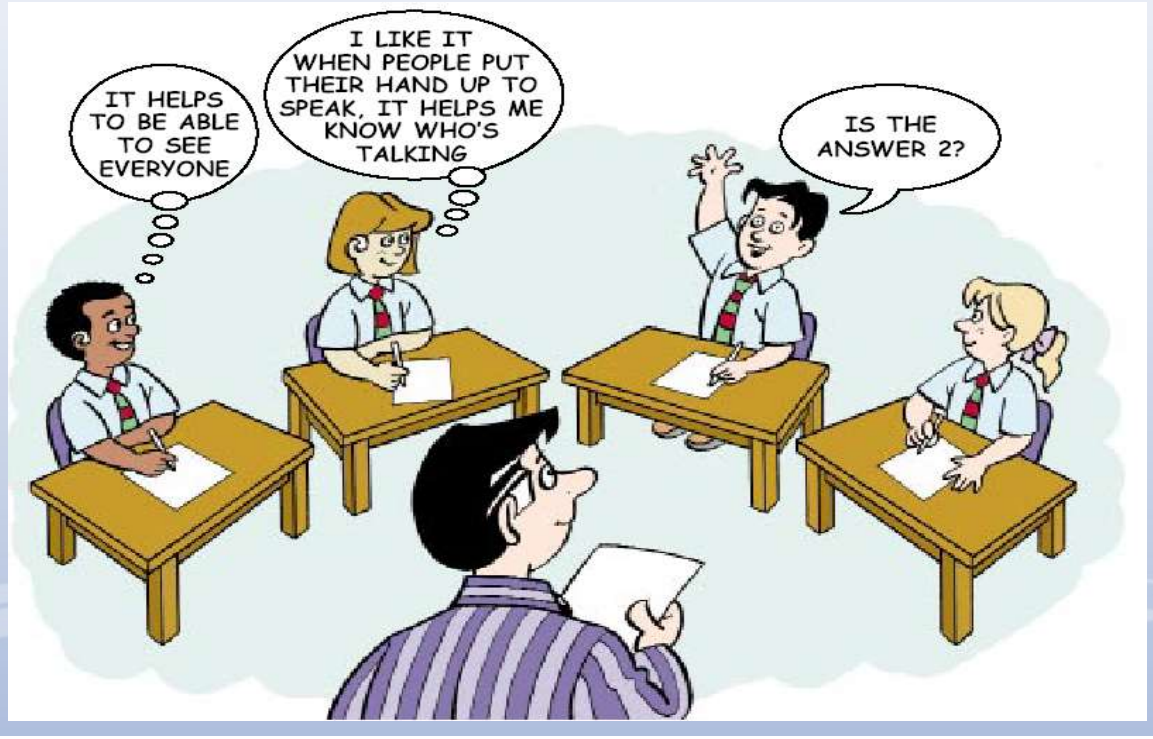
Support for Understanding



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Support for Understanding

Check understanding

- Better to ask *pertinent questions* than simply asking if student can hear. Very often students are unaware of what they have misheard or misunderstood or are too embarrassed to admit it.

- Check student is picking up group information and not just copying others.

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Social Support

Are other pupils aware they may need to get the student's attention or repeat what they have said?

Has the student got a friend/friendship group or do they need support to make one?

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Some thoughts and questions to keep in mind:

When deaf adolescents try to develop an identity…

- Are they able to communicate appropriately?
- Do they identify as hearing or deaf?
- With whom do they fit?

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Some more general deaf awareness tips…

- Get the young person's attention before starting
- Face the young person
- Make eye contact
- Speak clearly, at a natural pace – do not over-exaggerate your lip pattern
- Use an expressive face
- Use natural gestures
- Ensure your face is in good light
- Keep your mouth visible
- Make sure the young person knows the topic of conversation
- Do not switch to a new topic without warning
- Check the young person has understood you before continuing
- Speak one at a time

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Some useful websites & links…

- www.ndcs.org
- www.advancedbionics.com
- https://www.cochlear.com/uk/en/home
- www.earfoundation.org.uk
- www.successforkidswithhearingloss.com/

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