This topic tells you about your ears and how they work.

Your ears are very important. Think what it would be like if you could not hear people talking or music or the telephone ring or your pet dog bark. We all need to take care of our ears - the topic 'Ears - looking after your ears', will tell you how you can do this.

Some special words:
- vibration (vi-bray-shun)
- conductive (con-duk-tiv)
- noise
- cochlea (cok-lear)
- auditory (or-di-tor-y)
- sensory-neural (sens-ory new-ral)
- eustachian (you-stay-shun)
- antibiotics (anti-bi-otics)

See if you can work out what all these special words mean, when you read the next bit.

There are three parts to your ear
- Outer ear
- Middle ear
- Inner ear

Outer ear

These are the bits we can see, and also the ear canal. They act like a funnel to catch sound waves and direct them to the ear drum.

(A canal is a pathway for water, but the ear canal is a pathway for sound)
Middle ear

This is a small air-filled space on the inside of the eardrum. There are 3 tiny bones called ossicles in this part. They are called the hammer, anvil and stirrup (because that is what they look like).

When the sound waves move the eardrum, these bones move and pass on the vibration to the very much smaller oval shaped window of the cochlea (the bit that looks like a shell). The hammer is touching the ear drum so it shakes when the sound comes through, and the movement goes right through the anvil to the stirrup, which is touching the window of the cochlea.

Inner ear

The cochlea has fluid in it, which moves due to the vibrations and bends hairs on the outside of cells lining the cochlea. There are about 17,000 hair cells in each ear, so they really are tiny. They are not like the hair on your head.

Some of these hair cells (the 'inner hair cells') create an electrical impulse (signal), which is sent along the auditory nerve to the brain. Most of them (the 'outer' ones), however, are like tiny muscle cells, which react to the vibrations in the fluid by trembling and shaking; in this way they work like high quality amplifiers and make the vibrations much stronger and clearer for the smaller number of inner hair cells.

The brain then works out what you are hearing.

The semi-circular canals in your inner ear contain fluid too. They send messages to your brain to help you keep your balance when you move.

Hearing

If your ears are working well, you hear sounds all the time. You can’t switch your ears off, even when you are asleep.

Listening

When you really want to listen to something you tell your brain to concentrate on that sound. If your ears are healthy and are both working well, they can 'turn down' other sounds while you concentrate on what you want to hear.

If one ear isn’t working as well as the other then they can’t do this as well. If your outer hair cells have been damaged by too much loud noise, what you want to hear can get mixed up and smothered by the other sounds around.

With healthy ears you can choose what you want to listen to, but you can’t choose what you hear.

Understanding

Your brain sorts out the sounds and tells you what they mean.
Some people have problems understanding what they are hearing because their ears don't work well and they don't hear all the sounds. The brain does not get enough information to work it out, or the messages may be mixed up.

**Selective hearing**

Lots of mums and dads think that kids have this particular 'problem'. They think that you **select** (choose) what you are going to hear and what you definitely can't hear! Many mums say that dads do this too! In fact, this is something we may all do to try and make our lives a bit easier.

Some children wrote what they liked to hear and what they didn't like to hear.

**What I like to hear**

- My dog barking in his sleep.
- A friend saying, "Can you come and play?"
- Birds singing in the morning.
- "Let's go out for tea."
- I like my mummy saying that she loves me.
- I like to listen to music.
- "Do you want an ice-cream?"
- Mum saying goodnight.
- I like to hear the computer.
- I like to hear tea cooking.
- I like to hear dad saying, "Yes you can stay up later."

**What I don't like to hear**

- I don't like to hear very loud music.
- I hate to hear mosquitoes buzzing in my ears.
- Mum and dad arguing.
- People screaming.
- Chainsaws are too noisy.
- Mum saying it's time for bed.
- "You have to eat your vegetables."
- "Tidy up your room."
- People's fingernails scraping down the blackboard.

**What sounds do you like to hear?**

I know that there are times when you are concentrating so hard on something that you can shut out everything around you, but...

Do you pretend you haven’t heard sometimes - especially when it is something you don’t want to hear? Everybody does sometimes - even mums and dads!
Like every other part of your body, ears need looking after if they are going to work as well as they can.

**Dr Kim says**

Sometimes your ears feel funny when you are on a plane, going through a tunnel or driving up hills.

This is because there is air inside your ear drum and air outside. The pressure outside the ear changes when you go up high. You need to let more air into the inside of your ear or let some out to balance the air pressure on each side of your ear drum.

Try opening your mouth wide as if you are yawning, or chewing or blowing your nose. This lets air through the eustachian tube into the inner ear, your ears will feel like they go ‘pop’ and you will be able to hear normally again.

**Aren't ears wonderful?**

Catching soundwaves in the air.
Sending them along to where
The message gets through to your brain
Faster than the fastest train.
Sorting out what you want to hear
Whether the sound is far or near.
Wonderful music, nature's sounds
Birdsong, laughter and merry-go-rounds.
You wouldn't know when mum says, "Time for bed"
If you hadn't an ear on each side of your head.

*BH*